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Business Staff on Page 4

## NEXT WEEK...

Gear Generating Theory, Practice  
Million Pounds of Small Die Castings  
X-Raying Turbine Parts  
Controlling Oil-Fired Soaking Pits  
Training Metallurgical Engineers

# STEEL

The Magazine of Metalworking and Metalproducing

VOL. 119 NO. 25

DECEMBER 16, 1946

## NEWS

Steelworkers Prepare New Wage Demands	57
Coal Strike Leaves Industrial Scars; Steel Loss 1,500,000 Tons	59
Freight Rates Raised 17.6 Per Cent	60
Effect of Freight Rate Increase on Iron and Steel Being Studied	61
NAM Adopts Liberalized Labor Relations Policy at Convention	62
Metallurgists Discuss Stress Problems at New York Meeting	63
Restrictions on Issuance of Iron, Steel Priorities To Be Continued	64
Shipments of Steel Products Set New Postwar High	64
Industrial Machinery Builders View 1947 Outlook as Promising	65
★ Windows of Washington	66
British Steel Imports Fall Short	70
Broad Program Features Meeting of British Iron & Steel Institute	71
★ Mirrors of Motordom	73
★ Activities	76
Resumption of Activity on West Coast Seen Rapid	78
Southern California Industries Escape Serious Interruptions	79
★ Men of Industry	80
★ Obituaries	84
Shortages Back of Unbalance in Inventories	85
★ The Business Trend	146
★ Construction and Enterprise	170

## TECHNICAL

Gas Cyanide Method of Case Hardening	86
★ Seen and Heard in the Machinery Field	89
Salvaging and Reclaiming Scrap Yields Important Savings	90
A User Looks at Hydraulics	91
Wheels and Compounds for Buffing and Polishing—Part II	92
Lubricating Hot Strip Mills—Part II	94
★ Engineering News at a Glance	98
Diesel-Electric Power Propels Ore Carrier	100
Fabricating Aluminum Radiators	102
Russia Opens New Mines To Supply Kuznetsk Steelworks	104
Custom-Designed Power Units for Industrial Plants	107
Planing Cast Iron with Carbide Tools	108
Electropolishing Silver with Cyanide	110
Electric Steelmakers Consider Shop Problems	118
★ Industrial Equipment	122

## MARKETS

Upward Adjustments in Steel Prices Broadening in Scope	151
★ Market Prices and Composites	152
Leading Steel Producers Revise Sheet and Strip Prices Upward	158
★ Index to Advertisers	182

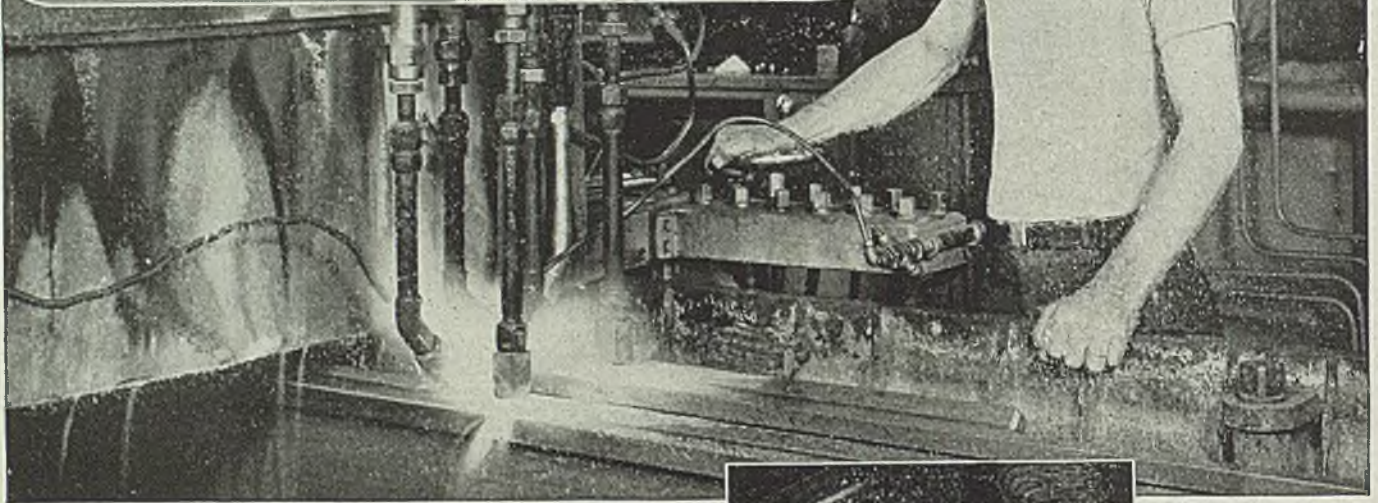
★—Denotes regular features.



35,000 Lathe Beds prove it!

**FLAME-HARDENED NICKEL IRON**

**CONQUERS WEAR**



During the past 5 years The Monarch Machine Tool Company has built more than 35,000 lathes.

So, they know a lot about lathes . . . and lathe beds, too.

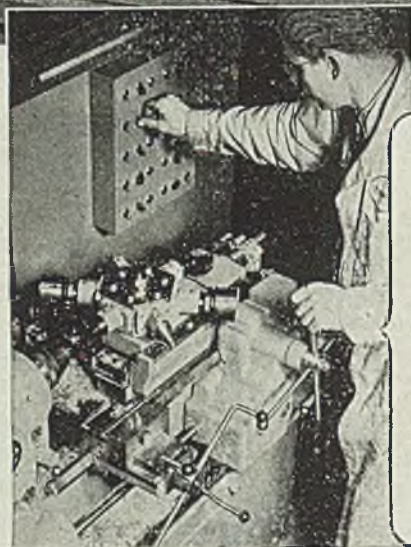
They know how to build beds that resist abrasion, scoring, wear . . . and maintain high accuracy to keep users' production costs low.

*That's why Monarch specifies Nickel alloyed iron for all beds.*

Experience shows good reason for this. For example, when their Nickel iron lathe beds, 8½ feet long, are flame-hardened to a depth of ⅛" to ¼", the warpage is only about 0.01". During finishing, this is ground off and final tolerance is only 0.0005".

The Nickel in the cast iron lowers the critical transformation range . . . thus, gives greater depth of hardness than in plain iron and minimizes distortion. Moreover, there is gradual blending of the flame-hardened layer into the softer pearlitic interior, whereas in unalloyed iron the transition zone is apt to be completely graphitized and hence extremely weak.

Consult us on the use of Nickel to meet your casting requirements. Send us details of your problems today.



*In this SPEED-MATIC hand screw machine, Monarch uses gears, shafts and pinions of Type 8749 Nickel alloy steel, along with flame-hardened Nickel cast iron beds.*

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**THE INTERNATIONAL NICKEL COMPANY, INC.** 67 WALL STREET  
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December 16, 1946

### Wrong Approach

This nation's experience with labor relations since V-J Day, culminating in the recent short-lived coal strike, has impressed all thoughtful citizens with the terrific cost of class warfare and with its futility as a substitute for true collective bargaining. In view of this costly lesson, the public has a right to hope that in the forthcoming negotiations between employers and the steel, automobile and electrical workers' unions both sides will go to the conference table with fair minds and with sincere determination to effect mutually satisfactory agreements.

Unfortunately, hope for negotiations on a higher plane is chilled by the curtain-raising stunt of Robert R. Nathan, ex-New Deal economist hired by CIO to make a study of wages and profits. Mr. Nathan has released a barrage of publicity to the effect that industry can grant substantial wage increases without increasing prices.

This is not a proper approach to the impending negotiations. It recalls the billion-dollar blunder of Henry Wallace who, after releasing an alleged "study" indicating that industry could increase wages sharply without increasing prices, let it ride until it had served its purpose in strikes in the automobile industry and then—after the damage had been done—repudiated the report in toto. Because of its similarity to the Wallace fiasco, the current Nathan approach reeks of bluff and insincerity. It goes back to the confusing issue of ability to pay. Its greatest weakness is that it asks for something for nothing.

A far better approach would be one in which the unions offer something for something. Their negotiators might well go to the conference table with this argument:

"Our men want higher wages because of the higher cost of living. During the past year employers have lost profits and our men have lost wages on billions of dollars of work that was not performed because of strikes and shortages of labor and materials. What we both need is continuous, uninterrupted operation at high levels that will permit efficient manufacture, promote lower prices and reverse the trend of the cost of living. Grant us a fair wage increase and in return we will work for increased productivity, reduced absenteeism, greater worker responsibility and the other things that are necessary for profitable operations."

This offer, if proposed sincerely, would make sense. It would deserve liberal consideration by employers. It would go far in relieving the pressure of public indignation over past union outrages. It would soften anti-union legislation.

• • •

**"EVOLUTIONARY THING":** Apparently the liberalized labor relations policy adopted by the National Association of Manufacturers at its recent meeting in New York has confounded numerous critics of that organization. Many left-wingers had been predicting that as a result of the recent elections, the old ultra-conservative bloc would gain new strength in NAM councils and the organization would pursue a more reactionary course.

Just the opposite has happened. How far NAM

is deviating from past attitudes is best illustrated by the comment of its incoming president, Earl Bunting, president of O'Sullivan Rubber Corp., that the change "is an evolutionary thing; it's more than an about-face, if it is an about-face. It is an abandonment of prejudices which some of us have held in the past. NAM principles now are aimed right down the middle of the road."

The transition which Mr. Bunting aptly terms an "evolutionary thing" is widespread. It does not pertain to NAM alone. It is reflected in the policies

(OVER)



# AS THE EDITOR VIEWS THE NEWS

and actions of nine out of ten business and professional organizations in the industrial field. It is the adjustment of executive thinking to the realities of the postwar world. It is a wholesome, evolutionary development which may figure prominently in strengthening the private enterprise system to a point where it can lead a chaotic world onto the road of peace and stability. —p. 62

**ICC DELAY IS COSTLY:** After a long delay, Interstate Commerce Commission has granted American railroads freight rate increases averaging 17.6 per cent over basic rates, effective Jan. 1. Although this action will increase the freight bill paid by shippers by nearly a billion dollars a year, the protests of railroad customers have been softened by the realization that the carriers for nearly a year will have incurred sharply increased payroll and other burdens with no adequate relief.

The sequence of events since President Truman stepped into the railroad labor impasse last May proves how unfair government procrastination can be. Because of the delay in rate revision 49 of the 130 Class I roads failed to earn interest and rentals, even with carry-back credits. Also, the roads carried more traffic this autumn than during the peak periods of the war years. They have been deprived of legitimate earnings on this record-breaking volume of business. —pp. 60, 61

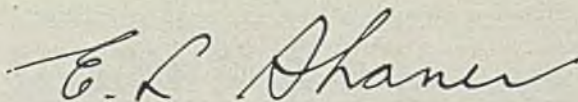
**"IMPORTED" SCIENTISTS:** Experience in connection with the 270 German and Austrian scientists and technical experts brought to this country some months ago has been so satisfactory that the War Department has decided to increase the number to approximately 1000.

The department states the work of these specialists "has proved especially valuable in fields where German technology has advanced beyond its American counterpart. The program promises to save two to ten years in American research because the Germans' earlier research has shown them many blind alleys to be avoided." The Germans and Austrians have been working principally in electronics, supersonics, guided missiles and jet propulsion, fuels and lubricants, diesel and turbojet engines, optics, synthetics and in other phases of applied physics and chemistry.

Interest of American manufacturers in the work of these scientists from abroad will be heightened by the announcement that the War Department now plans to release many of them to private industry, research laboratories and educational institutions.

—p. 66

**SIGNS OF THE TIMES:** Quonset hut armories are being erected in 89 localities by the U. S. Naval Reserve. Each unit (p. 67) consists of three 40 x 100 ft steel buildings set up side-by-side to provide a large enclosed area for training purposes. . . . A postwar inventory of iron and steel facilities in France indicates that nation has 108 blast furnaces with an average capacity of 300 tons per day making mostly basic iron, 59 stacks averaging 150 tons per day making other grades of iron, 92 bessemer converters averaging 25 tons in capacity, 142 open-hearth furnaces with capacities ranging from 10 to 120 tons, 80 electric arc furnaces with capacities up to 30 tons, 25 induction furnaces rated up to 1.5 tons and five crucible steelworks. Total capacity (p. 71) is 10,300,000 tons of pig iron and 13,010,000 tons of steel. Not all of this capacity is operable at present. . . . Estimated automobile production for the week ended Dec. 14 was 97,000 units (p. 73), which represents a new postwar peak and makes possible an output of 400,000 or more cars in December. . . . H. T. Johnson of General Motors, summarizing the experience of numerous GM plants with hydraulic equipment on machine tools (p. 91), states that while hydraulically operated tools have been greatly improved during the past year there is room for even greater improvement. One important advance, he declares, would be to make pumps, valves and piping more accessible so as to reduce maintenance costs and down-time "even in case of minor repairs." Another suggestion is that oil leakage be reduced through improved design and construction. . . . U. S. Maritime Commission on Jan. 8 will open bids on nine ships to be broken into scrap (p. 67), all of which are at foreign locations. Most of them are bomb, torpedo or mine casualties. It is estimated they will yield 54,000 gross tons of scrap. . . . A study of inventories by the National Industrial Conference Board concludes that the present situation is due largely to shortages of key materials or component parts (p. 85) which are bottlenecking industry's output, while materials in more abundant supply and goods in various stages of completion are piling up in plants and warehouses. . . . National Committee for Strengthening Congress, composed of eminent industrialists and others and headed by Robert Heller of Cleveland, opened offices in Washington (p. 67) to encourage teamwork between the President and Congress and discourage use of the filibuster.



EDITOR-IN-CHIEF





## The Scene Has Changed — But the Spirit Remains

This Christmas and the coming of the New Year brings us through our 104th year in the steel-service business. The plodding horses that carried our steel to an earlier generation of American manufacturers have passed from the scene. In their place, powerful trucks streak over the highways at speeds that would have seemed incredible not so long ago.

Similarly, the twelve Ryerson plants of today bear little resemblance to the tiny iron store where our business began in 1842. Carbon, alloy and stainless steels replace saddle tree, horse shoe, boiler and sheet iron in our stocks—and our methods have also changed to match the strides of industry through the past century.

But some things remain unchanged. The same driver who fastened a bit of holly on his team's harness to signify the Holiday Season, today may hang a sprig of holly in his truck. And after more than a hundred years, the same willingness to serve you is still the fundamental principle of our business.

Unchanged, too, is the meaning of Christmas. Today, as we move outward from the aftermath of history's greatest war, its symbol in words is more heartening than ever: Peace on earth and good will toward men.

Joseph T. Ryerson & Son, Inc. Steel-Service Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

# RYERSON STEEL



# Inland Buys War Plant

**—Will Aid  
Housing Program**



Another move in the Inland expansion program has just been completed with the purchase of a large government-owned blast furnace and coke plant adjoining Inland's Indiana Harbor plant.

This plant, including two blast furnaces, two batteries of coke ovens, a by-product plant and other auxiliary buildings and equipment, was built and operated by Inland for the government during the war. The reopening by Inland marks its first operation for pig iron production since shortly after VJ day.

At present, this production has

been pledged to NHA to help relieve one of the nation's biggest domestic problems . . . veterans' housing. However, when the veterans are served, it will be available to pig iron consumers generally.

This acquisition will not mean more steel today because there will be no immediate increase in steel finishing capacity. It will, however, serve as a base for increased steel production in the future. In the meantime you can be assured that Inland is producing as much steel as possible, and the same helpful metallurgical and engineering service is always available.

## INLAND STEEL CO.

38 South Dearborn Street, Chicago 3, Illinois

Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Paul, St. Louis



# Steelworkers Prepare New Wage Demands

*Union program expected to be formulated at Dec. 17-19 meeting in Pittsburgh. Nathan report may provide tipoff of CIO thinking on policy*

WITH the coal mine labor dispute temporarily out of the headlines, attention of industrialists now is focusing on impending labor developments affecting the iron and steel industry.

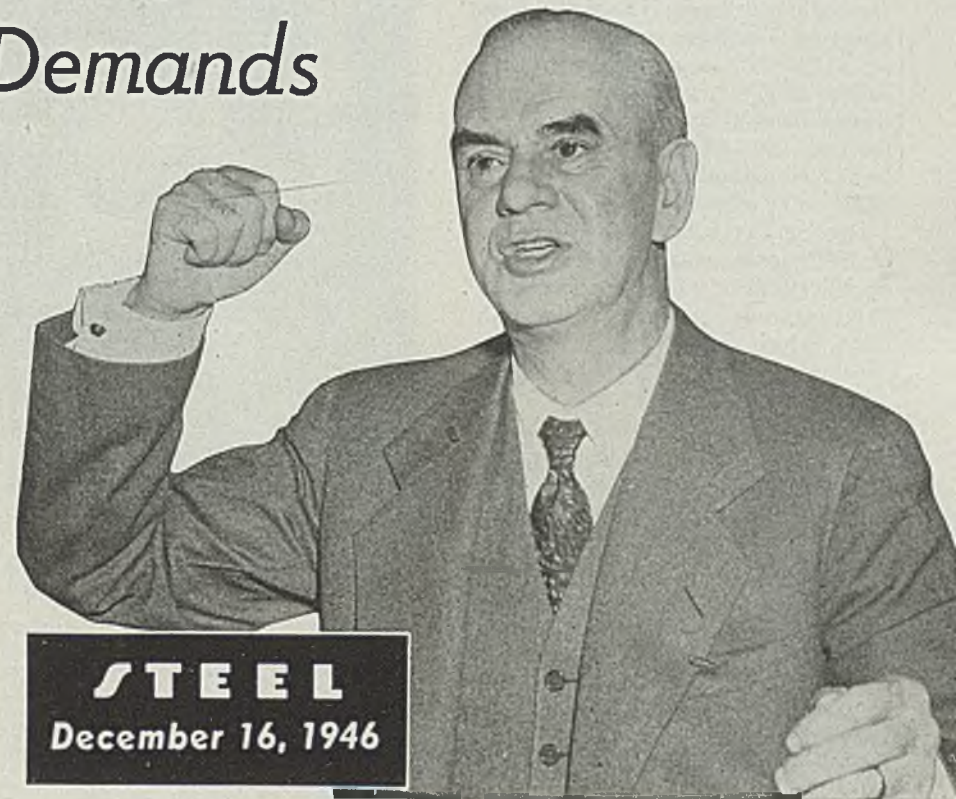
Looming ahead is the launching of negotiations for a new wage agreement between the United Steelworkers of America and the steel companies covering wages, working conditions, and other considerations including the guaranteed annual wage, health and welfare fund and union security. Present contracts with most steel companies expire in February.

For months past the steelworkers' union has been shaping its program, and expectations are this will be formulated at the meeting of the union's Executive Board and Wage Policy Committee at Pittsburgh Dec. 17, 18 and 19.

Significantly, at the same time the automobile workers' union and the electrical workers' union are holding policy conferences. These, in conjunction with a report on wages and profits by Robert R. Nathan, former New Deal economist retained by the CIO, are viewed as possibly providing the groundwork for developing a common wage yardstick for the mass production industries. This yardstick would be the guide in fixing wages on the basis of CIO economists' judgment as to how industry should share profits with labor.

That the union will ask for a wage increase is taken for granted. How much of an increase will be sought is not clear. However, ever since the recent CIO convention in Atlantic City at which a resolution on wages was adopted calling for "substantial" increases, it has rather generally been rumored that the steelworkers' union will seek an increase of at least 20 cents per hour. Such an increase would amount to almost 21 per cent over the present basic wage in the industry.

Significantly, at the CIO convention Philip Murray, president, announced that in preparing for the forthcoming wage negotiations the services of Mr. Nathan had been retained, to supplement extensive



studies under way by the union's own research department. Consequently, considerable importance attaches to a report issued last week by Nathan's organization, Robert R. Nathan Associates Inc., which is based on an analysis of the current economic situation and was made at the request of the CIO. The purpose of this report, which is signed by Mr. Nathan and an associate, Oscar Gass, is to provide a general economic background for wage discussions and settlements, though it is emphasized that responsibility for the research, analysis, and conclusions rests solely with the authors and is not to be imputed to the CIO.

However, the importance the CIO attaches to this report of Nathan was indicated by the manner in which it was presented to the public. The CIO official family, headed by Philip Murray, president, tendered a large group of newspapermen a formal luncheon at the Statler Hotel, Washington, last Wednesday at which Mr. Nathan fully explained his report and answered questions.

The Nathan report declares that seldom have we had such a combination of good business and bad psychology and it warns that the sharp drop in the purchasing power of the weekly pay envelope is seriously endangering the nation's economic fabric.

As a result of the increasing disparity between wages and prices, "workers in

*CIO President Philip Murray launches new drive for wage increases. NEA photo*

manufacturing can now buy only about four-fifths of the goods and services with their weekly pay that they could buy in January, 1945," the report states, adding: "On the average, in all manufacturing, an increase of about 21 per cent in weekly earnings—without any increase in prices—would have been required in October, 1946, to bring real weekly earnings back to the January, 1945, level. By the end of 1946, with the present trend of prices, an increase of about 23 per cent will be required."

The increases that Nathan mentions in his report represent an average for the industries in which CIO is immediately interested. In his detailed report Mr. Nathan concluded that to restore real wages to the January, 1945, level these percentage increases would be necessary: Durable goods, 27.5; automobiles, 28.4; steel, 25.7; electrical machinery, 17.6.

The report maintains that prices in the past five months have increased nearly as much as in the previous 50 months, and it holds that profits for the last half of 1946 are at all-time highs—far surpassing the best war years, and the records of 1929.

Further, it is stated, "on an after-



taxes basis—which is most relevant to the earnings of stockholders—corporate profits are approaching \$15 billion, fully one and a half times the level of the best war year. Corporate profits after taxes are now about one and three-fourths the volume of 1929 and three and three-fourths times as high as the average of the years 1936-39, it is claimed, holding that “for manufacturing corporations alone, on an after-taxes basis, the picture is very similar, with profits at the end of 1946, approaching an annual rate of \$8 billion; about 45 per cent above the best war year, one and three-fourths times as high as in 1929, and three and one-third times as high as the 1936-39 average.”

The report declares that it is obvious, from these profit returns that the 1946 wage increases could have been absorbed without raising the general level of prices and that the same obtains today.

The report continues: “Manufacturing corporations, without reducing their rate of return on net worth below the high level of 6.9 per cent earned in 1939, could grant wage increases of an annual value of about \$5.1 billion, which represents 21 per cent of the wages of all production workers. After granting such increases, manufacturing corporations would still earn about twice the average \$2½ billion profits earned in 1936-39 and almost as much as they earned at the war peak.

## Minimum Needs Cited

“The basic facts are clear,” states the report, “an increase of about 10 per cent in hourly earnings in manufactures is required at the end of 1946 to bring real hourly earnings back to the January, 1945, level; an increase of perhaps 23 per cent is required to bring real weekly earnings back to the January, 1945, level. An increase of about 17 per cent is required to meet the increase in the cost of living since the enunciation of the February, 1946, government wage policy.

“In manufacturing industries alone, the end of 1946 level of corporate profits after taxes will support a 21 per cent increase in the earnings of production workers without any further increase in productivity, without any further expansion in volume, and without reducing the return after taxes on net worth to a rate below that of 1936-39.

“In total corporate enterprise it may reasonably be conjectured that business can support a 25 per cent increase in wages on the same basis that manufacturing alone can support a 21 per cent increase.”

The report declares that these facts, obviously, do not apply to individual industries or firms.



*Smiles of these coal miners reflect happiness over their return to work after John L. Lewis called off the recent mine strike. These miners were returning to work at the Warden Coal Co. mine, Blythdale, Pa. NEA photo*

“The present imbalance between wages and profits is unsound,” the report continues. “It is not automatically self-terminating in a manner compatible with general economic stability. Rather, it is self-terminating through a recession. There is no evidence to date to indicate that business will cut prices prior to a depression in which unemployment, declining incomes and shrinking demands will make price declines unavoidable. This is too high a price for bringing wages and profits into sounder alignment.

## Says Wage Increase Is Essential

“The facts all lead to the conclusion that not only from the workers’ point of view, but also for the benefit of the whole economy a further substantial wage increase without a general price increase is possible, justifiable and essential.

“It would not do labor or the public or business any good for labor to forego the needed wage increases. Rather, raising wages without increasing prices appears to offer the only currently possible means of bringing about the kind of relationship which will avoid a serious decline in business activity.”

The report underscored the point that it did not suggest that a policy of major wage increases is in itself “sufficient to assure a continued stable and equitable expansion of economic activity.” It called for drastically altering tax and fiscal policies, curbs on monopolies and trade restraints, a “long-over-due” expansion of the social security system “for the maintenance of effective demand where the needs are greatest,” higher levels for minimum wages, and an “unequivocal

restatement of public responsibility for the maintenance of full employment and a renewed determination to co-operate with other nations in the achievement of this object.”

To what extent the Nathan findings will influence the Steelworkers’ union demands is uncertain. Experience of the unions the past year would seem to argue against the philosophy of higher pay without higher prices which formed the basis for union arguments in pressing for wage increases in late 1945 and early 1946. The Nathan report appears to be loaded heavily with this economic fallacy.

Persistence on the part of the union in pressing such a philosophy would likely result in another impasse in labor relations similar to that experienced early this year. And such would be contrary to the conciliatory attitude indicated by Mr. Murray at the CIO convention in November when he said, “There is no threat of a strike in the offing,” his words being taken as directed as much to industry as labor.

While the coming wage negotiations are demanding major attention, of more immediate and pressing concern to the steel industry is the move of the steelworkers’ union to collect for its members “portal-to-portal” pay. Last week so-called “portal-to-portal” pay of more than \$120 million for 120,000 steelworkers was claimed in federal court suits at Pittsburgh instigated by the CIO against two United States Steel Corp. subsidiaries, the Carnegie-Illinois Steel Corp. and National Tube Co. These suits are but the beginning of a nation-wide drive for “portal-to-portal” pay in the

(Please turn to Page 168)



# Coal Strike Leaves Industrial Scars; Steel Loss 1,500,000 Tons

*Mines operating at prestrike rate but disruptions caused by stoppage will be felt by metalworking companies throughout winter. Supreme Court to hear argument on contempt ruling against Lewis and miners' union on Jan. 14*

STEEL production regained 12 points to 72½ per cent last week following termination of the 17-day soft coal strike but still was 19 points under the prestrike level of 91½ per cent of capacity.

Total loss in steel ingot production as result of the coal strike will amount to approximately 1,500,000 tons. By the end of last week the loss had reached 1,350,000 tons and at least 150,000 tons more will be lost before all the furnaces suspended for lack of fuel resume.

Coal production rebounded quickly to approximately prestrike levels when the miners returned to work last Tuesday. The loss in coal production, estimated at 27 million tons, will have a disrupting effect on the economy throughout the winter; some of the restrictive measures forced by the coal strike are being continued (see page 64).

The losses in wages and industrial production as result of the mine strike run into millions of dollars. The coal miners themselves lost an average of about \$152 each during the latest stoppage, or more than \$60 million. This brings their loss in wages for the two coal strikes this year to an average of \$530 a miner or \$213 million total. In addition to the miners, thousands of steelworkers and other industrial employees were made idle.

Operating schedules at most metalworking plants held up fairly well during the coal strike, although shutdowns were beginning to appear before the walkout was ended. These companies will suffer their greatest loss in delayed steel deliveries caused by the disruption in steel-making plants.

The surrender of John L. Lewis to public and government pressure in ending the strike is difficult to appraise in its probable effect on future industrial wage demands and strikes. Some observers believe organized labor's hand has been weakened by Lewis' failure and that other unions will attempt to obtain wage concessions by persuasion rather than by threats of strikes.

Much will depend, of course, on the ruling of the United States Supreme Court in reviewing the contempt-of-court convictions of Lewis and his United Mine Workers. The high tribunal will hear arguments by the government and union

counsel in the case on Jan. 14.

Whatever action is taken by the Supreme Court, negotiations between the coal mine operators and the union are expected to be resumed sometime after the

first of the year. Just when the negotiations will start will depend to large extent on when the government initiates a movement to return the mines to the owners. The government is expected to issue a formal invitation to Lewis and the operators to reconvene in time to explore their differences before next March 31, the date to which Lewis has said the miners will continue at their jobs.

Leaders of the next Congress have indicated that the coal strike makes more imperative new legislation to restore quality of power, rights and responsibilities between labor and management and to restrain the "monopolies" now exercised by the big labor unions.

## Present, Past and Pending

### ■ CONSUMERS FORM COMPANY TO OPERATE APOLLO PLANT

CHICAGO—Apollo Mfg. Co. has been organized by 23 steel consuming companies to operate the plant formerly operated by Apollo Steel Co., Apollo, Pa., and recently sold to Irving Grayson, Detroit attorney, who has leased it to the new company. Operation will start immediately and all output, estimated at 10,000 tons of sheet monthly, will be used by the member companies. Officers of Apollo Mfg. Co. are: President, Arnold H. Maremont, executive vice president of the Maremont Automotive Industries Inc., Chicago; vice presidents, D. M. Houghton, chairman of the Atlas Tack Co., Fairhaven, Mass., and Frank J. Gibson, president of the Gibson Refrigerator Co., Greenville, Mich.; treasurer, Bernard Mitchell, president of the Mitchell Mfg. Co., Chicago; secretary, Bernard Nath, Chicago attorney.

### ■ GENERAL MOTORS INCREASES OUTPUT

DETROIT—Despite the coal strike General Motors Corp. maintained a steady pace in passenger car production in the week ended Dec. 7, actually increasing output by 1129 units over the previous week. GM passenger car production in the week was 30,938 units, approximately 77 per cent of average weekly GM output in the 1941 model year.

### ■ STEELWORKERS UNION SUED FOR CONTRACT BREACH

BUFFALO—Charging breach of a collective bargaining contract, the New York Car Wheel Co. has filed suit for \$750,000 damages against the United Steelworkers of America, CIO, as result of a strike which started Oct. 22, when workers refused to submit to physical examinations. The company charges the union broke its contractual no-strike clause.

### ■ PITTSBURGH STEEL BUYS ALLENPORT PLANT

PITTSBURGH—Pittsburgh Steel Co. has purchased from the War Assets Administration the facilities for production of cold-drawn seamless tubing at its Allenport, Pa., plant. The company, which paid \$361,996 for the facilities, has been operating the plant under a lease arrangement.

### ■ WILL OFFER MAGNETIC WIRE RECORDING MACHINE

ROCHESTER, N. Y.—A magnetic wire recording machine for home use will be placed on the market within the next six months by the Stromberg-Carlson Co., it was reported last week. The machine records by magnetizing a fine stainless steel wire of which 7200 feet may be wound on a spool.

### ■ AUTO MERGER BY KAISER REPORTED

DETROIT—Reports were current in financial circles last week to the effect a merger of Graham-Paige Motor Corp. into the Kaiser-Frazer Corp. has been virtually completed.

### ■ BLAW-KNOX BUYS FACILITIES FROM NAVY

PITTSBURGH—Blaw-Knox Co. has purchased from the Navy improvements installed at its Martins Ferry, O., plant during the war at a price of \$301,170. Plant was acquired by Blaw-Knox from the Carnegie-Illinois Steel Corp. and manufactured Bofors antiaircraft guns for the Navy. Peacetime use of the plant has not been disclosed.



# Freight Rates Raised 17.6 Per Cent

General over-all increase authorized by ICC as of Jan. 1. Reflects mounting labor and operating costs. Further boost may be necessary

FREIGHT rate increases averaging 17.6 per cent over basic rates, and aggregating nearly \$1 billion additional in annual freight charges to shippers, will go into effect Jan. 1. The increase, it is said, represents about 1 per cent of the value of commodities transported.

Acting on the railroads' request for relief, the Interstate Commerce Commission, after months of consideration, authorized the increase and also made permanent the 10 per cent boost in passenger fares which was granted in February, 1942, and which was scheduled to expire six months after legal termination of the war.

The new rates compare with an average of 19.6 per cent requested by the roads on all traffic. Originally the carriers had asked for a general 25 per cent hike, but numerous exceptions were indicated specifying lesser increases on particular products.

As a result of the increase just granted, the interim boost of about 6.5 per cent in rates authorized last June is cancelled. Under the new arrangement the increase for the eastern railroads will amount to approximately 17.9 per cent while that for carriers elsewhere will amount to 17.4 per cent.

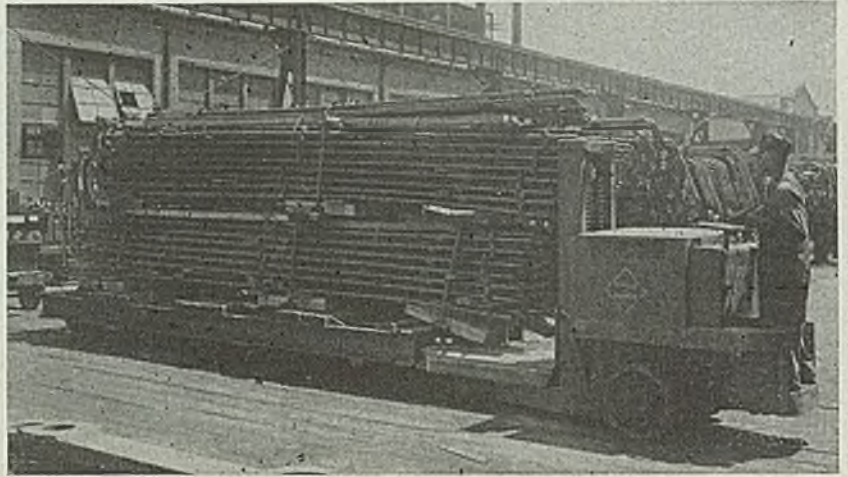
## Based on National Interests

In announcing its decision the ICC said the increases are needed for carrying out national transportation policy, and co-ordination and preservation of the transportation system adequate to meet national needs.

The increases authorized for long-haul services are on a general basis of 20 per cent for commodities other than those specially treated and 15 per cent for the basic products of agriculture (except fruits and vegetables) and livestock. An elaborate system of maximum increases was approved for various commodities, such as fruits and vegetables.

Rates were increased on iron and steel products, but no increase was approved in upper Superior rail rates on iron ore. On coal, blocks of flat increases, varying with the basic rates, were authorized.

Analyzing the railroads' financial position, the ICC pointed out the increasing wage and raw material costs with which



**HELPS RAILROADS:** Helping a railroad work at top speed in rehabilitating equipment is this electric power industrial truck produced by the Elwell-Parker Electric Co., Cleveland. The truck is pushing a dolly loaded with boiler tubes from a store yard to a locomotive repair shop

the railroads are contending. General increases in railroad wages in 1941, 1943 and in 1946 amounting to \$1,382,000,000 annually, and increases resulting from vacations with pay amounting to \$75 million annually, have had the effect of increasing operating costs \$1,457,000,000 annually, the commission pointed out.

Increased pay roll taxes on the higher wages are computed at \$82,920,000 a year, it said, and effective Jan. 1 the additional pay roll tax resulting from the Crosser Act will cost the railroads \$90 million or more a year.

"On the basis of 1946 purchases, increased costs due to increases, since 1939, in the prices of materials and supplies, including fuel, are estimated to be \$537 million a year," the ICC said, adding:

"The cumulative effect of the increases for wages, vacations, pay roll taxes, materials and supplies, as estimated by the petitioners (the railroads), that have occurred in the period from 1939 to 1946, as applied to the 1946 operations, is at the rate of \$2,166,920,000 per year."

While the increase in rates will not cancel losses already sustained by the roads, expectations in railroad circles are that they may put operations on a reasonably profitable level provided no further hikes are forced in wages and operating costs.

Excepting the emergency increase of around 6.5 per cent made effective on July 1, last, there has been no change in the rate structure since the outbreak

of the war in Europe in 1939.

On the basis of the present wage scale and cost of materials, the railroads estimate that on anticipated operations for next year, the annual increase in operating costs since 1939 will be \$2,176,240,000. The annual increase in the wage bill will be \$1,404,000,000 plus an additional \$174,240,000 to cover pay roll taxes on wage increases and the further pay roll levy provided in the Crosser Act. The vacations with pay granted employees in 1942 and 1944 will cost an added \$77 million. The increased cost of materials, supplies and fuel will be \$521 million.

It is estimated that nearly one-half of the total increase in cost, or slightly more than \$1 billion represents additional costs that the industry has experienced since the first of this year.

For the first ten months of this year the estimated net income of the 130 Class 1 railroads in the United States was \$155 million after interest and rentals. This figure included tax carry-back credits of \$85 million, leaving net income from operations of \$70 million. In the period forty-nine railroads failed to earn interest and rentals even in the tax carry-back credits. In the similar period of 1945, the Class 1 railroads had reported a net income of \$473,196,438.

Recently there have been indications that the railroad unions would seek another increase in wages. In addition there are pending changes in working rules which, if granted in their entirety, would



add tremendously to the annual wage bill. At the time of the last wage rise, however, the brotherhoods agreed to hold these demands in abeyance for a year, which means that they may not be considered until next June.

## Higher Bids Received for South Chicago Steel Plant

Bids on the \$91 million government-owned steel plant at South Chicago, Ill., were opened by the War Assets Administration with offers from the principal bidders being raised somewhat over previous figures.

Republic Steel Corp., operator of the plant, tendered two purchase offers—one of \$27 million cash in full on closing of the contract, the other offering a total of \$35 million over a 20-year period. Republic's previous bid had been \$30 million.

Philip D. Fitzgerald, acting on behalf of the Chester J. Clark & Associates syndicate of Chicago, offered \$33 million over 12 years, raising his bid from \$28,250,000. His offer included a statement of the syndicate's intention to spend up to an additional \$22 million for plant expansion over a period of 20 months.

Bid of C. A. Depue, president, Central Steel Tube Co. Inc., Clinton, Iowa, was raised to \$20 million, from an original offer of \$19,230,000.

Kaiser-Frazer Corp. withdrew its original lease offer in the latest bidding on the grounds that it thought it probable that the government would not act on the property's disposal by the time K-F needed the plant. Also declining to bid for the plant was John W. Turkovich, Detroit war veteran, who bid more than \$20 million in September.

Republic, in addition to its two purchase offers, made a lease proposal providing for the following minimum cumulative rentals per year: The first year, \$750,000; second year, \$875,000; subsequent years, \$1 million. The lease would run for ten years, with the right to renew for not less than five years and not more than 25. Included in the lease proposal were specified amounts to be paid the government on tonnage production.

Mr. Fitzgerald's bid contained an interesting feature, the explanation of a proposal which has been tendered to Philip Murray, president, Congress of Industrial Organizations and United Steelworkers of America, whereby the CIO would be assigned a seat on the board of directors of the operating company and would be given an unspecified amount of capital stock of the new company, stock dividends to be paid to the CIO for distribution among its members employed in the South Chicago plant.

## Effect of Freight Rate Increase On Iron and Steel Being Studied

*Tariff to be increased 20 per cent subject to a maximum of 10 cents per 100 pounds. Percentage method of raising rates accentuates freight absorption for Pittsburgh steel mills shipping to East and the Detroit area*

THE EFFECT of the increased freight rates, which become effective Jan. 1, on iron and steel shipments was being studied by industry traffic managers last week.

The carriers' rates were increased on iron and steel products, but no increase was approved in the Upper Lake Superior rail rates on iron ore. On coal, blocks of flat increases, varying with the basic rates, were approved. The full 25 per cent asked by the roads was approved for various special services.

An increase of 12 cents per ton was ordered on iron ore, gross or net as rated, except on rates to upper lake ports, or handling charges to those ports.

The same increase was ordered on furnace slag, fluxing stone, alumina bauxite ore and concentrates. The commission established increases of 20 per cent, and a maximum of not over 10 cents per 100 pounds, but not in excess of \$2 per net or gross ton, on aluminum ingot, pig or slab, comparable to the rates on iron and steel products. The same increase applies on aluminum bars, castings, pipe, sheet ware and articles.

The commission authorized an increase of 20 per cent, subject to a maximum of 10 cents per 100 pounds, on the following: Pig iron, iron and steel rated sixth class, not otherwise scheduled; rails, fastenings, frogs and switches; cast iron pipe and fittings; iron and steel pipe and fittings, not otherwise scheduled; iron and steel nails and wire, not woven; iron and steel rated fifth class, not otherwise scheduled; railway car wheels, axles, trucks; scrap iron and scrap steel.

Coal and coke constitute the most important group of commodities handled by railroads, comprising about 35 per cent of originated freight tonnage and yielding about 20 per cent of the roads' revenue in the prewar years 1939-41, and about 15 per cent during the war years, 1942-45.

Iron and steel commodities are collectively the third ranking group in importance to the roads, according to commission findings, as to tonnage, and second most important, as to revenue.

However, 19 steel companies, comprising in terms of ingot capacity about 75 per cent of the so-called independents,

had protested that such an increase would be excessive as applied to billets and articles taking the same rates, also as to scrap iron and steel.

Freight rates for movement of coal by rail will be advanced as follows: Fifteen cents per net ton and 17 cents per gross when freight rate is \$1 or less; for over \$1 to \$2.25 freight rate the increase is 25 and 28 cents per net and gross ton, respectively; when over \$2.25 freight rate, the advance amounts to 30 and 34 cents.

Fluxing stone freight rates will be increased 15 cents a net or gross ton.

### Will Accentuate Freight Absorption

The percentage method of increasing freight rates will accentuate the freight absorption for steel mills at Pittsburgh on shipments to the East and Detroit areas. On shipments from Pittsburgh to New York, for example, the rail rate will be increased from 38 to 43 cents per 100 pounds, while from Bethlehem, Pa., to New York the new rate will be raised from 17 to about 20 cents.

On the old basis Pittsburgh district mills had to absorb 19 cents per 100 pounds for those products based at Bethlehem on shipments to New York, but under the new freight structure freight absorption will amount to about 23 cents, or an increase of 4 cents.

On shipments into the Detroit district the freight absorption on products based at Cleveland will be increased 2 cents per 100 pounds. The same increase on freight differential applies on shipments from Chicago to Detroit on which Cleveland is governing basing point.

### COMPARATIVE FREIGHT RATES ON STEEL

(Cents per 100 pounds)

	Old Rate	Present Rate	New Rate
Pittsburgh to New York	38	40	43
Bethlehem to New York	17	19	20
Pittsburgh to Detroit...	29	33	35
Cleveland to Detroit...	22	24	26
Chicago to Detroit....	28	32	34

In railroad circles the belief was expressed that the improved financial position of the carriers expected to result from the freight rate boost will enable them to accelerate their equipment rehabilitation program. The carriers are desperately in need of hundreds of thousands of new cars.



# NAM Adopts Liberalized Labor Relations Policy at Convention

*Advocates co-operation with labor, high wages based on high productivity, stable employment, and sincere effort to make collective bargaining work. Earl Bunting elected president, succeeding Robert R. Wason, who became chairman*

COMMENTING on the National Association of Manufacturers new liberalized labor relations policy, adopted at its recent convention in New York, Earl Bunting, president, O'Sullivan Rubber Corp., Winchester, Va., and newly elected president of NAM, said that, "It's an evolutionary thing; it's more than an about-face, if it is an about-face. It is an abandonment of prejudices which some of us have held in the past. NAM principles are now aimed 'right down the middle of the road.'"

With respect to some manufacturers who wanted an outright repeal of the Wagner Act, Mr. Bunting said it was natural there should be different viewpoints among 16,000 manufacturers.

He said he believed one of the greatest faults in the Wagner Act was in its one-sided administration and he would hate to see it repealed before another law to take its place had been enacted.

In a statement of labor policy, NAM urged employers to encourage a spirit of co-operation with labor, high wages based on high productivity and incentives for superior output, good working conditions, as great a degree of stabilization of employment as possible and sincere efforts to make collective bargaining work. Also, it opposed in line with the position of American Federation of Labor, compulsory arbitration as "inconsistent with American ideals" and destructive of genuine collective bargaining.

## Nine Principles Set Forth

In addition, NAM in its statement of policy set forth nine principles:

Unions as well as employers to be required by law to bargain collectively in good faith.

Unions as well as employers to be required by law to adhere to the terms of collective bargaining contracts.

Union as well as business monopolies in restraint of trade to be prohibited.

Legal protection of employers as well as employees in the right to express their positions in labor disputes, and denial of protection to strikes not called by majority votes in secret ballots.

Outlawing of jurisdictional and sympathy strikes; strikes against the government; strikes to force employers to ignore

or violate the law, to recognize an uncertified union, to accept featherbedding or other work-restrictive demands; secondary boycotts.

Prohibition of mass picketing and any other form of coercion or intimidation.

No collective bargaining with foremen or other representatives of management.

Outlawing of the closed shop and other forms of compulsory union membership, as well as prohibition of interference with voluntary membership.

Establishment of free collective bargaining with a minimum of government interference, and impartial administration of improved laws to advance the interests of the whole public while safeguarding the rights of all workers.

H. E. Humphries Jr., chairman of the finance committee of the United States Rubber Co., a member of the NAM Government Finance Committee, and of the NAM Tax Council, intro-

duced the fiscal report. Besides the immediate 20 per cent tax reductions for individuals, he proposed reductions for business and individuals effective Jan. 1, 1948, with the following main points:

Reduction of six percentage points in corporate tax rates.

Overall limitation of 50 per cent on individual income taxes.

Elimination of double taxation on individual income taxes.

Exemption of intercorporate dividends from tax.

Repeal of 2 per cent penalty tax on consolidated returns.

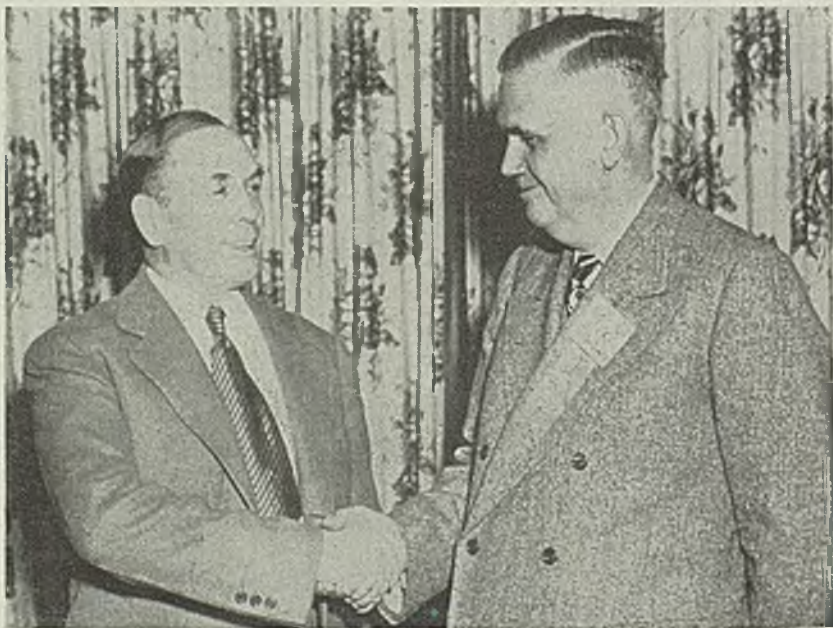
Substitution of six-year carry-forward of net business losses for present two-year carry-back and carry-forward.

## Cut in Federal Spending Urged

The fiscal report said that its purpose, besides relieving the tax burden, was to restore the government's financial integrity and promote the continued growth and development of the nation's economy. It urged the reduction of federal expenditures during the first six months of 1947 to offset any decline in receipts due to lowering tax rates, and tighter Congressional control of spending.

Mr. Bunting succeeds Robert R. Wason as president of the association. Mr. Wason automatically became chairman of the board. Mr. Bunting is 53 and has been an NAM director for a year.

Three directors-at-large to serve two-



NAM'S NEW PRESIDENT: Earl Bunting, right, president of the O'Sullivan Rubber Corp., Winchester, Va., is the newly elected president of the National Association of Manufacturers. Here he is shown being congratulated by the outgoing president, Robert R. Wason, president of Manning, Maxwell & Moore Inc., New York. NEA photo



year terms were elected. They were Harvey C. Fruehauf, president, Fruehauf Trailer Co., Detroit; John L. McCaffrey, president, International Harvester Co., Chicago; and Gwilym A. Price, president, Westinghouse Electric Corp., Pittsburgh.

Elected state directors for 1 year were: Arizona-New Mexico—Oscar C. Palmer, president, Palmer Mfg. Corp., Phoenix; California—John A. McCone, president, Joshua Hendy Iron Works, San Francisco, Lane D. Webber, vice president, Southern California Edison Co. Ltd., Los Angeles; Colorado—John G. Gates, secretary, Gates Rubber Co., Denver, and Carl A. Norgren, president, C. A. Norgren, Denver; Connecticut—John H. Chaplin, president, Veeder-Root, Inc., Hartford; Georgia—A. B. Edge Jr., president, Callaway Mills, LaGrange; Indiana—Guy A. Wainwright, president, Diamond Chain Co. Inc., Indianapolis; Maryland—Donovan R. Beachley, president, Beachley-Reichard Furniture Co. Inc., Hagerstown.

Massachusetts—Henry M. Bliss, president and treasurer, Pacific Mills, Boston; Michigan—C. C. Carlton, vice president, Motor Wheel Corp., Lansing; Minnesota—Walter M. Ringer, president, Foley Mfg. Co., Minneapolis; New Jersey—Charles P. Gulick, president, National Oil Products Co. Inc., Harrison, and Hubert F. O'Brien, president, A. P. Smith Mfg. Co., East Orange; New York—Norman J. Gould, president, Goulds Pumps Inc., Seneca Falls, and Edgar F. Wendt, president, Buffalo Forge Co., Buffalo.

North Carolina—Thurmond Chatham, chairman, Chatham Mfg. Co., Elkin, and T. O. Moore, vice president, P. H. Hanes Knitting Co., Winston-Salem; Ohio—J. C. Argetsinger, vice president, Youngstown Sheet & Tube Co., Youngstown; Pennsylvania—Ward M. Robinson, vice president and general manager, Talon Inc., Meadville; Rhode Island—Frederick S. Blackall Jr., president and treasurer, Taft-Peirce Mfg. Co., Woonsocket, and Norman D. MacLeod, president, Abrasive Machine Tool Co., East Providence; Tennessee—E. W. Palmer, president, Kingsport Press Inc., Kingsport.

Texas—William R. Archer, president, Uncle Johnny Mills, Houston; Washington—E. W. Daniels, president, Harbor Plywood Corp., Hoquiam, George Gunn Jr., president, Kirsten Pipe Co., Seattle, and Walter M. Leuthold, president, Deer Park Lumber Co., Deer Park; Wisconsin—James E. DeLong, president, Waukesha Motor Co., Waukesha; Idaho, Montana, North Dakota, South Dakota and Wyoming—A. B. Cobb, president, Home Oil & Refining Co., Great Falls, Mont.

## Metallurgists Discuss Stress Problems at New York Meeting

*Use of new instruments, equipment and methods in developing initial tests of steel and other metals provides subject material at annual session of Society for Experimental Stress Analysis. R. D. Mindlin heads organization*

NOTEWORTHY at meetings of the Society for Experimental Stress Analysis was greater attendance by metallurgists, and taking part in discussions and symposiums at the three-day annual session, New York, Dec. 9-11, were more metallurgists than usual.

Use of new instruments, equipment and methods in development of initial tests directed at stress problems involving steels and other metals held attention. In numerous instances investigation has reached a point in stress analysis where commercial application is apparently not far distant. In some, improved design, as in the case of weight-saving in an automotive wheel rim with better performance, commercial production has arrived.

Citing differences in temperature ranges and cooling rates in commonly used specifications, J. R. Stitt, the R. C. Mahon Co., Detroit, describes experiments with test specimens covering effect of temperature gradients upon the introduction of residual stresses in weldments, castings and roll formed structures. Residual stresses introduced by too rapid cooling after otherwise adequate thermal stress-relieving treatments are measured. While definite conclusions are not yet set forth, interest created indicates a stimulation of research in cooling of such shapes.

### Piston Testing Equipment Described

Development and use of equipment by Caterpillar Tractor Co., Peoria, Ill., is made possible by carrying electrical leads in a coil spring housing, one end following motion of the piston with the other end fastened to the engine block. To prevent breaking or whipping, the cable is supported in two small parallel guides. Possible future applications were suggested by W. A. Wallace and W. A. Casler.

This device is small enough to permit use without disturbing normal operations of the engine; strain gage, thermocouple and other electrical measurements on the piston and connecting rod are made possible and the equipment permits the obtaining of operating stresses and temperatures on diesel engine pistons and connecting rods.

Detection of vibratory strains in high-speed, high-temperature turbine blades under operating conditions, portends broader application of this apparatus in the other vibration problems. A method used by the National Advisory Committee for Aeronautics, Cleveland, was outlined by S. S. Manson, R. H. Kemp and W. C. Morgan. Wire resistance strain gages are employed, including a high-temperature gage to detect vibration in a modified turbosupercharger during operation.

Application of fine wire in regions of high stress as a means of detecting incipient fatigue failure was discussed by Henry W. Foster, Lockheed Aircraft Corp., Burbank, Calif.; in fatigue testing of large structures it is essential to determine development of fatigue cracks as soon as possible. Due to rupture of the wire following development of a minute crack, it is possible to detect local failure in early stages.

With an electric strain gage as a tool aid for designing automotive wheel rims, an improvement in design makes possible a saving of approximately 18 per cent in weight and a somewhat stronger rim by virtue of reduction in stress concentrations. This was reviewed by C. L. Eksergian, Budd Wheel Co., Detroit. A wheel rim is not readily subject to theoretical analysis due to complex and intermediate system of loading; road tests are cumbersome and time-consuming while fatigue tests simulating road conditions are subject to error and influenced by the particular material under test.

By resorting to the electric strain gage with static systems and degrees of loading embracing road conditions, actual stresses in critical sections resulting therefrom are readily obtained. This permits a rim design in which optimum sections in critical areas are employed to provide a more completely mean average stress.

R. D. Mindlin, Columbia University, was elected president; C. O. Dohrenwend, Midwest Research Institute, vice president, and named to executive committee for two years were I. G. Hedrick, Gruman Aircraft Corp., and R. E. Peterson, Westinghouse Electric Corp.



# Restrictions on Issuance of Iron, Steel Priorities To Be Continued

BAN on issuance of priorities on iron and steel, except for serious emergencies affecting the public health and safety or national welfare, is still in effect despite resumption of coal mining.

Civilian Production Administration ordered the temporary halt in the issuance of priorities, effective Dec. 9, because of dwindling production resulting from the work stoppage in the coal mines. Officials of the agency point out that as a result of the recent curtailment in production of iron and steel, supplies will remain well below the volume on which priorities had been established.

Other emergency measures which remain in full effect include: A cutback on merchant pig iron preference ratings for December delivery; permission to steel warehouses to reject large steel or-

ders; and the establishment of a ceiling of 25 per cent of production on rated orders which the steel mills must honor after Dec. 31, 1946.

Outstanding steel priorities amount to only about 10 per cent of overall normal steel production, CPA said. However, priorities for individual critical products, such as light gage sheet steel, amount to 40 to 50 per cent of production of some mills.

Because certifications and directives for pig iron to be delivered in December were issued on the basis of normal production, Civilian Production Administration will issue individual directives to producers permitting them to reduce the amount of merchant pig iron which they have scheduled for delivery during December on certified orders.

Warehouses are permitted to reject all steel orders, whether rated or unrated, calling for delivery of more than 10,000 pounds of steel in any one product classification where "delivery of the orders would seriously impair the warehouses' function in distribution of steel."

## October Steel Shipments Set Postwar High Mark

Finished steel shipments in October reached a new postwar high, statistics of the American Iron & Steel Institute show.

Movement that month totaled 5,675,339 net tons, highest since May, 1945, and exceeded September shipments by 680,962 tons. The October total represented 95.8 per cent of effective finishing capacity, while the September tonnage represented only 86.5 per cent.

Shipments in the first ten months of 1946 totaled 42,825,887 tons, representing 73.7 per cent of effective finishing capacity. In the corresponding

## Shipments of Steel Products Set New Postwar High

AMERICAN IRON AND STEEL INSTITUTE CAPACITY, PRODUCTION AND SHIPMENTS											
Period OCTOBER - 1946											
Steel Products	Number of companies	Items	Maximum Annual Potential Capacity Net Tons	Current Month				To Date This Year			
				Production		Shipments (Net Tons)		Production		Shipments (Net Tons)	
				Net Tons	Per cent of capacity	Total	To members of the industry for conversion into further finished products	Net Tons	Per cent of capacity	Total	To members of the industry for conversion into further finished products
Ingot, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	xxxx	xxxx	xxx	386,714	164,042	xxxx	xxx	2,988,107	1,362,466
Structural shapes (heavy)	12	2	9,421,550	395,466	53.4	387,302	xxxx	2,815,834	38.1	2,814,648	xxxx
Steel piling	4	3		32,180		31,190	xxxx	176,807		158,540	xxxx
Plates (sheared and universal)	29	1		17,080,770		472,276	32.5	486,456	24.8	3,528,614	216,565
Skelp	6	5	xxxx	xxxx	xxx	56,711	24,165	xxxx	xxx	350,432	159,970
Rails—Standard (over 60 lbs.)	4	6	3,657,000	215,225	69.3	213,671	xxxx	1,473,361	48.4	1,435,893	xxxx
—All other	5	7	392,000	10,084	30.2	12,613	xxxx	117,125	35.9	120,353	xxxx
Splice bars and tie plates	13	8	1,745,960	60,488	40.8	59,332	xxxx	508,708	35.0	531,531	xxxx
Track spikes	11	9	349,400	16,015	53.9	15,560	xxxx	114,602	39.4	119,186	xxxx
Hot Rolled Bars—Carbon	34	10	xxxx	756,966	xxx	629,768	80,407	5,658,036	xxx	* 4,624,196	583,790
—Reinforcing—New billet	15	11	xxxx	93,044	xxx	115,531	xxxx	777,261	xxx	858,603	xxxx
—Reinforcing—Hot rolled	12	12	xxxx	13,240	xxx	12,902	xxxx	114,356	xxx	115,717	xxxx
—Alloy	24	13	xxxx	207,459	xxx	175,568	11,469	1,445,076	xxx	* 1,212,658	104,263
—TOTAL	41	14	22,326,160	1,070,709	56.4	933,769	91,876	7,994,729	43.0	6,811,374	688,053
Cold Finished Bars—Carbon	24	15	xxxx	141,771	xxx	139,129	xxxx	1,070,035	xxx	1,062,070	xxxx
—Alloy	23	16	xxxx	21,351	xxx	19,227	xxxx	181,206	xxx	161,804	xxxx
—TOTAL	31	17	2,851,510	163,122	67.3	158,356	xxxx	1,251,241	52.7	1,223,874	xxxx
Tool steel bars	19	18	262,810	8,786	39.3	8,133	xxxx	83,758	38.3	80,379	xxxx
Pipe & Tubes—Butt weld	14	19	2,215,520	149,270	79.3	130,675	xxxx	1,151,367	62.4	1,073,781	xxxx
—Lap weld	9	20	730,200	32,656	52.6	31,712	xxxx	231,342	38.0	246,525	xxxx
—Electric weld	10	21	1,536,900	88,599	67.9	76,530	xxxx	641,430	50.1	551,020	xxxx
—Seamless	13	22	3,169,600	232,414	86.3	201,595	xxxx	1,801,955	68.3	1,582,294	xxxx
—Conduit (cap. & prod. incl. above)	6	23	xxxx	xxxx	xxx	12,501	xxxx	xxxx	xxx	80,287	xxxx
—Mech. tubing (cap. & prod. incl. above)	12	24	xxxx	xxxx	xxx	44,724	xxxx	xxxx	xxx	356,373	xxxx
Wire rods	26	25	7,293,670	476,441	76.9	107,340	37,796	3,617,598	59.5	852,767	293,571
Wire—Drawn	41	26	5,742,890	377,532	77.3	215,381	11,199	2,863,057	59.9	1,650,589	112,610
—Nails and staples	19	27	1,259,760	68,907	64.4	68,360	xxxx	442,191	46.9	492,239	xxxx
—Barbed and twisted	16	28	543,010	20,389	44.2	19,314	xxxx	172,660	38.2	170,293	xxxx
—Woven wire fence	16	29	1,121,060	36,735	38.6	36,994	xxxx	313,932	33.6	315,242	xxxx
—Bale ties	13	30	149,700	11,031	86.7	11,530	xxxx	76,747	61.5	80,501	xxxx
Black Plate—Ordinary	9	31	xxxx	xxxx	xxx	77,848	49	xxxx	xxx	608,813	1,326
—Chemically treated	8	32	465,000	12,761	32.3	10,276	xxxx	105,267	27.2	101,692	xxxx
Tin and Terne Plate—Hot dipped	9	33	3,758,850	183,462	57.4	174,743	xxxx	1,506,736	48.1	1,588,118	xxxx
—Electrolytic	9	34	2,231,850	82,344	43.4	78,053	xxxx	728,626	39.2	733,093	xxxx
Sheets—Hot rolled	31	35	19,785,320	1,476,281	87.8	700,107	45,790	11,261,983	68.3	5,087,816	342,512
—Cold rolled	14	36	7,309,460	575,123	92.6	438,520	xxxx	4,482,844	73.6	3,259,276	xxxx
—Galvanized	16	37	2,924,130	139,234	56.0	140,236	xxxx	1,159,311	47.6	1,194,487	xxxx
Strip—Hot rolled	25	38	7,180,030	270,886	44.4	178,237	20,485	2,012,838	33.7	1,282,969	197,260
—Cold rolled	34	39	3,067,450	139,173	53.4	133,332	xxxx	1,088,411	42.6	1,053,433	xxxx
Wheels (car, rolled steel)	5	40	315,400	24,006	89.6	22,847	xxxx	197,794	75.3	201,646	xxxx
Axles	6	41	398,170	15,484	45.8	13,831	xxxx	108,092	32.6	102,760	xxxx
All other	3	42	169,510	4,669	32.4	846	xxxx	36,582	25.9	5,079	xxxx
TOTAL STEEL PRODUCTS	143	43	xxxx	xxxx	xxx	5,675,339	414,507	xxxx	xxx	42,825,887	3,374,343
Effective steel finishing capacity	143	44	64,648,000	xxxx	xxx	xxxx	xxxx	xxxx	xxx	xxxx	xxxx
Percent of shipments to effective finishing capacity	143	45	xxxx	xxxx	xxx	95.8%	xxxx	xxxx	xxx	73.7%	xxxx

\* Adjusted.



period of last year shipments aggregated 52,740,917 tons, representing 85.5 per cent. The 1945 figure exceeds that of 1946 largely because of heavy war shipments in the first half of the former year and because shipments in the first half of 1946 were held down by strikes.

### Coal Strike Causes Drop In Steel Ingot Output

Suspension of steelmaking furnaces as a result of the coal strike late in November caused that month's steel ingot production to drop to the lowest level since June, when the industry was just recovering from the April-May coal strike.

November production totaled 6,378,606 net tons of ingots and steel for castings, according to the American Iron and Steel Institute. In October a peacetime record of 6,909,597 net tons (revised) was established.

For the first 11 months of this year ingot production totaled 60,631,782 net tons. This figure exceeds production for the first 11 months of any previous peacetime year.

### STEEL INGOT PRODUCTION STATISTICS

Based on reports by companies which in 1944 made 97.6% of the open hearth, 100% of the bessemer and 85.8% of the electric ingot and steel for castings production

	Open Hearth		Estimated Production—Bessemer		All Companies—Electric		Total		Calculated weekly production all companies	Number of weeks
	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.		
1946										
Jan. ....	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053	4.43
Feb. ....	1,300,944	20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129	4.00
March ....	5,946,698	86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859	4.43
1st qtr. ...	10,775,732	53.8	597,366	47.0	398,520	29.4	11,771,618	51.9	915,367	12.86
Apr. ....	5,333,139	79.8	286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028	4.29
May ....	3,699,979	53.6	153,409	35.0	219,064	46.9	4,072,452	52.2	919,289	4.43
June ....	5,145,594	77.0	251,253	59.2	227,979	50.4	5,624,826	74.4	1,311,148	4.29
2nd qtr. ...	14,178,712	69.9	690,750	53.7	688,074	50.1	15,557,536	67.9	1,195,814	13.01
1st 6 mos. ...	24,954,444	61.9	1,288,116	50.4	1,086,594	39.8	27,329,154	59.9	1,056,403	25.87
July ....	6,016,253	87.4	365,332	83.6	228,083	48.9	6,609,668	84.9	1,495,400	4.42
Aug. ....	6,251,271	90.6	373,837	85.4	261,755	56.0	6,886,863	88.2	1,554,597	4.43
Sept. ....	5,911,375	88.6	371,465	87.8	235,054	52.1	6,517,894	86.4	1,522,872	4.28
3rd qtr. ...	18,178,899	88.9	1,110,634	85.6	724,892	52.3	20,014,425	86.5	1,524,328	13.13
9 mos. ...	43,133,334	71.0	2,398,750	62.2	1,811,486	44.0	47,343,579	68.9	1,213,938	39.00
Oct. ....	6,268,102	90.8	387,933	88.6	253,562	54.3	6,909,597	88.5	1,559,728	4.43
Nov. ....	5,797,258	86.7	318,096	75.0	263,252	58.2	6,378,606	84.4	1,486,855	4.29
1945										
Jan. ....	6,469,340	90.5	379,062	76.0	355,910	76.8	7,204,312	88.8	1,626,256	4.43
Feb. ....	5,968,326	92.4	347,227	77.1	337,212	80.6	6,652,765	90.8	1,663,191	4.00
Mar. ....	6,927,939	96.9	398,351	79.8	379,639	81.9	7,705,929	95.0	1,739,487	4.43
1st qtr. ...	19,365,605	93.3	1,124,640	77.6	1,072,761	79.7	21,563,006	91.5	1,676,750	12.86
Apr. ....	6,541,627	94.5	372,952	77.2	375,308	83.6	7,289,887	92.8	1,699,274	4.29
May ....	6,664,117	93.2	402,100	80.6	383,450	82.7	7,449,667	91.8	1,681,640	4.43
June ....	6,129,763	88.5	379,807	78.6	330,952	73.7	6,840,522	87.1	1,594,527	4.29
2nd qtr. ...	19,335,507	92.1	1,154,859	78.8	1,089,710	80.0	21,580,076	90.6	1,658,730	13.01
1st 6 mos. ...	38,701,112	92.7	2,279,499	78.2	2,162,471	79.9	43,143,082	91.0	1,667,688	25.87
July ....	6,318,975	88.6	381,832	76.7	284,764	61.6	6,985,571	86.3	1,580,446	4.42
Aug. ....	5,172,344	72.3	347,088	69.5	215,885	46.6	5,735,317	70.7	1,294,654	4.43
Sept. ....	5,435,799	78.7	352,247	73.2	193,829	43.3	5,982,475	76.3	1,397,775	4.28
3rd qtr. ...	16,927,118	79.9	1,081,767	73.1	694,478	50.5	18,703,363	77.8	1,424,475	13.13
9 mos. ...	55,628,230	88.4	3,361,266	78.5	2,856,949	70.0	61,846,445	86.6	1,585,806	39.00
Oct. ....	5,146,787	72.0	242,122	48.5	207,867	44.8	5,596,776	69.0	1,283,381	4.43
Nov. ....	5,641,308	81.5	358,664	74.2	200,494	44.7	6,200,466	78.9	1,445,330	4.29
Dec. ....	5,523,277	77.4	343,266	68.9	191,394	41.4	6,057,937	74.8	1,370,574	4.42
4th qtr. ...	16,311,372	76.9	944,052	63.8	599,755	43.6	17,855,179	74.2	1,358,842	13.14
2d 6 mos. ...	33,238,490	78.4	2,025,819	68.5	1,294,233	47.1	36,558,542	76.0	1,391,646	26.27
Total ...	71,939,602	85.5	4,305,318	73.3	3,456,704	63.4	79,701,624	83.5	1,528,608	52.14

For 1945 percentages are calculated on weekly capacities of 1,614,338 net tons of open hearth, 112,658 tons of bessemer and 104,640 tons of electric ingots and steel for castings, total 1,831,636 tons; based on annual capacities as of Jan. 1, 1945 as follows: Open hearth 84,171,500 net tons, bessemer 5,874,000 tons, electric 5,455,890 tons.

For 1946 percentages are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of Jan. 1, 1946, as follows: Open hearth 81,236,250 net tons, bessemer 5,154,000 net tons, electric 5,500,290 net tons, total 91,890,540 net tons.

## Industrial Machinery Builders View 1947 Outlook as Promising

PROSPECTS for the machine tool and machinery industries are considered encouraging for the months ahead as 1946 nears a close. This view prevails among machinery builders despite the fact that since last April a month-to-month decline in new orders has been under way.

Materials and components shortages, strikes among large users of machine tools and other hindrances to all-out industrial production have served throughout the past year to hold demand for new equipment in check. Various large projected industrial expansion programs have been deferred also, while offerings of government surplus machinery at bargain prices have interfered to some extent with sales of new equipment.

Removal of all of these hindrances to active demand for new equipment is not likely. Labor troubles are anticipated in industry at least in the early months

of 1947 but indications are the situation will be less acute than was the case early in 1946. Materials shortages will continue to be contended with but they are expected to be less acute, permitting manufacturing programs to proceed at a more satisfactory pace. Then, government surplus stocks of machinery are likely to be pretty well liquidated within the next few months.

All of which spells encouragement to machinery interests, who, generally speaking, feel a large volume of business will develop when the economy gets back onto the track.

In connection with plant expansion, a recent statement by Ewan Clague, commissioner of the Bureau of Labor Statistics, Department of Commerce, is highly significant of the tremendous need for industrial equipment. Speaking at a meeting of the Society for Advancement of Management, Mr. Clague predicted that expenditures for new plant and equipment by American manufacturing and mining companies during the final two quarters of the current year will exceed \$3 billion. Comparing such expenditures with past figures, he said:

"Expenditures for new plant and equipment by manufacturing and mining companies increased from \$760 million in the second quarter of 1945 to \$1,500,000,000 in the second quarter of 1946. Expenditures planned for the balance of 1946 are even higher than the second quarter rate. The total for this year will probably be two and one-half times as great as the prewar annual rate."

### Fair Demand for Machine Tools Reported at St. Louis

St. Louis — Demand for new machine tools here continues fair, with most of the new plant needs filled and most sales now involving expansion projects and some replacement.

Surplus declarations remain as a curb on the market although there have been no big government sales here recently.

Potential buyers of new equipment, however, often defer placing new orders until the surplus market is thoroughly scoured. This tendency is aided by delays in new tool deliveries which remain, in general, six to eight months on heavy items and three months on light. Some specific small items, however, are much more quickly available.

The coal strike and rail embargo had no local effect.



*Contribution of "imported" German and Austrian scientists to nation's technical knowledge so satisfactory War Department plans to increase number in country to 1000. Many may be released to private industry and research laboratories*

SO SATISFACTORY has been the utilization of 270 German and Austrian scientists and technical experts brought to the United States last year and early in 1946 (STEEL of Sept. 30, 1946, p. 42), the War Department announces it has decided to increase the number to approximately 1000 as soon as arrangements can be made for their transportation.

In addition, "wider avenues of research have been opened to them." Furthermore, the War Department now plans to release many of these Germans to private industry, research laboratories and educational institutions.

"Their singular freedom with the store of knowledge accumulated during years of intensive research has proved especially valuable in fields where German technology has advanced beyond its American counterpart," says a department spokesman. "The program promises to save two to ten years in American research, since the Germans' earlier research has shown them many blind alleys to be avoided."

The German scientists are being utilized principally at this time in the fields of electronics, supersonics, guided missiles and jet propulsion, fuels and lubricants, diesel and turbojet engines, optics, synthetics and in other aspects of applied physics and chemistry.

"It is estimated," the spokesman said, "that the American taxpayer has been saved, through utilization of the Germans' knowledge and experience, a minimum of \$750 million in basic rocket research alone."

Here are some of the special assignments on which groups of the Germans now are at work:

A highspeed, lightweight diesel engine as a prime mover for locomotives, with emphasis on low fuel consumption, minimum maintenance expense, and minimum use of critical materials;

Improved parachutes of the "ribbon" type which can be used as aircraft landing brakes;

Improved equipment for the production and fabrication of light metals—to include hydraulic presses, rolling mills for cold-rolling, double-action hammers, etc.;

Compilation of a new book to prescribe methods for short-cutting the development of airplanes of the future;

Development of an improved method of air map photography;

Perfection of a supersonic wind tunnel for experimental research in aircraft design;

A study of the latest techniques for production of synthetic gasoline from coal.

The German scientists and technical workers are in the United States at a top salary at \$3120 in U. S. currency plus \$6 a day living expenses. Many of them already have taken the initial step toward becoming United States citizens. In the meantime, all of them are under continuous observation although many have won the right to "honor system" freedom under which, at certain times and under certain conditions, they are permitted to visit communities close to the places where they are employed.

## RFC Loans for Housing

Backtracking on its original position,

the Reconstruction Finance Corp. agreed to honor the request of the housing expediter for loans to six companies to enable them to produce prefabricated houses, or prefabricated building materials and members, for the veterans housing program.

The loans, and the companies obtaining them, are:

Clements Corp., Southport, Conn., \$1,100,000, for the production of 2500 prefabricated steel houses in the calendar year 1947;

Laminated Wood Products Co., Knoxville, Tenn., \$130,000, for production of 3-ply hardwood flooring;

Interlocking Walls Corp., Los Angeles, \$69,000, for production of precast reinforced concrete panels and partitions;

General Panel Corp., Los Angeles, \$1,500,000, for production of 8000 prefabricated steel homes in 1947;

Knox Corp., Thomson, Ga., \$1 million for production of 6000 prefabricated plywood homes in 1947;

Continental Basic Materials Co., Chulavista, Calif., \$100,000, for production of \$3 million square feet of lightweight concrete aggregate, to be used in constructing 4500 homes in 1947.

While the RFC thus has agreed to loan



**AIDS AMERICA NOW:** Dr. Theodor Wilhelm Zobel, German scientist whose talents once were the property of the German Luftwaffe but who now works at Wright Field laboratories, Dayton, O., under contract with the U. S. War Department, is engaged in work on the interference-Schlieren method of photographing airflow over airplane surfaces. Careful study of airflow characteristics is essential to development of high speed planes.

NEA photo



\$3,899,000 as asked, it has not yet rescinded its denials of four other loan requests which come to many millions more. It has asked the Stone & Webster Engineering Co. to investigate two of these cases and report. One involves Higgins Inc., New Orleans, which would build 10,000 prefabricated steel houses if it could get a loan of \$11 million. The other involves Reliance Homes Inc., Lester, Pa., which wants a loan of \$15 million to get started on production of 31,000 prefabricated steel houses.

So far the RFC continues to refuse consideration of the request to loan somewhere between \$32 and \$52 millions to the Lustron Corp., Chicago, to implement a plan to make use of the Dodge-Chrysler airplane engine plant at Chicago to produce 30,000 porcelain-enameled steel houses. This plant, which cost the government \$171 million, has been promised to the Tucker Corp. which plans to use it to manufacture a new make of automobile and, despite urgent requests by Wilson Wyatt, just resigned as housing expediter, the War Assets Administration has refused to cancel its deal with the Tucker company. Outcome of this quarrel is up to President Truman for decision.

The remaining loan on which the RFC denial still stands would place at the disposal of General Homes Inc., Columbus, O., several millions for starting production of prefabricated aluminum houses.

Two loan requests were withdrawn by the housing expediter. These involved \$800,000 for Western Gypsum Inc., Sigurd, Utah, and \$500,000 for Vacuum Concrete Corp., Philadelphia.

## To Keep Congress on Track

If members of the eightieth Congress show signs of going astray when they begin to organize along lines of the new "Legislative Reorganization Act of 1946" there will be a committee of businessmen and other citizens on hand to help them get back on the track.

This new group is known as "The National Committee for Straightening the Congress" and it has opened headquarters at 1435 K Street N. W., Washington 5, D. C. Its chairman is Robert Heller, Cleveland industrial engineer, chosen because of his leadership in the field. His report "Strengthening the Congress" which he prepared for the National Planning Association in 1944 is widely credited as furnishing the inspiration out of which grew the Legislative Reorganization Act of 1946.

Other members are Winthrop W. Aldrich, chairman, Chase National Bank of New York; Edward B. Farley, chairman, American-Hawaiian Steamship Co.;

Paul G. Hoffman, president, Studebaker Corp.; Ernest C. Kanzler, president, Universal Credit Corp.; Fowler McCormick, chairman, International Harvester Co.; Thomas A. Morgan, chairman, the Sperry Gyroscope Co.; Beardsley Ruml, chairman, R. H. Macy & Co.; H. Christian Sonne, president, Amsinck, Sonne & Co.; Charles E. Wilson, president, General Electric Co.; Raymond Rubicam; also publishers and editors of a number of newspapers, and representatives of a number of labor unions, church, women's and other organizations.

The committee will work toward these additional immediate objectives:

1—"The President and Congress must work together. A mechanism must be set up which will encourage teamwork. The best way to get teamwork is to establish Majority and Minority Policy Committees in both houses; only if the Congress can itself create clear policy can it hope to collaborate effectively with the President."

2—"The filibuster must be ended. In a period when there are many obstacles to getting things done on time, we cannot afford to let a selfish few obstruct. Honest debate should lead to an honest vote in the Senate. The time has come for a frontal attack on the filibuster."

## Armed Forces Unification

Chances for achieving unification of the armed services in the eightieth Congress are considered good. So far this long-discussed idea has not been placed on the legislative agenda considered by the Senate Republican Steering Committee. But it can scarcely be avoided when the matter of appropriations comes up, for to skin the combined Army-Navy-Air Forces budget down to \$10 to \$12 billion, as now contemplated, will force elimination of duplication of overhead and other expense to the bone.

The move also will get a lift if the eightieth Congress, in line with plans of the Republican leadership, organizes in accordance with the Legislative Reorganization Act of 1946. Instead of the old Committees on Naval and Military Affairs, there will be a Committee on Armed Services in each house. That automatically would eliminate a lot of committee rivalry which has influenced congressional actions in the past.

Several merger bills will be introduced but chances are they will not differ in such a way as to create any deep controversy. At present there is considerable support for S. 2044 which was approved by the Senate Military Committee in the seventy-ninth Congress and which probably had a Senate majority's approval.

This bill would have created a single Department of Common Defense, under

a civilian secretary who would be a member of the President's cabinet. Under this man and his immediate staff would be three equal branches—Army, Navy and Air, with the Marine Corps continuing as an integral part of the Navy. The bill also would create a strategy group to be known as a Council of Common Defense. It would comprise the secretaries of State and Common Defense, the three service secretaries, and the chairman of a new National Security Resources Board.

## Erecting Quonset Armories

The Naval Reserve is erecting Quonset hut armories in 89 localities throughout the country. Three of the large, 40 by 100 ft steel buildings are set up side-by-side and thus provide a large enclosed area for training reserves.

The Quonsets, named for the Naval Air Station at Quonset Point, R. I., now are being produced in several sizes for industrial, commercial, farm and emergency housing purposes by the Stran-Steel Division, Great Lakes Steel Corp., Detroit.

## Will Review Standards

The dependence which the armed forces place on the Aircraft Industries Association again has been demonstrated by a new policy just announced by the Aeronautical Board. This is composed of representatives of Army Air Forces and the Navy's Bureau of Aeronautics. The board, through the association, will submit all new and revised Army-Navy Aeronautical standards or specifications for review and comment by the aircraft industry before their final issue. The work will be handled by the AIA's Aircraft, Engine and Propeller technical committees.

In addition, the board is setting up arrangements for similar assistance from manufacturers of accessory equipment and structural components, and to this end now is actively in contact with the Society of Automotive Engineers, American Institute of Bolt, Nut & Rivet Manufacturers, Screw Industry Standards Committee, Tire and Rim Association and the Radio Manufacturers Association.

## More Ships Up for Scrap

The next opening of bids on ships to be broken into scrap, to be held by the Maritime Commission on Jan. 8, will be unusual in that the nine craft involved are all at foreign locations. Most of them are bomb, torpedo and mine casualties, while several are beyond repair following accidents at sea.

They are located off Anzio, Naples and San Giovanni, Italy; Piraeus, Greece; St. Nazaire, France; Campleton, Scotland; and Okinawa. Scrap contained in them is estimated at 54,000 gross tons.



# NEW CINCINNATI HYDRO-TEL

## has everything you need in a general purpose miller!

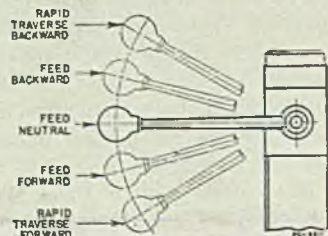
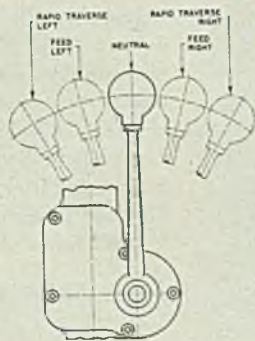


Quick selection of spindle speeds. Selected by rotation of a single crank, easily reached while standing at the front of the machine. One rotation of crank changes speed one increment.

Easy and quick selection of feeds, through dial controls, while standing in the operating position at the front of the machine.



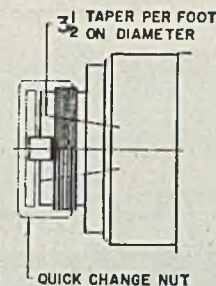
Five position levers for table (right) and cross traverse (below) offer quick movements for both setting up and operating the machine... power rapid traverse to table and cross slide at the rate of 120 inches per minute.



CINCINNATI 16" Vertical Hydro-Tel for general purpose milling. Mechanical and electrical controls can all be reached from operator's working position without walking or stretching.



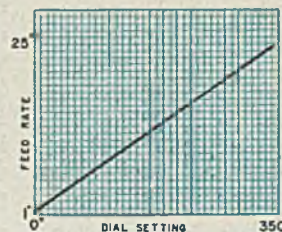
The spindle nose incorporates a quick change feature... you can change cutters in 20 seconds or less.



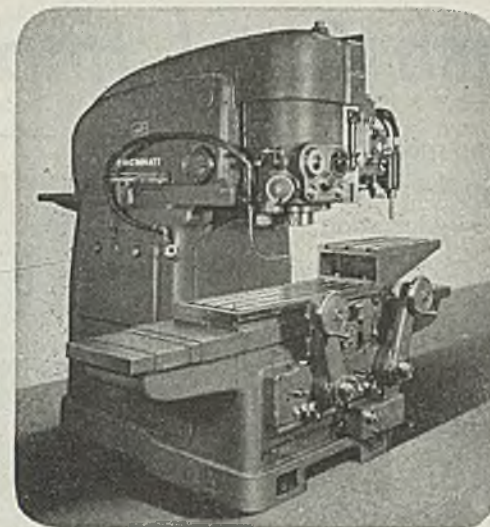
Wide range of spindle speeds... 16 speeds, 25 to 1500 or 33 to 2000 r.p.m.; 60 to 1 ratio.



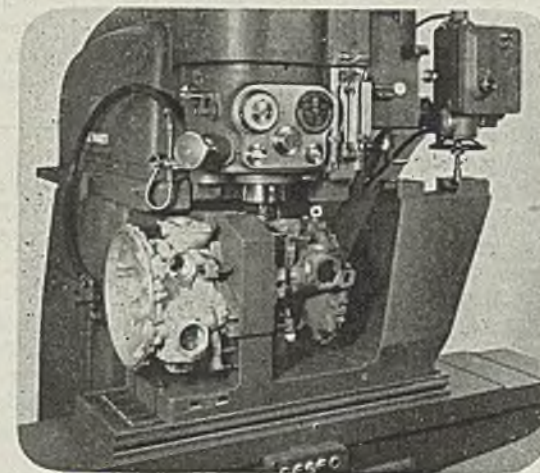
The operator's hand, thoroughly relaxed, exerts only a few ounces of effort to move hundreds of pounds in the table and cross slide units through Servo hydraulic control. (Right- and left-hand handwheels respectively).



Wide range of feeds to table and cross slide, independent of each other, 1" to 25" per minute, infinitely variable, selected by dial control.



CINCINNATI 16" Vertical Hydro-Tel Die-Sinker with Automatic Depth Control Unit



CINCINNATI 16" Vertical Hydro-Tel with automatic 360° profiling unit

Regardless of how you may rate the importance of features in a general purpose miller, there are a few basic considerations around which an efficient machine must be designed. In the new CINCINNATI 16" Vertical Hydro-Tel Milling Machine you will not only find all these fundamental requirements, but many additional features... in fact so many, a recent purchaser remarked: "It's the best vertical milling machine on the market." The illustrations on these two pages show some of the ways in which the new 16" Vertical Hydro-Tel fulfills the primary requisites of a general purpose miller. It is rigidly constructed and powered to take a healthy cut. The bed and column are

cast in one piece, box section, which means no deflection under cutting stresses. Further, you have the assurance of accurately milled surfaces throughout the entire range of power feed traverse, because the machine has ample support for table and cross slide. Built-in leveling jacks also contribute to accuracy. The new CINCINNATI 16" Vertical Hydro-Tel is available in three styles: 1) general purpose milling; 2) die-sinking; 3) 360° profiling. Complete information may be obtained by writing for new catalog M-1497. A brief description will be found in Sweet's Catalog File for Mechanical Industries.

# THE CINCINNATI

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# British Steel Imports Fall Short

*Hopes for receipt of 2 million tons from the United States by end of 1948 fading. Cut in exports of finished products expected*

THERE IS concern in Great Britain about the dwindling hope of receiving eventually the 2 million tons of steel imports which were expected from the United States by the end of 1948.

Despite the fact that British works are producing at a prewar rate, requirements are so great there is a serious shortage, and apart from the effects of the reduction of imports on the home market, this is bound to cause a reduction of British exports, not only of iron and steel proper, but also of locomotives, rails, and manufactured products of which steel is the principal component.

Last news of the nationalization plans for the iron and steel industry came from Herbert Morrison, Lord President of the Council, who recently declared in the House of Commons "that the government definitely intends to present a bill for national ownership" of at least a section of the industry. However, no time was indicated and it is generally believed that the bill will not come up before 1948.

## Belgium

The Belgian government has announced it has adopted a series of resolutions affecting price and wage policy. The first resolution states the government must be kept permanently informed on the comparative levels of wholesale and retail prices in Belgium and abroad. The second says severe control of supplies from abroad must continue, and that there can be no question of liquidating the Belgian economic missions in foreign countries before the end of 1947. Rational utilization of foreign currencies will also be required.

In the third resolution it is stated that "to the fullest possible extent, indices of prices must be adapted to indices of wages." The regulation and control of the price policy must continue, says the fourth resolution, but it is desirable to take into account the supply position of the various articles with special reference to luxuries. According to the fifth resolution a proper and effective control of cost prices will be undertaken. Cost control commissions will be extended and will consist of high officials, three delegates from the employers and three from the workers, this scheme



**HOUSES FOR BRITAIN:** These houses in Birmingham, England, have semi-steel, semibrick exteriors. To speed production, roofs are put on frameworks first so that construction can continue during inclement weather. About 800 of these will be ready for occupancy by Christmas. Acme photo

to apply to the various fields, such as collieries, steel manufacture, etc. These commissions will be required to present their reports by Jan. 15, 1947.

The sixth resolution states control of prices at the consumption level, with the participation of those concerned, will be further strengthened. Under the seventh resolution it is provided that the policy of subsidies should help in applying a policy of price stabilization, but this can only be justified as a temporary measure. The last resolution states that supervision of the level of price controls both import and export policy. Thus, there must be a certain amount of direction in regard to foreign trade, and this is also related to Belgium's supplies of foreign currency.

Belgian and Luxemburgian exports of iron and steel in September amounted to 148,244 metric tons, against 121,839 tons in August. For the first three quarters of the year exports totalled 1,092,732 tons. The main markets were Denmark, Holland, Norway, Switzerland, Argentina and Palestine; exports to France, Portugal, China and Egypt showed a decline.

The tonnage exported in September was greater than that exported by Great Britain; in fact 15,000 tons of Belgian and Luxemburgian iron and steel products have been earmarked for delivery to Great Britain during the fourth quarter of 1946, and of this total about two thirds are semifinished products; the price for billets is reported to be about £20 15s 0d (\$83.00), and about £25 (\$100) per ton f.o.b. Antwerp.

Despite the better output of steel,

makers are unable to meet the large demand, both for export and for the domestic market; they are all the more unwilling to commit themselves as coal deliveries from Germany and the United States are diminishing. Delays of delivery are extending considerably, reaching from 8 to 10 months for merchant bars, up to 10 months for hot-rolled hoops, and from 5 to 7 months for plates; for sheets and wire products no date is given.

Some exporters are somewhat concerned at the extent of export business done under commercial agreements between governments; it has been stated that the volume of such business accounts for some 80 per cent of the total; sellers would prefer to do more business in the open market where they would obtain better prices.

The Usines de la Providence at Marchienne au Pont has blown in a third furnace, although experiencing some difficulties in regard to coke supplies. Steel production at these works is about 56 per cent of prewar.

It is reported a new research center has been organized in Belgium, under the name of Centre Belge de Metallurgie Physique. The original members are Societe' John Cockerill, Ougree-Marihay, Esperance-Longdoz, Usines a Tubes de la Meuse and other non iron and steel concerns.

## Luxemburg

Output of iron and steel has been progressively increasing since the beginning of the year, but there are signs of slowing down owing to reduced supplies of coal



and coke, especially that coming from Germany. In view of this situation makers are not willingly committing themselves in regard to new orders and deliveries are extending to up to 10 months for certain products. The foundries and engineering works are becoming more active and are beginning to book some export orders. However, the situation in the steel industry may stop further progress over a period.

#### • Czechoslovakia

Under the two-year plan now being followed by the authorities the Czech iron and steelworks are being grouped into six national undertakings. Each of these has a director and a management board. The six directors have been nominated by the Central Organization of the Czechoslovak Iron & Steel Industry, which is under direct government control. The general directorate centralizes purchases of raw materials, collection of scrap and sales of iron and steel products, the latter through six sales organizations.

Ore is imported to make up for national deficiencies, mainly from Russia and Sweden. The production target for 1948 is 1,395,000 metric tons of pig iron and 2,200,000 tons of steel ingots. In September the Czech works exported 15,540 metric tons of iron and steel.

A commercial agreement has just been arranged with Holland by which Czech machinery, motors and metal products will be exported against Dutch agricultural machinery and chemical products.

#### France

The Monnet plan, which covers a period of five years, provides for an ultimate output of steel of 15 million metric tons; the present capacity is about 12 million tons, but the actual rate of production is on the basis of about 5 million tons per year. The plan provides for the development of coke ovens at the steelworks, modernization of the steelworks and their expansion, and erection of rolling mills, especially for plates and sheets. Plans for the erection of a modern strip mill are materializing. It will be a joint undertaking between the Acieries du Nord et de l'Est and the Usines de Denain Anzin. The mill will be supplied by the United States and much of the equipment will be manufactured in France.

France has at present, but not all in working order, 108 blast furnaces making mostly basic bessemer; the average capacity of these furnaces is 300 tons per day, equivalent to 8,500,000 tons per year for the 108 furnaces; in addition there are 51 blast furnaces for other grades of pig iron, with an average capacity of 150 tons, and capable of producing together

another 1,800,000 tons. For steel there are 19 basic bessemer steelworks with 92 converters averaging 25 tons capacity and capable together of an output of 9 million tons; the number of open-hearth furnaces is 142 with an average individual capacity of from 10 to 120 tons; these can

make about 3 million tons of steel per year; there are also 80 arc furnaces up to 30 tons capacity and 25 induction furnaces up to 1.5 tons; these together can produce about 1 million tons a year. Finally, five works operate crucible and could produce about 10,000 tons annually.

## Broad Technical Program Features Autumn Meeting of British Iron & Steel Institute

AUTUMN meeting of the British Iron & Steel Institute was held in London Nov. 13 and 14. President Dr. C. H. Desch opened the meeting and the secretary then reported that at the last meeting of the Council, Dr. Desch had been nominated for the presidency of the Institute for the second successive year.

Dealing with postwar activities of the Institute, Dr. Desch announced that a monthly journal would be starting in January, 1947. There will be an extension of the Institute's information service, in co-operation with the British Iron & Steel Research Association. On June 18 and 19, 1947, there will be a symposium on powder metallurgy, with the co-operation of the nonferrous metals organizations.

The technical session followed with a joint discussion on the following papers: "The Influence of Port Design on Open-Hearth Furnace Flames," by J. H. Chesters, D. Sc., The United Steel Companies Ltd., Stocksbridge, and M. W. Thring, The British Coal Utilisation Research Association, London; and "A Heat Flow Meter for Use in Furnaces," by R. H. Baulk and M. W. Thring, The British Coal Research Association, London. These papers were followed by "Special Instruments and Technique," based on the papers themselves.

In the afternoon discussion took place on:—"Thermal Conditions within the Open Hearth Furnace," and "General Conclusions," also arising from the two main papers presented in the morning.

On the morning of Nov. 14, the following papers were presented:—"The Origin and Constitution of Certain Non Metallic Inclusions in Steel," by J. R. Rait and H. W. Pinder, Research Department, William Jessop & Sons Ltd., Sheffield. "The Neutralization of Sulphur in Cast Iron by Various Alloying Elements," by H. Morrogh, British Cast Iron Research Association, Birmingham; "The Removal of Hydrogen from Steel," by Professor J. H. Andrew, D. Sc., H. Lee, Ph. D., A. K. Mallik, Ph. D., and A. G. Quarrell, D. Sc., of the University of Sheffield.

In the afternoon of the same day were

presented:—"The New Annealing Plant for Steel Strip in Coils at the Whitehead Iron & Steel Co. Ltd., Newport, Mon.," by B. Jones, D. Sc., Whitehead Iron & Steel Co. Ltd., and I. Jenkins, M. Sc., Research Laboratories, General Electric Co. Ltd., Wembley, London. "The Protection of Iron and Steel Against Marine Corrosion and Fouling" was the subject of a discussion based on the following three papers:—"The Formation of Anti Corrosive Compositions for Ships' Bottoms and Under Water Service on Steels," by W. Fancutt and J. C. Hudson, D. Sc., official investigators of the Institute's Corrosion Committee; "Report on Anti Fouling Research, 1942-44," by the Marine Corrosion subcommittee; "Interim Descriptive Statement on the 'Leaching Rate Test' for Ships' Anti Fouling Compositions," by the Joint Technical Panel on the Leaching Rate Test of the Marine Corrosion subcommittee.

On the evening of the first day of the meeting, a film display was given, the program being as follows:—

"Open Hearth Furnace Flames," by J. H. Chesters, The United Steel Companies Ltd., giving a record of flame characteristics and other aspects of the trials and experiments conducted in the open hearth melting shop at Templeborough; this film was related to the first report presented at the morning meeting.

"The Control and Prevention of Distortion in Arc Welding," prepared by Walt Disney Productions and released by Lincoln Electric Co. Ltd.

"A Photographic Investigation of the Brightness of Liquid Steel Streams," by J. A. Hall, of the National Physical Laboratory, giving a short record of observations made by the National Physical Laboratory.

"The Measurement of Liquid Steel Temperatures," prepared by J. A. Hall, of the National Physical Laboratory, for the Pyrometry subcommittee of the British Iron & Steel Research Association. The film gives a record of the technique of the quick immersion thermocouple, showing the method of assembly and the ways in which it has been applied in different works and types of furnaces.

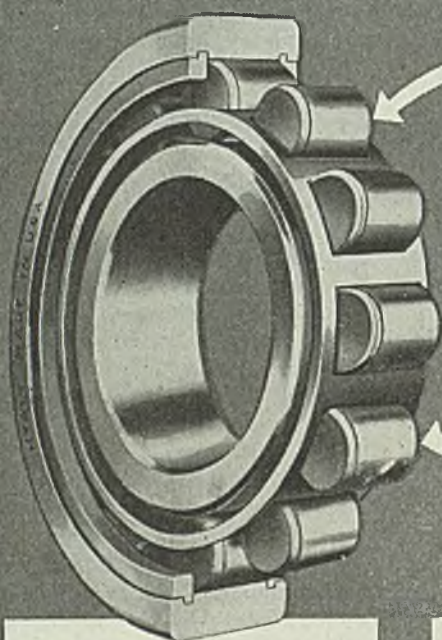


**WHY**

*Rollers*

**DO A JOB  
WHILE THEY**

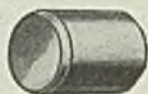
*Roll —*



**1.**

This cutaway section of a Hyatt Roller Bearing shows the rollers which roll within the confines of special alloy steel races.

**2.**



This is a typical Hyatt solid, special steel roller removed from the bearing.

**3.**



The load is distributed evenly over the length of the roller assuring maximum load-carrying capacity.

Hyatt Roller Bearings reduce friction in countless machines and equipment . . . in mills and factories . . . on farms . . . oil fields . . . railways . . . highways and skyways. Hyatts, for more than half a century, have been helping things run

smoother and longer.

Hyatt engineers will gladly answer your bearing questions and depend upon it . . . the right answers. Hyatt Bearings Division — General Motors Corporation, Harrison, New Jersey.

**HYATT**

**ROLLER  
BEARINGS**



# Mirrors of Motordom

*Auto industry swings back into production quickly as coal strike ends and freight embargo is lifted. December output may approach 400,000 barring further interruptions. General Motors suspends portion of tool and die program*

## DETROIT

A MIND-READER now doing business at a downtown hotel cabaret predicted a week in advance that the coal strike would end Saturday afternoon, Dec. 7. If he had only been kind enough to make this information available generally, he would have saved business people, as well as magazine writers, here a lot of worry and embarrassment. The Friday rail embargo threw traffic departments into an uproar in the effort to keep parts and materials moving into automobile and parts plants. Actually they had some success in obtaining temporary exceptions to the embargo order, permission being granted, for example, to continue shipments over main railroad lines, provided no transfer from one line to another was involved. This would have cleared the way for many basic materials and parts to move into Detroit and gave hope that automobile production could be continued after a fashion.

Lewis' surrender, however, quickly put an end to all discussions of freight expedients and after the weekend production activity was back to nearly normal. Ford had laid off 20,000 and was planning to dismiss another 20,000 but rescinded the order at the last minute. Automobile assemblies for the week prior to last hit a new peak of 96,500 and appeared headed still higher last week. Barring further interruptions and possible year-end closings of assembly lines, this month could see 400,000 cars and trucks produced, maintaining the pace of October and November.

## GM Suspends Tooling Program

Announcement that General Motors had suspended portions of tooling and die programs for 1948 models of Pontiac, Oldsmobile and Chevrolet was not too surprising in view of the many other suspensions which GM has made in future planning. Actually, what is involved in the cancellation is this, according to those close to the picture. . . the corporation had three new bodies being tooled, designated tentatively A, B and C. The so-called A body was of the type now used interchangeably on Pontiac, Olds and Chevrolet. It was originally

a Chevrolet design and several years ago was extended to Pontiac and Olds. Somewhat smaller than the regular bodies of these two divisions, the design nevertheless proved popular and represented a cost saving because it could be produced

## Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1946	1941
January .....	121,934	524,073
February .....	84,141	509,332
March .....	140,777	533,878
April .....	248,318	489,856
May .....	247,620	545,355
June .....	216,637	546,278
July .....	331,000	468,897
August .....	359,101	164,793
September .....	342,727	248,751
October .....	410,466*	401,369
November .....	378,900*	373,992

Total, 11 mos. 2,881,621 4,806,474

Estimates for week ended:

Nov. 23 .....	96,461	80,820
Nov. 30 .....	77,222	96,495
Dec. 7 .....	96,519	92,205
Dec. 14 .....	97,000	95,990

\* Preliminary.

by Fisher Body in greater volume. This body, completely redesigned and restyled throughout for 1948 models, has been dropped from the program, at a reported saving of some \$50 million.

Naturally, the suspension was a blow to the tool and die shops in this area which were well along on the project. They have been forced to make extensive layoffs, half a dozen or more shops dismissing from 50 to 100 men. Patterns have been withdrawn from foundries, and inventories are being made of all work completed thus far, which of course will be chargeable to GM. The second of the three body designs, the B designation, is believed to be to the larger body used interchangeably on Buick, Pontiac and Oldsmobile. Little work has been released on this program, but it is about ready and should come out for tooling after the first of the year. The third or

C design, possibly a still larger type used interchangeably on Oldsmobile, Buick and Cadillac, apparently is still on the drawing boards.

Engineering work on the Chevrolet light car is continuing, although all tool and die work has been suspended for the time being. Understanding is that the corporation will "take another look" at the situation around March and probably give the go-ahead once more at that time. In fact, equipment sources which have received orders for machinery and tools are scheduling their work on this basis, figuring that deliveries will be scheduled about six months from next March.

Cancellation of the least expensive of three new body lines by GM suggests it may be planning to concentrate new styling in the larger and more expensive models—Pontiac, Olds, Buick and Cadillac, continuing for the moment the present designs on the smaller Pontiac and Olds and the Chevrolet. This would appear to be smart planning, for any major capital expenditure on lower-priced models would have to be reflected in price, and many prospective buyers consider the price of the large-volume units already out of their reach.

## Chrysler Inquiries Out

Die shops are hopeful the turn of the year will see some Chrysler 1948 model business released to take up the slack occasioned by the GM reduction. Signs point to such a development, since Chrysler divisions have been making inquiries in a number of shops as to available time, costs, etc.

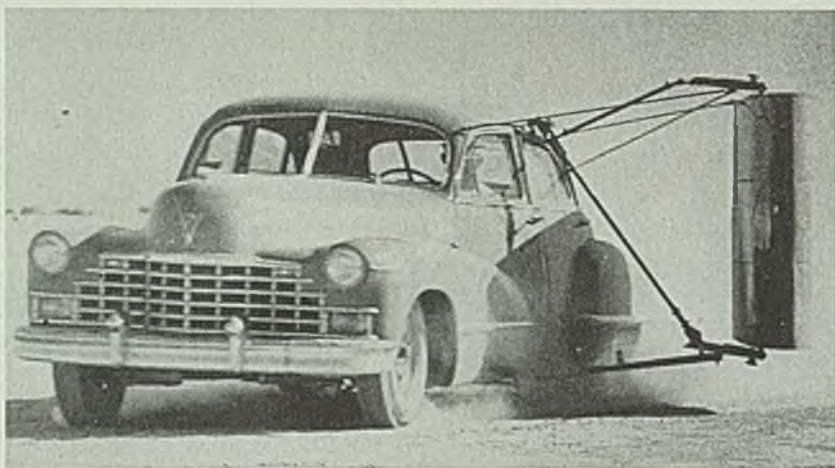
Automotive tooling, along with most everything else, has spurted sharply both in cost and lead time from prewar levels. One estimate is that these factors currently are 50 per cent or more beyond the "good old days." High labor rates, poor productivity and high overhead are the problems in this business as in most others.

## Ford Tractor Under New Name

Ford tractor business, recently divorced from the Harry Ferguson organization, of which Roger Kyes is president, will continue under the name of Dearborn Motors Corp., with headquarters in Dearborn, Mich. Frank R. Pierce, former vice president of General Motors in charge of the employee co-operation staff, has been named president. He was with

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**SAFETY WING:** An airplane wing section attached to one side of an automobile enables the car to speed safely around circular track on the U. S. Rubber Co.'s proving grounds near Lancaster, Calif. The wing counterbalances centrifugal force on curves, eliminates side scrubbing of tires and makes test conditions very much like those of normal highway driving. High speeds not considered safe for testing on public roads can thus be attained on a circular track. The car pictured approached the camera at 90 mph

Frigidaire from 1921 until 1939 when he transferred to Nash-Kelvinator, returning to GM in 1943. His position at the corporation will be assumed by Harry B. Coen who has been director of labor relations on the personnel staff.

Ford tractor production continues unchanged at the Highland Park plant, the switch from the Ferguson management involving principally a change in name and establishment of a new distributor organization for handling tractors and implements. Break with Ferguson came primarily from the policy of the new Ford management of scrutinizing cost sheets more meticulously. Study showed the company to be losing money on tractors under the old management, so a quick decision was made to change. The elder Henry Ford's agreement with Harry Ferguson in the first place was understood to be entirely an oral one, so there was little hesitancy in breaking it.

Messrs. Ferguson and Kyes have announced they will proceed with plans to establish new manufacturing facilities for the Ferguson tractors and implements in this country, an arrangement already having been concluded for their production in England by the Standard Motor works. An undertaking of this magnitude is no simple problem, particularly in view of the difficulty of obtaining sufficient engines, this in turn being complicated by shortage of gray iron foundry capacity. Obviously no Ford engines will be available for a new Ferguson tractor. The two companies are

now in an interesting position, the one with ample production facilities but no distributors, the other with plenty of distributors but no manufacturing plants. Whether Ferguson distributors will switch over to the Ford tractor remains to be seen; but at least Ford is continuing to turn out the tractors, at a rate of some 800 per week.

### More Ford Reorganization

More additions have been announced in the planning and control office at Ford where L. D. Crusoe, vice president, is engaged in an extensive program of reorganization and delineation of responsibilities throughout the Rouge plant. R. S. McNamara, former professor of business administration at Harvard and later in the statistical control section of the air forces, has been appointed assistant director of planning. W. C. Boyle, with 24 years of experience in the cost accounting department of Fisher Body, has been named director of the cost accounting department. E. R. McGauley, former controller and assistant treasurer of the ordnance steel foundry in Bettendorf, Iowa, and also active in the GM controller's office for many years, has been assigned as accounting manager of steel operations for Ford, while K. D. Cassidy, former member of Mr. Crusoe's staff at Bendix Aviation is the new accounting manager for the Highland Park plant and all parts manufacturing operations.

Charles T. Ellis, former factory manager for Acme White Lead & Color Works, Detroit, has been named to direct

all Ford purchases of paint, raw materials, petroleum products, pigments and oils.

It requires no Dick Tracy to detect a thorough overhauling of the entire Ford purchasing, planning and cost control functions is in process. In fact, some observers are beginning to wonder whether Ford ever had any planning and cost control departments. Perhaps a story told around Detroit will throw some light on the speculation.

It seems that a number of years ago when Ford was bringing out the new Model A, Mr. Ford announced to his engineers that he wanted the car built for a certain cost figure, let us say \$400. After a few weeks of calculations and contemplation, the engineers came back with a detailed report which, in summary, stated the model could be built at a cost of \$475. Somewhat taken aback, Mr. Ford said, in effect,—"Who told you it would cost that much."

Said the engineers, "Why, the cost department made the estimates."

Said Mr. Ford, "And where is the cost department?"

Said the engineers, "Well, they are over in such and such a building."

Said Mr. Ford, ringing for Harry Bennett, "Harry, I want you to take me over to the cost department."

Said Mr. Bennett, "Yes, Chief, right away."

The two gentlemen forthwith visited the cost department, where scores of accountants and clerks were busily adding columns of figures.

Said Mr. Ford, "Harry, I want you to clear out this bunch by tomorrow morning. Take all the records down to the boiler room and burn them, at least they will make some heat. We will build that car for \$400."

### Department Disbanded

No sooner said than done. Next morning the cost department was cleared, the records destroyed, and all employees instructed to report to the personnel office for reassignment. Whether the car was built for \$400 or not will have to remain unanswered, probably it was not.

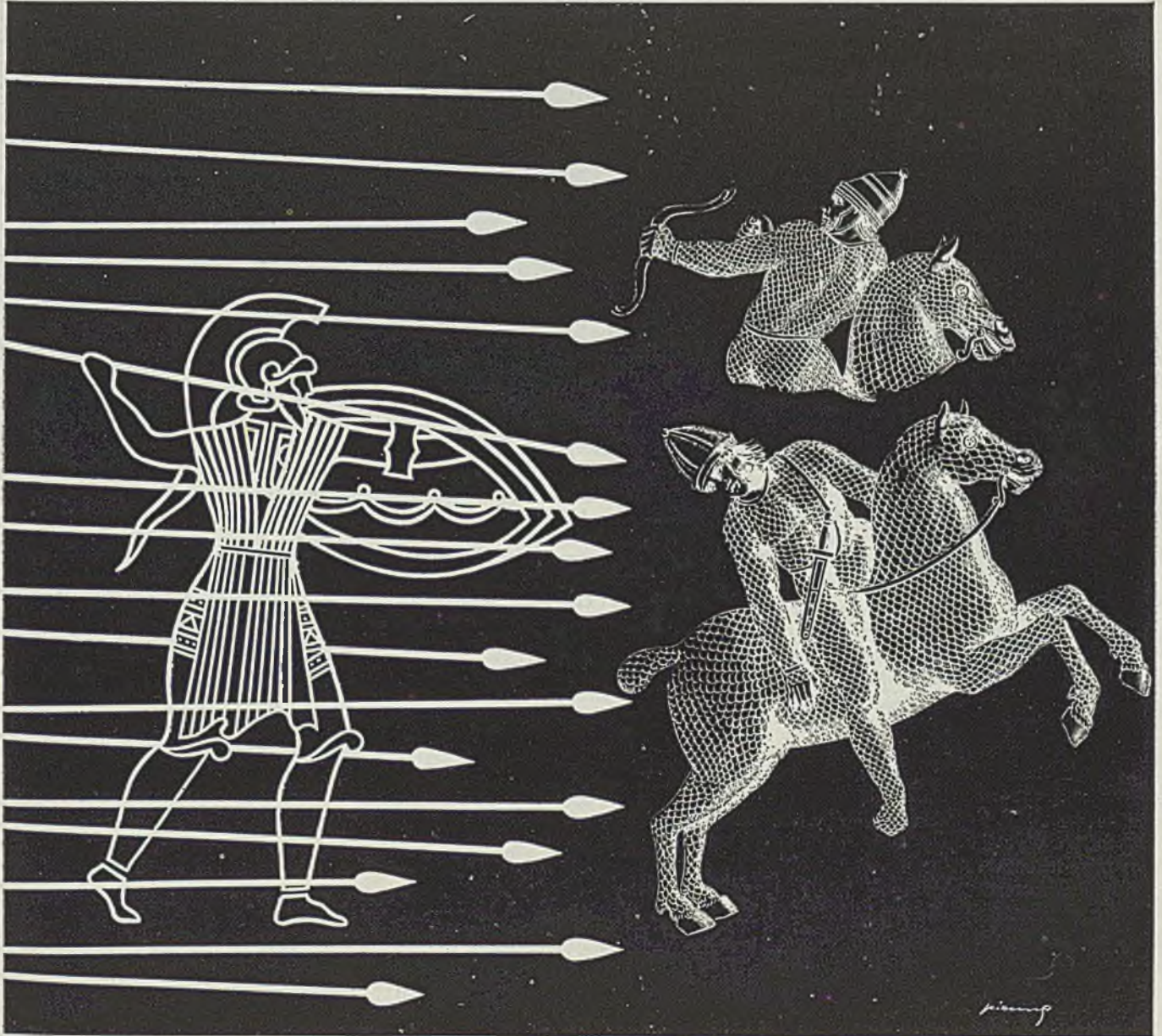
The story has a familiar Ford ring, many like it having been told during the regime of the elder Mr. Ford and his aide, Harry Bennett. Its entire accuracy is of little importance now. The point is that the present management under E. R. Breech and his new associates are organizing a cost control department which from all outward appearances will be top-drawer. Some of the old-time salesmen who long have drawn a handsome living from Ford business avow they don't like this new-fangled business. They say they prefer the old "rule of thumb."



# THE MACEDONIAN SURPRISE PARTY

When the proud Persian hordes plunged headlong at Philip of Macedon's army, they were dumped into the minor leagues by an entirely new strategy, the phalanx: a solid wall of warriors sixteen ranks deep. Strength-in-depth withstood and defeated the impact of an over-confident enemy.

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# Brainard Steel Sale to Sharon Wins Approval

*Stockholders vote disposal of facilities to larger steel producing company. Sharon provided new semifinished outlet*

Youngstown—Stockholders of Brainard Steel Co., Warren, O., strip steel producer, have approved sale of its assets to Sharon Steel Corp., Sharon, Pa. The transaction involves transfer of stock.

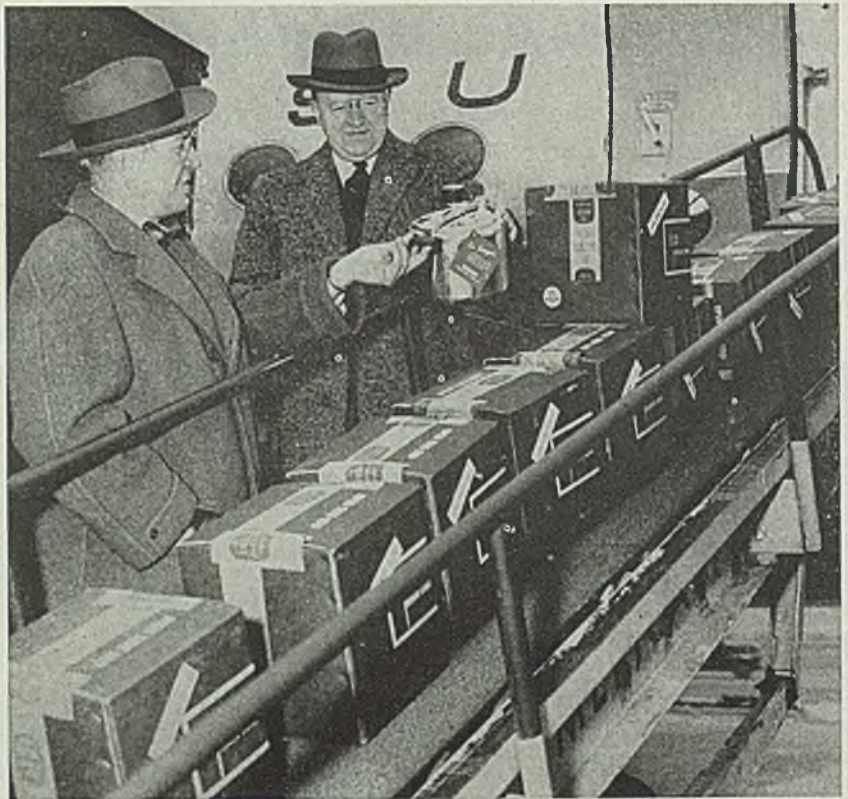
It is understood 76,935 shares of the 78,916 shares voted, without a negative vote. In the transaction the 78,916 shares of Brainard common stock will be exchanged for 30,600 shares of Sharon common, and in addition a 60 cents cash dividend will be paid. Under this, Brainard shareholders will realize about \$979,200 or about \$13.21 per share for the \$1 par value stock.

The Brainard company was incorporated in May, 1929, in Ohio, and maintains sales offices in Atlanta, Ga., Detroit, New York and Philadelphia. Products offered for sale include cold-rolled and electric-galvanized strip steel, patent hoops, electric-weld tubing, box strapping and tools. At its Warren, O., works it has annual capacity for production of 30,000 tons of cold-rolled strip, 9000 tons of galvanized strip and 7200 tons of painted strip. At its East Orwell, O., works it has capacity for production of 5000 tons of electric weld tubing.

The company has been headed by E. T. Sproull, president and general sales manager. In the acquisition by the Sharon corporation it is understood no change in management is contemplated.

Acquisition of the Brainard company is part of Sharon Steel Corp.'s program for enlarging its outlets for semifinished steel and finished steel. Only 11 months ago Sharon purchased the Farrell Works of the Carnegie-Illinois Steel Corp., greatly increasing its steel ingot producing capacity. Since then it also has obtained increased coke supply through 5-year lease of a by-product coke plant from the government at Morgantown, W. Va.

Several months ago Sharon acquired the Bopp Steel Corp., Dearborn, Mich., producer of cold-rolled strip, and since April, 1, 1945, it has operated the Detroit Seamless Steel Tubes Co., Detroit, as a wholly owned subsidiary. Sharon also is majority stockholder of the Niles Rolling Mill Co., Niles, O. Also affiliated with Sharon is the Mullins Mfg. Corp.



**OFF TO RIO:** To make speedy delivery of seven and one-half tons of kitchenware to Rio de Janeiro, Brazil, the Ekco Products Co., Chicago, utilized a chartered Brazilian airplane. Shown loading the \$50,000 cargo into a four-engine plane for the 5300-mile flight from Chicago are Frederick Keller, left, Ekco vice president, and George C. Payne, Chicago regional manager for the U. S. Department of Commerce

Sharon Steel Corp. is headed by Henry A. Roemer as chairman and president. Directors are: Howard Booher, C. Homer Butts, David B. Carson, E. P. Brooks, George L. Collord, E. T. Fruit, Andrew M. Kennedy, B. E. Kibbee, L. F. Rains, Henry A. Roemer and George E. Whitlock.

## National Steel Products To Construct New Plant

National Steel Products Co., Houston, Tex., subsidiary of National Steel Corp., Pittsburgh, recently purchased a 10-acre tract in Houston on which a warehouse and factory building to cost in excess of \$250,000 will be erected. The plot cost \$170,000. Construction of the facility will be started as soon as building materials become available, it was announced.

## Crucible Steel Co. Opens New Warehouse in Chicago

Expansion of Chicago facilities of Crucible Steel Co. of America was accomplished with the recent opening of

a new warehouse at 4501-4531 W. Cortland St. Formal opening ceremonies were attended by more than three hundred industrialists, including W. H. Colvin Jr., Crucible's president, and other company officials. The program was in charge of E. K. Streeter, Chicago manager.

The new steel warehouse is the largest of Crucible's 26 sales offices and is equipped with the most modern types of equipment for handling tool steel, stainless steel and high grade specialties.

## Two Subsidiaries Merged Into Westinghouse Electric

Stockholders of Westinghouse Electric Corp., Pittsburgh, have approved the merger of Benolite Corp., Manor, Pa., and B. F. Sturtevant Corp., Boston, both wholly owned subsidiaries, into the Westinghouse company. Benolite makes insulating varnishes, and the Sturtevant company is a producer of all types of air handling, ventilating and air conditioning equipment.

Under the merger plan the capital stock structure of the company will be reorganized.



# BRIEFS . . . .

*Paragraph mentions of developments of interest and significance within the metalworking industry*

Aluminum Co. of America, Pittsburgh, has announced that after Jan. 1 the alumina and fluoride products of Aluminum Ore Co., a subsidiary, will be marketed under the Alcoa trademark and trade name. The previous trademark, Alorco, will be discontinued, and all merchandising of the ore company's products will be done by the Chemical Division, Aluminum Co. of America.

Brown Instrument Co., Philadelphia, has opened a branch at 117 West Eighth St., Tulsa, Okla., in charge of R. P. Walker.

Thornton Tandem Co., Detroit, manufacturer of special truck equipment, has changed its name and is now operating as Detroit Automotive Products Corp.

Plastics Division, Springfield, Mass., Monsanto Chemical Co., will open a Cincinnati sales office on Jan. 1. Its sales territory will cover part of Ohio, Indiana, Kentucky, Tennessee and Pennsylvania and all of West Virginia.

Snow - Rominger, Breckenridge, Tex., has purchased J. W. Wash Mfg. Co., that city, and Snow Construction Co., Abilene, Tex., and will conduct a construction and manufacturing business.

James A. Murphy Co., Hamilton, O., has appointed Clark Bennett, with offices at 400 W. Madison St., Chicago 6, as exclusive sales and engineering representative in the Chicago area for the Murphy company's cooling equipment and automatic traps for removing water and oil from compressed air systems.

H. K. Ferguson Co., Cleveland, has been awarded contracts for design and construction of a manufacturing plant at Syracuse, N. Y., for Bristol Laboratories Inc. The plant will provide facilities for production of new antibiotics after they have passed the laboratory stage and before they are ready to go into full-scale manufacture.

Mechanical Goods Division, Goodyear Tire & Rubber Co., Akron, has announced that its industrial rubber hose-making capacity is virtually double that of the last prewar year. Demand for hose is exceeding peak production, and plant expansion will be continued into 1947. Current production is being concentrated on air, steam, water, vacuum,

paint spray, acetylene welding, and petroleum hoses.

General Motors Corp., Detroit, has reported that it has a higher proportion of World War II veterans in its working force than any other industrial group reported by the United States Bureau of Labor Statistics. Currently 32 per cent of all employees of the company are veterans.

Arcos Corp., Philadelphia, manufacturer of electrodes and rods for welding and cutting stainless steels and alloys, has completed a new laboratory building adjoining its plant. Transfer of the company's research and engineering department from 401 N. Broad St. to the new facility at 50th and Paschall Aves. has been completed.

Libbey-Owens-Ford Glass Co., Toledo, O., has begun volume production of transparent mirrors, which present a reflective surface on one side and a window on the other.

Raybestos-Manhattan Inc., Manhattan Rubber Division, Passaic, N. J., has been given the National Victory Garden Institute's highest award in recognition of the patriotic work done by the rubber company's employees in 400 garden plots in a ten and one-half acre project.

Eversharp Inc., Chicago, has developed x-ray inspection equipment capable of locating air bubbles in ink-filled cartidges for pens.

Fairbanks, Morse & Co., Chicago, has delivered to the Kansas City Southern Lines what is said to be the world's largest and most powerful diesel-electric locomotive. Consisting of four units with a total of 8000 hp, the locomotive is over 259 feet long.

Stewart-Warner Corp., Chicago, has begun a campaign to tell "Industry's Side to Labor" by means of pay envelope inserts defining and explaining the free enterprise system.

Lincoln Electric Co., Cleveland, has named G. S. Parsons, San Diego, Calif., as a dealer for its equipment.

SKF Industries Inc., Philadelphia, has announced that production of antifriction bearings is currently three times the

1939 output. A principal factor in the heavy demand is the steel industry's need for spherical roller bearings, according to the company.

War Assets Administration, Washington, has established a Western Aircraft Components Sales Center at Torrance, Calif., to be used as a central storage point for aircraft components agents operating in the West Coast area. The WACSC is located in the former Aluminum Co. of America plant at 190th St. and Normandie Ave.

Bureau of Mines, Department of the Interior, Washington, has reported that iron ore reserves in the American and British occupied zones of Germany are estimated to contain approximately 375 million metric tons of commercial grade with additional tonnages of potentially commercial ore. The survey of these resources is contained in the supplement to the Bureau of Mines Mineral Trade Notes for October, 1946.

Bunell Machine & Tool Co., Cleveland, has reported that a current trend, particularly in the tool and die industry, is a closer tie-in between design engineers and shop mechanics. Greatly improved production techniques have resulted from the combination of practical shop know-how of experienced toolmakers and technical engineering theory and practice of engineers.

American Ship Building Co., Cleveland, has begun production of a line of steel boilers for residential use at its Toledo, O., plant and plans to add a line of coal stokers in the near future.

William B. Pollock Co., Youngstown, has acquired from Reconstruction Finance Corp. for \$69,000 the addition which was built to its plant during the war. The addition contains 17,715 square feet of floor space.

United Aluminum Castings Co., Cleveland, plans erection of a new plant on W. 140th St., which, when completed, will house the company's manufacturing activities, now located at 10714 Bellaire Rd.

E. I. du Pont de Nemours & Co., Wilmington, Del., has opened a technical service laboratory on Buchtel Ave. in Akron.

Virginia Bridge Co., Roanoke, Va., subsidiary of United States Steel Corp., is planning construction of a \$1 million plant adjacent to its present Birmingham facility.



# Resumption Of Activity Seen Rapid

*Industry in Pacific area expected to regain production stride quickly. Not as seriously affected by coal strike as other districts*

## SAN FRANCISCO

WEST COAST, which was not affected as seriously by the bituminous coal strike as most other parts of the nation, expects to recover its stride rapidly with the walkout ended.

Two factors were responsible for the relatively favorable position enjoyed by the West in the recent trouble. One is that the West is dependent chiefly on oil and gas instead of coal as fuel to power its industries. This independence from coal was reflected in the fact that only a few small companies in the western area were forced to suspend operations entirely, and only a few others had been forced to curtail output when the strike ended.

## Traffic Relatively Unhampered

The second factor was that oil-burning railroads of the West gained exemption from the railroad embargo so that traffic was not hampered to the extent movements in the East were tied up. The chief threat from the embargo was that it would cut off shipments of materials and components from the East. Because of the disruption caused by the embargo in the East it is likely west-bound shipments may be thrown out of kilter for some time, and that will have a retarding effect on some industries. However, normal resumption of rail traffic much sooner than had been expected will enable most firms to schedule operations with a fair certainty of meeting them.

At the time the coal strike ended, chief effects of the walkout were being felt in Utah at the Geneva steel mill. Just before the strike ended Geneva had closed one of its two batteries of coke ovens and was operating only two blast furnaces and two of its four open hearths. The structural and plate mills were still rolling, however, on backlogs. Just before the strike ended it had been



**OREGON GRAIN CARRIER:** Tractor truck with special tank trailer is being used by Pendleton Grain Growers Inc., Pendleton, Oreg., to move great quantities of grain to shipping points. The tractor truck is a recently announced model made at International Harvester Co.'s new Emeryville Works, Emeryville, Calif. It is estimated that the tank truck will have transported one-half million bushels of wheat by the end of 1946

Geneva's prospect that the mill would be closed about the first of the year.

Now, however, there is good indication that operations will pick up rapidly. Geneva's source of coal is close by and, at this writing, it is believed coal will move to the coke ovens fairly rapidly.

In the San Francisco area the end of the strike found all steel companies operating, and, barring further troubles, continued production is in the cards. Columbia Steel Co. had supplies enough to keep its plants in operation until Dec. 22, and Bethlehem Pacific Coast Steel Corp. was well enough situated to maintain operations for "several weeks."

Other plants also had expected to be able to operate until early in January, so ending of the strike assured them of continued operation. American Smelting & Refining Co., for example, had expected to be able to continue into January.

## Normal Shipments Hold Key

Because of possible disruption of railroad movements as an aftermath of the embargo, some fabricators and foundries may not be able to hit full stride quickly. That depends entirely, however, on how soon normal shipments are resumed. Foundries which depend on sand from the East will be affected particularly.

Auto assembly plants in this area also will hinge their operations on how quickly they can begin getting a steady flow of components from the East. When the strike ended they had only about enough materials on hand for another week's operation.

Construction industries are similarly affected. The shortage of diversified materials, such as nails, plumbing fixtures, metals and the like, was made more acute by the embargo and if ship-

ments are slow in getting back to normal, building may be affected seriously in January.

## Steel Order Backlogs in Pacific Northwest Heavy

### SEATTLE

The strangling effects of the coal shortage did not reach the Pacific Coast. Most of the railroads serving this section use fuel oil, but embargoes on shipments would have seriously affected industrial operations had they continued for any length of time.

Local rolling mills report sustained output. Backlogs are heavy and bookings for 1947 are being accepted in limited tonnages in view of the existing uncertainty. First concern is to execute current orders. Recent bar bookings have been in small lots but there is a heavy potential demand for reinforcing.

Fabricating shops may have to close unless larger supplies of steel are received. Decreased mill output and the maritime strike have combined to make the position of fabricators extremely critical. Inventories are practically exhausted and new business is being taken only in small tonnages or over the counter orders. Backlogs are fairly large and completion of contracts is indefinite.

If plates were available, large contracts would be placed but shops are seriously handicapped by conditions.

Yarrows Ltd., whose yard has been active since the end of the war, has bid on construction of three steel 273-foot ships for the Ming Sung Industries of China. Each unit will cost in excess of \$2 million. This yard is building a \$3 million steamer for the Canadian National Steamships Ltd., converting a large carrier for a Hongkong shipping firm and has launched a 90-foot steel barge



for the Imperial Oil Co. Large crews have been continuously at work at this plant.

Members of the Northwest Mining Association in the fifty-second annual convention in Spokane were told by Grant M. Valentine, state geologist, that the lead and zinc mines of Washington and Idaho may soon become the country's leading producers. He based this statement on the decreasing output of the Tri-state district of Missouri, Kansas and Oklahoma. He also stated that recently discovered bauxite may prove to be one of Washington state's most valuable resources. Frank W. Woodside, Vancouver, B. C., predicted that long idle mining camps in British Columbia and the Yukon territory will experience a boom next year.

Leckenby Structural Steel Co., which has moved operations to a new plant at 2877 11th Ave. S. W., Seattle, announces that it will be in production in January of a prefabricated steel industrial building. This structure is particularly designed for shop and warehouse purposes. Plans call for welded steel trusses with aluminum or steel corrugated sheeting for roof and sides.

## Establish AFA Chapter in Pacific Northwest Area

Establishment at Seattle of a Washington chapter of the American Foundrymen's Association has been approved by directors of the technical society in response to a petition signed by 72 Pacific Northwest foundrymen representing 36 companies.

The new chapter, AFA's fourth on the Pacific Coast and thirty-fourth in North America, was organized at a Seattle meeting at which Sheldon V. Wood, Minneapolis, president of the association, W. W. Maloney, secretary-treasurer, and W. R. Pindell of Northwest Foundry & Furnace Works Inc., Portland, Oreg., chapter chairman, were guest speakers.

Officers of the Washington chapter, elected unanimously at the organization meeting, are: C. M. Anderson, Eagle Brass Foundry Co., chairman; George M. Rau, Olympic Foundry Co., vice chairman, and A. D. Cummings, Western Foundry Sand Co., secretary-treasurer. They are located in Seattle.

Directors named to serve until the first regular election include: G. S. Schaller, University of Washington; C. W. Summerville, Seattle Brass Co., and J. D. Tracy, Salmon Bay Foundry Co., all of Seattle; E. D. Boyle, Puget Sound Naval Shipyard, Bremerton; V. C. Cretan, Atlas Foundry & Machine Co., Tacoma, and Howard Heath, Sumner Iron Works, Everett.

# Southern California Industries Escape Serious Interruptions

*Coal strike ends before widespread shutdown of manufacturing plants was forced by freight embargo. Shortages of materials would have forced many shops to close within a few weeks. Area largely uses oil for fuel*

## LOS ANGELES

SUDDEN ending of the bituminous coal mine strike caused industrialists in this area to breathe a sigh of relief. While district industry is dependent on coal for fuel to only a limited extent, a prolonged walkout in the mines with its corollary freight embargoes would have dealt manufacturing operations here a severe blow.

Fortunately, the strike was ended before serious interruptions in operations were experienced by many plants. Salisbury Motors Inc., subsidiary of Northrop Aviation, was forced to shut down its plant at Pomona. The unit produces motor scooters and small gas engines as well as other devices powered by the engines. Don I. Carroll, president, said raw material shortages and freight embargoes made necessary the laying off of some 400 workers.

The rail embargo, which went into effect midnight, Dec. 5, reacted drastically on industry throughout the southern California area. It prevented automotive, tire, steel and other products made in the area to move beyond the northern and eastern termini of the three major railroads, Union Pacific, Southern Pacific and Santa Fe, unless specifically exempted.

## Truck Hauling Predominates

Los Angeles harbor was not as seriously affected as were other Pacific Coast ports because the harbor is not a trans-shipment port and approximately 75 per cent of tonnage is handled by truck to and from the docks.

Walter Measday, regional director of the U. S. Department of Commerce, had predicted crippling of operations at a majority of all plants in the area, and, as a matter of fact, creeping paralysis already had been felt just prior to the calling off of the strike on Saturday, Dec. 7. Spot surveys showed that industry in general, particularly the smaller plants representing about 45 per cent of the area's industrial capacity, could continue operations only from 2 to 4 weeks if the strike continued.

Mr. Measday explained that while few Los Angeles area factories use coal directly, virtually all are dependent on rail transportation and on steel, lack of which

would tie up production lines. Metalworking factories would be hardest hit.

Indicative of how serious a view was taken of the coal strike despite the fact oil is the principal fuel in the district, various industries had announced plans for curtailing operations.

General Motors officials had predicted that by Dec. 12, following the pattern set by the parent plants in Detroit, the factory at South Gate would shut down, bringing enforced idleness to 2400 hourly rate workers and 400 salaried ones.

Ford Motor Co. spokesmen looked for the closing of plants at Richmond and Long Beach by Dec. 14, resulting in lay-off of 1300 workers.

Chrysler Motors of California expected to remain open until Dec. 21, depending upon the movement of stock from Detroit.

Lockheed Aircraft Corp. said inventories would have been seriously unbalanced by Dec. 12 or 13, and actual shutdown of the plant, employing 19,000, would have been gradual over a period of from 30 to 60 days.

Douglas Aircraft Co. plants at Santa Monica, Long Beach and El Segundo expected to operate fully only until about Dec. 17, depending upon transportation. Some 5000 employees would have been affected the first month and 10,000 in two months.

North American Aviation Inc., with 10,000 workers, had planned to continue for 60 days, with military aircraft operations the last to suspend.

## Coast Steelworkers Plan Portal-To-Portal Pay Suit

Approximately 2300 employees of Columbia Steel Co.'s Pittsburg works, in the San Francisco area, have prepared to sue the company to obtain three years' portal-to-portal pay they claim should have been paid during the last three years. This would amount to 36 minutes' pay daily, the union claims. The workers are members of the United Steelworkers of America.

The employees voted to file individual suits for the portal-to-portal pay under the Fair Wage Standards Act. A recent Supreme Court decision upheld the portal-to-portal pay.



# Men of Industry



THOMAS J. WALNE

Thomas J. Walne has been appointed vice president and general manager, and E. M. Gretzler, vice president in charge of export sales, National Supply Export Co., New York, subsidiary of National Supply Co., Pittsburgh. The promotions became effective Dec. 1, upon the retirement of L. V. Boggs. Mr. Boggs, who established the export department that later was incorporated as the subsidiary of National Supply, will remain with the corporation in an advisory capacity. He has been with the company 26 years. Mr. Walne, who has been in the oil industry since 1923, joined National Supply Co. in 1943. For 2 years he was in the Toledo, O., offices of the company, and last year became division engineer of National Supply Export Co. Mr. Gretzler joined National Supply Co. in 1919. In 1927 he was manager of the company's branch in the Ploesti oil field in Rumania, returning to New York in 1937 to become manager of export sales.

Karl D. Fernstrom has been named vice president and director of production, American Machine & Foundry Co., Brooklyn, N. Y. Mr. Fernstrom was vice president in charge of production, Cramp Shipbuilding Co., Philadelphia.

William G. Piwonka has been named technical service manager, Motor Coach Division, White Motor Co., Cleveland. Mr. Piwonka is a past chairman of the Cleveland section, Society of Automotive Engineers.

Frank J. Prime has been appointed assistant to the vice president, Radio Tube Division, Sylvania Electric Products Inc., New York. Mr. Prime joined the company in 1932, as a cost account-



E. M. GRETZLER

ant in the parts manufacturing department. Later he served as superintendent of parts manufacturing, superintendent of the Montoursville plant, and cost accountant for the Radio Tube Division.

Robert W. Breckenridge has been named vice president, Automatic Die & Products Co., Cleveland. He was with Breckenridge Machine Co., Cleveland.

C. E. Hamilton, Seattle, and A. B. Andrews Jr., Raleigh, N. C., have been appointed representatives for industrial products manufactured by Tomkins-Johnson Co., Jackson, Mich.

Marvin Taub, advertising manager, Radio Receptor Co. Inc., New York, has been elected membership chairman, New York Advertising Chapter, American Veterans Committee.

Harold L. Gebike has been appointed to the newly created position of comptroller, Electro Refractories & Alloys Corp., Buffalo. He had been plant comptroller in Rome, N. Y., General Cable Corp., New York.

R. F. Hilbert has been appointed sales agent in the Rochester, N. Y., area, Vascology-Ramet Corp., North Chicago, Ill. Prior to establishing his own business in 1945, Mr. Hilbert had spent 17 years in the machine tool industry as a sales representative.

Frank B. Gordon, Harcon Corp., Boston, has been elected president for 1947, Boston chapter, Institute of Scrap Iron & Steel. Other officers elected by the chapter are: First vice president, David Reisner, William Reisner & Co., Clinton,



R. L. VAN CLEVE

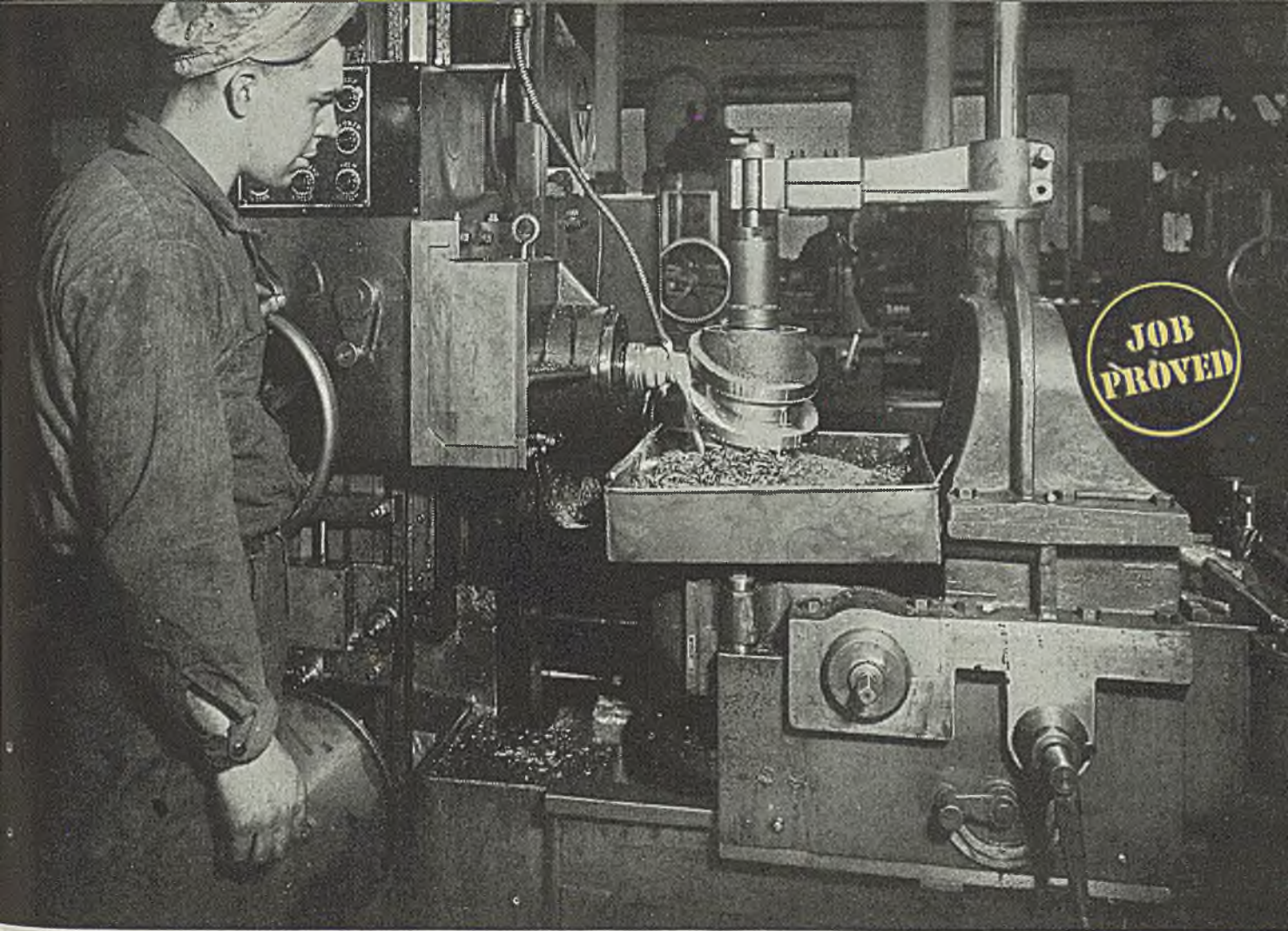
Mass.; second vice president, Stanley Amidon, Charles Dreifus Co., Worcester, Mass.; treasurer, Sam Brier, Harcon Corp.; and secretary for another year, N. E. Slavin, N. E. Slavin Co., Boston. William Mitchell, William G. Mitchell Co., Marblehead, Mass., has been chosen chairman of the executive committee.

R. L. Van Cleve has been appointed director of purchases, Carnegie-Illinois Steel Corp., Pittsburgh, subsidiary of United States Steel Corp. Mr. Van Cleve was a field engineer with Riter-Conley Mfg. Co. before joining Carnegie Steel Co. in 1914. He began with the Carnegie company in the open hearth department at the Edgar Thomson works, Braddock, Pa. In 1920, he was transferred to the company's general offices in Pittsburgh, and 4 years later was made assistant special agent. Mr. Van Cleve was named manager of blast furnace products, coke by-products and scrap in 1934, and the following year became assistant purchasing agent. He had been general purchasing agent since September, 1945.

Kennametal Inc., Latrobe, Pa., has added the following four men to its staff of application engineers: Delmar E. Baker, working out of the midwestern district headquarters office, Chicago; William L. Chambers and Richard H. Oberholtzer, located in central district headquarters, Detroit; and Leo J. Perette, assigned to the Cincinnati-Indianapolis area, and headquartered in the Cincinnati office.

Richard A. Weppner has been appointed sales representative in the Philadelphia territory, Heil Process Equipment Corp., Cleveland. He will make





**CUTTER LIFE DOUBLED . . .** *Costs cut 25%*

## **SUNOCO EMULSIFYING CUTTING OIL**

**Used for Milling Cams, Eliminates Stains and Odor, Produces Better Finish**

A well-known machine-tool builder, in the cam-milling operation shown above, was not obtaining satisfactory finish. The cutting emulsion had an objectionable odor and had to be changed every two weeks.

**Lubrication costs** were cut 25% when they changed to Sunoco Emulsifying Cutting Oil for both milling and grinding. The new oil lasts more than four times as long. Cutter life has doubled. Finish has improved. Objectionable odor eliminated.

**The facts:** Machine: Rowbottom cam miller  
Operation: Milling cams  
Material: Air-cooled alloy steel casting  
Depth of cut:  $\frac{3}{8}$ "

Tool: High-speed Weldon end mill  
Cutting Lubricant: 1 part Sunoco to 15 parts water

**In hundreds of shops** Sunoco Emulsifying Cutting Oil has been "Job-Proved." It mixes easily with water. Its high cooling and lubricating qualities are important wherever ferrous or non-ferrous materials must be cut with precision and at high speed.

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Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

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**INDUSTRIAL  
PRODUCTS**



his headquarters in Glenside, Pa. Mr. Weppner will handle the company's process tanks, process tank heaters and special tank linings.

Ray H. Morris has resigned his post with Hardinge Bros. Inc., Elmira, N. Y.

Frank X. Karle has been appointed treasurer, Aluminum Industries Inc., Cincinnati, succeeding Harry J. Hater who retains the office of president and general manager. Mr. Karle, who was elected a director in September, has been with the company since 1924. He began as a bookkeeper, and later was appointed to the offices of auditor and comptroller.

S. Samuel Kasden, H. Kasden & Sons Inc., New Haven, Conn., has been selected as president for 1947, southern New England chapter, Institute of Scrap Iron & Steel. Other officers chosen by the chapter are: First vice president, Leo H. Dragat, H. Dragat & Sons Inc., Hartford, Conn.; second vice president, Robert Jacob, Jacob Bros. Inc., Bridgeport, Conn.; and secretary-treasurer, Charles O. McIntosh, Charles O. McIntosh Co., West Hartford, Conn. Joseph A. Schiavone, M. Schiavone & Sons Inc., New Haven, has been elected to head the executive committee of the chapter.

Robert A. Wahl has been appointed sales manager, Union Steel Castings Division, Pittsburgh, Blaw-Knox Co., Pittsburgh. Mr. Wahl has been with the company since 1937, and has held several purchasing and sales positions.

R. B. Tripp has been named executive vice president, Ohio Forge & Machine Corp., Cleveland. He had been vice president of the company. T. E. Leighton, formerly secretary and treasurer of the corporation, has been appointed vice

president and treasurer. C. E. Thayer has been promoted from assistant secretary to secretary.

B. E. Kibbee has retired as executive vice president, Sharon Steel Corp., Sharon, Pa. Mr. Kibbee will continue with the company as treasurer and member of the board of directors.

Herbert H. Smith has been promoted to sales agent, Mine and Industrial Division, National Malleable & Steel Castings Co., Cleveland. Mr. Smith, who had been a field engineer for the company since 1945, joined its engineering department in Cleveland in 1937.

Arthur E. Bayley has been appointed assistant treasurer, United States Steel Supply Co., Chicago, a subsidiary of United States Steel Corp. Mr. Bayley had been in New York with American Steel & Wire Co., Cleveland, since 1942, except for a period of 2 years during which he served in the Navy.

John J. Wild has been appointed sales manager, Potter Instrument Co., Flushing, N. Y. Before joining the Potter company, Mr. Wild had been assistant sales manager, television equipment sales section, General Electric Co., Schenectady, N. Y.

H. F. Banks has been appointed assistant sales manager in charge of the eastern half of the United States, Oldsmobile Division, Lansing, Mich., General Motors Corp., Detroit. Russell Lesher has been appointed assistant sales manager in charge of the West for Oldsmobile. J. H. Handley has been named manager of parts and accessory merchandising for the division, and G. S. Brown has been named sales promotion manager. F. Q. Murphy has been named zone

manager for Oldsmobile in New York; D. A. McIntyre, zone manager in Detroit; L. J. Blunden, zone manager in Chicago; G. R. Jones, zone manager in Oakland; and R. L. Myers will be given special assignment on the West Coast. J. H. Lemons has acquired an Oldsmobile dealership, and W. O. Lampe remains as executive assistant to the general sales manager, D. E. Ralston. Messrs. Banks, Lesher and Handley will headquarter in Lansing. Mr. Banks has been with General Motors since 1926. He held successively positions of field representative, retail sales manager, assistant zone manager, and zone manager in Chicago, Milwaukee and Detroit, respectively. He was named manager for Oldsmobile in Detroit in September, 1945. Mr. Lesher joined Olds Motor Works as cashier in 1925, and was named zone manager for Oldsmobile in Chicago in January, 1945. Mr. Handley joined Oldsmobile in 1926, and was named assistant zone manager in Boston in January, 1946. Mr. Brown has been with Oldsmobile since 1933. He served as field representative in the Detroit and New York zones before his transfer to the home office in Lansing in 1941. He was named assistant sales promotion manager in September, 1945.

William K. Bonte has been appointed chief industrial engineer, Republic Steel Corp., Cleveland, succeeding the late Elmer Kropp. Mr. Bonte had been acting chief industrial engineer for the last 10 months. Mr. Bonte's first association with the steel industry was with Carpenter Steel Co., Reading, Pa. Later he was with Peerless Drawn Steel Co., Massillon, O., (now a part of Republic Steel's Union Drawn Steel Division), and with Bethlehem Steel Co., Bethlehem, Pa. During the last 25 years, he has been with Central Steel Co., and Republic Steel Corp. (with which Central Steel was merged in 1930), in su-



ROBERT A. WAHL

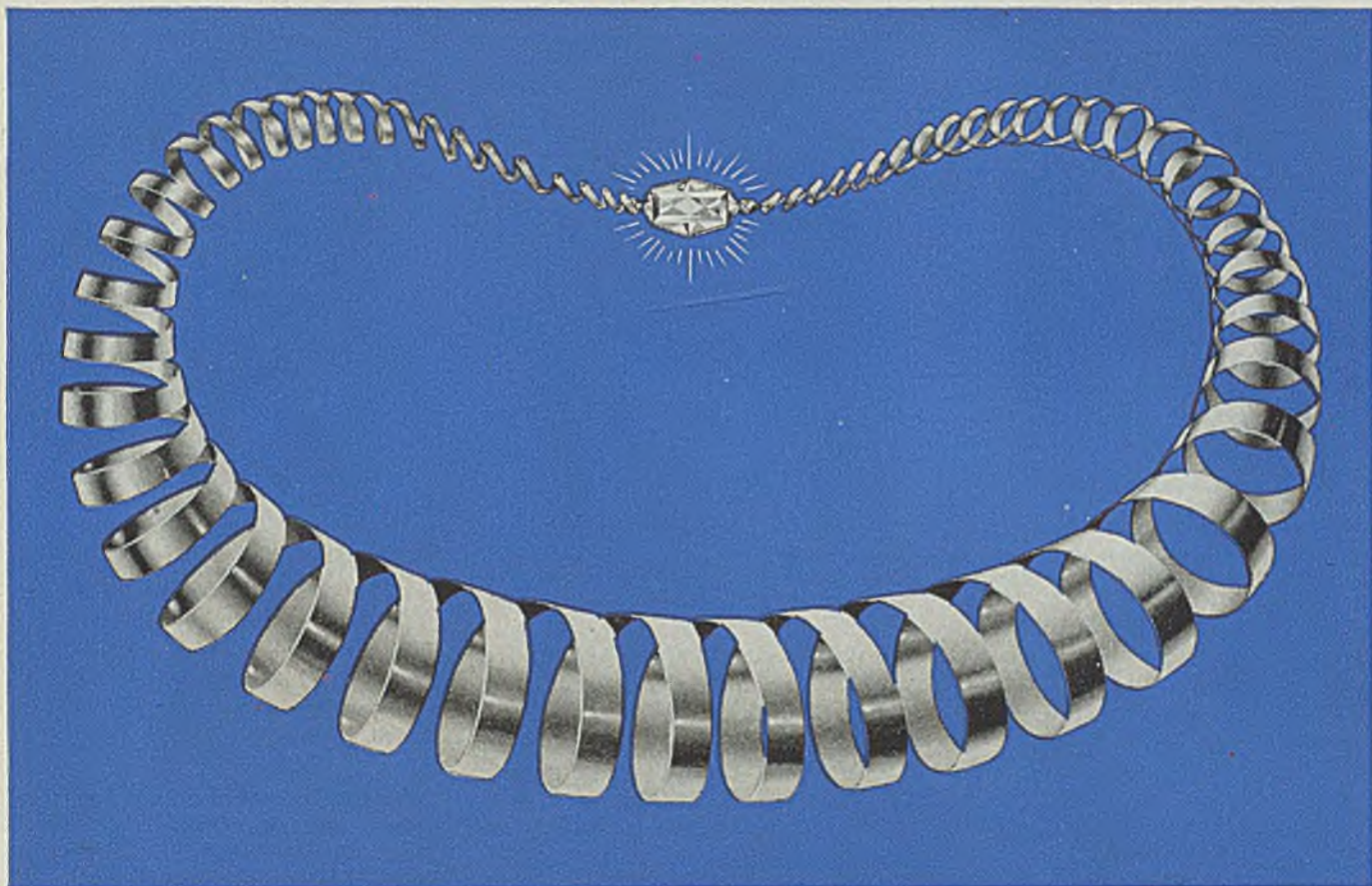


JOHN J. WILD



WILLIAM K. BONTE





Necklace Design by Tapper

## INDUSTRY'S PRECIOUS METAL

FOLLANSBEE Steels are precious, too. You don't pay prices based on *scarcity* when you buy Follansbee Steels even though we can't produce all you need. Nor do you pay a precious-metal price for the *high intrinsic value* of Follansbee Cold Finished Strip, Electrical Sheets, or Polished Blue Steels. ☆ ☆ ☆ Follansbee Steels are still scarce, but Follansbee metallurgical and manufacturing methods assure you the highest quality and most precise physical specifications in the limited quantities available to you. ☆ ☆ ☆ If we are to increase the supply of Follansbee Steels it is imperative that you keep your scrap moving to the mills regularly. Will you speed up on your scrap disposal methods today? ☆ ☆ ☆

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*Sales Offices:* New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee.

*Sales Agents:* Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants:* Follansbee, W.Va., and Toronto, Ohio. *Follansbee Metal Warehouses:* Pittsburgh, Pa., Rochester, N.Y. and Fairfield, Conn. COLD ROLLED STRIP • POLISHED BLUE SHEETS  
CLAD METALS • ELECTRICAL SHEETS AND STRIP • SEAMLESS TERNE ROLL ROOFING





**EUGENE W. FULLER**

*Who directs the management of Shakeproof Inc., division of Illinois Tool Works, Chicago, noted in STEEL, Dec. 9 issue, p. 84.*



**A. S. GLOSSBRENNER**

*Elected assistant vice president in charge of steel operations, Youngstown Sheet & Tube Co., Youngstown, STEEL, Dec. 9 issue, p. 84*



**JOHN T. CASEY**

*Appointed director of public relations, Jack & Heintz Precision Industries Inc., Cleveland, noted in STEEL, Dec. 9 issue, p. 85.*

pervisory positions, principally in the accounting department. From 1931 to 1936, he was works accountant for the Youngstown and Warren districts. In 1936, Mr. Bonte was transferred to the staff of the comptroller of Republic Steel Corp., and was responsible for works accounting and inventories.

John L. Lang has been appointed welding engineer, Lukenweld Inc., a division of Lukens Steel Co., Coatesville, Pa. For the last 5 years he was with New York Shipbuilding Corp., Camden, N. J., as supervisor of the chemical and metallurgical laboratory, and as assistant to the welding engineer.

Richard D. Mayne has been appointed plant manager, Hannibal, Mo., plant, Universal Atlas Cement Co., New York, a subsidiary of United States Steel Corp. He succeeds Ray E. Hoffman, who has retired after 27 years as plant manager. Mr. Hoffman joined the Atlas company in 1909, as a mining engineer at the

Hannibal plant. Mr. Mayne joined Atlas in 1937, and had been assistant plant manager at Hannibal since 1943.

Edward G. Budd Jr. has been elected president, Budd Co., Philadelphia, succeeding the late Edward G. Budd, who founded the company in 1912. The new president has been with the company since 1923. He was elected vice president in 1934, a director in 1938, and executive vice president in 1943.

Harry B. Coen, who was recently placed in charge of the employee co-operation staff, General Motors Corp., Detroit, has been elected a vice president of the corporation. Mr. Coen, who came to the company's central office in 1939 after serving as manager of Flint, Mich., operations for the Chevrolet Motor Division for several years, was director of labor relations prior to his new appointment. Louis G. Seaton, a member of the personnel staff for 14 years, has been named to succeed Mr.

Coen as director of labor relations. Mr. Seaton joined General Motors in 1928, as a member of the staff of the sales section.

Roy E. Hammond has been appointed general assistant comptroller, General Motors Corp., Detroit. Mr. Hammond, who had been assistant comptroller of the company since January, 1944, began his career in the automobile business with Oakland Motor Car Co., Pontiac, Mich., in 1919. He later joined the General Motors central office staff in Detroit. In 1925, he was transferred to the Overseas Division, serving in Brazil and in New York. In 1930, he went to the Frigidaire Division as assistant treasurer, and in 1942 he became a member of the comptroller's staff of the corporation in Detroit.

Robert H. Kittner has been elected vice president in charge of the newly created Plastics & Chemicals Division, Glenn L. Martin Co., Baltimore.

## OBITUARIES...

A. B. C. Hardy, 77, banker, pioneer in the motor car industry and former carriage manufacturer, died recently in Flint, Mich. In 1902, he founded Flint Automobile Co., the first automotive company to be organized in that city. He was president and general manager of the company. Previously, he had been president of Durant-Dort Carriage Co., Flint. From 1909 through 1911, he held several important General Motors executive positions. In 1912, he became vice president of Little Motor Car Co., and Mason Motor Car Co., both of Flint. Two years later Mr. Hardy was vice president and general manager of Chevrolet Motor Co. He was appointed president and

general manager, Olds Motor Works, Lansing, Mich., in 1921, and resigned from that company 4 years later to enter the banking field.

William R. Boyle, 55, metals sales department, American Smelting & Refining Co., New York, died in that city, Dec. 2.

John J. Kelly, 53, for 22 years manager of industrial relations, Marquette Cement Mfg. Co., Chicago, died in La Salle, Ill., Dec. 7.

Clarence R. Hochmuth, 52, works manager, Kearney & Trecker Corp., Milwaukee, died recently at his home in that city. He had been with the firm 34

years, and had been works manager since 1939.

W. Scott Long, 60, Chicago sales representative, Briggs & Stratton Corp., Milwaukee, died recently. He had been with the company 12 years.

Jerome F. McGee, 47, former assistant manager of sales in Milwaukee for Carnegie-Illinois Steel Corp., Pittsburgh, died in Kansas City, Mo., Dec. 6.

Victor E. Anderson, 67, designing engineer of heavy machinery, A. O. Smith Corp., Milwaukee, died at his home in that city recently. He had been with the corporation 19 years.



# Shortages Back Of Unbalance In Inventories

*Conference Board survey shows more abundant items and goods in process pile up. Demand unsatisfied*

SHORTAGES of key materials are bottlenecking industry's output, while materials in more abundant supply and goods in various stages of completion are piling up in plants and warehouses, according to a survey just completed by the National Industrial Conference Board.

At the same time, demand for most products remains unsatisfied, shipments lag behind new orders, and backlogs continue to mount.

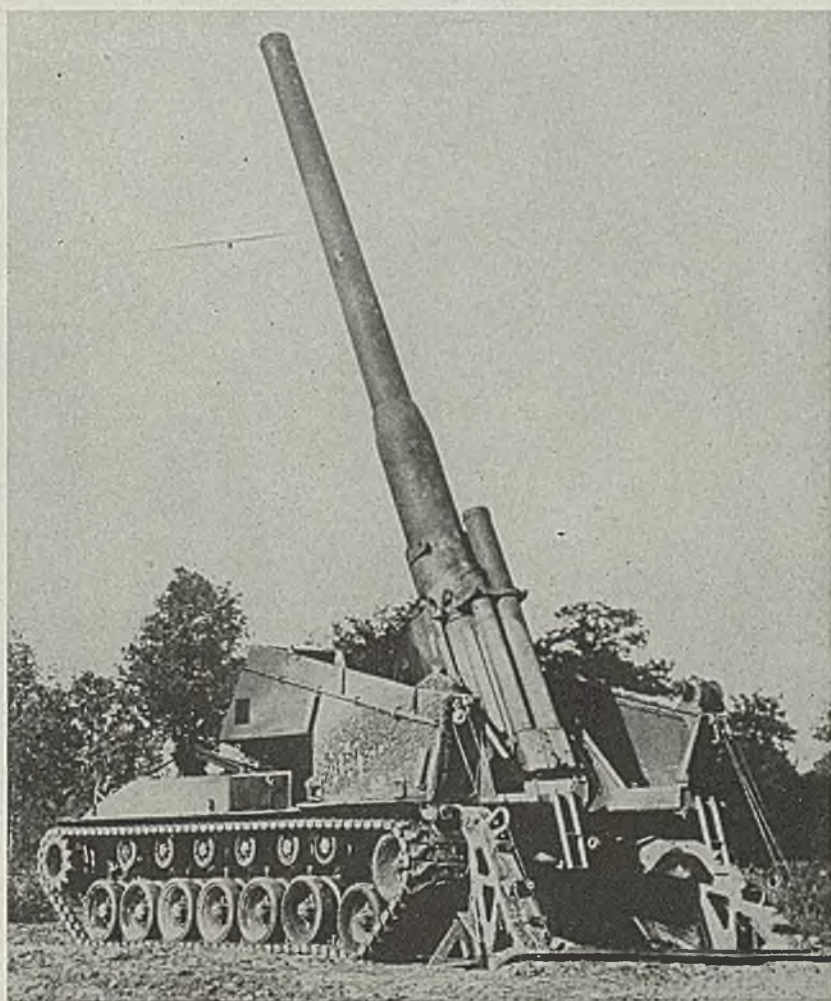
Keeping production lines moving in spite of these shortages is causing more concern to manufacturers today than the possible danger in peak total inventories about which the Department of Commerce recently cautioned business.

Paradoxically, shortages are largely responsible for the increase in total inventories. Where they have occurred in key raw materials or component parts (such as steel, lumber, lead, tin, copper wire, roller bearings, and electric motors) the completion of goods in process has been held up and supplies of more abundant raw materials have piled up.

## Indiscriminate Buying Noted

Another result of today's abnormal conditions is that many buyers feel they must buy whatever is offered, in the quantities offered, to insure a future supply of materials which they may not need currently. This practice contributes to the maldistribution of existing supplies, creating excesses of a particular item in the hands of one manufacturer while another may be forced to shut down for lack of that same item.

Relatively few instances of unusual accumulations of finished goods were reported in the board's survey; in most cases, the high level of demand, together with the low volume of finished goods, have resulted in the immediate shipment of products upon completion. Where such accumulations did occur, they were regarded as temporary, resulting from transportation difficulties and changes in customers' delivery schedules as a result of strikes.



**FIREPOWER:** This 8-in. rifle, measuring 35 ft 9 in. along the barrel and mounted on a 63-ton armored tank-type land battlewagon designed by Chrysler Corp., Detroit, for the Army Ordnance Department, can shoot a 240 lb shell 27 miles. The rifle is interchangeable with a 10-in. howitzer on the mobile carriage. The vehicle can be made ready for action in five minutes by backing up and ramming a spade tail into the ground to resist recoil. NEA photo

Most significant effect of the shortages has been the pyramiding of goods in process. Many of these goods, the Conference Board finds, are only one or two steps away from completion. However, until the missing items are obtained, shipments cannot be made.

Some manufacturers reported that production schedules are on a day-to-day basis because of the supply situation. These manufacturers are sparing no efforts to obtain necessary materials, and in some instances, relatively bulky items have been even flown to plants to prevent an interruption in output.

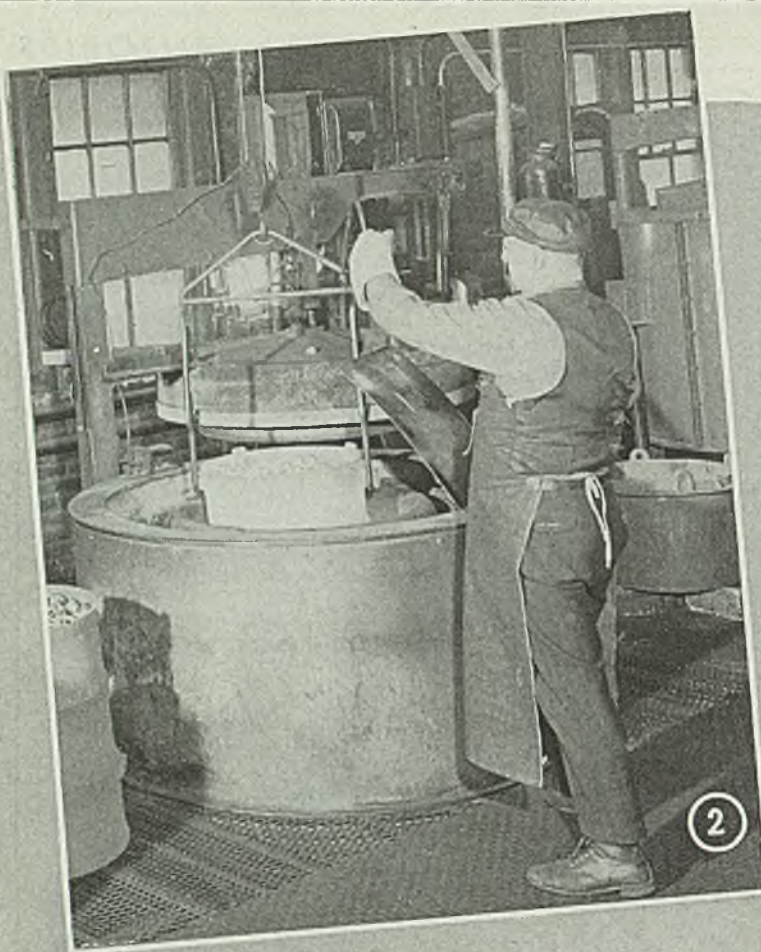
Another inventory problem cited in the survey is the "inflated" value of raw materials and goods in process. Particular attention is directed toward the increased value of goods in process resulting from sharp rises in labor costs. Con-

cern over these increased investments has caused some manufacturers to review their methods of pricing, while others are attempting to meet the condition through tighter control over future purchasing.

Virtually all executives reported to the Conference Board that cancellations are at a normal or even subnormal level. Significantly, however, a number of companies noted a drop in inquiries reflecting cutbacks or postponements of plant expansion programs.

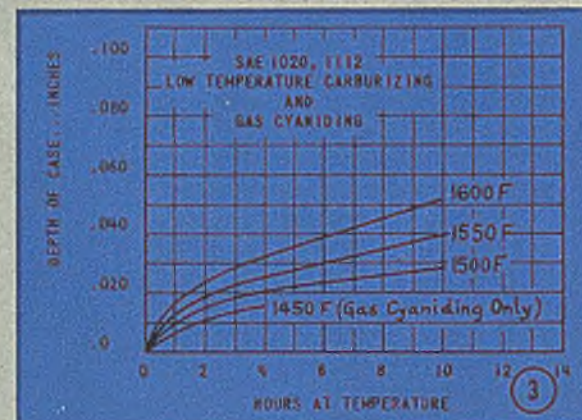
A note of caution is introduced by a number of executives who believe that the demand situation must be watched closely as it could deteriorate very rapidly. Few executives feel that there is much inflation or duplication in orders, although some have noticed a stiffening of buyer resistance and an increase in selectivity in recent months.





By H. M. PARSHALL  
Leeds & Northrup Co.  
Philadelphia

# Gas Cyaniding



... is useful method of case hardening, especially for parts made of low carbon, nonalloyed steels such as SAE 1020 and 1112. Process consists of exposing parts, at proper temperature, to gaseous medium containing carbon and nitrogen

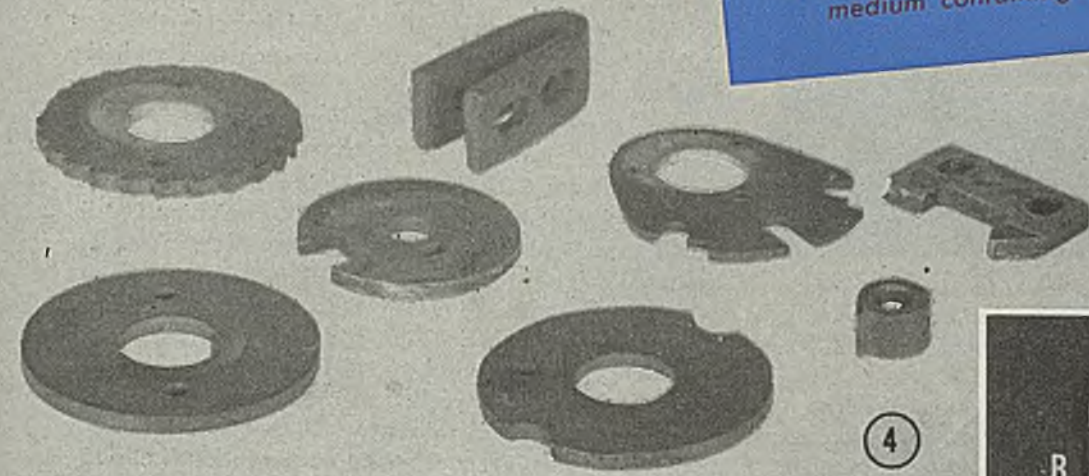


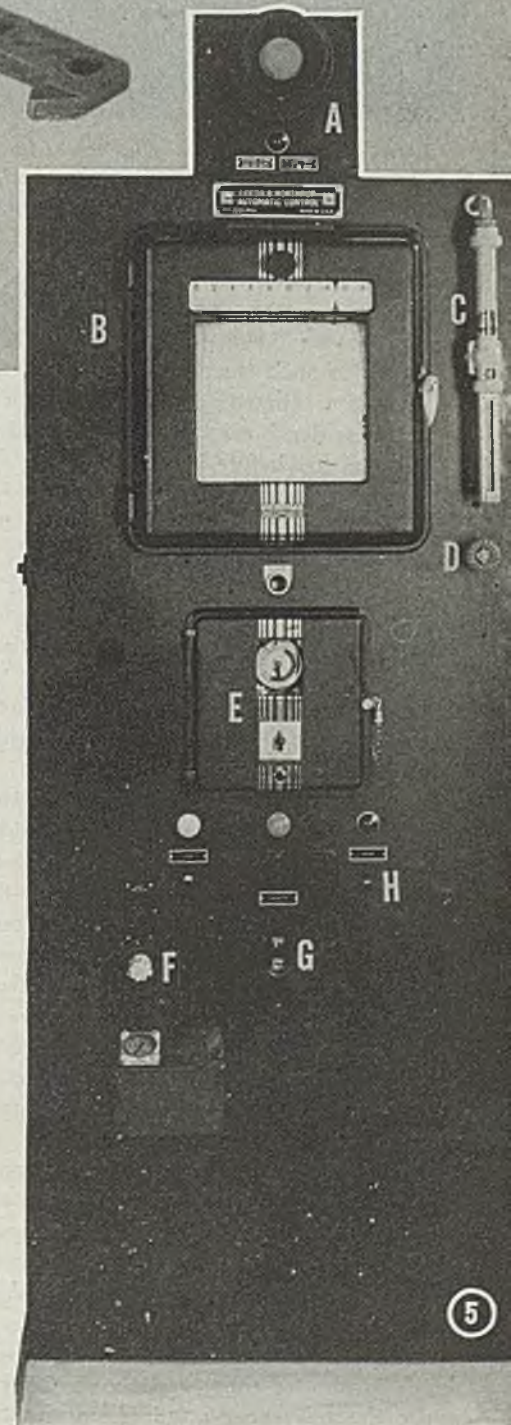
Fig. 1—Brake wheel side block after cyaniding. Diameter is 2 1/4-in., thickness 1 in.; machining tolerances are 0.0005 to 0.002-in. before cyaniding and plus or minus 0.005-in. after cyaniding

Fig. 2—Heat-treater removing load of bearing cones from furnace

Fig. 3—Average cyaniding rate for two typical low carbon steels

Fig. 4—Gas cyanided parts for recording instruments include ratchets, cams and panels

Fig. 5—Control panel for gas cyaniding. A—overheat alarm, B—Micromax recording controller, C—visual indicator for ammonia flow, D—ammonia regulating valve, E—control unit with 24-hour timer, F—Fluid flow adjustment knob, G—start-stop switch for forced convection fan, H—furnace heater switch



**D**URING recent years, gas cyaniding has become one of the most useful methods of case-hardening, particularly for parts made of low-carbon, non-alloyed steels such as SAE 1020 and 1112. As compared with carburizing it offers several specific advantages for certain kinds of work. The average gas cyaniding temperature is about 200° F lower than average carburization temperature; consequently distortion due to heating, handling and quenching is considerably reduced.

Of even greater importance in reducing distortion is the fact that a uniform hard cyanided case can be obtained by an oil quench rather than by water or brine. This latter factor is particularly applicable in hardening parts which have irregular cross sections, where soft spots may sometimes be left on carburized work. Cyaniding provides a rapid method of producing a file hard surface on parts which require a relatively shallow case.

In general, the process of gas cyaniding consists of exposing the parts to be treated, at the proper temperature, to a gaseous medium which contains available carbon and nitrogen. The equipment used in the Homocarb method of gas cyaniding consists of a furnace, of the same type that has been used successfully for many years for gas carburizing. For cyaniding, however, the furnace atmosphere consists of a mixture of ammonia and carburizing gas.

The furnace itself is especially designed for gas-atmosphere heat-treating. Fig. 2 illustrates a typical installa-

tion. Furnace atmosphere is heated by a ribbon-type electric heater mounted outside of the work space and driven through the load by a powerful fan. This forced convection heating method assures that all parts of the load are evenly heated, and that an ample supply of cyaniding gas is supplied to every surface that is to be hardened. Temperatures in different parts of the work space, even when dense, closely packed work is treated, are uniform to within few degrees. Work comes to temperature quickly and evenly, with a minimum of heating strains.

Control is provided by the panel, Fig. 5. This unit enables regulation of each of the variables which affect depth, hardness and uniformity of the case. Composition of the cyaniding gas is adjusted by the heat-treater, by two controls on the furnace panel. Carburizing gas is furnished by Homocarb fluid, pumped into the furnace at a controlled rate set by a flow-adjustment dial. When this fluid enters the furnace chamber, it almost immediately becomes a carbon-rich gas.

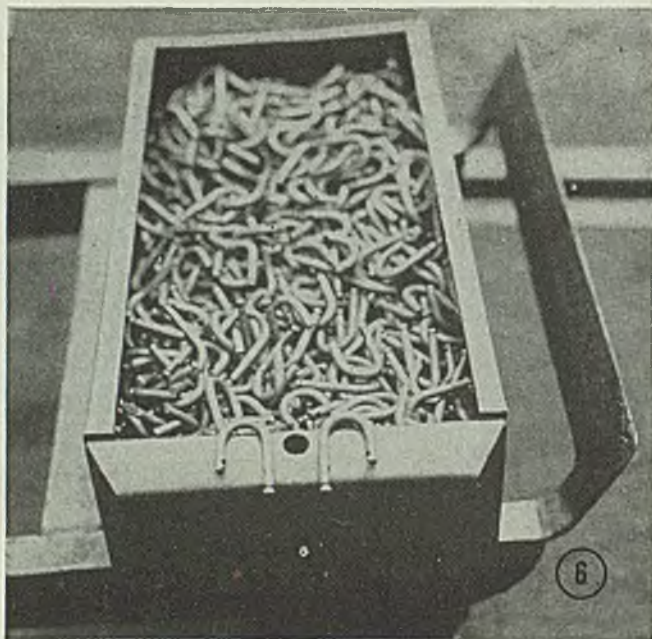
To this is added ammonia gas, supplied from a pressure cylinder. Rate of addition of ammonia is also regulated by a needle valve on the instrument panel; rate of flow is indicated by a Floscope. For usual cyaniding work, ammonia content is adjusted to approximately 30 per cent of the total gas mixture. More dense, closely-packed loads generally will require a higher percentage of ammonia.

The amount of fluid and gas supplied depends on the size of the furnace, density and size of load, and the desired case characteristic. For example, a furnace with

a work space of 6 cu ft requires for average loads about 1-3/4-pt of fluid and about 20 cu ft of ammonia per hour. Source of cyanide never becomes depleted, for a fresh supply of ammonia and fluid flows continuously through the furnace. Gas mixture burns at the furnace outlet to form a harmless gas which is dissipated in the surrounding atmosphere. No ventilating hood is required when this system is used.

Temperature control is provided by the Micromax recording controller which uses a thermocouple in the furnace work space as detector. The control system now used with this and all other L&N heat-treating furnaces is the relatively new duration-adjusting type, known as D. A. T. Through the use of an improved method of supplying controlled heating power, D. A. T. operates the heating element at a lower average temperature, with consequent improvement in life of the heater. Another outstanding feature of this type of control system is that it does not





*Fig. 6—Load of lock shackles ready for gas cyaniding. For parts like these requiring only a relatively shallow case, cyaniding cycle is limited to less than 1 hour*

require any additional voltage regulating equipment. Variations in supply voltage do not affect furnace temperature, because the control system itself inherently compensates for such fluctuations.

Time of treatment, another important factor in determining case depth can also be controlled accurately. The heat-treater has before him on the chart a complete record of temperature throughout the heating cycle, and can tell exactly how long work has been at temperature. Or, he can set a timer on the panel to flash on a signal light after a selected number of hours of treatment have elapsed.

As in the case of Homo-carburizing there is no packing or other special preparation of parts. Many small parts are simply dumped into the work basket. Larger pieces or those which may be damaged by dump loading and quenching are mounted on jigs.

For typical heat, to be cyanided at 1600° F, the heat-treater loads the furnace at the cyaniding temperature. When furnace temperature rises to between 1200 and 1300° F, after an initial drop due to the cold load, he turns on the Homocarb fluid and ammonia. Because fresh cyaniding gas is supplied continuously, the case develops more rapidly than in other methods of cyaniding; time at a given temperature to obtain comparable case depth is considerably shorter. Consequently, for a given size of furnace the heat-treating capacity in pounds per hour is considerably higher where the gas cyaniding process is used.

**Results Obtained by Gas Cyaniding:** Fig. 3 shows average cyaniding rates for SAE 1020 and 1112 steel at various temperatures. At the higher temperatures—above 1450° F—the cyanide case develops at approximately the same rate as a carburized case under similar hardening conditions.

As in carburizing, higher temperatures give greater case depth in shorter time, and the limiting factors are generally the tolerances required on the treated parts and

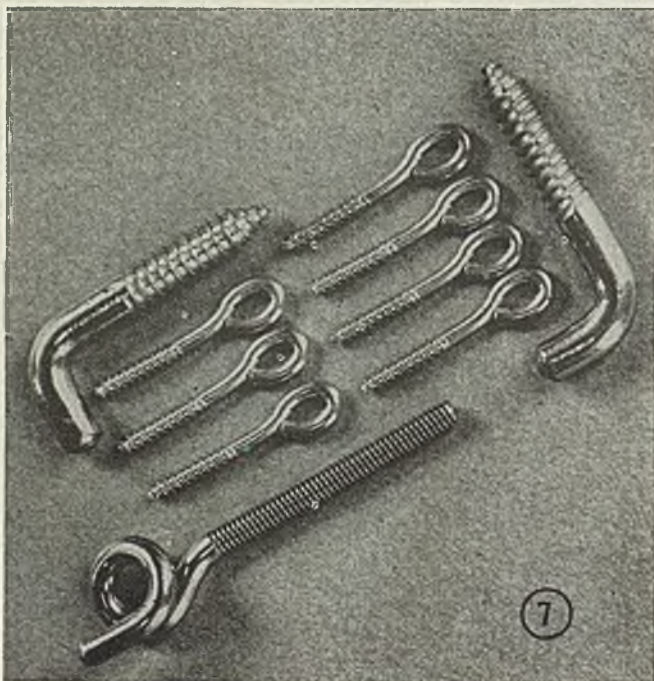
the danger of distortion. It is often advisable, when cyaniding at the higher temperatures, to slow cool in the furnace atmosphere to around 1500° F and quench from this lower temperature.

As an example of how closely tolerances can be maintained, one user is able to hold finished parts after cyaniding to plus or minus 0.0005-in without grinding. The parts treated, Fig. 1, are brake wheel side blocks made from screw machine steel, ASM C-1118. Blocks are dumped into trays, cyanided at 1500° F for about 3 hours and oil quenched. Case is file-hard and is 0.020 to 0.025-in. deep. Because gas cyaniding is used, there is no loss of cyaniding medium which would otherwise be entrained in the recesses, flanges and threaded holes in this part and subsequently carried into the quench tank with the blocks.

Lock shackles, shown in Fig. 6, are given a file-hard case by gas cyaniding at 1550° F for 40 min. Case depth averages 0.010-in. These parts are dumped into the work basket in loads of about 2500, weighing 260 lb. Small cams and ratchets for recording instruments are mounted on fixtures to assure a uniform case on flat sides which might come into close contact if they were dumped into the work basket. Fig. 4 shows these parts after cyaniding. A short cycle is used—about one hour at 1650° F, followed by cooling to 1550° F and oil quench. Superficial rockwell hardness is 79 to 81 on the 30-N scale—corresponding to 62 to 64 on the rockwell C scale; case depth is about 0.020-in.

A manufacturer of mill wire goods does all cyaniding at the same temperature, and varies time of treatment to obtain the specified case depth. Fig. 7 shows some typical parts, all of which are made of SAE 1020 steel. Guide wires and oval eyes are held at temperature for 1 hour, for a case of 0.010-in. The refrigerator hooks take on a case of 0.025 to 0.027-in. after cyaniding for 3½ hours.

*Fig. 7—Typical gas cyanided mill wire parts, all made of SAE 1020 steel*





**TURBO-JET PIONEER:** When 6000 to 7000 engineers gather for the annual meeting of the American Society of Mechanical Engineers, there is apt to be among them some one individual who—through his inventions—literally is changing the course of history.

My impression, formed at the recent ASME meeting in New York, is that the man there present who most literally comes up to that specification, is Air Commodore Frank Whittle of the Royal Air Force of Great Britain. He was awarded the Daniel Guggenheim Medal "for pioneering the development of turbo-jet propulsion of aircraft."

I was fortunate in being invited—as one of a group of technical editors—to sit down with Air Commodore Whittle for an interview during which he told us something about his experiences. If you think that he is a typical "crazy inventor" who won a 50-50 contest with death by managing to take off (and land) in a "crate driven by a blow torch," you are wrong.

He is a highly trained airman who is also a highly trained engineer, being an alumnus and finished product of Cranwell, of Henlow and of Cambridge University. He is 39 and looks like Governor Dewey of New York. "I never was considered actually crazy—merely slightly eccentric," he remarked. He has a sense of humor as well as an inventive mind.

In view of achievements in jet-propulsion since Power Jets, Ltd., was organized in March of 1936, to develop the Whittle engine, the Air Commodore's predictions to the effect that within a relatively short time jet propulsion will be applied to large commercial aircraft is not to be taken lightly.

In that connection, he really began to talk my language when he discussed the big forging presses which will be required to forge the big turbine wheels which will be required for the big commercial turbo-jet engines which he envisions.

Unlike Leonardo da Vinci, who dreamed up great inventions but failed to dream up the tools with which to build them, Air Commodore Whittle is dreaming up the tools along with his inventions. As a practical tool engineer as well as a creative scientist, he is "getting places"—and fast—with brilliant inventions which are destined to get a lot of people to a lot of places fast in the not far distant future.

**SIMPLE WORDS ARE GOOD:** On my way back from the annual meeting of the American Society of Mechanical Engineers in New York, I stopped off in Washington to attend the December sessions of the National Conference of Business Paper Editors. One memorable feature was a visit to the office of the affable but determined Attorney General of the United States, Tom Clark. What Mr. Clark had to say on that occasion I am not at liberty to report. The following thoughts, however, are not "off-the-record."

On the wall of the Attorney General's office hangs a splendid oil painting of the late John Garibaldi Sargent, who was Attorney General during the Coolidge administration. This lifelike portrait aroused memories of a scene in a country court room in Vermont.

The case under consideration involved questions of originality of certain features of an automatic machine for making parts from metal strips by shearing. The main

# Seen and Heard in the Machinery Field

By GUY HUBBARD

Machine Tool Editor

question involved angular setting of the moving blade.

Around this a group of lawyers and technical consultants had built up a lengthy brief replete with those big words which are so common in the legal and engineering professions. Few, if any, of the common folks in the court room could make head nor tail of what it was all about.

After the men of many and big words had succeeded in filling the court room, and the minds of all within it, with legal and technical fog, Mr. Sargent stood up and said: "Ever see a pair of sheep shears?"

As he asked this homespun question, he pulled a pair of rusty sheep shears out of the pocket of his baggy coat. It was a matter of record that they had been forged by a Vermont blacksmith more than a century before. His name and the date were stamped on them.

With the help of these old sheep shears and a few simple words that everyone in the courtroom understood, Mr. Sargent proved beyond the shadow of a doubt that the basic idea of "the shearing cut" actually is an old, old idea on which no one possibly could have any monopoly.

When Mr. Sargent went to Washington he continued to be the same plain-spoken man that he always had been. It is a matter of record that he was a good Attorney General.

**OUR INDUSTRIES CAN'T VEGETATE:** One of the most common charges against big industries has been that they perpetuate outmoded products by hindering individuals in the development of new products. There have been stories to the effect that brilliant inventors have been hired merely to keep them bottled up, to prevent them from upsetting the industrial status quo.

As a matter of fact anything of that kind would be impossible here in America because of our system of free competition and because of the individual freedom of our scientists, engineers, inventors and technicians. High wheeled bicycles, steam-driven motor cars, naphtha launches, "talking machines" with morning glory horns, and machine tools with multi-belted countershafts, all have had their periods of usefulness. None of them, as far as I am aware, ever has been artificially "perpetuated".

Their makers either have brought out new products for new times—or have gone out of business. Their inventors either have developed the new products for the old companies, or have gone with new companies where they could do so—or have retired. In no case has any company or any individual, been able to keep up with the competitive race by standing still.



**SALVAGING and**

**RECLAIMING**

# SCRAP

**Worn out equipment mounting to almost 50,000 tons annually yields important savings at railroad scrap reclamation plant**



*Fig. 1—Scrap-conscious worker finds two “nickels’ worth” of scrap*

*Fig. 2—Worn ends of 39-ft rails are cleaned for torch cutting which lops off 18 in. Fish plate holes are re-drilled and serviceable 36-ft rails are ready for use*

*Fig. 3—First job in scrap handling is segregation. In-bound scrap (rear left) is sorted and loaded into out-bound cars (right), or palletized for shipment to stores and repair shops*

BECAUSE the problems of handling scrap bear no direct relationship to all-important production, there is a natural tendency in the industrial world to slight this phase of operations.

Yet scrap is an inevitable by-product in most fabrication, and there are definite economic reasons for devoting to scrap handling a proportionate amount of the attention paid to manufacturing and maintenance operations. When properly organized, with careful analysis and economic control, scrap salvage and reclamation can be a profitable operation.

Through individual effort, and jointly through the Association of American Railroads, the railroads in particular have, over the years, concentrated on the twin problems of scrap salvage and reclamation. At Meadville, Pa., the Erie railroad operates a scrap and reclamation plant which is said to be a model of efficient handling of used material and equipment. Established 19 years ago, the plant employs 70 men, and receives (Please turn to Page 142)





AS MANY people know, I started about 3 years ago through talks to technical societies, engineering departments of machine tool builders, and in one case to a meeting of the National Machine Tool Builders Association, to criticize the selection and installation of electrical and hydraulic equipment on machine tools.

After considerable discussion among the executives at our central office and the master mechanics and plant engineers of our various divisions at that time, it was decided that this was the best method to use to bring to the attention of the machine tool builders and the manufacturers of electrical and hydraulic equipment the difficulties encountered with this type of equipment in our plants. Through this approach we naturally expected to eventually get better machine tools, particularly from the maintenance angle. Of course, to achieve this goal it was necessary that everybody concerned consider our comments as constructive criticism and make every possible effort to correct the points brought to their attention.

#### Plan Special Conferences

I know that a great deal more can be accomplished on hydraulic equipment by the same sort of co-operative effort on the part of everybody interested in such equipment. In fact, we in General Motors intend to start an hydraulic activity in the near future patterned after our conferences with the machine tool builders, the electrical motor and equipment manufacturers and other large users of machine tools. I sincerely hope that our efforts will be accepted by everybody concerned as we intend them.

Some of my previous comments have either been badly misunderstood or deliberately misquoted. In spite of the fact the remarks I have made in the past were the result of contacts with the maintenance personnel in our plants, I have been accused of giving only my own personal opinions. I have been accused of making untrue statements and of also stating that hydraulics in general had no advantages and would be replaced by mechanical methods. In order that everybody may understand my position perfectly I want to make a few statements at this point.

#### Experience a Good Cross-Section

1. All of the statements I have made in the past and those I make here are based on accurate information received from our plants. We have 39 divisions and over 100 plants. These plants use well over 100,000 metal cutting machine tools and presses. I honestly believe that our experiences with machine tools and

other equipment represents a good cross-section of the experiences of most users of hydraulic and other equipment.

2. I have definitely stated and I emphasize again that my comments refer to the use of hydraulics on machine tools and presses only. I am not familiar with the installation of hydraulic accessories in other types of equipment, and therefore cannot make any comments on their use.
3. I have never made a statement to the effect that hydraulics generally are no good and are on the way out,

reflects more on the manufacturers of the hydraulic equipment and on hydraulics in general than on the machine tool builder. Most hydraulic equipment is basically well engineered and well built but the installation of much of the equipment has not been well engineered.

#### Hydraulically Operated Tools Improved

Believing that a summary of the comments of our plants on hydraulic equipment would be of interest, I again contacted the people in our plants who are most interested in this type of equipment. Almost everybody I talked with

By H. T. JOHNSON

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Process and Development Section  
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Detroit\*

# *A user looks at* Hydraulics

*To improve design, installation and operation of equipment, there must be closer co-operation between the manufacturer of hydraulically operated or controlled equipment and his users, says the author. In this provocative article one of the largest buyers of machine tools and presses discusses the several causes of misunderstanding and difficulties*

although I have been quoted as making that statement. What I have said is that unless some phases of the application and installation of hydraulic equipment are not cleaned up, there will be a resistance on the part of shop personnel to the use of hydraulically operated machine tools. Due to inaccessibility of hydraulic equipment and leakage due to high pressures, both of which result in high maintenance cost, this trend has become quite apparent in our plants in the case of hydraulically operated presses.

#### Definite Need for Hydraulics

There is a very definite need for hydraulics in present machine tools but at the same time the selection and installation of hydraulic equipment requires a great deal of thought. The manufacturer of hydraulic equipment must work closely with the machine tool designer and make certain that his equipment is installed in an efficient and accessible manner. Failure of hydraulic equipment

was of the opinion that hydraulically operated machine tools had been greatly improved over the past year but that there are still several places where even greater improvements can be made in the tools.

#### Suggestions for Further Improvement

All of our plants are greatly disturbed regarding the inaccessibility of pumps, valves, piping, etc. in present machine tools. This results in excessive maintenance costs and long periods of downtime in cases of even minor repairs. I enumerate some of the criticisms from our plants and in most cases quote the people contacted:

1. "Many machines have the pump and valves located in the oil reservoir. This makes it necessary to disconnect a great deal of piping and drain the reservoir before any maintenance work can be accomplished. In cases where solenoid valves are located in reservoirs there is, in addition, a safety problem and also in many cases the oil mist affects the

\* Based on an address before the Cleveland Engineering Society, Oct. 8, 1946.

(Please turn to Page 113)



By JOHN HYLER

*Efficient operations depend upon proper selection of wheels and buffing compositions including rouge, tal-low, Vienna lime, grease sticks or greaseless compounds*

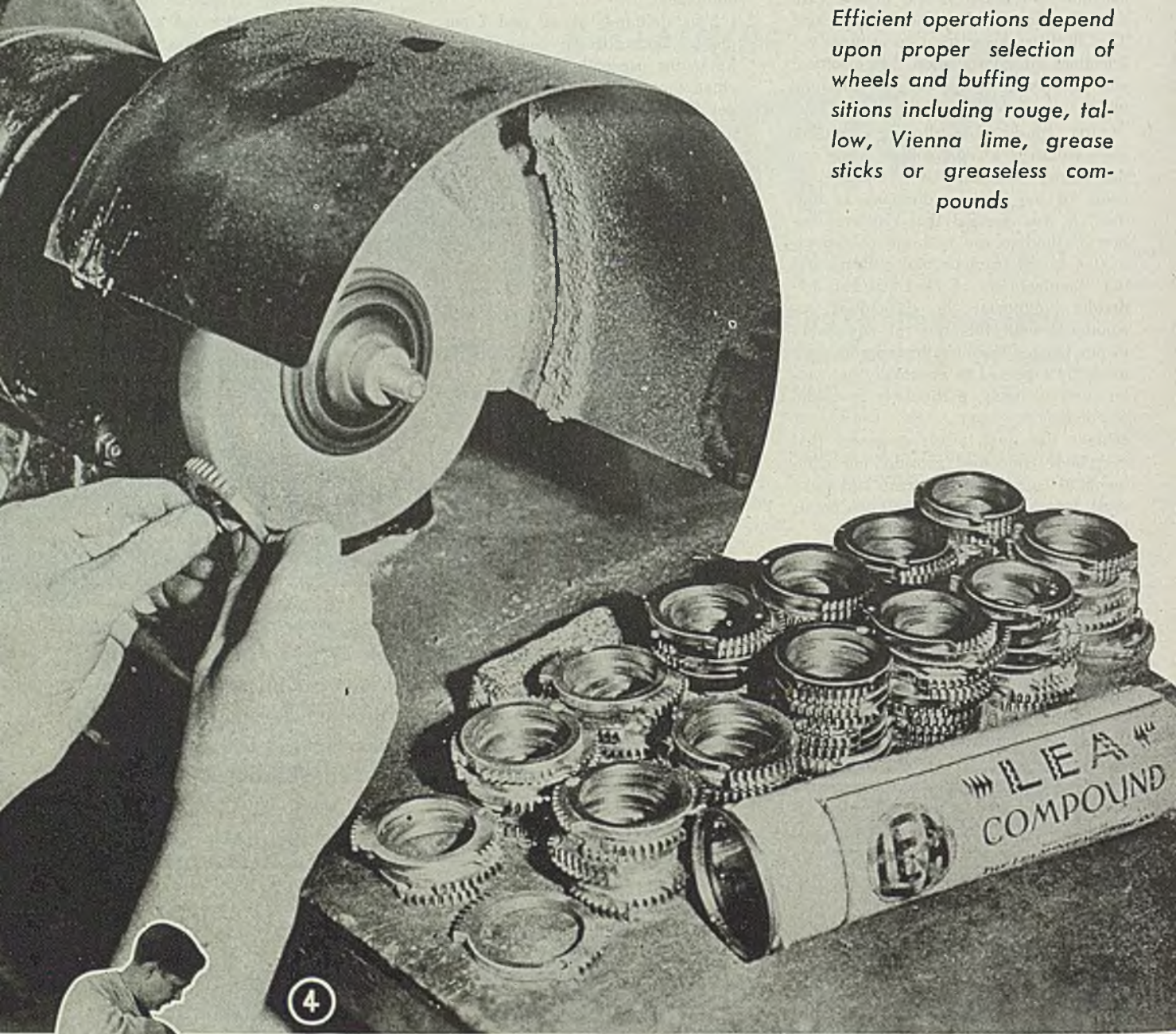


Fig. 4—Burring gears and gear teeth using special abrasive compound on loose muslin buff. Photo courtesy Lea Mfg. Co.,

Fig. 5—Operator here is cleaning interior of ham mold boiler with wire brush on flexible shaft unit. Photo courtesy R. G. Haskins Co.,





## WHEELS AND COMPOUNDS FOR

# Buffing and Polishing

REMOVAL of scale, dirt, corrosion etc., in many cases is an important preliminary to abrasive wheel polishing. Circular, power-driven brushes have been perfected for this service. Those with tampico bristles long have been popular on lighter work. Wire brushes now are used for heavy service where there would be undue wear on tampico bristles.

Before considering abrasives in various buffing compounds, it should be mentioned that fine finish is possible with a setup wheel, through the simple expedient of stoning down its face while revolving. This knocks down protruding points which cause scratches. The method is applied to wheels set up with 200 grain abrasive with excellent results on some kinds of work.

In selecting buffing compositions, as well as buffs, the rule is to use the finest grained material that will with a moderate amount of work remove all scratches resulting from a previous operation. In removing scratches, it often is better to resort to an additional operation, rather than to make an operator work unduly hard on a single operation.

Emery cake is commonly used on iron and steel. Tripoli, which may be had powdered or in various compositions, is favored for softer metals. Polishing and buffing rouge is used for much of the finer polishing, not only on stainless steel, chromium, nickel, etc., but also on glass, gold, platinum and silver. Something relatively new in this line is a water-soluble coloring rouge which is readily cleaned from work.

Tallow used in buffing and polishing, Vienna lime, grease sticks, etc., are among the commodities available from manufacturers of buffing and polishing compounds. Various special compounds usually are to be had from those who furnish regular materials. The same types of abrasives widely used in bulk form in setting up wheels

with glue also are sold to manufacturers of buffing and polishing compounds, in finer forms, for manufacture into greasecakes.

Greaseless buffing compounds sometimes are highly effective for various burring operations as well as for polishing and buffing. For work which contains grooves, recesses or filigree, presaponified compositions are available. These wash from work quickly and easily, leaving it absolutely clean. The polisher today not only has a wide choice of materials, he also has the benefit of accrued experience of firms supplying them.

**Buffing Wheels**—Various fabrics, felts and leathers are used for buffs, either sewed or open. Sewed buffing wheels must be used where speeds are too low for centrifugal force to hold the layers or plies straight out from the spindle. Leading felt manufacturers supply material designed for polishing purposes, and many leather manufacturers provide ordinary buffing and polishing leathers commonly used by wheel manufacturers. Certain of the latter specialize on bullneck, buffalo and walrus leather.

In cutting materials into circular disks there is a large waste factor unless some of the circular layers are pieced together from scraps. While it is possible to obtain wheels having all full disks, those interspersed with a moderate number of pieced disks are considered good quality. As to choice of material for buffs, that is a matter of judgment based upon nature of work. For fine-grain polishing such as final operations on products preparatory to buffing or plating, a wheel made of finely-woven material is preferable.

One line of such wheels is made up of sewed sections 1/4-in. thick. These sections in turn are cemented into wheels of the required face thickness, these being squeezed in a hydraulic press until the cement has set. The manufacturer supplies a special polishing grease for use in connection with these wheels when set up with 180-grit or finer abrasive. This combination brings out fine finish on steel, cast iron, bronze, aluminum, copper or brass preparatory to plating or buffing.

Close examination should be made when buying fabric buffs, to make sure that they (*Please turn to Page 117*)



PRIMARY lubricants required for strip steel mill machinery are circulating oil, antifriction bearing greases and gear lubricant.

Circulating oil must be a highly refined product made from most carefully selected stock. Exacting demands imposed by the operating conditions require that in steel mill service a circulating oil must function without possibility of breakdown and formation of damaging sludge and carbon deposits. Resistance to oxidation (high chemical stability) and ability to separate rapidly from water are essential in this type of service.

The tendency in strip steel service is towards a multi-purpose type of grease capable of standing heat, water and contamination. Extreme pressure properties are necessary to meet the loads and back-up roll conditions. Extreme pressure characteristics also lessen the tendency towards pitting of bearings on hot strip stands. Resistance to water-washing is required when the grease is used on work roll bearings. Good pumpability is essential as the grease may often have to be pumped through lengthy distributing lines. Maximum stability assures good resistance to oxidation and satisfactory protection of highly polished bearing surfaces, also freedom from separation under the severe churning action encountered in roller bearings.

In steel mill service the pressures usually encountered will be high; they may be especially severe on gear tooth surfaces where a relatively small area of contact prevails. This has favored a decided trend toward the mild extreme pressure type of noncorrosive gear lubricant. The load-carrying ability is obtained by blending high-quality mineral oils with carefully selected lead soaps and suitable extreme pressure additives in such a manner as to produce compounds of pronounced stability and adhesiveness,

# Lubricating

which free themselves readily of water. As shock loads are frequently encountered, the gear lubricant must not only be viscous enough to cushion these hammer-like blows on the teeth, but also adhesive enough to resist being squeezed from the tooth contact areas.

An effective circulating system capable of circulating a sufficient volume of oil, and of such capacity that a suitable rest period for the return oil is practicable.

Location of steam or cooling water coils is most important. If within the settling tank or base of a pinion stand, preferably they should be on the side instead of on the bottom to avoid water contamination in case of leakage, or "cooking" the oil when steam heating is required. Better still, install heating coils outside the tank.

Filters and centrifuges assure proper purification of oil by removal of all foreign matter. Magnetic filters remove finely divided iron. Bag filters and centrifuges take care of water, dirt and other nonlubricating materials.

# hot strip mills

Various type facilities improve lubrication. Amount of grease delivered to roller bearings controlled by simple method. Development of tight housings for gears affords continuous circulation of fluid oils. Planning lubricating system is discussed in this second and concluding article

By A. F. BREWER  
Mechanical Engineer  
and  
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Clay-type filters are best suited where water is absent; will not operate on oils containing water as the latter tends to "mud" or pack the clay.

Air vents relieve back pressure on the lubricant. Unless an oil can expand freely with increase in temperature, the back pressure may cause seals or bearing housings to leak. Small return lines can cause back pressure to build up. Grease lubricated antifriction bearings also should be vented to protect the seals when grease is applied under pressure. Reduction gear housings should be vented to keep the temperatures down.

Rust proofing circulating tanks is a beneficial procedure, especially on the interior surfaces of the top, and sides above the oil level. This keeps rust particles from forming and flaking off to contaminate the oil.

A 2-tank settling system enables one to always be available for use when the other is to be cleaned. Batch cleaning of the oil, along with tank cleaning at regular

intervals, insures longer oil life and prevents foreign matter from circulating.

Cleaning procedure frequently depends upon extent of oil contamination. Cleaning of a settling tank removes iron soaps and other substances which serve as catalysts to promote sludging.

Checking for moisture content should be done daily. Water content in a circulating oil may build up fast if seals are damaged. Removal of water promptly facilitates breaking of potential emulsions. Water legs are helpful in keeping small amounts of water out of settling tanks, or indicating the presence of water.

Centralized pressure lubrication involves either grease or oil, according to the design of the lubricating system. Where oil is used, circulation normally prevails, the oil being re-used over and over again. Suitable oil purification equipment is incorporated in the circulating system.

Grease, however, is used but once. Since purification of grease is not practicable, a fresh charge is delivered whenever the pressure lubricating system goes into operation. Advantages to any such means of lubrication include:

1. Positive delivery of lubricant insures maintenance of a sufficient film between the bearing surfaces.
2. Nonlubricating foreign matter is excluded.
3. Equipment can be lubricated while in operation.
4. Hazard in handling or filling of lubricating equipment is reduced.
5. Economy of lubricants.

The adaptability of centralized control was first studied with respect to greases; it was pioneered by the iron and steel industry. When roll neck bearings, table rolls, and the wide variety of other heavy duty bearings were largely exposed, heavy greases were used; they were best able to remain adjacent to the parts to be lubricated with consequently less loss. At best, however, this type of lubrication was inadequate. Furthermore, loss of lubricant meant dripping and introduced a personal hazard which was contrary to all ideals of safety. As steel mill rolling machinery was improved and designed to run at higher speeds, a number of ways were developed to enable control of greases and their delivery to the various points of application. In all, power in some form or other prevails. Control at each point to be lubricated is attained by positive piston displacement types of metering valves. In such a system either one or two lubricant supply lines can be connected to each valve according to the type of system. In the steel mill, dual lines are sometimes

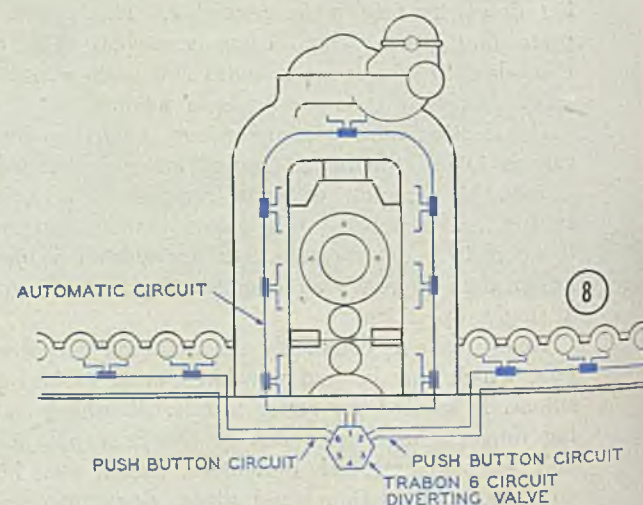
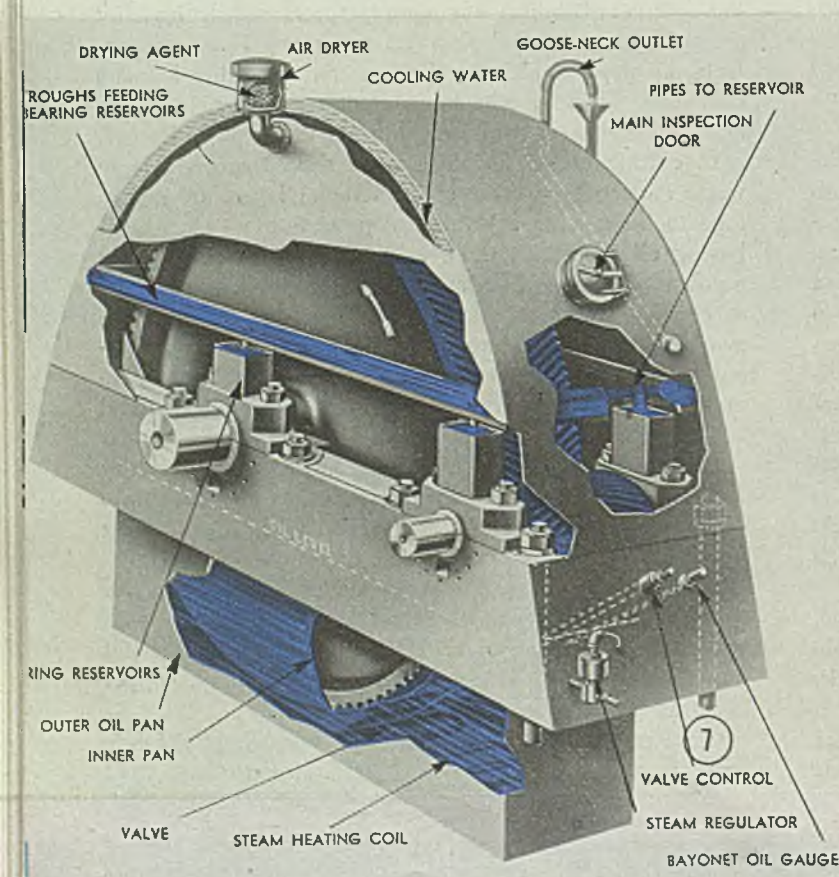
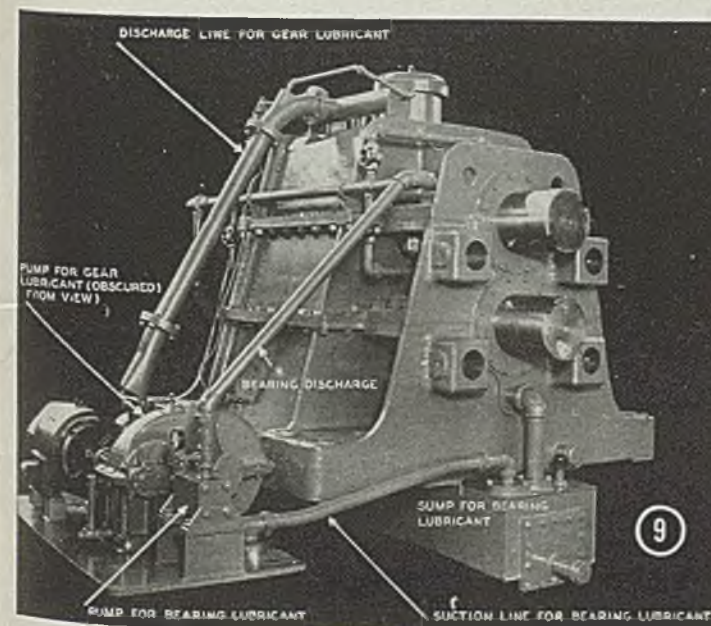


Fig. 7—Cutaway view of pinion drive gear unit showing controlled system of splash lubrication

Fig. 8—Automatic circuit for feeding mill bearings. Two pushbutton circuits provided to feed roll bearings. Diverting valve handles up to six circuits

Fig. 9—Exterior view of pinion stand and lubricating unit with important parts indicated





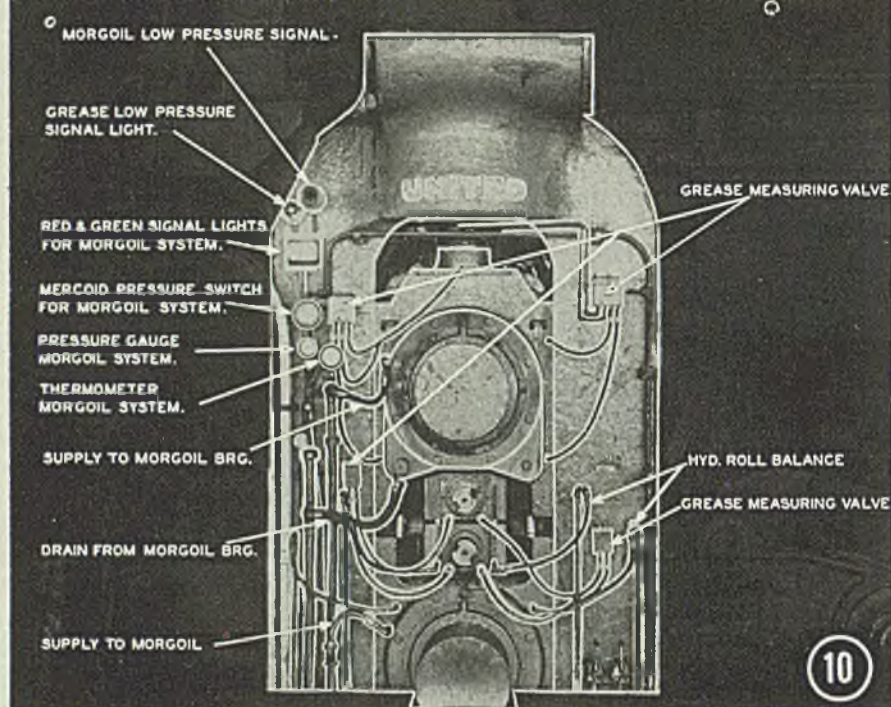


Fig. 10—Side view of hot strip mill showing details of lubricating system serving bearings

employed, each serving alternately to load the respective valves periodically with the right amount of lubricant, and also to discharge this to the bearings. Certain of these systems are designed to eliminate the necessity for springs, check valves or restricted port openings. Due to the fact that they operate under high pressure, any air in the system is soon exhausted by the measuring valves to assure positive delivery of a measured charge of lubricant.

As centralized pressure grease lubrication gained in popularity in the steel industry, improvement in bearing closure with marked extension of the use of roller bearings and the use of lighter bodied greases also developed. Both increase operating economies, the former from the viewpoint of reducing leakage and improving working conditions, the latter by reducing the amount of power required for mill operation.

Collective lubrication through manifold equipment as practiced today, assures a positive and uniform distribution of the lubricant. Furthermore, direct power systems are well suited to service where comparatively high application pressures are desirable. Positive and complete cleaning of bearing grooves and clearance spaces at periodic intervals is of primary importance, especially where conditions of operation may result in accumulation of dust, dirt or other nonlubricating foreign matter in these places.

The value of pressure in forcing out old grease and dirt from certain types of bearings has been definitely proved. Judgment is necessary, however, in determining when this has been complete-

ly accomplished and when to shut off the pressure and cease forcing in new grease. If properly done, pressure grease lubrication is decidedly economical. If the operator is careless, however, unobservant, or continues to apply lubricant beyond the necessary extent, grease will not only be wasted but also a sloppy condition around bearings may develop.

The amount of grease delivered to a roller bearing can be controlled by judicious installation of a suitable vent in the upper part of the housing which enables efflux of grease after a certain amount has been charged. Concentration of pressure gun fittings at a central panel or point of control will also aid in reducing hazard and the labor essential to lubrication.

Continuous circulation of comparatively fluid oils became practicable with the extension of oil-tight housings to certain types of steel mill gears, and the design of lubricating systems to serve both gears and bearings with the same oil. Installations of this type are comparable to the reduction-gear steam turbine, involving operating conditions which require oils of similar characteristics, though usually of somewhat heavier body, ranging in viscosity from around 800 to 2500 secs. Saybolt at 100° F.

Gear design influenced this development—improvement in tooth cutting especially with respect to bevel units having been studied in the interest of obtaining higher speeds with reduction in wear and noise. Circulation of fluid oils under uniform pressure conditions was found to be in line with these requirements, and helpful in reducing operat-

ing temperatures through the cooling effect of an excess of fresh cool oil. The sleeve-type, flood lubricated bearing was also a contributing factor; its development not only focused attention upon the matter of bearing sealing but also upon the necessity for oils which would be chemically stable and resistant to emulsification and sludge formation; this is important when the bearing is not sealed effectually against entry of water. With the advent of higher speed mills, increase in the amount of water used on the stock, increases the chance of water leakage into the bearing.

Obviously the viscosity is the most important physical characteristic, for it is subject to change with change in temperature and contingent upon change in speed. The temperature range in the modern steel mill circulating system is confined within a relatively narrow range say between 90 and 130° F., with a fair average bearing temperature of around 105°. The viscosity of the oil should be studied at the prevailing operating or bearing temperature.

In turn, where practicable, the viscosity should vary inversely as the speed. So, in a variable-speed continuous mill where the speed of roughing is slow, heavier oil is required than would be needed for the bearings on the finishing end which are subjected to higher roll neck speeds.

High-quality oils should always be used unless heat has developed or leakage occurs to such an extent as to warrant the use of secondary oils.

The extent to which entirely automatic operation should be approached has been widely discussed. Certain authorities feel that the unit idea whereby each mill is designed as an individually lubricated unit, will reduce the possibility of extended difficulties should faulty circulation develop anywhere in the system.

Force-feed lubrication involving full pressure affords a most efficient method of bearing and gear lubrication; it is applicable with equal facility to the sleeve-type roll neck bearing or the oil tight gear housing. By circulating, clean oil under uniform pressures, from a central reservoir, to bearings and gears to provide proper lubrication and to remove heat from the friction surfaces, the life of these parts is materially increased, especially under overload and speedup conditions.

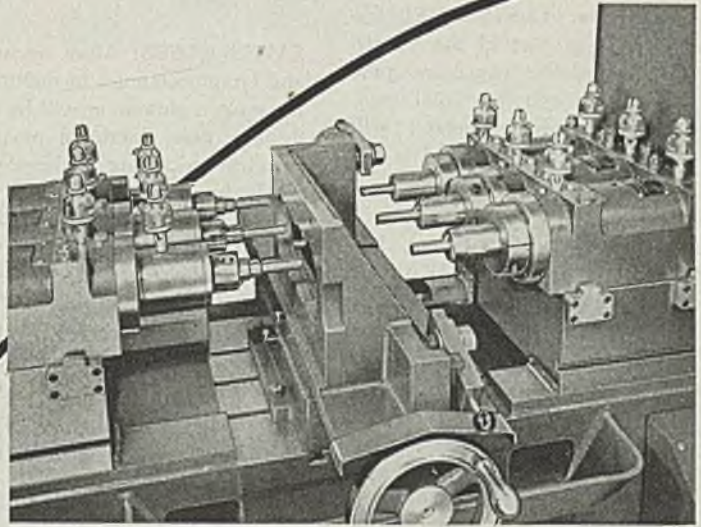
With the full pressure system the supply pump delivers oil at a predetermined pressure from the settling tank to a pressure tank in which an air cushion is provided at the top. Such systems call for two pumps, one of which serves as a spare. This latter cuts in automatically, by means of electrically operated pressure

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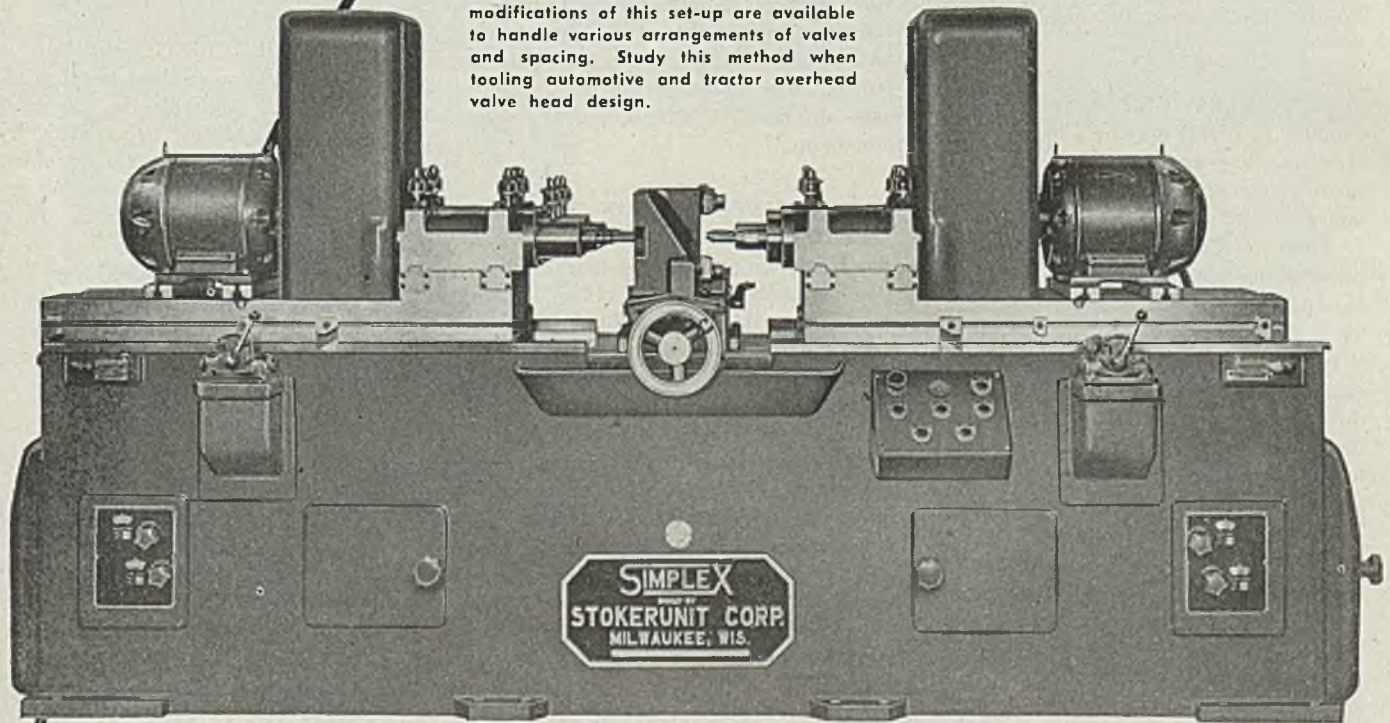


# SIMPLEX

The life and efficiency of a gasoline engine depends much upon the accuracy of valves and valve guides. One progressive manufacturer found that by placing the cylinder heads for an overhead valve engine in a simple cross-sliding fixture, semi-finish boring one side and precision boring the valve guides and valve seats from the other, he achieved the finest precision and engine performance.



This SIMPLEX 2U 2-way Precision Boring Machine, with three #1 spindles on each side and cross-sliding fixture, bores two intake and two exhaust valve guides and seats in a four step cycle. Many modifications of this set-up are available to handle various arrangements of valves and spacing. Study this method when tooling automotive and tractor overhead valve head design.



## Precision Boring Machines

**STOKERUNIT CORPORATION**

**SIMPLEX Machine Tools Division**

4532 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools



**MORE POWER FOR INDUSTRY:** A generator, large enough to supply an average city of 45,000 homes, is being built by General Electric Co. at its Schenectady works for Cleveland Electric Illuminating Co., as part of the latter's 3-year 30-million-dollar expansion program. The single cylinder 1800 rpm, hydrogen-cooled turbine generator will have a rating of 75,000 kw, and is expected to be in operation in 1948.

**WATER-MOBILE:** Under patent No. 2,399,141, at the patent office, Washington, is listed a water automobile that operates both on land and water. Developed by Joseph W. Quinn of Santa Monica, Calif., the vehicle is operated like the ordinary car. Its wheels are hydraulically controlled and vertically adjustable, allowing the vehicle to adapt itself to deep or shallow water. Rear wheels are of modified paddle wheel structure. Overhanging each wheel, and supported for vertical turning movement, is a fender or guard having an out-turned bottom edge and board. This constitutes an elevator plane to raise or lower the vehicle on the surface of the water.

**MIXES AND POURS:** Answer to the contractor's prayer may be a unique concrete pouring machine that mixes and pours at the same time—while traveling under its own power. Developed by Ira J. Kuert of California, the machine is expected to help considerably in relieving the housing shortage. In pouring a 40 x 80-ft standard concrete building, it is said to complete the job in 35 per cent less time, as the concrete is poured direct from the mixer to the forms. Machine also is equipped with a pouring tower that can be extended 65 ft. Erected in sections, it need only be extended to the height of the intended building. Entire machine also tilts 10 degrees to compensate for grades. According to Hobart Bros. in Troy, O., arc welding played an important part in the construction of the unit, first of which was built by Johnson & Thomas Machine Works of Los Angeles.

**ADOPTS OWN "BABY":** Representing the company's first production under its own name, the 2-oz plastics injection molding machine, currently manufactured by Hydraulic Machinery Inc., Dearborn, Mich., is designed with a 50 per cent overload capacity. It handles a wide range of parts—from decorative units for autos to jewelry—a new type electronic control guaranteeing accuracy of plus or

minus 2 degrees. Danger of burning materials is eliminated by two controls that regulate the heat in the chamber and nozzle.

**SAVES COSTS:** More accurate control and large economies in melting and casting molten aluminum will be made when using a new aluminum processing temperature measuring device developed recently by Brown Instrument Co., Philadelphia. Described as a thermocouple for molten aluminum pot temperature measurement, the device contains a newly designed silicon carbide protecting tube that exceeds earlier models in speed of response to temperature changes.

**FAST MELTING:** Some 600 lb of lead is melted in 29 min in a melting furnace developed by Johnson Gas Appliance Co., Cedar Rapids, Iowa. It provides pot temperatures up to 1500° F quickly with all six of its burners operating. Only three of these burners are needed to maintain the unit at working level. Each of the burners is equipped with independent shut-off valve and pilot light. Heavy insulating refractory around the removable pot, not only retains heat, but minimizes operator fatigue. The company reports the furnace also handles babbitt, tin, zinc and aluminum.

**PATENT INFORMATION:** Manufacturers should make every effort to learn the best way to obtain patent information. According to Invention Inc., Washington, everything a manufacturer makes, sells and competes against is an invention, and practically every invention is represented, sooner or later, by a patent in the patent office. If the difference between an assignment search and a patent search, or between an infringement search and a validity search is not known, the organization is offering a service that describes more than 30 different types and variations of patent research so that they may be compared side by side.

**REMOVING SILICONE FILMS:** Many unique advantages to be gained through use of silicone greases were given up reluctantly by some laboratories because of the difficulty in removing the non-wetting film formed by these lubricants. Best cleaning methods previously developed involved use of caustic solutions. These had to be watched carefully to avoid etching the glass. A hydrocarbon solvent was found recently which removes silicone films from glassware quickly and efficiently, according to "The

Burrell Announcer" distributed by Burrell Technical Supply Co. of Pittsburgh. The discovery was reported by G. Constabaris of the University of British Columbia. He found that silicone films could be removed from laboratory glass by decahydronaphthalene, sold under the trade name of Decalin.

**"BRAIN AID:":** Right size punch press for blanking, drawing and other press operations is selected by a calculating device developed by Len Crary, an engineer with E. W. Bliss Co. According to the inventor, all calculations are made directly on the device without resorting to any formulas. With it, an average person can learn to figure ordinary jobs quickly. The calculator selects correct size press by giving the crankshaft diameter and tonnage—at the bottom of the stroke—required to do a blanking job; and selects the press for drawing jobs by giving the crankshaft diameter and tonnage away from bottom stroke with the maximum press speed possible for the particular metal being drawn.

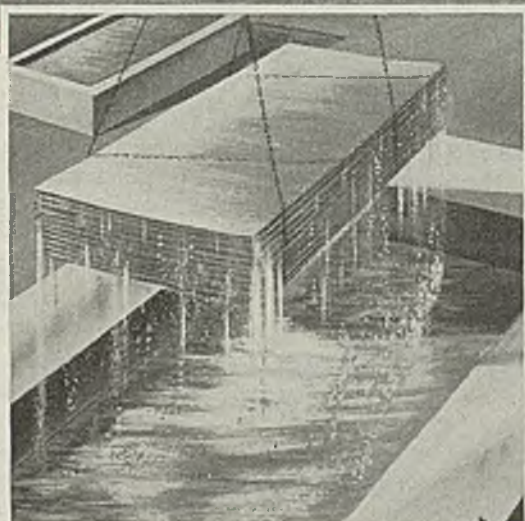
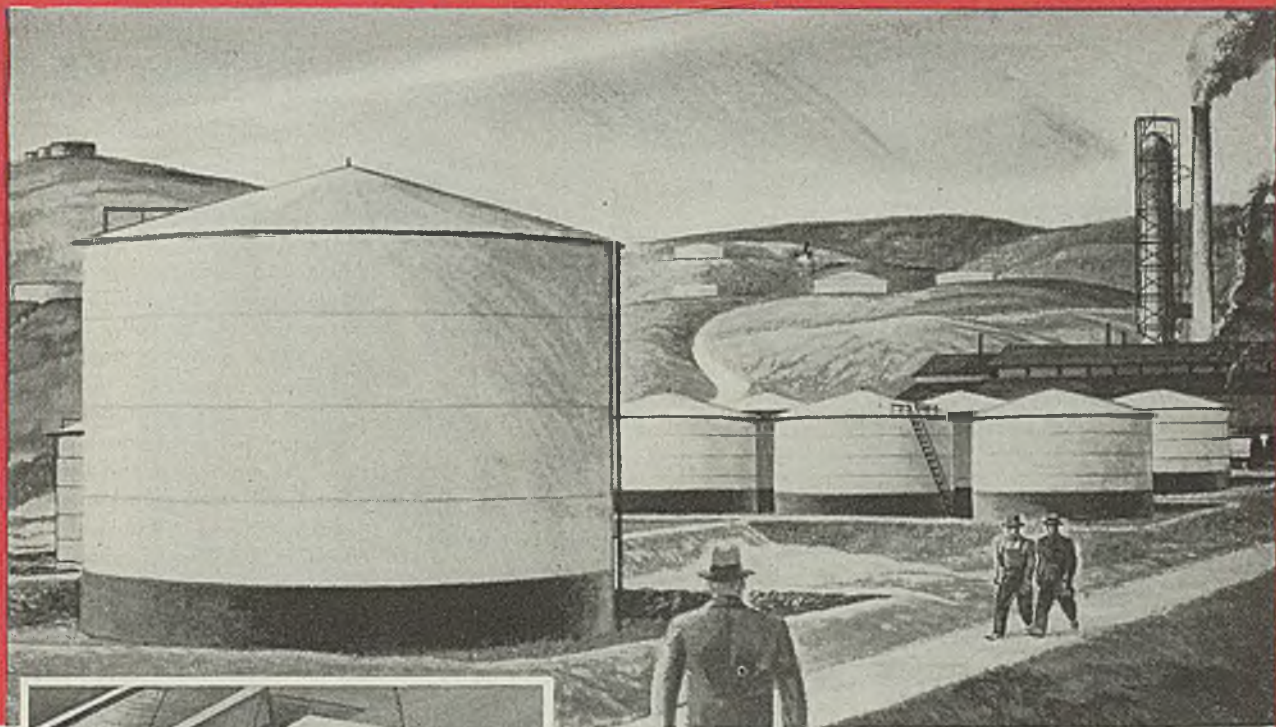
**SPEEDS SOLDERING:** Continuous production soldering of sheet metal products is speeded up with the use of a self-cleaning liquid flux being made by American Chemical Paint Co., Ambler, Pa. The product not only fluxes, but removes oil, light rust and scale. It is prepared especially for use on iron, steel and stainless steel or galvanized iron, and sticks to wet or oily surfaces. Even on a vertical surface it provides a continuous film of flux. The liquid, called Flosol, contains free muriatic acid.

**IMPROVES INSULATION:** Excellent electrical properties of tetrafluoroethylene, a plastic called Teflon produced by E. I. Du Pont de Nemours & Co., Wilmington, Del., coupled with its stability under heat, give it many potential applications in the power field. The material, it is reported, is unharmed by temperatures up to 575° F, and withstands every known solvent. Thin tapes of the plastic are being evaluated as insulation for dry transformers, as insulation and slot liners for high temperature motors and as a dielectric for condensers. In an ASTM test, a sample of the material does not fail in 720 sec, which indicates a service life of five to six times as long as that of commonly used materials. Surpassing polystyrene and polythene, tetrafluoroethylene has an extremely low dielectric loss factor, even at frequencies up to 3000 megacycles.



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# HANLON - GREGORY

## GALVANIZING COMPANY

Pittsburgh,



Pennsylvania



# Diesel-Electric Power

**PROPELLS ORE  
CARRIER**



ADVANTAGES shown by operating records of land power plants and locomotives in and around its own plants led Inland Steel Co., Chicago, to install diesel engines and electric drive mechanisms on its iron ore carrier, the *E. J. Block*, when it was rebuilt recently. The installation now takes up little room and allows the ship to carry an additional 1000 tons of cargo. In addition, two less men are required in the engine room, a gain is realized in the consumption of fuel oil, and more flexibility of operation is obtained.

In the reconstruction process of the 38-year-old ship, fore and aft deck houses were remodeled, new auxiliary and deck machinery was installed along with new steering gear and windlasses. Automatic gyro steering apparatus, ship-to-shore radio telephone, radio direction finder, radar for all-weather navigation, pilot house control of propelling machinery and forced air ventilation are other

features of the modernized freighter.

Utilization of two-cycle, V-type engines which produce a power impulse on every downward stroke of the piston, allows the engine to produce greater power within the compactness of a smaller and lighter weight engine. Main engines, one of which can be seen in Fig. 2, consist of two 12-278A diesels of the above type made by General Motors Corp., Diesel Engine Division, Cleveland. Brake horsepower rating of the engines is 1200 at 750 rpm. They have a cylinder bore of 8 $\frac{3}{4}$ -in. and a stroke of 10 $\frac{1}{2}$ -in., operating at a piston speed of 1313 fpm.

On a common, fabricated steel sub-base of each engine and shown in Fig. 2, is a propulsion generator of direct current type rated at 814 kw, 560 v, 1454 amp at 750 rpm, as well as a direct current exciter generator, directly connected to the propulsion generator, which is rated at 24 kw, 120 v, and 200 amp when turning at 375 to 750 rpm. The two propulsion generators are shunt wound with start fields to enable the diesel engines that drive the propulsion generators to be started by using the corresponding generator as a starting motor when supplied by a 64 v starting battery.

Current produced from two diesel driven generators is transmitted through a switchboard to two electric propulsion motors, each rated at 1020 hp, 560 v, 1454 amp at 700 to 875 rpm. These motors turn the propeller shaft and the 14 ft 6 in. diameter propeller through a 9.625 to 1 reduction gear which has a rating of 2000 shaft horsepower and capable of full rated power at 73 to 91 rpm. Propulsion motors are in foreground and speed reduction gear behind them in Fig. 3. Capable of continuous operation, at all speeds ahead and astern up to rated speed, motors are reversible and can deliver rated power continuously at any speed between 700 and 875 rpm.

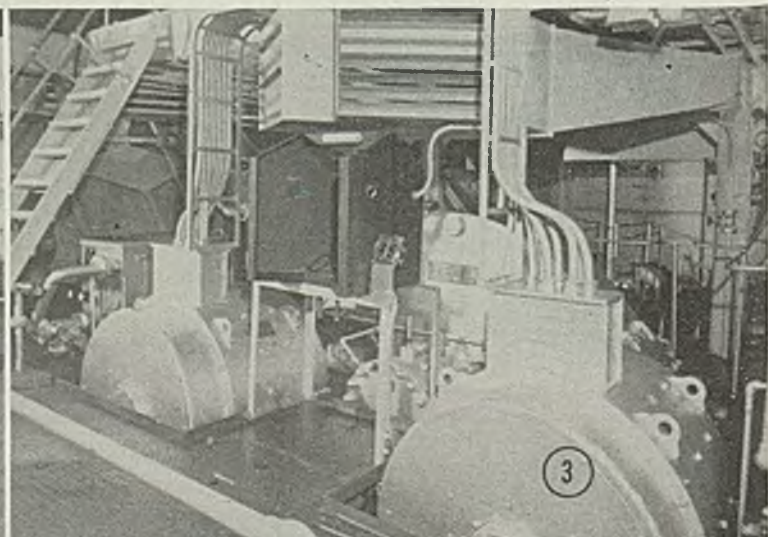
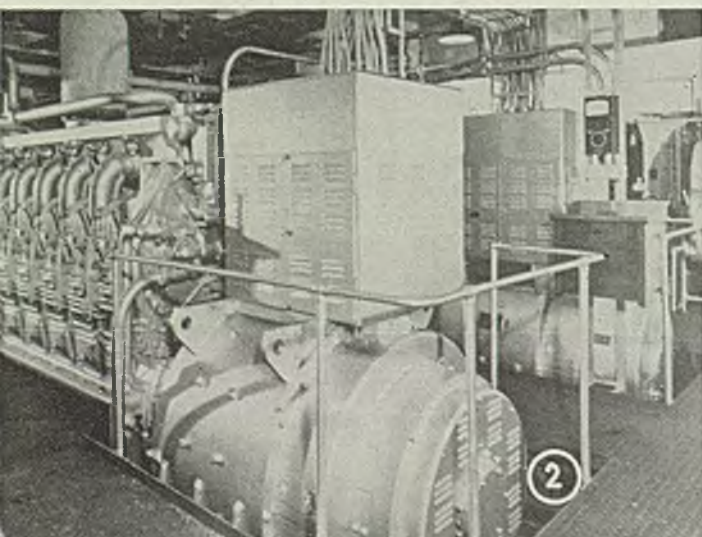
Due to the wide range between the light and loaded draft of an ore carrier there is considerable variation in the amount of power required to move the vessel. When the *E. J. Block* is heavily loaded and operating at lower than rated speed, the full rated horsepower can be applied to the slower turning propeller through increased excitation of the mo-

(Please turn to Page 136)

Fig. 1—View of the 552-ft *E. J. BLOCK*, the first diesel-electric powered ore carrier on the Great Lakes

Fig. 2—View of propulsion generators driven by two General Motors diesel engines

Fig. 3—Current from generators is transmitted through switchboard and control stand to two electric propulsion motors, rated at 1020 hp. Motors turn propeller shaft through a 9.625 to 1 reduction gear rated at 2000 shp







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for tough jobs involving heavy impacts and dynamic stresses. Since then down-time because of pin and link failures has been eliminated—costly maintenance work has been avoided. Write for information about Jalloy steel.

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PITTSBURGH 30, PENNSYLVANIA



BETTER radiators for automobiles and airplanes may result from study of three items of German equipment—a machine for making aircraft intercoolers by press welding aluminum sheets, and two types of machines for forming aluminum radiators—brought to this country by the Office of Technical Services, Department of Commerce.

Use of the press welding apparatus, developed by the Adam Opel automobile factory in Russelsheim, is said to represent an innovation in radiator manufacture. The usual method of making radiators is to start with an assembly of tubes, standing upright, and to weld them together. For the German process, however, starting material is a sheet of aluminum, 0.4-mm thick.

The metal is folded to make two layers, placed in the welder between the matching dies, Fig. 3, in a 400-ton

# FABRICATING *Aluminum Radiators*

*Three novel machines developed by the Germans may lead to manufacture of improved automobile and aircraft radiators*

press, and heated to more than 800° F, well up toward the melting point of aluminum (around 1200° F). Pressure is then applied to the dies. The two hot sheets of aluminum, squeezed together between the dies, are welded in

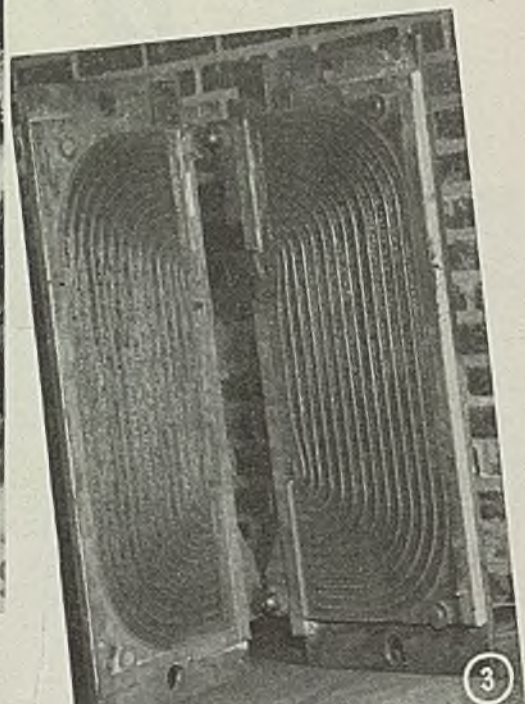
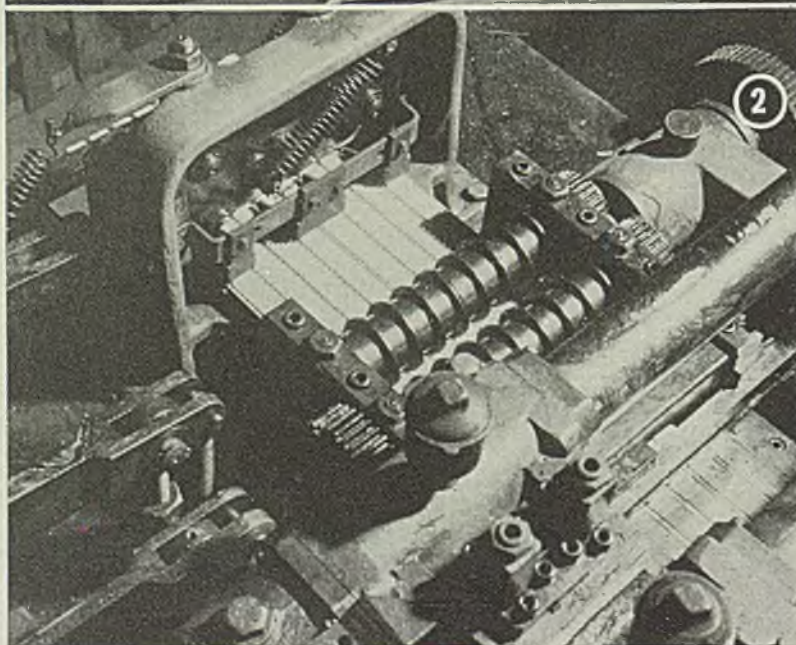
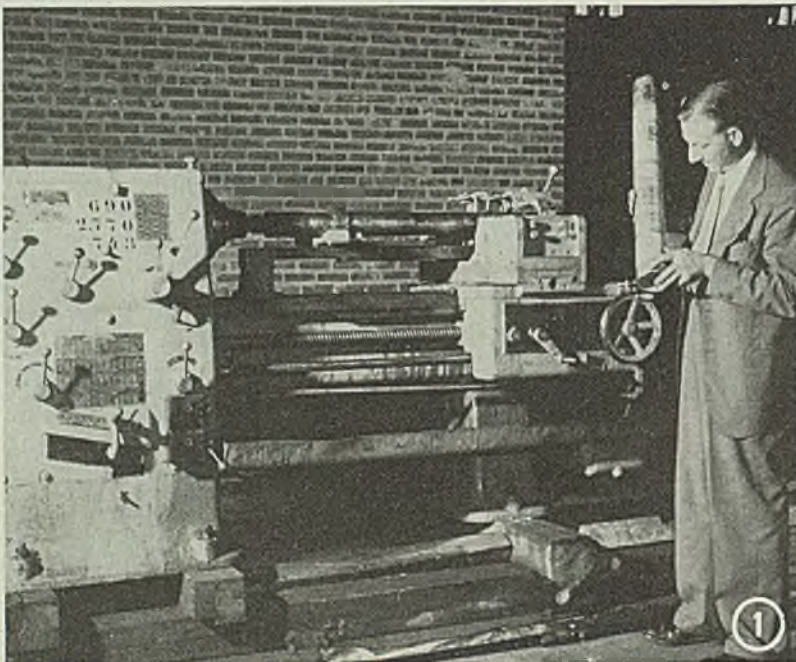
seams, where ridges of the dies coincide.

While the dies are still held together, a blast of hot air, under pressure of about 300 psi, is forced between the aluminum layers through openings between the ridges of the dies. They metal swells out into the hollows of the dies and forms a series of tubes. A complete press cycle takes about 40 sec.

A machine, Fig. 1, for rolling fins into tubes of aluminum and then flattening the tubes to make radiator elements was also developed by the Opel firm. Fig. 2 is a close-up of machine making radiator channels with integral finning.

The third machine, from Langerer & Reich at Stuttgart, shapes the radiator core from a coiled strip of aluminum or other nonferrous metal. Even zinc was used for this purpose in Germany when other metals were scarce.

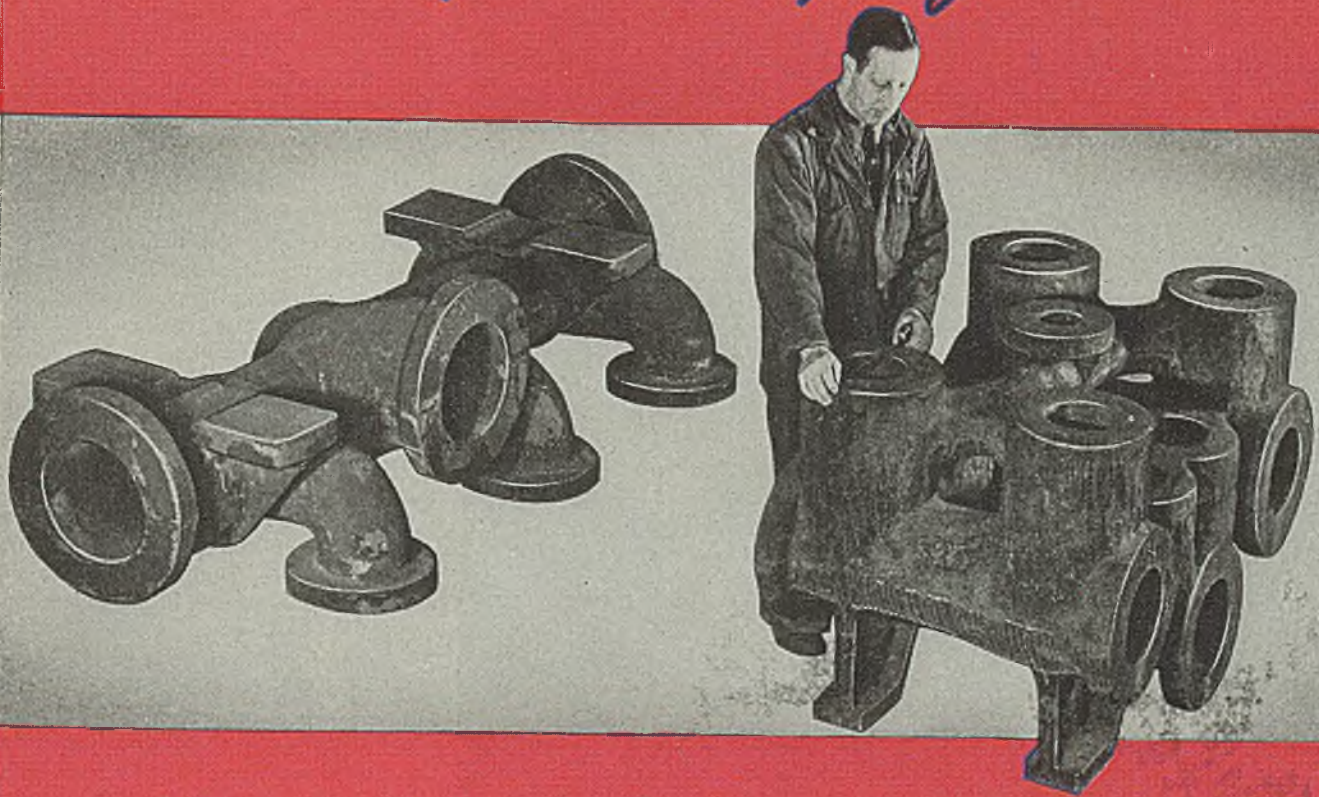
The ribbon of metal is fed through rollers, which offset it to make longitudinal ridges as far apart as desired for the radiator tubes. Next, a cross head, equipped with cutters, shaves the outer surface into sharp fins, about nine to the inch. Two of these strips cut to the proper length and welded together, make a radiator core.





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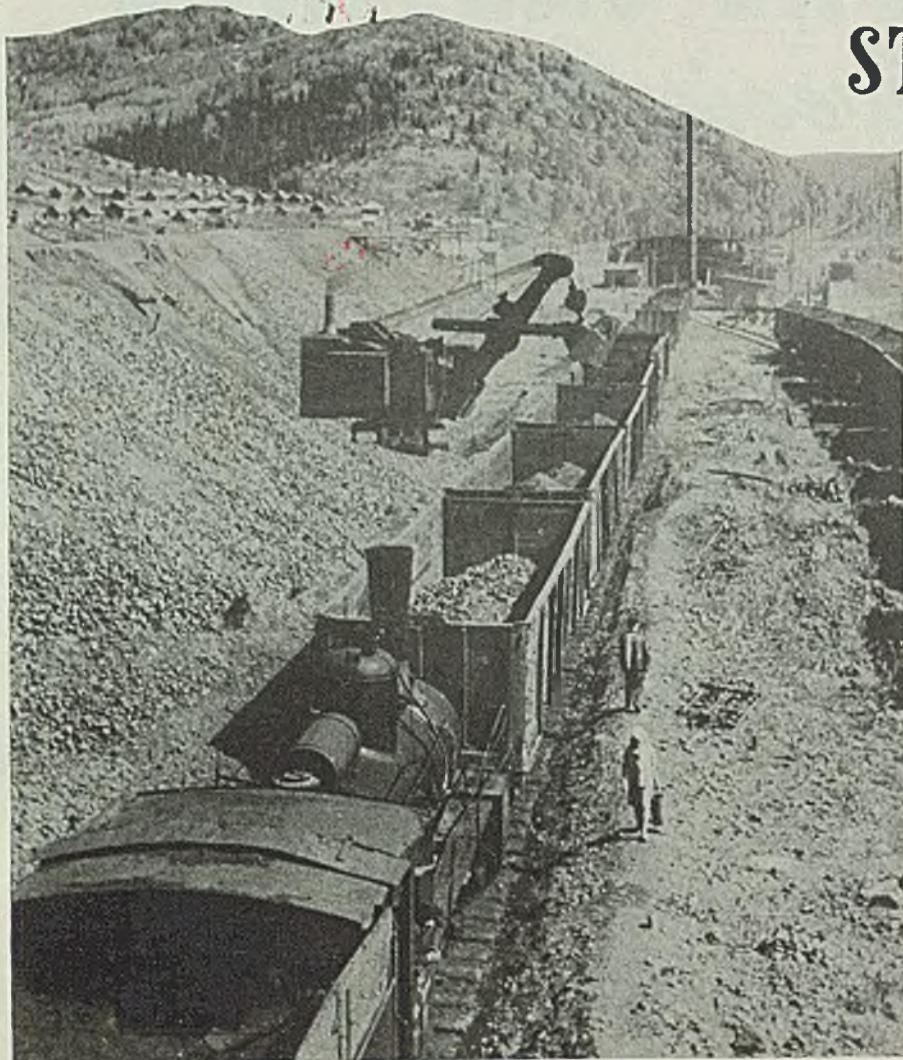
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# KUZNETSK STEELWORKS

By A. Mikhailov



*Loading iron ore at the Tashtagol mines for the Siberian blast furnace at Kuznetsk*

MEASURES have been taken under the new 5-year plan of the Soviet Union to insure for the Kuznetsk Metallurgical Plant, Kuznetsk, Siberia, its own iron ore supply. This plant located 2485 miles from Moscow, was given the name Kuznetsk, meaning the town of blacksmiths, because centuries ago the Shortsi who inhabited the basin were skilled blacksmiths capable of forging excellent mail helmets and spears. After the inclusion of the basin within the boundaries of the Moscow state at the beginning of the Seventeenth century the population paid its taxes to the Tsar in metalware and not in furs as in other districts of Siberia. Gradually this work fell into decline.

In the three centuries that followed nothing happened to change the pattern of life in the Kuznetsk basin. The riches of the deposits lay almost untouched. Fin-

ally a survey of the coal deposits in the basin showed that they comprised 450,000 million tons, were concentrated in small areas, near the surface and were distinguished by their high quality. During the first 5-year plan construction of the Urals-Kuznetsk proper was started, thus linking up the Kuznetsk coal mines with iron ore of the Urals.

Numerous coal mines in the Kuznetsk basin were sunk and put into operation. Simultaneously ore mines and metallurgical establishments in the Urals and a large metallurgical plant basin itself went into operation. Later the steel plant at Kuznetsk was turning out pig-iron, steel and rolled metal. From the Urals came trains with ore; on the return trip from Kuznetsk coal was brought to the Urals iron and steel works.

The Kuznetsk Metallurgical Plant grew into a large establishment. By the end of

the second 5-year plan the Kuznetsk blast furnaces were producing 7,000,000 tons of iron, the open hearths 6,000,000 tons of steel and the rolling mills 4,500,000 tons of finished products which played an outstanding role in the victory over Hitlerite Germany. During World War II the Kuznetsk plant turned out enough steel to make 100 million shells and 50,000 heavy tanks.

After the end of the war the Kuznetsk plant resumed production of metal for civil needs; its output now exceeds the 1940 level. In the fourth 5-year plan the capacity of the plant is to be considerably increased: by 1950 it will produce one-and-a-half times as much as now. Geologists have found rich deposits of iron ore within 60 to 120 miles from the plant.

South of the Kuznetsk basin is a country called Gornaya Shoria where live the Shortsi—descendants of the first blacksmiths of the basin. In Gornaya Shoria and in other places ore mines have been sunk; trains carry away the iron ore mined here to the Kuznetsk plant. The share of Siberian ore in the plant's raw material balance continues to grow.

In 1946 to 1950 iron ore mines with a capacity of more than 2,000,000 tons of iron ore annually will be put into operation. Huge sums are to be spent on the new ore mines as well as railway lines to connect the mines with the metallurgical plant. By the end of the 5-year plan the local iron ore base in Siberia will have grown considerably while the Urals will be getting coking coal in large quantity from Kazakhstan and from its own deposits discovered by geologists in recent years. Thus in Siberia and in the Urals the production of metal and the mining of iron ore and coal are to be considerably increased.

**Dashkesan Iron Ore:** More than a century ago inhabitants of Dashkesan, discovered an iron ore deposit in the outskirts of their village not far from the border of Soviet Armenia. They smelted this ore in primitive furnaces and from the metal forged weapons.

In 1944, the Soviet government decided to sink ore mines in this district, about 1 mile from the village of Upper



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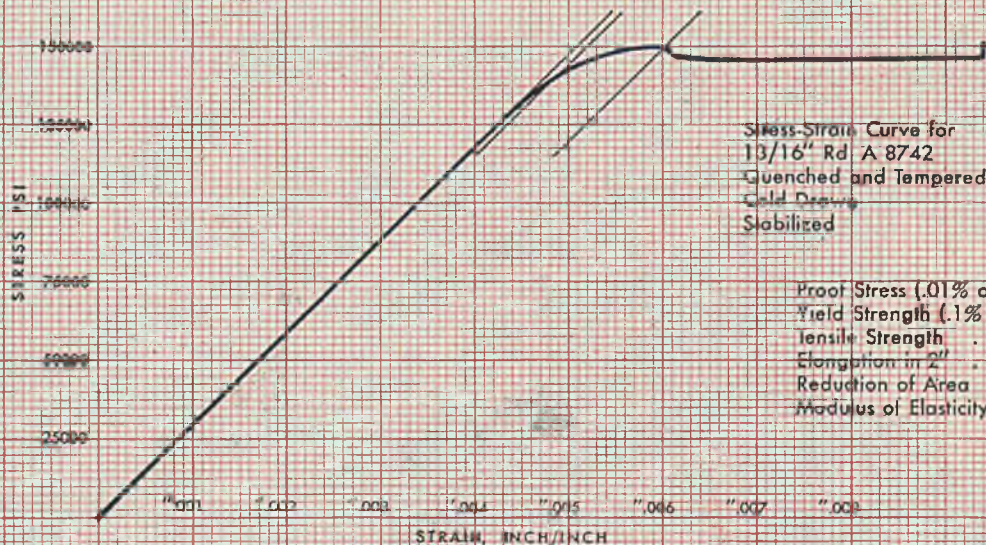
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Dashkesan. Amidst the spurs of Kokhi-yal mountain range stretches a narrow valley of the river Kashkara-Chai. A magnetic iron mine lies in the rocky slopes adjacent to the valley. Not far from lower Dashkesan is a cobalt mine, and nearby, at a height of 4592 ft above sea level an alunite mine. West of Upper Dashkesan are situated baryte deposits.

Builders have now been working in the mountains for more than a year. An excellent road laid high in the mountains leads to Dashkesan. An electrical railway, which will connect Dashkesan with the other Transcaucasian railways, is under construction. This railway will have eight viaducts up to 128 ft high and three tunnels. Traffic on the first sections of the railway has already been opened.

A power station has been built near the mines; an ore concentration factory is being erected and drifts tunnelled. A housing project has been built in the mining village. Ore is extracted by Azerbaijani collective farmers who are being trained by skilled miners from the Ukraine.

Ore from the Dashkesan deposits will be supplied to the Transcaucasian Iron & Steel Works, the first metallurgy plant that is being built in Georgia under the new 5-year plan.

## ASTM Accepts New and Revised Specifications

American Society for Testing Materials, Philadelphia, through its administrative committee on standards, recently approved numerous new and revised specifications and tests, on the recommendation of several of its technical committees.

The magnesium-base alloy extruded round tubing specification (B 217) covers four types of alloys, three containing aluminum ranging from 2.5 to 9.2 per cent and the fourth being a manganese composition with a minimum of 1.20 per cent manganese. Tensile requirements for the alloys containing aluminum range from 34,000 to 38,000 psi, while manganese alloy has a minimum of 28,000 psi.

Change in method of preparing steel panels (D 609) is intended to improve the surface of panel and therefore the whole testing procedure. Requirements for additional pigments are incorporated into specifications for zinc chromate (D 478). Test D 895 for water vapor permeability of shipping containers applies to finished containers when closed and sealed in conventional manner. Permeability for this test is defined at the rate that water is transmitted into container from test atmosphere under certain conditions.

New methods for computing calorific

value of gaseous fuels (D 900) covers definition of terms, testing procedures which involve adjustments for humidity correction and control, and finally the calculation of calorific value. Discussion of theory of method of calculation as well as procedures for arriving at total and net values are included.

Change in tentative requirements for rubber sheath compound (D 532) eliminates vulcanizing in a metal mold, providing physical requirements properties are met. Ozone-resistant type wire insulation (D 574) will have value of constant K in formula for insulation resistance changed from 5280 to 2000. During the war, this constant was dropped to 1000 in emergency provisions, so that revision is actually an increase. Change in test for rubber hose (D 380) will permit use of a certified test slap from the same material used in the hose in cases where the material is so thin that minimum requirement of  $\frac{1}{2}$ -in. cannot be made available.

Two new methods of testing adhesives, tensile properties of adhesives (D 897) and resistance of adhesive bonds to chemical reagents (D 896) are a result of work by a new committee of the

society. Tensile test determines comparative properties of adhesives, using standard shape specimen with specific conditions of pretreatment, temperature and testing speed. Test for resistance of adhesive bonds to chemical reagents requires use of other new tests for tensile properties. Procedure requires that each specimen shall be in a separate container, totally immersed in reagent for seven days at a temperature between 25 and 30° C. After rinsing and drying, specimen is tested.

Copies of all new and revised specifications are available from ASTM headquarters.

## Movie of Carbide's Uses

Designed to familiarize users of hard metal carbides with recent accomplishments of these metals, a new sound movie has been prepared for release to technical societies and industrial plants by Carboloy Co. Inc., Detroit. Picture describes some of the industrial methods made possible by adoption of carbide tools, dies, wear resistant inserts and other similar parts.

### Custom-designed

# Power Units

### for Industrial Plants

NEW integrated unit-area system for industrial plants, which simplifies the use, installation and maintenance of air-conditioning and other equipment in "controlled conditions" factories was recently introduced by Austin Co., Cleveland.

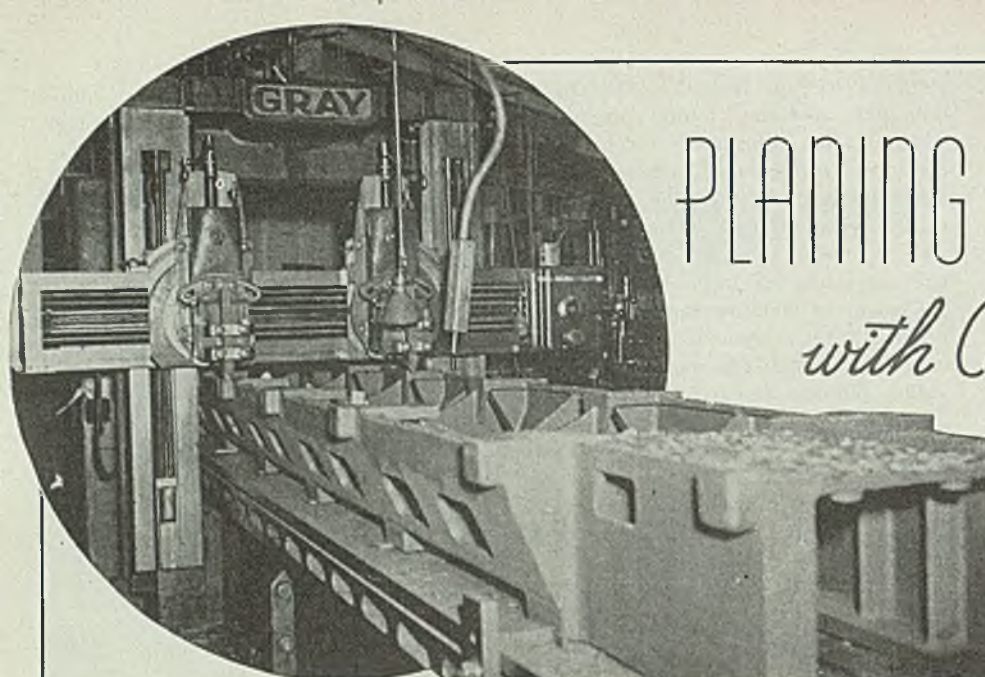
The result of two years of research, the new system is based on the utilization of standard air-conditioning and power distributing equipment in units which are predesigned to serve floor areas of almost any size. It eliminates need for custom-designed equipment and structures and permits installation of load center equipment, fans, filters, cooling and other air-conditioning machinery at floor level on platforms which are then raised with all equipment in place. The platforms are specially designed as integral parts of the buildings and fit neatly into otherwise unused space between roof trusses, so that neither floor space nor penthouses are required.

The Austin research division developed plans applying the new system to structures of 60, 70, and 80-ft span, in units 240-ft long. The system is being used in principle in one of the nine controlled-conditions buildings which the company has under construction.

Standard welded H-section trusses developed by Austin for flexibility of use will be employed throughout plants applying the new idea. Extra weight sections will be specified in place of normal sizes for trusses carrying the equipment platforms, and they will be fabricated in standard truss jigs.

It is expected that this new concept of plant design will result in substantial savings in construction time, since the equipment can be ordered before detailed construction drawings or specifications are even started. At the same time, company engineers state, maximum standardization of all mechanical equipment and accessibility of these facilities will simplify maintenance.





# PLANING CAST IRON

## *with Carbide Tools*

*Rough machining textile machine base at 200 sfpm with a 3/8-in. depth of cut and 0.030-in. feed on a 20-ft planer, using cemented carbide planing tools*

ROUTINE planing of such ferrous castings as turret lathes, pedestals, slides, saddles, cross slides and cross slide carriages is performed at Warner & Swasey Co., Cleveland, using carbide tools. In the experience of the company, the relatively lower surface speeds of most planers do not make this type of operation less adaptable to carbides.

Good results are said to have been obtained even on older machines with top practical speeds of as low as 70 fpm or less. On these machines, carbides enjoy long service life between grinds. Standard shop practice on newer machines is 200 sfpm. Usually from 4 to 24 pieces are planed in a single setup.

The company's experience also indicates that carbide tools take severe

interruptions, as shown in accompanying illustration. Here, a large bed for a textile machine is being planed at a surface speed of about 200 sfpm. The numerous interruptions in the cut are caused by the necessity of internally bracing the machine base to provide rigidity in the finished machine.

In setting up for planing any kind of iron casting, reference is made to simple tooling data sheets which cover the general classes of planing. These sheets provide needed data on number of cuts, types of tools, feed, depth of cut, cutting speed and speed return. In general, these cutting recommendations are based on the slowest planer which might be used for this type of work.

Two optional methods are used for rough planing vertical surfaces.

They consist of rough planing sides with either two square nose side roughing tools taking a 1/4-in. average depth of cut, or rough planing sides with two lead angle or rough nose roughing tools — again taking 1/4-in. cut. A round nose tool is used where there is no interference, since a reduction in feed from 0.030 to 0.016-in. would be required with the square nose type.

A square nose tool is used in cutting to shoulders. Sides are semi-finished with one side of the finishing tool taking an average depth of cut of 0.010 to 0.012-in. For roughing and finishing respectively, speeds of 200 and 220 fpm are used. Feeds for finishing vertical surfaces are about half those required for planing horizontal surfaces.

## Metal Product Finishing

*Finishing Metal Products*, second edition, by Herbert R. Simonds and Adolph Bregman; cloth 5 1/4 x 8 1/4 in.; published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 18, for \$4.

New edition of this work describes many developments in the metal finishing field which took place during the war, and the years immediately preceding. It brings up to date the entire subject as covered in the first edition and adds much new material. Of particular importance are new chapters on coloring metal, on costs and estimates and on organic coatings.

The volume is offered in the hope that it will point the way to more attractive finishes and more efficient ways of producing them. It considers most of the usual types of finishes, such as galvanizing, polishing, plating, lacquering and painting, and in addition many new

and specialized finishes. So closely associated with the final finish of a metal product are the preparatory processes such as cleaning and descaling that many chapters are devoted to those processes and the relation to metal finishing technique.

## Bulletin Covers Induction Heating History

A 59-page bulletin entitled "Induction Heating," issued by Ohio Crankshaft Co., Cleveland, covers the general history, principles and applications of the process. It has numerous photographs and line drawings illustrating the principles and equipment and controls. Graphs, charts and tables are used to elaborate on technical considerations. Bulletin is being distributed gratis and may be obtained by writing to the company.

## American Observer Tells Of Problems of Persia

*Americans in Persia*, by Arthur C. Millspaugh; cloth, 293 pages, 6 x 9 in. published by the Brookings Institution, Washington, for \$3.

The author served as administrator general of the finances of Persia from 1922 to 1927 and again from 1943 to 1945. Having worked intimately in such a capacity for 5 years and after an interval of 15 years returned under war conditions for another 2 years, he is entitled to speak with a measure of assurance.

The book is a personal recounting of conditions in this trouble spot, and the publisher assumes no responsibility for the material. The author also has had no connection with the state department and his conclusions are not in any way official.



*the RIGHT horsepower*



*the RIGHT shaft speed*



*the RIGHT mounting*

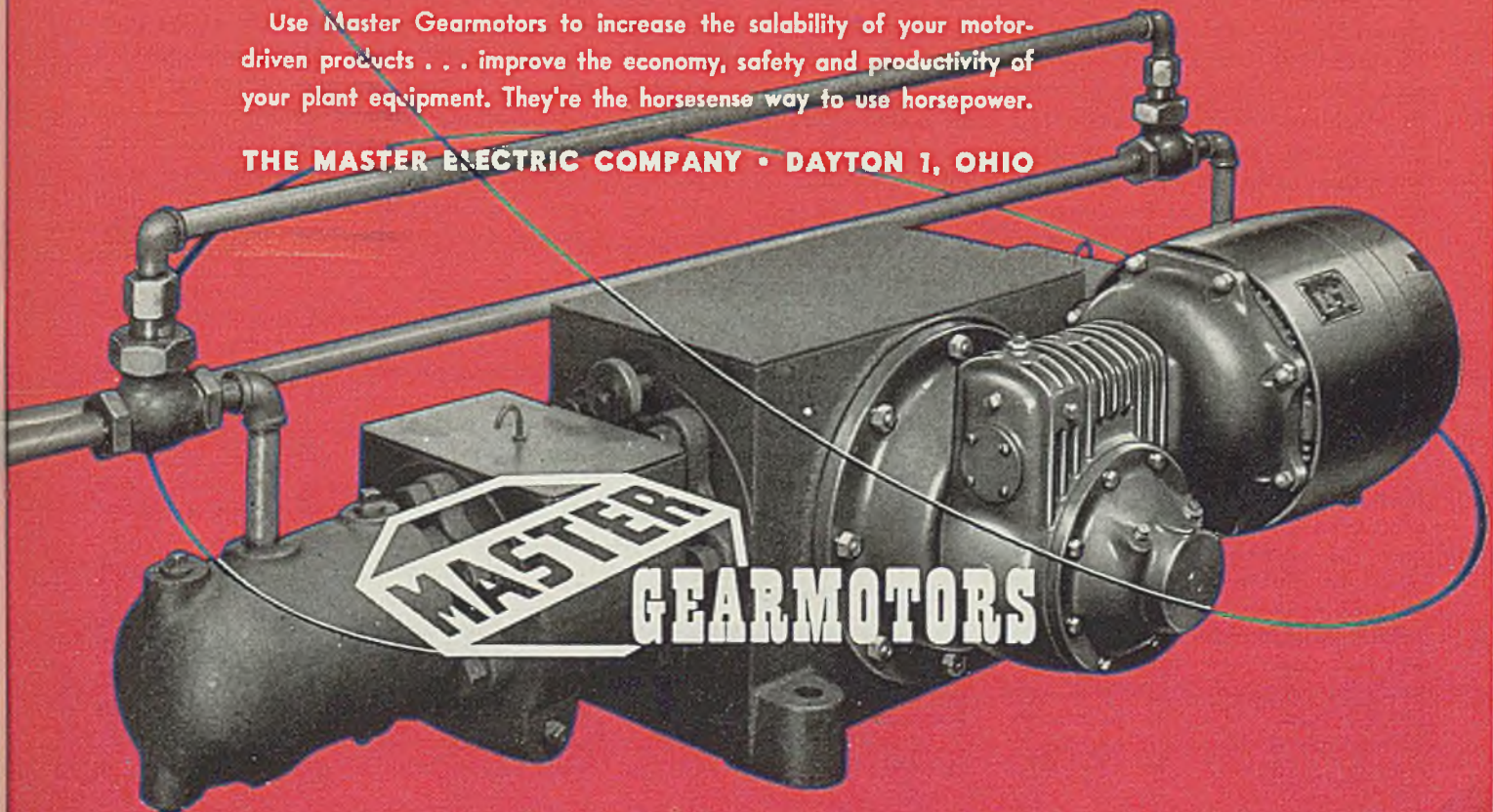


All of these . . . the explosion-proof motor, the gear-reduction unit and the flange mounting . . . all are standard Master units that easily combine into one compact, integral power drive for this double action proportioning pump. This integral construction permits many parts to be stripped away from both the power unit and the completed machine and pays off handsomely in savings in material . . . savings in space.

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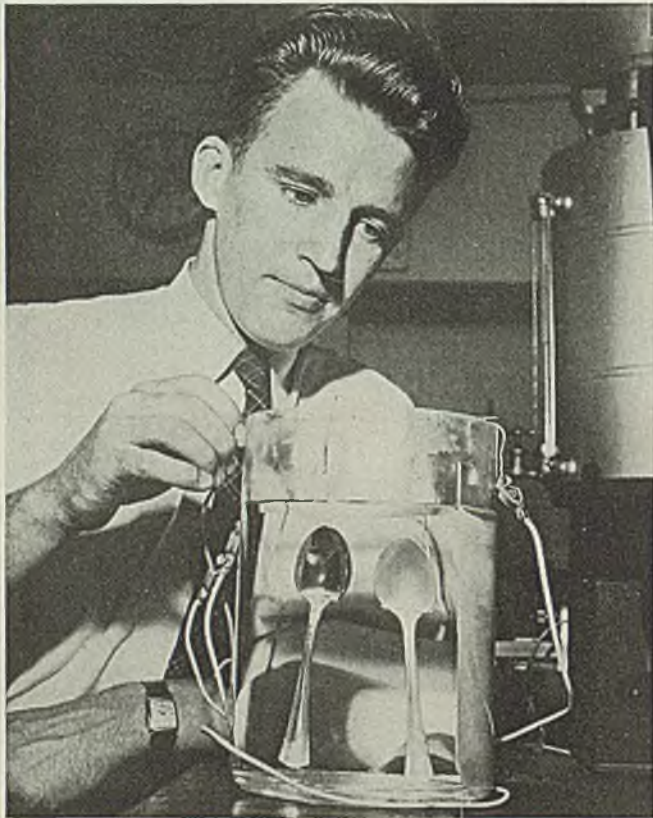


**GEARMOTORS**



# ELECTROPOLISHING

## Silver



ADDITION of cyanide to a phosphor bronze electro-cleaning solution was accidentally discovered to have a polishing effect upon silver—a discovery which might well institute great changes in the silver plating industry. The procedure was developed in the electronics department of Westinghouse Electric Corp. research laboratories, when a physicist in trying to clean diaphragms suspended them in a solution to which cyanide had been added—then later noticed that the silver-plated wire on which they were hung came out of the bath with a high luster after alternating current had been applied.

Normally, metal articles to be silver plated are im-

mersed in a silver cyanide plating bath and negative current passed through, causing a deposit of white and lusterless silver upon the objects. A finish such as this requires buffing to impart the necessary shine—an extra operation which removes part of the silver deposit through abrasion.

With the newly discovered method, the silver plated object is immersed in a bath of silver cyanide solution normal to the regular plating operation. Positive current is applied instead of the negative current used in the plating operation. The current is applied at about four times the amperage used for plating, but not continuously. Intermittent positive energy application for several cycles gives the article an increasing luster. Peak luster is reached after a minute's processing, Westinghouse states.

In photograph at left, the teaspoon on the right was silver surfaced by sending negative current through the silver cyanide plating solution. By applying the opposite current intermittently through the same solution, this spoon achieves the luster of the one at the left.

Electrolytic polishing can be effected with a plain cyanide solution but more practical application is to use the same silver cyanide plating bath. This procedure has the advantage of retaining in the original solution the small quantity of silver removed by the electrolytic action of the cyanide while polishing.

A small motor operated switch has been devised to open and close a contactor so the current is applied and interrupted at the proper and regular intervals. At Westinghouse, the new process is being used to polish silvered contactors, items of switchgear, microwave apparatus, radar sets and other experimental devices. The electropolishing process saves time, labor and material. It is expected that tests will show the bright finish imparted to have a superior brilliance, wearing quality and tarnish resistance, according to engineers of the company.

## Agriculturists Share Welding Awards

Cash awards totaling \$30,000 were recently distributed by James F. Lincoln Arc Welding Foundation to 163 agricultural educators and farmers in its first agricultural award and scholarship program. In addition to the cash awards which brought in hundreds of papers from 40 states on new and unique arc welding applications on farm maintenance and construction operations, 30 agricultural scholarships worth \$250 each were given to colleges of agriculture in states of residence of the top 10 awardees.

Of the winners, 15 were residents of New York, 12 reside in Ohio, 11 in Illinois, nine in Pennsylvania, seven each in Michigan, Wisconsin and Texas, six in Iowa and Kansas and five each in the states of California, Idaho and Minnesota.

## Book Contains Technical Lamp and Lighting Data

A new 76-page book containing technical data gathered from a wide range of bulletins and articles published by Engineering Division of General Electric Lamp Department, as well as latest

lamp developments and their practical applications in many fields, is available from the company. It is a condensed text on design and operation of incandescent, mercury and fluorescent light sources.

Topics such as lamp economics, temperatures, voltages, auxiliary equipment and various types such as germicidal, infrared and glow lamps are discussed. Book is illustrated with photos, diagrams and charts. Designated as Lamp Bulletin LD-1, it is available from G.E. Lamp Department, Nela Park, Cleveland, at a unit or quantity cost of 40 cents each.



# NEW CATALOG


## MAKES THESE BETTER WELDING ACCESSORIES EASIER TO BUY

**36 Pages of Easy-to-use, Ready-reference Buying Information Covering the Complete G-E Accessory Line!**

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Every item in the G-E arc-welding accessory line, one of the most complete lines available, is designed to help make better welding easier. It includes electrode holders of all types, ventilated helmets and hand-shields, goggles and lenses, chrome-leather and flameproofed-duck protective clothing, cable connectors and clamps, and various tools and aids such as slag hammers, scratch brushes, Strike-easy crayon and compound, weld-splatter-resistant compounds, fillet-weld gages, and supervisor's viewing lenses.

All these items are arranged in logical groupings in the new catalog with all pertinent information on each group arranged continuously. No flipping pages or referring back and forth from one end of the book to the other; descriptive material, prices, catalog numbers, etc., on any item or class of accessories is all in one place for easy reference. If you do any welding at all, you'll certainly want a copy!

GENERAL  ELECTRIC



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**GENERAL  ELECTRIC**

Please send me my copy of the new  
G-E Arc-welding Accessories Catalog,  
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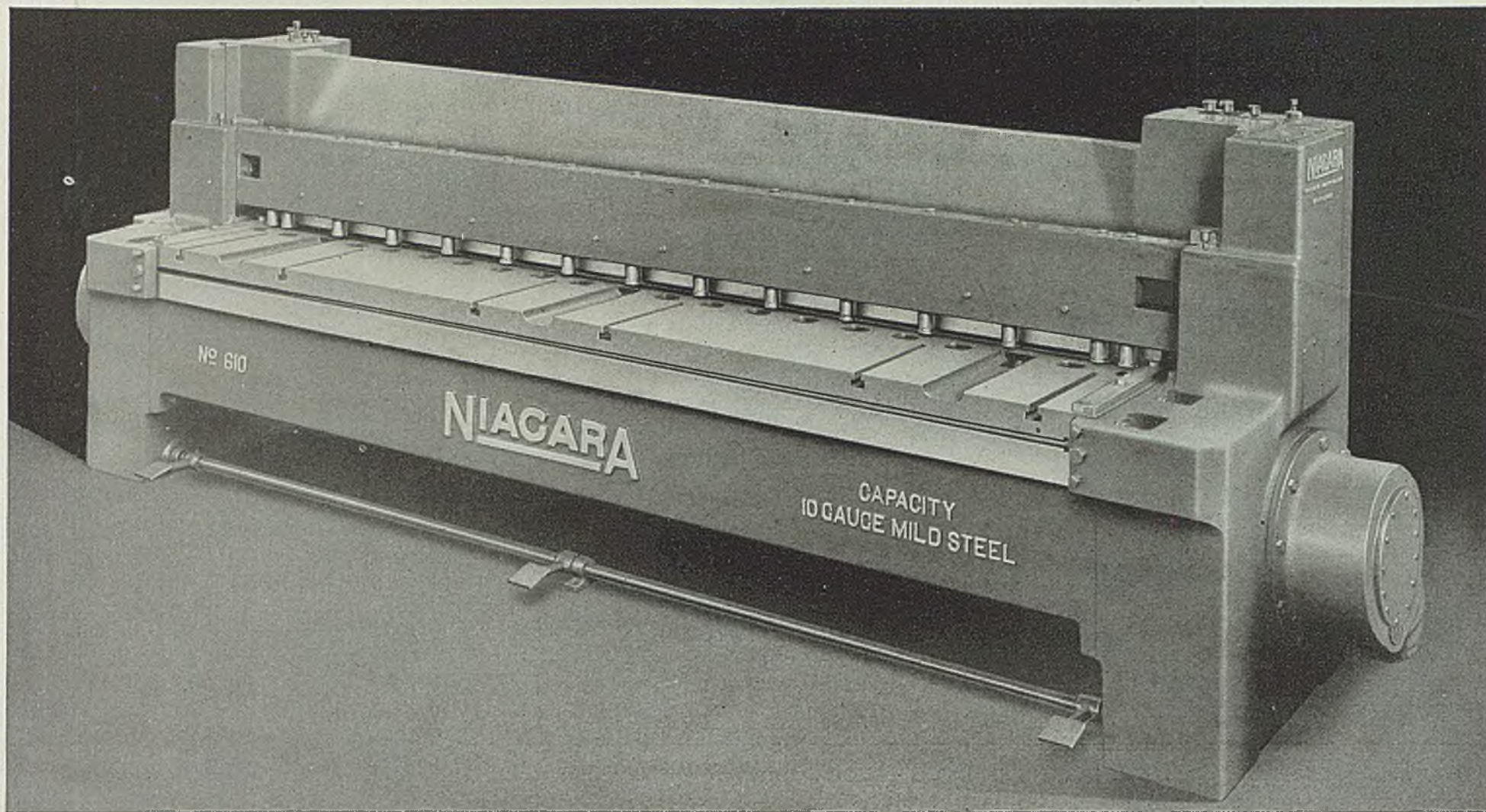
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## User Looks at Hydraulics

(Continued from Page 91)

- operation of these valves".
2. In other cases pumps are hidden in the base of the machine and then surrounded with piping, making it necessary to break several joints in order to service the pump.
  3. Feed cylinders are usually installed in such a manner that tables or slides must be removed in order to replace piston rod packings or repair oil leaks at pipe joints. In many cases the removal and replacement of a table or slide requires from 16 to 48 hours.
  4. In many cases oil reservoirs are located in a machine so low that they cannot be drained but must be pumped out. This makes the draining and cleaning of reservoirs a lengthy operation.

In order to remedy some of our difficulties caused by inaccessibility, several of our people made the following suggestions:

1. In one of our largest plants, which I believe is the largest user of hydraulically operated machine tools in General Motors, they are of the opinion that too high a premium is placed on floor space. In many cases the pump and reservoir could be located on the floor alongside the machine, thus making it very simple to change or service pumps and eliminate long periods of down-time.
2. Most machine tool builders are now installing their electrical controls in a neat, accessible enclosure outside of the machine. It is suggested that the same idea could be used in the case of hydraulic valves and other controls. They should not, however, be a part of the electrical control enclosure. By use of this construction, controls can be removed without disturbing the piping and trouble is easily located. These panels preferably should be mounted on the machine, but if made a separate unit, it should be placed as close as possible to the machine in order to keep the amount of exposed piping to a minimum.
3. Pipe units should be designed so that they can be easily removed as an assembly and all joints should be located so that in case of leakage the oil will drain to a sump rather than on the floor or on the machine.
4. Oil reservoirs should be located at a point high enough in the machine so that they can be easily drained and flushed clean. Pumping and wiping is not an efficient method of cleaning an oil reservoir.
5. Accessibility does not necessarily mean placing all the piping, valves,

etc. outside of the machine. They may still be placed inside the machine, but convenient light-weight covers should be provided so that repairs and replacement can be made easily.

Another unanimous complaint among our plants is oil leakage. This leakage results not only in high maintenance costs and poor housekeeping but also allows air to enter the system, resulting in uneven rates of feed. This condition results in excessive tool cost, since most of the modern cutting tools depend on an accurate, constant feed for their high rate of production.

This leakage occurs at pipe joints, feed cylinder glands and at the drive shaft seal in the pump. The use of manifolds and valve panels will reduce the number of pipe joints and thereby reduce the potential points of leakage. In many cases the better support of pipes and the use of vibration eliminating supports would do away with the joints loosening up and the actual fracturing of pipes and tubes. We all realize that the elimination of leaks is a big problem, but everything possible should be done to remedy this condition.

The third most common complaint was that very few machine tool builders furnish a diagram of the circuit used. Almost all the people contacted mentioned this. One of our plant engineers stated that he thought the manufacturers considered their circuits a secret. I believe that accurate schematic diagrams giving all the information necessary for servicing an installation would materially re-

duce the time required to maintain hydraulic machines. The plant engineer of one of our largest plants had the following suggestion:

"All manufacturers of hydraulically operated machines should provide the user with accurate, colored schematic circuit diagrams. There should be a schematic diagram for each phase of the machine cycle (clamp, rapid traverse, rapid reverse, etc.). The lack of schematic diagrams is the chief cause of excessive periods of down-time for hydraulic trouble shooting which in turn results in excessive loss of production. There should be a standard color code adopted and used by all manufacturers of hydraulic equipment.

**Red** —Pressure  
**Yellow**—Suction or Drain Oil  
**Blue** —Charge or Back Pressure Oil  
**Green** —Trapped or Stagnant Oil  
**Brown** —Metered Oil

"This code indicates the action of the oil in the circuit regardless of its pressure."

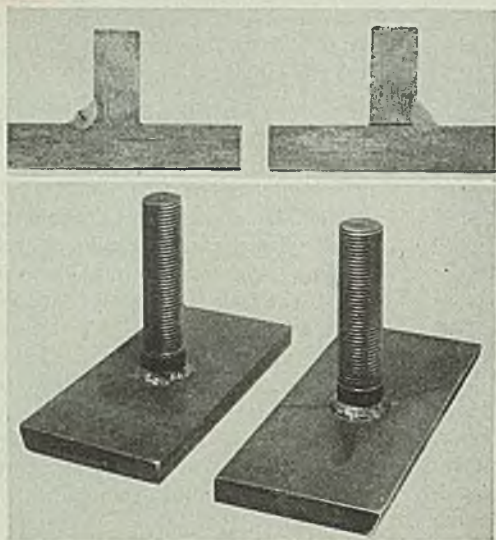
Another plant engineer suggested that the circuit diagrams should specify the model and type or size of parts so that replacement or stock parts could be ordered from the diagram rather than wait until something goes wrong and then remove the part before being able to order a new one.

In connection with schematic diagrams, it is necessary that immediate steps be taken to establish and use uniform sche-



**NO "TIRING" WORK:** A 60 per cent saving in weight is achieved in these 28 aluminum truck tire flap curing rims fabricated by American Welding & Mfg. Co., Warren, O. Rims are rolled from  $\frac{3}{8}$ -in. flat strip and flash butt resistance welded





#### SIMPLIFIED WELDING:

Examples of welding jobs performed with new electrode having low hydrogen, low-moisture coating are illustrated in the accompanying views. Of the samples of high-carbon steel, top, and high sulphur steel, bottom, the samples on the right were welded with the new electrode, announced recently by Lincoln Electric Co., Cleveland. According to company engineers, preheating of high tensile, low alloy steels can be eliminated and welding of materials which are to be enameled can be simplified, by using the new electrodes.

matic symbols and also uniform terminology for hydraulic accessories. The lack of this uniformity at the present time is the cause of a great deal of confusion on the part of machine tool designers and also maintenance personnel.

*Inaccessibility, oil leakage and lack of information* are apparently the cause of most of the dissatisfaction among our people. They all have a direct bearing on maintenance costs and loss of production, and every effort should be made to remedy these conditions as soon as possible.

In addition to the three problems I have mentioned there were several other criticisms and suggestions, the most important of which deserve attention. While these points were not brought up by all of our plants, a large majority brought them up in discussions.

1. Oil reservoirs are too small, resulting in overheating the oil which causes improper functioning of valves and distortion of the machines themselves. In order to overcome this difficulty, some machine tool builders install refrigerating units or other means for cooling the oil, all of which further complicates an already complicated machine, and none are entirely satisfactory. In many cases it has been necessary to install auxiliary reservoirs on machines in our plants and this at its best is a makeshift arrangement.
2. I find that straight hydraulic clamping has been the cause of many accidents due to the failure of the hydraulic system. We recently wrecked an expensive machine and its tooling due to one of the pipes to the clamping mechanism breaking. Hydraulic pressure should never be used for clamping without an intermediate mechanical device such as a cam or toggle which will re-

main locked if the oil pressure should fail.

3. In large process type machines using many heads or working stations, most of our divisions prefer an individual self contained hydraulic unit for each head. Any other construction results in pipes being strung around a machine, and not only confuses the maintenance people but multiplies trouble with leaks and adjustments. In many cases a machine with individual units can be operated while one station is being repaired; but in the case of a central pump supplying many stations the entire machine must be shut down.
4. The use of fluid motors in combination with screw or other types of mechanical feeds should be given more consideration. This design gives the advantages of the flexibility of hydraulics and in addition eliminates much piping and many valves.
5. Many manufacturers of machine tools do not give enough attention to the lubrication of table and slide ways. If possible, this is more important than on mechanical feed machines since poor lubrication at these points results in high pressures which in turn cause heat, leakage, and erratic performance.
6. We have had considerable difficulty with solenoid valves due to the elaborate linkages wearing. In many designs very slight wear will result in valve operation failures.
7. Many valve bodies are so designed that the mounting bolts distort these parts when tightened. Also, pipe and tube connections distort valve bodies when the oil temperature rises, resulting in valve spools binding.
8. We have had some cases where feed cylinders are not securely fastened to the machine frame, allowing them

to move. This condition results in excessive piston rod packing wear, leakage at pipe joints and vibration.

9. The last item I have is very important from our point of view and that is a standardization program covering the various pumps, valves, switches, etc. used in hydraulic equipment. With the many different makes being used by the machine tool builders it is imperative that mounting dimensions be standardized. It is now necessary for us to stock hundreds of such items simply because mounting dimensions vary.

I believe that there are many advantages to an arrangement similar to that now in effect between the electrical equipment manufacturers, the machine tool builders and the machine tool users. This joint group has accomplished a great deal in the last 2 years and I believe that such an arrangement with the manufacturers of hydraulic equipment could clear up much of the misunderstanding regarding hydraulic equipment which now exists.

We in General Motors definitely agree that there is a great need for hydraulically operated equipment, but we also feel that we should make known our difficulties with present hydraulic equipment. There should be more done than furnishing a list of parts to the machine tool builder. He should co-operate in the design of machines and make certain that his equipment is installed in such a manner that it is satisfactory to the purchaser of the complete machine. Dissatisfaction on the part of purchasers reflects on the manufacturer of hydraulics used and also on hydraulics as a whole.

As for the argument regarding advantages and disadvantages of various methods of operating and controlling machine tools, we have four choices:

- (a)—Electrical
- (b)—Hydraulic
- (c)—Mechanical
- (d)—Combination of any of these three.

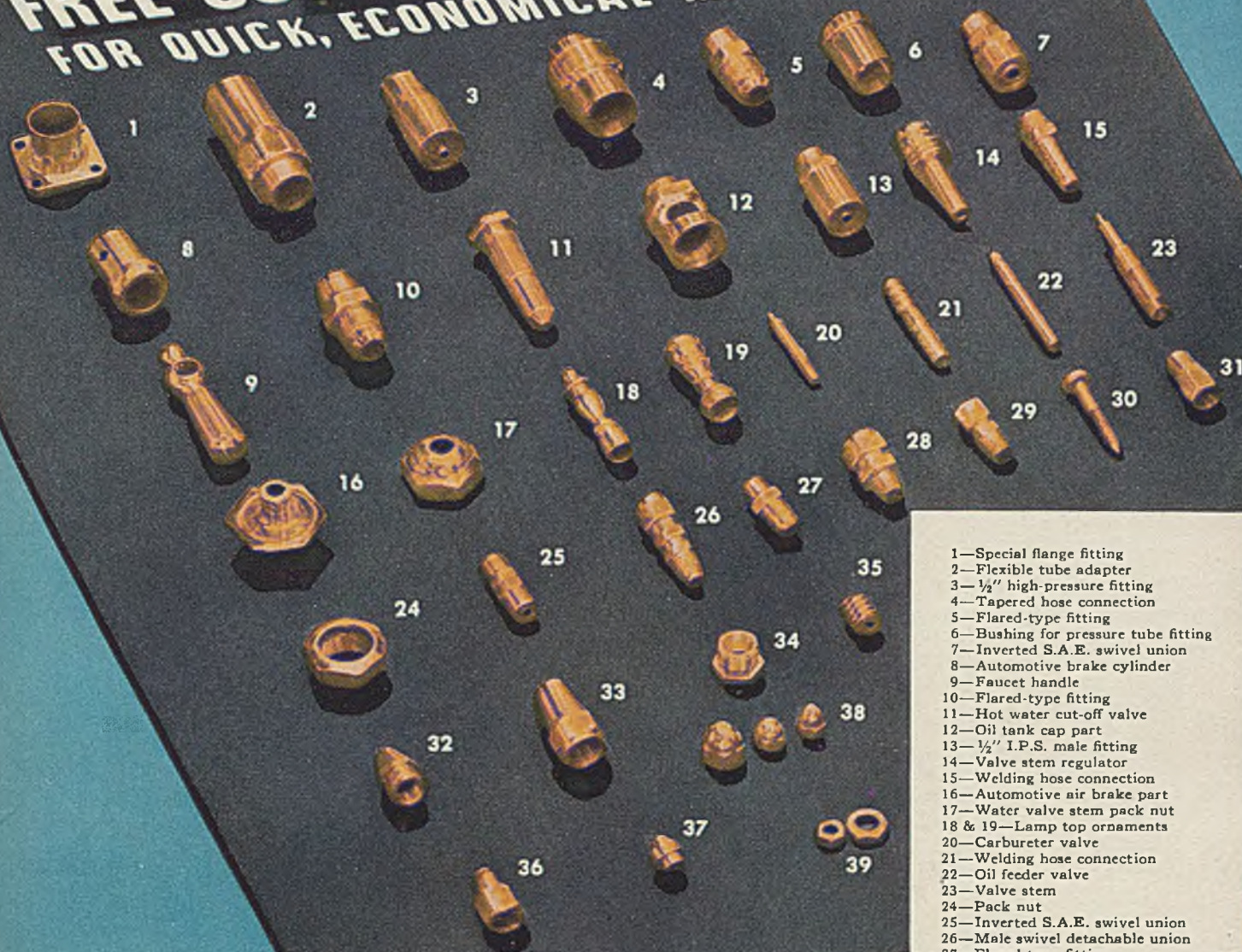
We have them all today and they will continue to be used where each fits best. Improvements are constantly being made in all methods.

In the case of machine tools, it is necessary that the designers be informed of all advancements made in each of the three methods. They must also co-operate fully with the manufacturers of this equipment and use the particular system which will produce the best results at the lowest cost. Since the machine tool industry is a highly competitive industry, costs are very important and will no doubt in many cases have a large influence in the selection of the operating and controlling methods that are used.



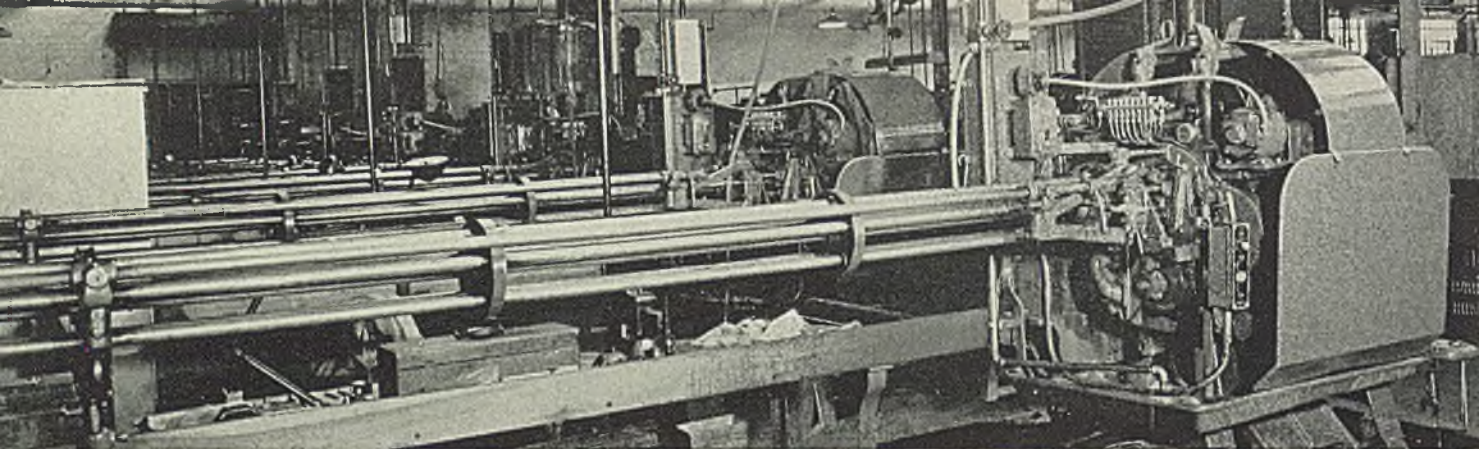
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FOR QUICK, ECONOMICAL MACHINING



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- 4—Tapered hose connection
- 5—Flared-type fitting
- 6—Bushing for pressure tube fitting
- 7—Inverted S.A.E. swivel union
- 8—Automotive brake cylinder
- 9—Faucet handle
- 10—Flared-type fitting
- 11—Hot water cut-off valve
- 12—Oil tank cap part
- 13— $\frac{1}{2}$ " I.P.S. male fitting
- 14—Valve stem regulator
- 15—Welding hose connection
- 16—Automotive air brake part
- 17—Water valve stem pack nut
- 18 & 19—Lamp top ornaments
- 20—Carburetor valve
- 21—Welding hose connection
- 22—Oil feeder valve
- 23—Valve stem
- 24—Pack nut
- 25—Inverted S.A.E. swivel union
- 26—Male swivel detachable union
- 27—Flared-type fitting
- 28—Detachabale ring-type hose fitting
- 29—Compression fitting assembly
- 30—Oil feeder adjusting valve
- 31— $\frac{7}{16}$ " female compression union
- 32—Fuse part
- 33—S.A.E. long nut
- 34—Orifice spud
- 35—Worm gear
- 36—Threaded sleeve-type union
- 37—Toilet tank spud
- 38—Acorn nuts for finish trim
- 39—Hex nuts





## Facts about REVERE FREE CUTTING BRASS ROD

**Lead Content.** Revere Free Cutting Brass Rod contains about 3% lead. This is not dissolved but is thoroughly distributed throughout the metal in the form of finely-divided particles. The lead reduces friction by causing the chips to break off short, so that they are in only momentary contact with the cutting edge of the tool. This lessens the amount of heat generated. Life of the tool is correspondingly extended, and long runs without regrinding are usual.

**Machining Speeds.** Surface speeds as high as 700 feet per minute are possible. Rough cuts as deep as 0.020" can be taken. Such speeds and cuts materially reduce production time over other materials having less outstanding machining characteristics.

**Finish.** With proper tooling, parts made of Revere Free Cutting Brass Rod come from the machine with a brilliant, smooth, highly-polished appearance, due to the practically flawless surface. Any tolerance within the capability of the machine and operator may be easily obtained. Threads are sharp and clean down to their roots.

**No Burrs.** This metal may be cut- and roll-threaded, drilled and tapped, milled, broached, and sawed with no appreciable burrs.

**Temper.** In the majority of cases, Revere Free Cutting Brass Rod is supplied hard drawn. This hardness facilitates chip breakage, while the high strength resulting from drawing assures strong threads. However, if desired for special purposes, Revere can supply soft Free Cutting Brass Rod.

**High Standards.** Revere Free Cutting Brass Rod is drawn to close tolerances on dimensions and straightness, and is stress-relieved after drawing. The metallurgical and physical characteristics of the metal are under constant laboratory check. It is therefore especially suitable for automatic screw machines, which require stock having high uniformity in quality and dimensions.

**Additional Advantages.** The smooth surfaces produced by machining Revere Free Cutting Brass Rod are ideal for plating. The metal is easily soldered, can be welded if desired, and it is of course non-rusting and corrosion-resistant. Even at a slightly higher cost over other materials, this brass often is more economical for screw machine production, due to the speed with which the various operations may be conducted, and the value of the scrap.

**Consult Revere.** Because no single metal or alloy is suitable for all requirements, Revere offers many, each having some outstanding virtues and advantages. Selection of the most advantageous Revere Metal for a given process, part, or product may make a big improvement in such important items as cost of manufacture, durability, and even saleability. The Revere Technical Advisory Service will gladly cooperate with you in studying your requirements.

### TYPICAL PROPERTIES

#### REVERE FREE CUTTING BRASS ROD Alloy No. 240

##### COMPOSITION

Copper 61.5%  
Zinc 35.5  
Lead 3.0

##### TENSILE STRENGTH

Hard\* 65,000 pounds per square inch  
Soft† 50,000

##### ELONGATION

% in 2 inches  
Hard\* 15  
Soft† 50

##### DENSITY

0.307 lbs. per cubic inch

##### COEFFICIENT OF EXPANSION

.0000113 per °F @ 68° F

##### ELECTRICAL CONDUCTIVITY

28.6 (% I.A.C.S. @ 68° F)

##### THERMAL CONDUCTIVITY

73 Btu. per sq. ft. per ft.  
per hr. per °F @ 68° F

\*Hard, Rockwell B72 (app.)

†Soft, Rockwell F65 (app.)

Revere Metals include: Copper and Copper Alloys: Sheet and Plate, Roll and Strip, Rod and Bar, Tube and Pipe, Extruded Shapes, Forgings; Aluminum Alloys: Tube, Extruded Shapes, Forgings; Magnesium Alloys: Sheet and Plate, Rod and Bar, Tube, Extruded Shapes, Forgings; Steel: Electric Welded Steel Tube.

# REVERE

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## Buffing and Polishing

(Concluded from Page 93)

are of quality desired. A magnifying glass allows counting of number of threads per inch and also shows up whether or not the material is "loaded" with starch or other filler. Absence of starch or other filler, bleaching materials or dyes, is desirable. Glue can obtain a direct bond on unfilled fabric, while unbleached, undyed material can best be impregnated with buffing compounds or abrasive.

Wheels made from bleached muslin are somewhat harder than those of unbleached material. However, for rougher kinds of polishing where coarse abrasive grain is used (for instance on castings or forgings) wheels of colored muslin are used. Made of remnants of shirting, apron materials, etc., they provide low-cost wheels sufficiently good for such purposes.

Canvas wheels are preferred by many shops for heavy, severe polishing operations. So-called disk-type canvas wheels have several plies solidly cemented together. This construction provides a relatively hard face. Three different densities usually are available. Woven cotton canvas measuring from 1/8 to 5/16-in. thick is used, thickness depending on density required. These so-called "compress wheels" hold their shape well, even when only 1/4-in. thick. They vary in thicknesses all the way from 1/4 to 8 in.

Compress wheels of various densities also are made of leather. Faces of these can be shaped to contours of parts. They have been very widely used in factories making cutlery, small tools and similar products. Canvas compress wheels sometimes are used as grease wheels for fine finishes.

Canvas wheels with plies held together by wood screws, are available. This screw bonding is employed by at least one leading buff manufacturer in making plow polishing wheels, it being optional to concentric rows of hand sewing. The screws are shorter than the thickness of the wheel, and are set into both sides in concentric rows. Rows on one side are staggered with regard to those on the other, so that uniform cushioning and locking effect is achieved.

These screw-bonded wheels are made 18 in. in diameter and upward, in various face widths. When one of the wheels wears down close to the first row of screws, those screws are removed. Thereupon the wheel continues in service until it becomes necessary to remove the second row of screws, and so on until minimum usable diameter is reached.

Every apprentice polisher should be carefully instructed in the handling of

felt wheels. No other polishing wheel can be damaged so easily through burning. This is true especially of wheels of relatively large diameter running at high surface speed. Good balance of these wheels is extremely important. If abrasive grain is worn away at one point as a result of unbalance or because that one point is "high", the wheel will burn at that point. Then it will have to be turned down until all of the burned portion is removed, which is wasteful and expensive.

Primary function of the felt wheel is finishing. As a rule, it should not be set up with abrasive grain coarser than 150 grit. Several manufacturers of polishing and rubbing felts—ranging from soft to rock hard—provide small felt wheels and "bobs" shaped according to customers' blueprints.

Even though felt wheels must be handled with care, it is a fact that in the hands of competent, careful craftsmen they are superior for many finishing operations. Felt has the necessary resiliency and flexibility for producing high-quality finishes. These wheels are available in as many as nine different degrees of hardness, in wide range of sizes and thicknesses.

**Leather Polishing Wheels:** Sheepskin, bull-neck leather and walrus leather wheels all have their places in the buffing and polishing field. Sheepskin wheels are provided in solid cemented, sewed and cemented, machine quilted, and hand quilted, in addition to so-called "loose sheepskin" type. The latter simply is made up of a number of disks sewed only once close to the hole. This makes it so flexible that it can be used as a substitute for a muslin buff for high-lighting work—such as brass plated lamp bases—containing "valleys". A muslin buff is inclined to leave lint and grease in the valleys, hence the loose sheepskin wheel is preferred because of its cleanliness.

Disks for these wheels are die cut, the center holes being punched simultaneously, to insure concentricity and balance. In some plants where work of various widths calls for use of loose sheepskin wheels, single disks of sheepskin are purchased. The polisher simply puts enough of the disks on the polishing lathe arbor to build up a composite wheel face of the width suited to the work at hand.

Bull-neck polishing wheels are used chiefly for polishing flat surfaces with abrasives not coarser than 120 grit. Therefore they should present to the work as true a wheel face as possible. Realizing this, some makers bond the leather disks with flexible adhesive, similar in "consistency" to the leather itself. This bonding prevents one disk

from yielding more than another at any point, thus insuring an even cushion for the entire width of the face. This eliminates formation of ridges.

Walrus leather wheels have had their chief use in finishing small items, for instance small arms and jewelry. Walrus leather is particularly good for making bobs of small diameter for internal work. Improved methods of tanning give walrus leather toughness, flexibility and wearing qualities desirable in polishing wheels and bobs. Such leather is being furnished in any required thickness from 1/2 to 1 1/4-in.

In running small-diameter bobs and wheels, bear in mind that rpm must be stepped up in order to obtain proper surface speeds, 7500 to 8000 surface fpm usually being required to insure a good job of polishing.

A process now is carried on commercially through which worn-out buffs are remade into large, usable ones. This is accomplished by cutting wedge-shaped segments from buffs worn down to 8 or 9 in. in diameter. Six of these segments then are mounted and locked on steel hub, thus building up a new buff of generous diameter.

(To be continued)

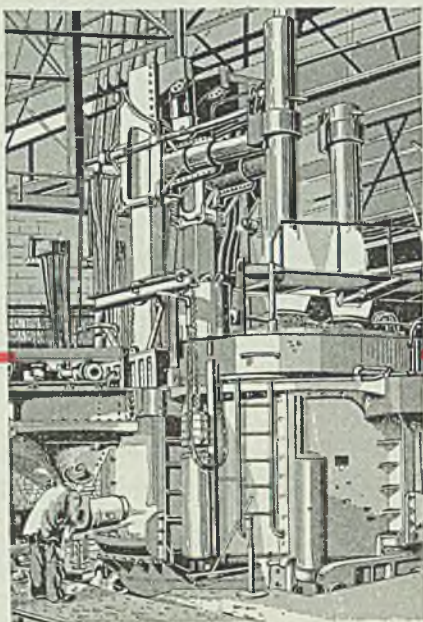
## Bright Hardening Stainless

In the discussion "Bright Hardening Stainless Steel" it was stated that the Westinghouse Ammogas furnace was designed for hardening tools that do not need to retain original brightness. G. J. Oswald, manager, metallurgical laboratory, National Cash Register Co., Dayton, O., points out that the Ammogas furnace is a standard bright hardening tool treating furnace designed to harden tools without producing either scale or decarburization.

National Cash Register developed a very closely controlled atmosphere metering device and converted the furnace to exclusive use of bright hardening stainless steels. The success of this process depends on intelligent operation, close supervision, and top-notch functioning of all phases of the equipment. The atmosphere dew point is actually in the region of minus 65° F. The article appeared in the Nov. 25, 1946 issue of STEEL.

Prepared by a committee representing materials handling specialists and transportation groups, a simplified practice recommendation for pallets is being distributed for comments and acceptance by Division of Simplified Practice, National Bureau of Standards. Copies may be obtained from U. S. Department of Commerce, Washington.





## CONSIDER SHOP

*Need for better tools for handling electric furnace electrodes is stressed by melt shop personnel. Dividing line between top-charged and side-charged furnaces appears established at 14-ft diameter. Ten-hour heats of stainless from tonnage furnaces contemplated in near future*

DESPITE the shortage of hotel accommodations in Pittsburgh during the first week of this month, attendance at the fourth annual conference on electric furnace steel reached 541 surpassing that of a year ago. The conference held at the William Penn Hotel, Dec. 5-7 was sponsored by the Electric Furnace Steel Committee, Iron and Steel Division, American Institute of Mining and Metallurgical Engineers. Next year's conference is to be held at the William Penn Hotel, Pittsburgh, Dec. 4-6 inclusive.

A digest of the various papers presented at technical sessions on basic steel follow:

**Carbon and Graphite Electric-Furnace Electrodes**, by T. L. Nelson, National Carbon Co., Inc., Niagara Falls, N. Y.: Technique of manufacture of electrodes has now advanced so that electrodes are available in sizes larger than any required for the largest existing electric steel furnace.

At temperatures of 2900 to 3100° F attained inside most electric steel furnaces, carbon and graphite oxidize in the presence of oxygen, and though this action is somewhat retarded within the furnace because of the limited access of air, oxidation nevertheless is directly responsible for from 60 to 75 per cent of the total consumption of electrodes. Oxidation can be minimized by attention to atmospheric seals, such as ports and charging doors.

Electrode cracks usually make their first appearance as short socket splits, about the time the joint reaches the part of the column that is just inside the roof, which is subjected alternately to the intense heat of the furnace and the comparative chill of the water-cooled gland as the column moves slowly up and down. In furnaces provided with swinging roofs, cracks frequently develop as the white-

hot columns are raised to the tops of the masts and swung to one side, where the electrodes cool rapidly in their self-created drafts.

More or less continual spalling occurs in most high-power services, and represents a substantial proportion of the consumption due to causes other than oxidation. Spalling applies to the relatively small losses that occur at the tips of the columns as a result of the local stresses set up by the sharp thermal gradients in the vicinity of the arc.

The smallest diameter of electrodes should be used that will safely carry the amount of power required to permit a maximum rate of production without excessive consumption of electrodes due either to overheating (oxidation) or to breakage.

General practice for many years has been to use carbon nipples with carbon electrodes and graphite nipples with graphite electrodes, although graphite nipples have been in limited use as a means of connection for carbon electrodes for about ten years. Those who employed the latter combination have generally realized better over-all electrode operation but the increased cost of the graphite nipple has acted as a restraint against its widespread adoption. Experimental work continuing over several years has established some distinct advantages in this use of graphite nipples for carbon electrodes.

1. An Acme-threaded graphite nipple of approximately the same diameter and three-fourths the length of the standard round-thread carbon nipple was found by laboratory tests to produce the best joint as to strength and resistance. Its suitability was confirmed in trade tests in the open-arc class of usage encompassing the sizes from 6 to 20 in.

2. Short-length Acme-thread nipples were found to have a decided advantage

over pitch-treated Acme-thread carbon nipples in terms of joint failure and joint appearance when used over a year's period in 35-in. electrodes in a 3-phase submerged-arc furnace.

3. An Acme-threaded nipple, with pitch diameter approximately 0.51 times the electrode diameter and a length 1.5 times the nipple diameter, yielded the best balanced performance.

4. C-1 or C-3 cement when applied to the faces of the electrode joints has been found to constitute a beneficial accessory in replacing standard joint compound.

Discussion of this paper brought out pleas from electric furnace operators for better electrode handling tools. In many shops, plugs after using are thrown on the concrete floor with the result that the cast-iron threads are damaged. It was announced that a plug now under development will be 20 per cent lighter than those used at present but one operator was of the opinion that this reduction in weight was not enough. An aluminum alloy, S-17, which can be heat-treated was suggested as a suitable material to use to obtain strong threads and at the same time light weight.

**Preparation of Raw Materials for Fast Melting in An Electric Arc Furnace** by S. D. Gladding, Bethlehem Steel Co., Bethlehem, Pa.: Segregation of purchased scrap is best accomplished by chemical analyses of each incoming carload, and careful sampling methods must be developed for the various types of materials coming in. Spot and spark testing and visual inspection are also used extensively. It has been found advantageous, for instance, to make spark and spot tests at the loading platform after the scrap has been placed in the charging buggies. This insures maintenance of segregation up to the moment of charging and has paid dividends in preventing missed heats.

# Electric Steelmakers

## PROBLEMS

Both on single-slag heats and on heats made with two slags, all raw materials such as ore, mill scale, cinder, ferroalloys, burnt lime, fluorspar, sand and elements used for slag treatment should be dried at temperatures between 500 and 1200° F. Any appreciable amount of moisture in the charge will result in absorption of hydrogen in the metal bath, particularly during the refining period of the heat.

A manufacturer of electric furnaces in commenting on this paper pointed out that mechanical charging appeared to be the accepted practice on electric arc furnaces 14 ft diameter and larger; whereas on furnaces of small diameters top charging is the accepted international practice. The verdict of the industry, he stated, is that those who once use top charged furnaces will never go back to door charging. While there are places where top-charged units cannot be used, given a new plant, we feel the future lies for the production of steel in the top-charged unit. He explained that there is a time saving in charging and in the meltdown, the charge can be centrally placed on the hearth and hot metal can be charged through the top without any detrimental affect on the bottom.

An operator in discussing practice at his shop stated that top-charged furnaces are desirable where solid scrap is charged followed by one recharge of lighter scrap. However, where light scrap is handled he recommended the door-charged unit. He dumps about 12 ton of scrap in two buckets in 19 min, the recharge taking about the same time.

Condition of the scrap available is the criterion of side and top-charged electric furnaces according to the opinion of another operator.

**Oxidizing Period in Basic Electric Steelmaking** by A. C. Texter, Atlas Steels, Ltd., Welland, Ont.: This period begins with the first drop of metal melted and ends with the first addition of a reducing agent to the bath or slag. The manner in which additions are made has an all important influence on the development of the heat and on the quality of the finished metal. The choice of oxidizing practice

and the emphasis to be placed on the various factors will depend upon the quality of scrap available, grade of steel being produced, and quality desired.

The first step in proper oxidation control is control of the furnace charge. Steel scrap will form the bulk of the charge and should be free from dirt, foreign material and excessive rust. Oxide material may be charged in the form of iron ore, roll scale or sinter. Sinter is probably preferable as it will support the arc, but despite this advantage of sinter, iron ore is most widely used. Roll scale is a good source of iron oxide but frequently carries undesirable alloys.

Use of either limestone or burnt lime will depend upon the operator. Burnt lime will give less oxidation, is easier to charge and will not require power for calcination in the furnace. For high phosphorus or silicon charges, lime-stone additions sometime become too bulky and interfere with melting, and in these cases adding part or all of the CaO as burnt lime is advisable.

### Carbon Control Essential

Carbon control in oxidation is important. A good oxidation period means far more than the efficient removal of phosphorus, silicon, or other impurities. Most operators agree that in order to produce maximum quality, sufficient carbon must be present to combine with the iron ore to promote an active carbon boil.

Basicity of the slag is all important in the effective removal of phosphorus. In actual practice to obtain phosphorus contents consistently lower than 0.030 per cent is often necessary to charge limestone equal to 6 or 7 per cent of the charged weight when using commercial scrap of relatively high phosphorus content, and still further additions may be necessary after meltdown.

A viscous or thick pasty slag will not permit easy transfer of FeO from slag to bath for oxidation neither will it permit proper bath to slag reactions and will slow down all melting reactions. Additions of fluorspar, fine iron ore or scale, will thin the slag and result in good contact between bath and slag. We have often found

it advisable to charge fluorspar with the original charge, particularly with heavy additions of limestone or burnt lime.

If the meltdown is followed by a boiling period in which carbon is removed at an optimum rate, for an optimum period, and with an optimum amount of ore, the steel will not only be cleaner, but will also be more homogeneous and more thoroughly degasified. As a result, the heat will show higher physical properties, particularly where transverse testing is considered.

Iron ore additions to the charge or re-charge cannot produce proper boiling at the same time as melting is taking place because it has to oxidize silicon, phosphorus and manganese. Only after these elements have been lowered will it react with the carbon. With a "full" boil practice, a minimum of oxide material and sufficient carbon are charged to insure a high carbon melt-in; then, with a properly controlled boiling period the carbon is not reduced any lower than absolutely necessary and over-oxidation is avoided.

Hydrogen will originate from moisture, rust, oil, etc., and for this reason every precaution must be taken to keep the scrap and all additions as free as possible from moisture and other sources of hydrogen. We have installed a rather elaborate drying system to insure the use of dry raw materials. Although we do not dry the lime used, it is received fresh daily and is of low moisture content; other materials such as coke, spar, ferrosilicon and sand are dried to a very low moisture content. As we use the electrolytic material which contains considerable hydrogen, if nickel is to be added to the heat we try to add as much as possible with the charge and any balance preferably before or during boiling. Ferromolybdenum and other nonoxidizable alloys are also added in the charge or as soon as possible, preferably before boiling is complete.

The first step in the attainment of a good boil which will give without over-oxidation a bath relatively free from hydrogen and nonmetallic inclusions, is the control of the carbon and manganese at meltdown. Approximately 20 to 25 points of carbon should be boiled out in a period of 45 to 60 min and manganese oxidation should proceed at approximately a similar or a slightly higher rate. This means that if the carbon is to be boiled down to say 5 points below the range, a meltin carbon of approximately 20 points above the low side of the range should be obtained.

Amount of ore which will be required is a function of the temperature. If additions are delayed until the bath is approximately 3050° F. 6 lb of ore per pound of carbon oxidized will be sufficient. At lower temperatures larger amounts of ore will be required to produce an active boil with the usual result



that the bath at "slag-off" is over oxidized and the heat of inferior quality. Boiling should not be carried out at higher temperatures due to the excessive attack on refractories. Moreover, at higher temperatures the solubility of hydrogen is greatly increased and may cause wildness.

The rate of boiling must be a compromise. Slow rates do not produce the best condition for degasification and inclusion removal. Violent boiling is hard on furnace refractories and will usually result in an increase rather than a decrease in inclusion content.

After ore additions are completed, a definite period must elapse before slag-off. We allow 15 to 20 minutes during which period the bath should be well stirred. The boiling action will cease, the temperature drop off, and equilibrium conditions between the slag and metal will be approached.

Partial deoxidation is sometimes carried out before the oxidizing slag is removed by reboiling with ferromanganese or spiegel additions. Reboils are advocated for the purpose of lowering the FeO content of the steel and eliminating silicate inclusions by the formation of fluid manganese silicates, but must be timed properly so that they are far enough ahead of slag-off to give maximum silicate removal, yet not too far in advance of slag-off so that the action will tend to reverse and the bath be re-oxidized. We are firm believers in the early additions of all alloys, particularly manganese, and if the manganese is not added as a reboil before slag-off it is the first addition made to the bare bath after slag-off, and in some cases, manganese is added at both points.

**Oxygen in Basic Electric Furnace Baths** by S. F. Urban, Titanium Alloy Mfg. Co., Niagara Falls, N. Y. and G. Derge, Carnegie Institute of Technology, Pittsburgh: Heat records, which include oxygen analyses in addition to the regular slag and metal analyses, were examined by the authors for 30 electric furnace heats. The available methods of sampling for oxygen were compared. The authors cited the following conclusions:

1. Although bomb tests give slightly lower oxygen values than chilled wedge samples, there is insufficient evidence to accept either one as the absolute value. Both methods of sampling the steel bath for oxygen give the same indications of oxygen behavior and are equally useful. The chilled sample seems more convenient.

2. The metal bath reaches a minimum oxygen value after 40 to 80 min under the reducing slag. Prolonged holding is thus a waste of furnace time.

3. Minimum oxygen value is dependent upon the carbon in the bath and the carbon-oxygen equilibrium, rather than by the time of holding under the slag.

4. Amount of sulphur held with a given slag is determined by its state of reduction rather than its basicity, in the range

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of basic compositions studied.

**Melting Semikilled Steel in the Basic Electric Arc Furnace** by R. J. McCurdy and R. W. Farley, Republic Steel Corp., Chicago: It is essential to charge flux (since furnace time will be saved by shaping up the slag during melting) to start the boil at the earliest moment, and to maintain it throughout the melting. Accordingly, ore is charged, and generally some pig iron for increased agitation. Normally, 45 lb of ore per ton of scrap charge, 25 lb of pig per ton, and 30 lb of burned lime per ton, or equivalent in limestone, will be charged.

A good layer of heavy scrap on bottom is covered with ore and lime. Burned lime, if well scattered, may be placed anywhere: Stone, if in large lumps, must be kept from under the electrodes, preferably outside the delta. The ore should be free from lump, and lumps if present, must be kept from under the electrodes, preferably well within the delta.

Melting is started on the highest voltage on most heats. It is found that no damage to refractories results. Use of high voltage gives maximum power factor, highest rate of heat input, and fast melting. The recharge is put in as soon as there is room in the furnace for a sizable amount of scrap. Slag is flushed off freely during the melting. It is desired to keep a small volume, well shaped up, having good heat absorption, and such as to permit composition adjustment at a minimum expense.

An average of 0.01 per cent P has been removed from early test to tap. Sulphur meltin was seldom much higher than the maximum desired. Thus an average drop of 0.008 per cent S from early test to tap

was all that was necessary to produce an average ladle test of 0.036 S.

Following the above practice it is usually possible to clear the banks of remnants of scrap at about the time the bottom cleans up. Ferromanganese is added to the ladle during the tap. Ferrosilicon 50 per cent is added during the tap for deoxidation. Aluminum is used only in case ladle recarburization is required, 5 lb per point of carbon added to the ladle.

The heat is poured hot, (2875° F). Bottoms and tops of the ingots should be poured slowly. Ingots are capped with shot aluminum to control bleeding, aiming at a low crown. From ½ to 1½ lb of aluminum per 8600 lb ingot is usually required.

Ingots which freeze flat generally roll out with large breaks. Ingots which bleed show many small breaks, generally concentrated toward the top and corners. Ingots which freeze with a low crown can generally be rolled into a billet product of satisfactory surface quality and with a minimum of discard for pipe. Costs per net ton of ingots for this program have been somewhat higher than for basic open-hearth ingots made in the same melt shop.

**Production of Rimmed Steel in Basic Electric Furnace**, by A. K. Moore, Steel Co. of Canada, Hamilton, Ont. We have been operating a 70-ton basic electric furnace in line with our nine open-hearth furnaces since June 28, 1943, and have been able to produce all grades of rimming steels which are made in the open hearths. These grades range from under 0.07 carbon deep drawing up to 0.28 carbon commercial and cold heading. In making this range no appreciable difference in surface quality of the ingot or working quality of the product has been detected.

A satisfactory rimming action is obtained for steels under 0.10 carbon with FeO percentage ranging from 13 per cent upward and for steel over 0.10 carbon an FeO of 11 per cent and upward will produce a reasonably satisfactory rim at proper temperatures.

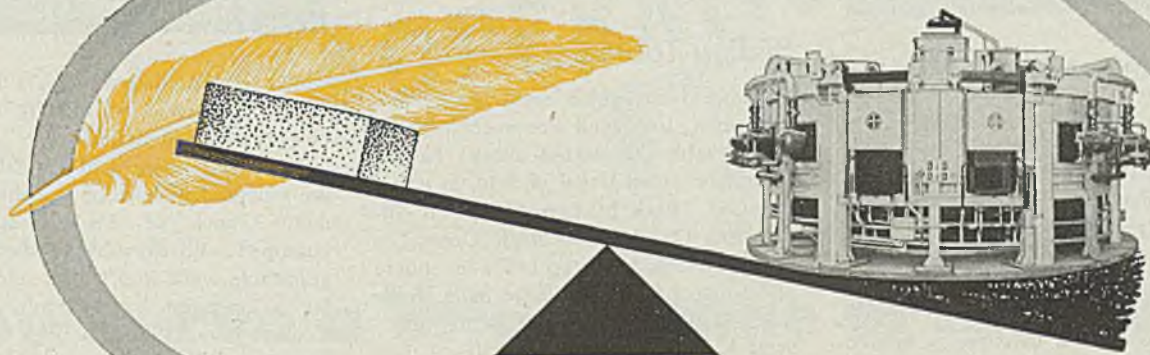
Materials in the first charge and the order in which they are put in the furnace are mill crops, ore or sinter, lime, carbon, crops and miscellaneous heavy melting. The second charge is carbon or pig iron depending on the preliminary test plus balance of scrap for a total of 160,000 lb. Sinter or ore is charged to produce activity in the bath and as a source of oxide for the slag, enough carbon being charged to produce a proper melting carbon. In the later stages of the melting period, if necessary, lime is added by shovel to produce a slag of

(Please turn to Page 136)



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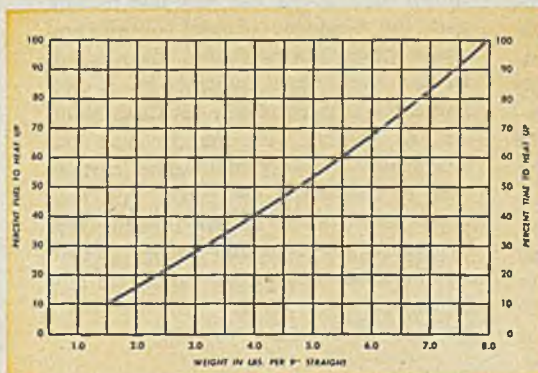
Here's an example, based on actual experimental data, that shows how the weight factor can affect the performance of your furnaces:

In a furnace, 12" deep by 40" wide by 13½" high tests were run using brick linings of different weights. With each lining, the hearth was constructed of heavy firebrick and the heat liberation was kept constant (30,000 Btu/sq. ft./hr.).

The curve at the right shows the results of these tests. For instance, the furnace when lined with an insulating firebrick weighing 3 pounds per nine-inch straight requires 180% more

time and 180% more fuel to heat up than when lined with insulating firebrick weighing only 1½ lbs.!

Equally as important as their light weight—B&W I.F.B. afford close temperature control, more uniform heating. This is because their low heat storage capacity and low conductivity permit the hot-face temperature to respond speedily to the rate of furnace heat input. The result — more uniform product quality.



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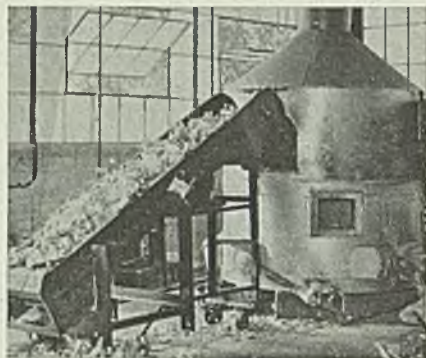


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# Industrial Equipment

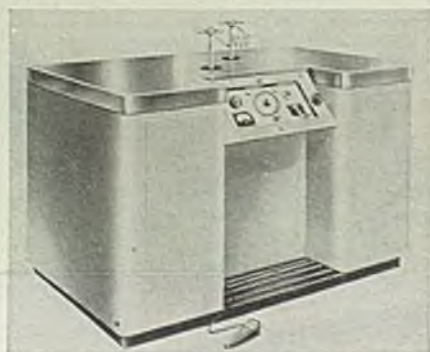


## Die Casting Alloying Pots

Fed with a continuous type conveyor, gas-fired die casting alloying pots built by Bellevue Industrial Furnace Co., 2971 Bellevue, Detroit 7, range in capacity from 2000 to 10,000 lb. Designed for use in die casting plants for reclaiming sprues and other scrap material as well as for alloying die cast metal, the pots are made to be fed to capacity hourly. The 6000 lb capacity model illustrated above is fed at rate of 1000 lb every 10 min. Temperature range on all models is from 350° F to 1200° F. Steel 12/16/46; Item No. 9028

## Induction Heating Unit

Using no vacuum tube oscillators, spark gaps or motor generators, the new Trigatron induction heating machine, illustrated below, made by Gordon Electronics Inc., 224 Penn Avenue, Pittsburgh 22, features internal or external heating, heat focused to specified areas, uniform surface heating and precise temperature control. Offered in various sizes from 1 to 200 kw and larger, the machine has centrally located controls which are mounted behind a transparent locked door (except the operational switches). With a power factor of better than 92 per cent, the machine (the 10 kw size shown here) has an output frequency of approximately 500,000 cy-



cles per second. It measures 3 ft high, 3 ft deep and 5 ft long and has a knee-hole for operation in a sitting position. Steel 12/16/46; Item No. 9029

## Sliding Table

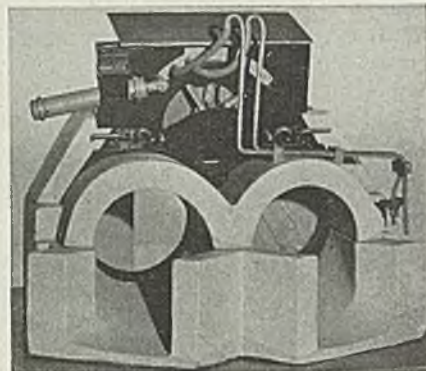
Designed for quick mounting to any drill press, the small heavy-duty 2-way sliding table (illustrated above) has an accurately gaged travel of 5 in. in either direction. Built by Leo. G. Brown Engineering Co., 1127 Riverside Drive, Los Angeles 31, its table top is 7½-in. square and is fitted for 1-in. T-head bolts. Table is 3¾-in. high and weighs 24 lb. Steel 12/16/46; Item No. 9030

## Reversing Valve

Features of the new type of reversing valve for heating and small melting furnaces developed by Blaw-Knox Co., Pittsburgh, include compactness, adaptability for low headroom conditions and simplicity of design and operation to reduce maintenance. Constructed with straight flow lines for passage of gases, the valve, shown right above, has only one moving part for complete reversal of air and waste gases. A swinging damper, of welded steel plate construction, is hollowed for passage of air. It turns about an axis central with the air port and alternately connects air intake port to each of two waste gas ports. All three ports are formed in an integral seat casting which is water cooled. Unit can be used with either natural or fan-blown air. Steel 12/16/46; Item No. 9026

## Semiautomatic Lathe

Furnished with either single or double-action cross slides, the No. 650 single-spindle lathe (shown at right), a product of Oster Mfg. Co., Cleveland 3, is equipped with 4-speed motor and hydraulic feeds. Headstock casting contains spindle bearings, oil reservoir and spindle, which is provided with a flange type American Standard 6A1 spindle nose for mounting collet head or other work-holding devices. Cross slide is actuated by a 3½-in. diameter hydraulic cylinder



which is controlled through a lever and solenoid operated valve. It also may be operated automatically.

Hydraulic pump and its 2-hp motor are mounted in base of machine. Automatic chuck of 1½-in. capacity is equipped with draw-back collet with an adjustable work stop in the spindle. Collet is operated by hydraulic cylinder. Coolant pump is driven by a ¼-hp motor, controlled by same switch that controls hydraulic pump motor. Steel 12/16/46; Item No. 9027

## Gear Drive

Floating Gearmatic gear drive introduced by McNally Pittsburg Mfg. Corp., Pittsburg, Kans., for double roll crushers allows wider adjustment of crusher roll centers. Driver gear is held in position while driven gear, which is mounted on a movable shaft, is followed by two floating pinions as it is shifted to new positions. Train operates in a bath of oil, gear cover acting as a well. Steel 12/16/46; Item No. 9797

## Laboratory Box Furnace

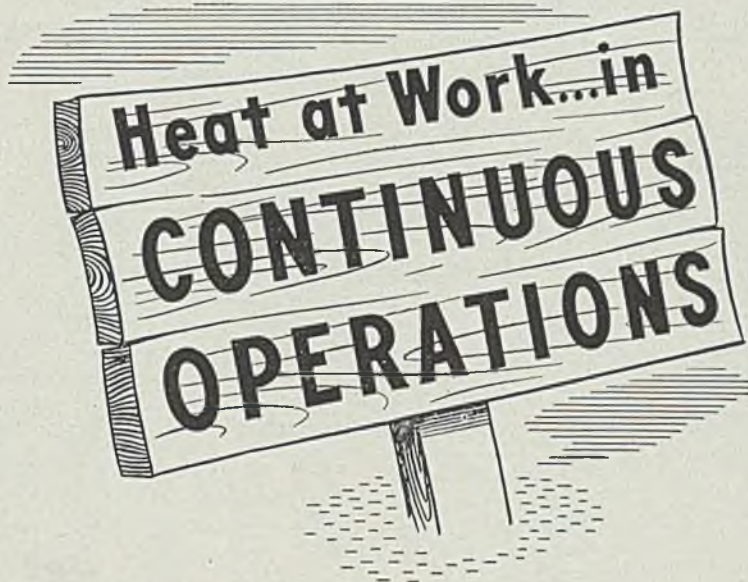
High, automatically controlled temperatures can be met for laboratory requirements with the box furnace announced by Industrial Heating Division of General Electric Co., Schenectady, N. Y. and illustrated here. Suitable for operation up to 3100° F, it can be



(All claims are those of respective manufacturers, for additional information fill in and return the coupon on page 124.)



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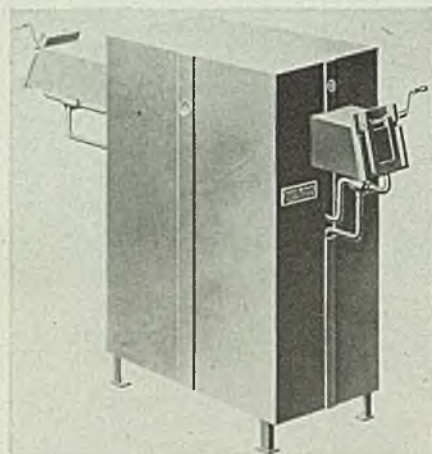
13825 TRISKETT ROAD

CLEVELAND 11, OHIO

ASSOCIATED COMPANY: JAMES DAY MACHINERY LTD., LONDON W.1, ENGLAND



used for melting and bright annealing of metals, sintering of powdered metals, reduction of metallic oxides, ceramic firing and copper and silver alloy brazing of metals. Molybdenum rods rated at



20 kw, 65 v single phase, form the heating units. Heating chamber is 4 in. wide, 4½-in. high and 25 in. long. Cooling chamber permits materials to be cooled in protective atmosphere, preventing oxidation of charge. Doors of both chambers have flame curtains to prevent loss of atmosphere. Automatic temperature control may be either strip or round chart or of indicating type. It operates from radiation thermocouple focused on interior wall of heating chamber.

Steel 12/16/46; Item No. 9031

## Infrared Heating Unit

Miskella Infra-Red Co., East 73rd and Grand avenue, Cleveland 4, is producing the Heatolier, a combination circular fixture embodying principles of infrared heating, incandescent light bulbs

and circular fluorescent lamps. Made with a white enameled body which is flared to serve as a reflector for the fluorescent lamp, fixture is made in two models one for two 250 w infrared lamps and one for four such lamps.

Smaller model A has a 2-lamp circuit with two 250 w lamps connected to produce a total of 500 w in heat. It is operated by a double-action heat switch. Larger model B has separate switches for each pair of lamps. Odd socket in center can be used for incandescent bulb or another heat lamp. Both models include separate switches for fluorescent lamps.

Steel 12/16/46; Item No. 9788

## Boring Bars and Blades

Behr Products Co., 18732 Woodward avenue, Detroit 3, is manufacturing a taper shank type boring bar which is offered with several types of blades. Cuts up to 3/4-in. on a side are easily taken without chatter.

Boring bar, A, uses standard facing or shoulder boring blade, B, cuts flat and



square with spindle axis. Back facing or inverted boring blade, C, or single end cutting fly tool blade, D, may also be used with bar. Shown in E is a small hole adapter for holes smaller than 2 in. diameter.

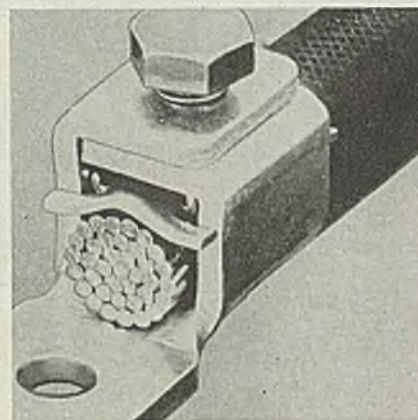
Model 1500 tools have a boring range up to 6 in. in diameter. Holes up to 12

in. in diameter may be bored with Model 1501 tools.

Steel 12/16/46; Item No. 9829

## Solderless Lug

Accommodating a range of wire and cable sizes from No. 4/0 wire to 500 Mcm cable this new screw lug, designated KPA34, is installed by tightening



the clamping bolt which forces pressure bar up on cable. Built by Burndy Engineering Co. Inc., 107 Bruckner boulevard, New York 54, the Scrulug is formed from pure copper and brazed for added mechanical strength. It was designed to have the operating characteristics of the largest cable.

Steel 12/16/46; Item No. 9963

## Air-Draw Furnaces

New line of recirculating gas-fired air-draw furnaces, use an atmospheric burner with a comparatively rich primary mixture, with enough air as a secondary supply to complete combustion. Manufactured by Eclipse Fuel Engineering Co., 778 South Main street, Rock-

**FOR MORE INFORMATION** on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9028	9788	9809
9029	9829	9860
9030	9963	9805
9026	9862	9813
9027	9842	9790
9797	9849	9955
9031	9843	9792

12-16-46

NAME ..... TITLE .....

COMPANY .....

PRODUCTS MADE .....

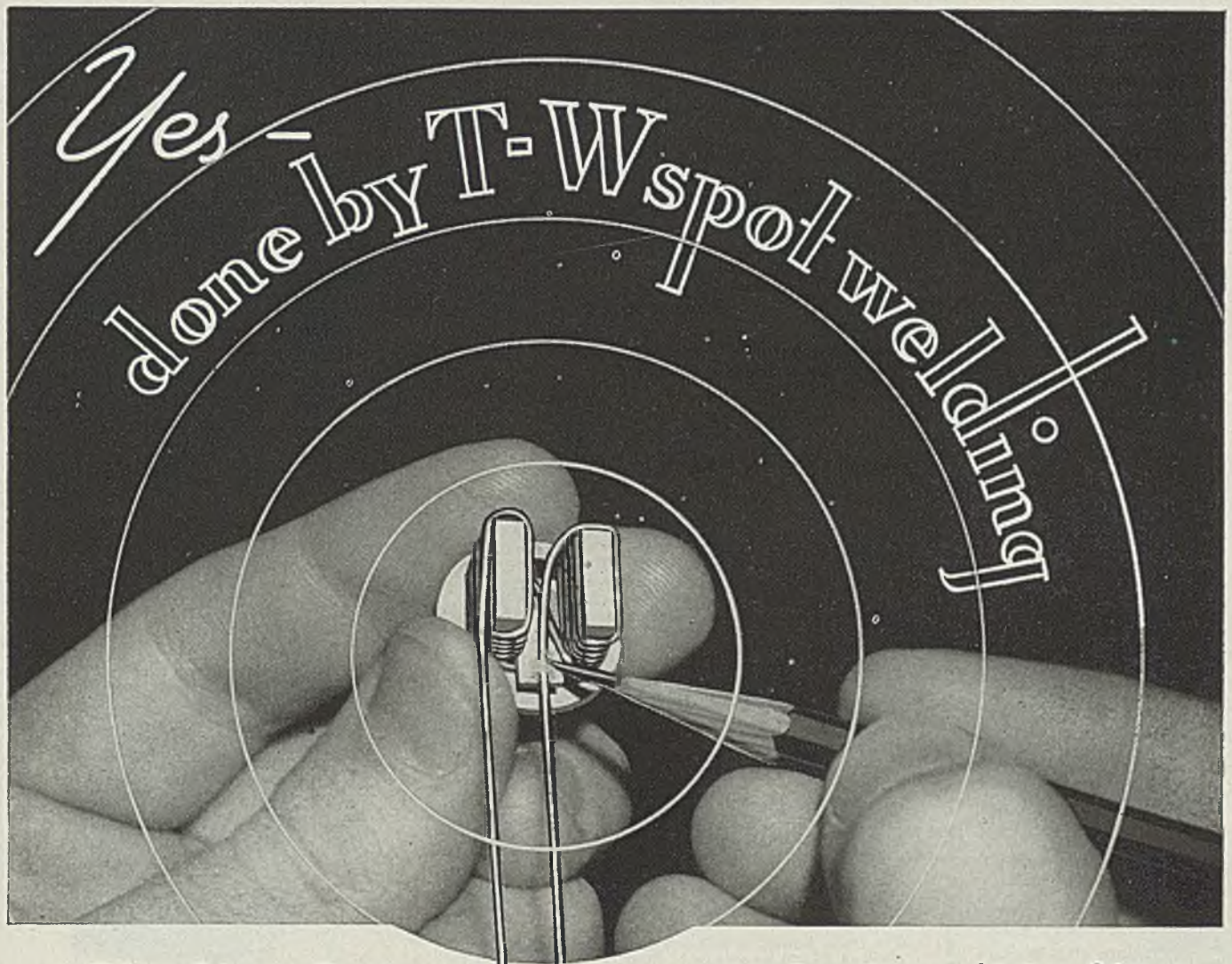
STREET .....

CITY and ZONE ..... STATE .....

Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)





## Pin Size Copper wire attached to $\frac{1}{2}$ " x $\frac{3}{16}$ " brass plate on a Taylor-Winfield spot welder

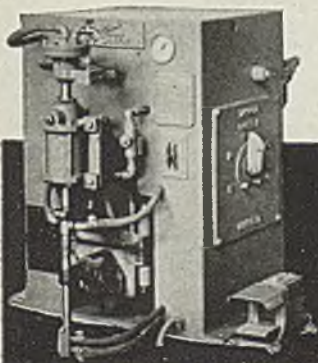
*You can do amazing things with resistance welding machines.*

The usual method for attaching this wire to the minute brass plate would be soldering. But too many fumbling thumbs cause too many rejects. Equally important, corrosion troubles are eliminated because resistance welding does not require the use of flux.

Taylor-Winfield equipped a Spot Welder with special dies to expedite handling of the odd-shaped parts. Result, continuous production with practically no rejects on this electrical part.

Resistance welding has put the joining of metals on a production basis. Try it and watch those production costs go down. *Write Taylor-Winfield for profitable information on spot, seam, flash-butt, or projection, all forms of resistance welding.*

Combining streamlined appearance with sound engineering practice, Taylor-Winfield spot welders are used for the welding of clean and coated carbon steels, stainless steels and weldable alloys of aluminum, nickel, copper and magnesium.



*The* **TAYLOR-WINFIELD**  
CORPORATION  
WARREN • OHIO







## COST OF MATERIAL HANDLING

Per ton—based on 180 tons per day

In addition to these savings, Baker Trucks reduce warehouse rental charges by tiering, contribute to plant safety, speed production and material movement, and perform many other operations that reduce plant overhead.



Handling conditions vary for each particular plant. Your own problem should be presented to an experienced material handling engineer. However, the following example outlines a simple method for determining the savings possible with an electric industrial truck. Let us assume a hypothetical plant with the simple problem of transporting daily 180-tons of material 200 feet from stockrooms to processing machines. Without power trucks this would require 10 truckers, each making 10 round trips per hour, or 80 trips per day, carrying 450 lbs. of material per load.

**TABLE I—Handling Costs Without Electric Truck**

Based on 180 tons per day	Cost per day	Cost per ton
Labor (85¢ per hour) .....	\$68.00	\$0.378
Social Security Taxes .....	2.72	0.015
Workmen's Compensation .....	1.00	0.006
Hand Truck Depreciation .....	0.30	0.002
<b>Total</b> .....	<b>\$72.02</b>	<b>\$0.401</b>

In order to mechanize handling operations, the following equipment would be required:

**TABLE II—Cost of Equipment for Mechanizing**

Fork Lift Truck 2000-lb. capacity .....	\$4,100.00
Battery .....	600.00
Charging Equipment .....	840.00
200 pallets .....	700.00
<b>Total</b> .....	<b>\$6,240.00</b>

The truck, handling one-ton pallet loads of material, making 24 round trips per hour, could transport the 180 tons in 7½ hours.

**TABLE III—Annual Expense—Truck Operation**

Depreciation—Truck at 10% .....	\$410.00
Battery at 20% .....	120.00
Charging equipment at 6½% .....	56.00
Pallets at 20% .....	140.00
Tires .....	100.00
Repair and Maintenance—Truck .....	164.00
Battery .....	24.00
Charging Equipment .....	33.60
Replacement of damaged pallets .....	70.00
Electricity .....	82.00
Insurance .....	10.00
<b>Total annual expense</b> .....	<b>\$1,209.60</b>
<b>Expense per day</b> .....	<b>4.03</b>

**TABLE IV—Handling Costs—With Electric Truck**

Based on 180 tons per day	Cost per day	Cost per ton
Labor (Driver—\$1 per hour) .....	\$8.00	\$0.044
Social Security Taxes .....	0.32	0.002
Workmen's Compensation .....	0.16	0.001
Truck Expense .....	4.03	0.022
<b>Total</b> .....	<b>\$12.51</b>	<b>\$0.069</b>

**TABLE V—Savings With Electric Truck**

Savings Per Ton .....	\$ 0.332
Savings Per Day (Handling 180 tons) .....	59.51
Savings Per Year (300 days) .....	17,853.00
Per Cent Reduction in handling costs .....	83%
Annual earnings on investment .....	286%

While this example is obviously oversimplified, Baker Material Handling Engineers are prepared to show you how similar savings can be made on handling operations in your plant.

## —INDUSTRIAL EQUIPMENT—

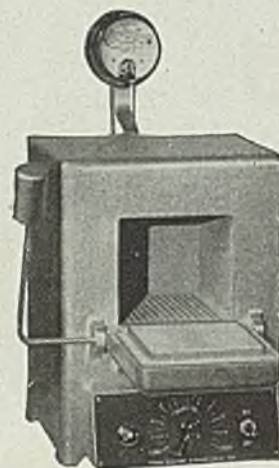
ford, Ill., the burners are protected against electric and gas failures by an electronic flame-failure unit which prevents filling work chamber or recirculating system with unburned gases.

Furnaces have a panel control system, which is completely assembled and pre-tested at factory, and delivered for installation as a single unit.

Steel 12/16/46; Item No. 9862

## Electric Furnace

New electric furnace developed by Thermo Electric Mfg. Co., Dubuque, Iowa, offers wider utility for general laboratory use and for production heat treating of small parts. Known as model CEA, its heating chamber measures 4-3/4-in. wide 4-1/4-in. high and 6 in.



deep. Furnace maintains a temperature of 2000° F continuously, and automatically holds any selected temperature from 500° to 2000° F.

Construction of furnace features one-piece aluminum casting for body and door. Counter-balanced door is hinged to swing forward, providing a loading platform. High temperature alloys are used for heating element which completely surrounds chamber to assure uniform distribution of heat. Entire muffle core, with embedded heating element, can be removed for replacement.

Steel 12/16/46; Item No. 9842

## Tube Expander

Dismantling of the outer boiler jacket or cutting through this jacket with an acetylene torch to gain access to boiler tubes for repair is avoided when the special purpose tube expander, manufactured by Richard Dudgeon Inc., 24 Columbia street, New York 2, is used. Its use also does away with climbing into boiler to reach inside ends of lower pass tubes as it is designed to roll the far ends of tubes into the tube sheets, entering from the smoke box or fire

**BAKER INDUSTRIAL TRUCK DIVISION of The Baker-Raulang Company**  
2167 WEST 25TH STREET • CLEVELAND, OHIO  
In Canada: Railway and Power Engineering Corporation, Ltd.

# Baker INDUSTRIAL TRUCKS



R O L L I N G

T E C H N I Q U E . . .

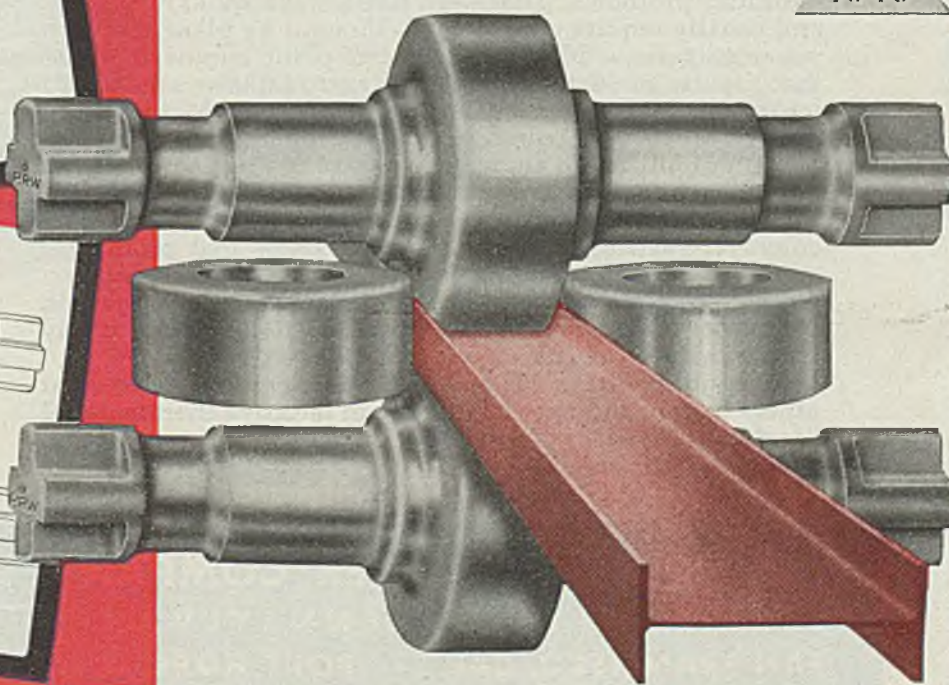
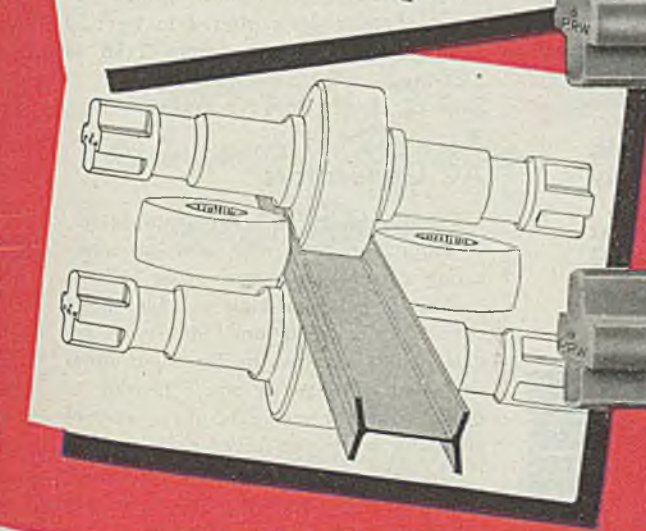
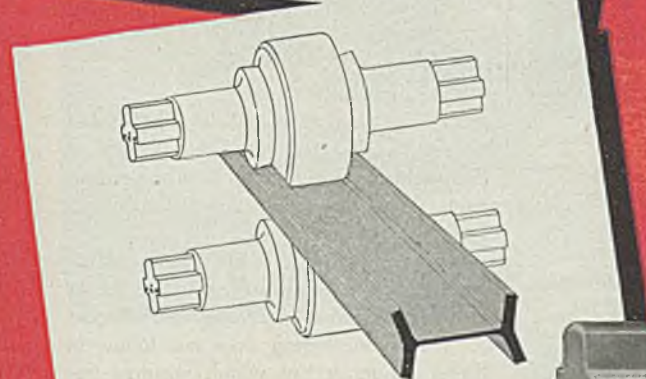
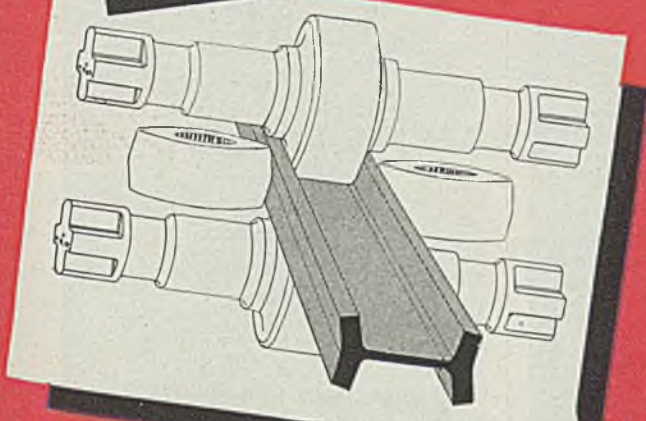
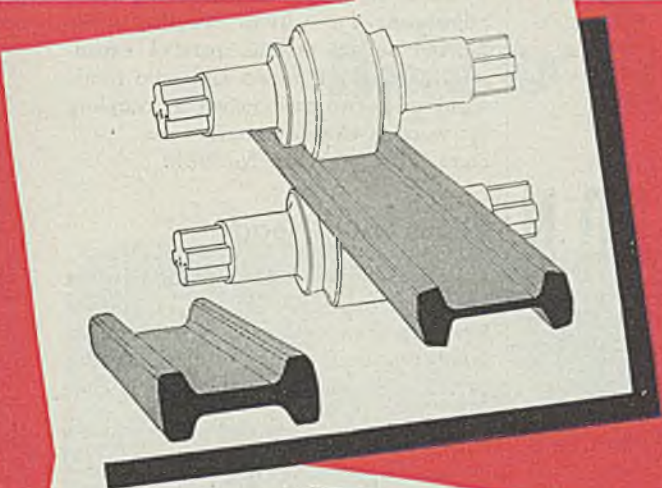


# Universal Beam Mills

Although there are very few mills of this type in this country the tonnage of large beams and large H beams with parallel flanges is counted in the thousands. These mills afford the only means by which these larger sections can be rolled. Here again proper rolls play a large part in producing a quality product.

Pittsburgh Rolls are made by skilled craftsmen whose thorough practical knowledge of metallurgy, foundry methods and accuracy in roll turning is the accumulated result of over seventy-five years devoted to the exclusive manufacture of rolling mill rolls. The use of Pittsburgh Rolls can result only in *less cost per ton of steel rolled.*

**PITTSBURGH ROLLS**  
Division of Blaw-Knox Company  
PITTSBURGH, PA.



**PITTSBURGH ROLLS**

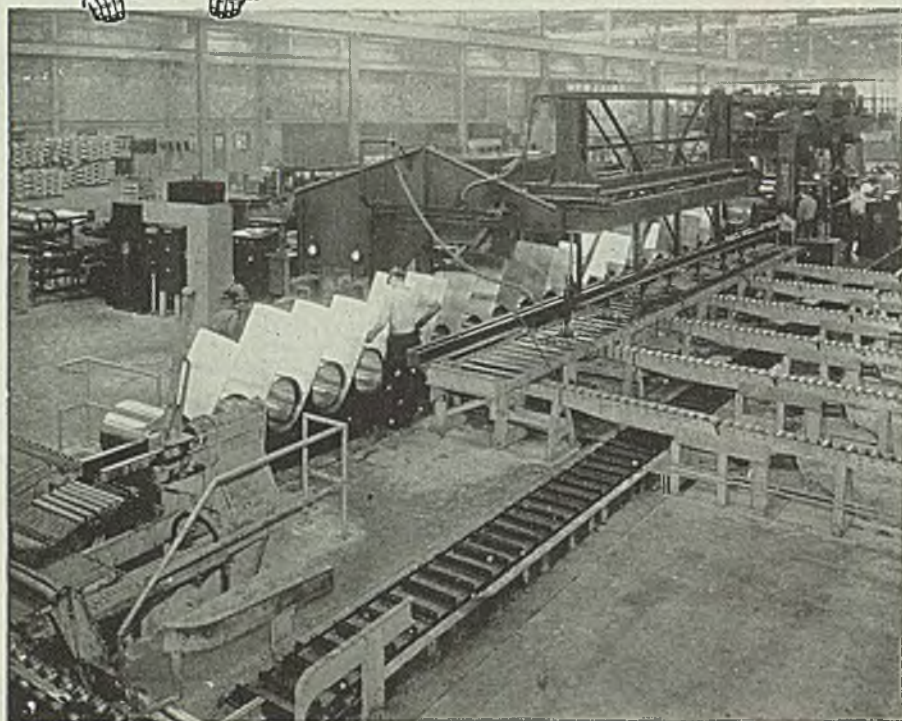




## HANDLING PROBLEMS DESERVE



# Special ATTENTION



**E**VERY manufacturer, in striving to keep costs at a minimum, must deal with more or less difficult material handling problems. These are not always quickly solved, and usually require considerable thought by plant and conveyor engineers. Most experienced plant engineers agree that the use of Mathews methods and Mathews equipment means efficient material handling. That is why Mathews Engineers are usually called in on the problem requiring special attention. There are many types of Mathews Conveyers of both gravity and power designs, and from these types are selected the units which make up Mathews continuous flow conveyor systems. It is with such systems that prominent manufacturers are reducing worker fatigue and keeping materials moving through processing machinery, storage and shipping, with a minimum of product re-handling, costly confusion and delay.

It might be that a Mathews Engineer can show you what others in your industry have done to improve their material handling. We will welcome your inquiry and give it prompt and thorough service.

**MATHEWS CONVEYER COMPANY**  
**ELLWOOD CITY, PENNSYLVANIA**  
**SAN FRANCISCO, CAL. • PORT HOPE, ONT.**  
**ENGINEERING OFFICES IN PRINCIPAL CITIES**

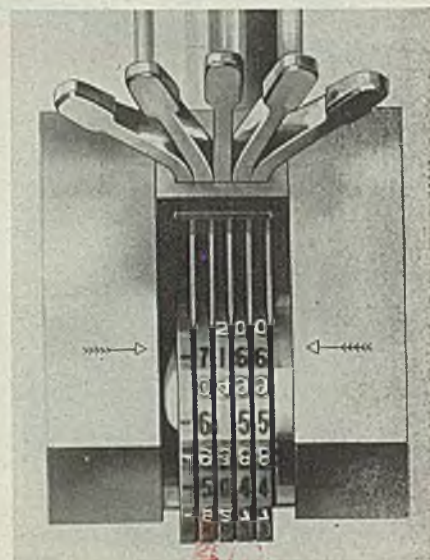
## —INDUSTRIAL EQUIPMENT—

door and reaching through whole length of tube. Revolving stop collar permits adjustment for various lengths, while tapered rollers provide parallel expansion. Expander is made with solid frame shank or in two parts joined by coupling for work in close quarters.

Steel 12/16/46; Item No. 9849

### Numbering Head

Wm. A. Force & Co., of 216 Nichols avenue, Brooklyn 8, N. Y., is manufacturing a new selective type indenting numbering head for use on metal. Known as model 27, each of its wheels is con-



trolled by an individual lever operated to secure selective numbers at will of the operator. One number is advanced on each wheel for each depression of its lever.

Wheels are indexed for direct reading of number in printing position. Unit is adaptable for any small metal part on which numbering does not follow in direct sequence but which requires frequent changes. It is offered in 6-wheel capacity in figure sizes from 1/16 to 3/32-in.

Steel 12/16/46; Item No. 9843

### AC Generators

Kato Engineering Co., Mankato, Minn., is manufacturing a new series of alternating current generators, made in both 8 and 10 poles, making possible direct connection to 720 and 900 rpm engines. Alternator can be furnished either with two bearings, or single bearing to permit direct carriage of drive end of alternator on engine-driven shaft.

The 900 rpm generators are available with direct connected exciter or top mounted exciter, the 720 rpm generators only with top mounted V belt-driven exciter. All exciters are of shunt-wound

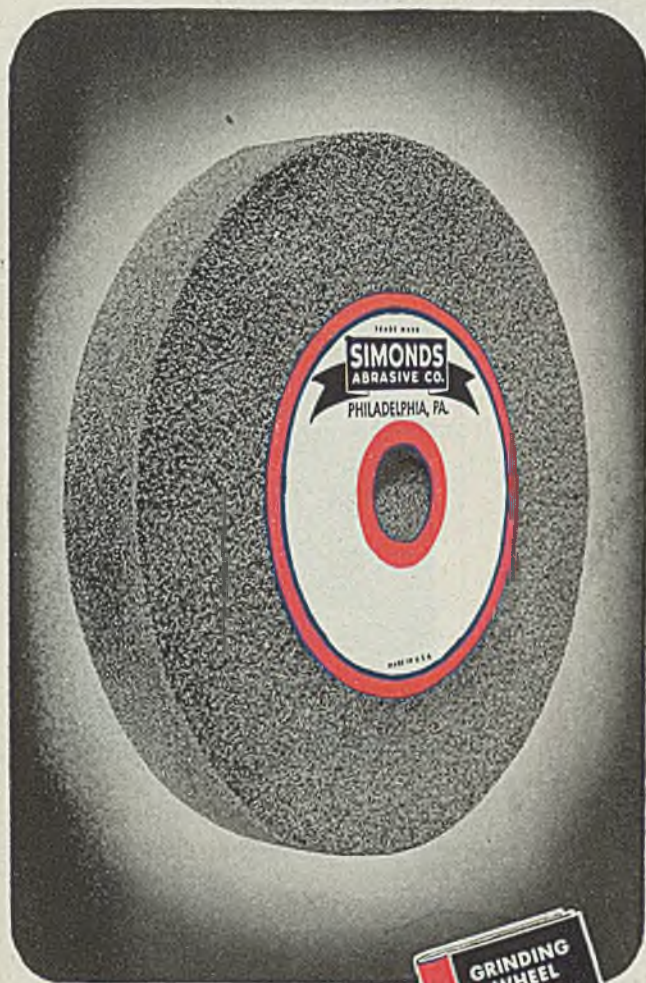


# Rule O' Thumb



may get you

half a wheel



*Write for the  
Simonds Abrasive  
Data Book*

Why wear down and out two or three wheels when one might do the job and do it better? Selecting wheels by guess adds up to too much money for too many wheels; too much cost because of sluggish stock removal, inaccuracies in finishing, and rejected work.

These are facts and are good reasons why there are thousands upon thousands of combinations in grain, size, grade, structure and bond in the complete line of Simonds Abrasive Borolon (aluminum oxide) and Electroton (silicon carbide) products.

Whether you are working on soft plastics or the hardest metal, with the Simonds Abrasive Data Book you have the means of intelligently selecting the grinding products that will do your jobs better and cheaper.

Borolon and Electroton Stocks are now restored for prompt supply of your requirements. You will find Simonds Abrasive Distributors ready to help you in your wheel selection and prompt to serve your needs.



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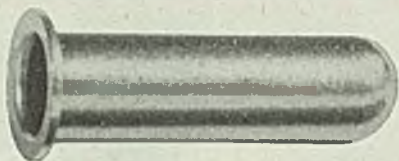
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GRINDING WHEEL CO. LTD.

SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES



# KONDOR DRAW

FOR DEEP DRAWING  
PURE NICKEL CONTAINERS



## This PURE NICKEL CONTAINER was drawn with KONDOR DRAW

Previous to the use of Kondor Draw, pure nickel created serious problems for the press room—such as excessive pick-up and galling, followed by breakage.

KONDOR DRAW provides important advantages—it prevents galling, pick-up and scratches, and eliminates honing of the dies.

KONDOR DRAW affords substantial economies—it reduces breakage, permits reduction in pressure; reducing power input, provides longer die life and it makes possible the use of materials formerly considered difficult for deep drawing operations.

*Write for a generous sample of Kondor Draw  
for use in your press room*

**LET US  
PROVE IT!**

**KONDOR PRODUCTS**

CORPORATION

INDUSTRIAL PROCESSING CHEMICALS

WEST CLIFTON BLVD. AT STONE • CLEVELAND 7, OHIO

KONDOR DRAW Metal Cleaners Grease Solvents Rust Solvents Rust Proofing Base Compounds Quenching Oils SPECTRUM

OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA.

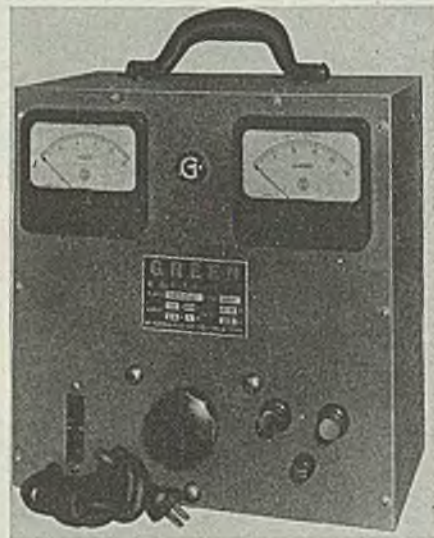
## —INDUSTRIAL EQUIPMENT—

type and can be furnished at either 125 or 250 dc.

Generators are available in 2 and 3-wire, single-phase, and 3 and 4-wire, 3-phase for voltage combinations, such as 110-220 v for single phase and 208-120 v 3-phase; also 3-phase, 440 v.  
Steel 12/16/46; Item No. 9809

## Bench Rectifier

Portable rectifier unit announced by W. Green Electric Co. Inc., 130 Cedar street, New York, is a complete direct-current power supply source, with a capacity of 150 w. Cabinet dimensions of the unit are 14 x 14 x 9 in., its weight, approximately 45 lb. Output is adjust-



able from 0 to 6 v and has a continuous capacity of 25 amp.

Rectifier has single-phase full wave circuit, using a quadruple protected selenium rectifier element. It is convection cooled, has no moving parts and operates noiselessly. An on-off switch of magnet circuit breaker type provides input protection, output protection is provided by a panel mounted fuse in direct-current circuit.

Steel 12/16/46; Item No. 9860

## Thermometer

An all-metal thermometer known as the Max-Min, which indicates maximum or minimum temperatures in processing operations, is being introduced by Weston Electrical Instrument Corp., Newark, N. J. It includes an auxiliary red index which is manually set by a finger knob which protrudes from center of scale glass.

When record of lowest temperature reached is desired, index is placed to low side of the temperature pointer. Pointer will move index to lowest temperature reached during any operating





## BLAST CLEANING BOTH VERTICAL AND HORIZONTAL SURFACES *at One Time*

*No other  
airless blast machine  
has this cost-saving feature*

Thorough and uniform cleaning of vertical and horizontal surfaces with one pass through the machine—eliminating the necessity, in many cases, of turning the work for second and third passes . . . has revolutionized the blast cleaning of large or small castings and other metal parts on table-type machines.

Pangborn's ROTOBLAST\* Table directs the blast stream onto the work at a 45° angle. Thus a great variety of shapes can be handled on this table with complete assurance that all planes will receive equal cleaning—no possibility of over-cleaning some planes.

### And These Other PANGBORN FEATURES Save You More Time and Money

**Variable table speed.** Can be suited to the work—higher speeds (and higher production) for pieces easy to clean.

**Large work openings.** High work pieces easily handled.

**Rim drive.** Driving the table from the rim (instead of from center spindle) gives smoother motion and facilitates inspection of driving unit.

**No clogging.** The abrasive sweeps are rotated independently of the table; regardless of amount of abrasive thrown, the sweeps handle it without clogging.

**Surface peening.** Uniform abrasive impact over every point of the work table (due to 45° wheel) and variable table speed make this unit ideal for surface peening as well as blast cleaning.

Send coupon now for Bulletin 211A on ROTOBLAST Tables. And for any type of blast cleaning equipment—airless or compressed air—"Come to Pangborn", world's largest manufacturer of blast cleaning and dust control equipment.

\*Trademark of the Pangborn Corporation

# Pangborn

PANGBORN CORPORATION, HAGERSTOWN, MARYLAND

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Gentlemen: Please send me free Bulletin 211A on ROTOBLAST Tables.

Check also for information on: ROTOBLAST Rocker Barrels ☐  
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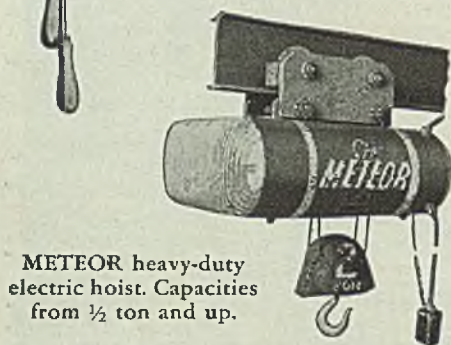
# CM

68 Years of experience  
really means something

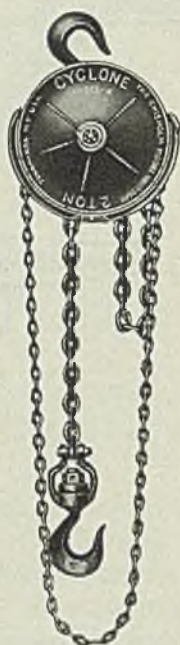
# HOISTS



COMET light weight electric hoist. Capacities from 1/8th to 1 ton.



METEOR heavy-duty electric hoist. Capacities from 1/2 ton and up.



CYCLONE 12 bearing high speed hand hoist. Capacities from 1/4th ton and up.

Since 1876 Chisholm-Moore has been providing industry with many types of overhead materials handling equipment. These years of experience combined with "service-thinking" engineering skill are reflected in the operating efficiency, durability, economy and safety features of all CM materials handling equipment... Hand Chain Hoists, Electric Hoists, Monorail Trolleys, Traveling Cranes, CM Puller (for horizontal pulling) and other CM equipment are fully illustrated and described in Catalog 1944. You'll find the information most helpful. Write us today for a copy.

## CHISHOLM=MOORE HOIST CORPORATION

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GENERAL OFFICES AND FACTORIES: 118 Fremont Ave., TONAWANDA, N. Y.

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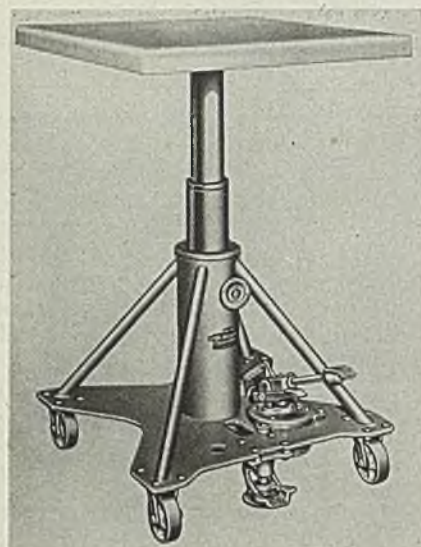
period, and it will remain at that point until manually reset. For a record of highest temperature reached, index is set on high side of pointer.

Thermometer is available in two models, 221M and 222M, with scale diameters of 3 and 5 in., respectively. It is also offered in stem lengths from 2 1/2 to 48 in.

Steel 12/16/46; Item No. 9805

### Hydraulic Table

Lyon-Raymond Corp., 2857 Madison street, Greene, N. Y., has developed a telescopic cylinder for their hydraulic elevating table which makes possible an



elevating range from 28 to 50 in. or a total lift of 22 in.

In handling of dies, jigs and fixtures, the telescopic table permits leveling with press beds and storage racks, allowing for easy transfer. Greater range of elevation is also valuable when the table is used in assembly operations and as a transfer member in a conveyor line.

Steel 12/16/46; Item No. 9813

### Electronic Generator

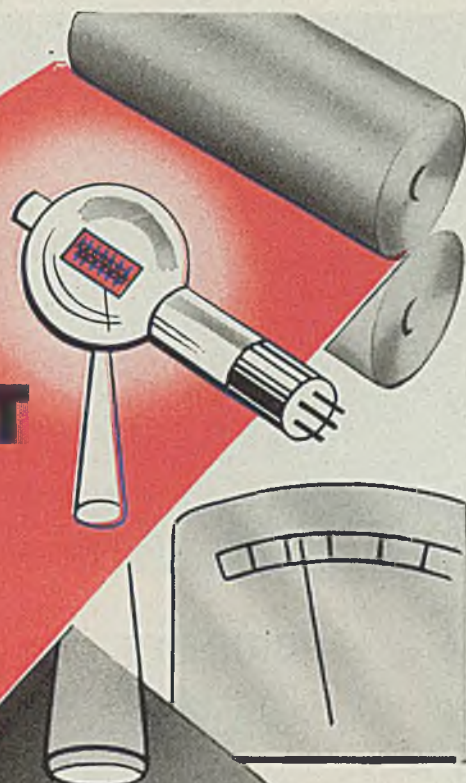
Both induction and dielectric heating operations are handled by a Thermonic M-285C electronic heating generator recently developed by Induction Heating Corp., 389 Lafayette street, New York 3. Designed for use in experimental laboratories, testing depots and development research departments, it is provided with two separate, interchangeable oscillator sections. Induction oscillator feeds into a radio-frequency output transformer, while dielectric oscillator feeds through coaxial cables to heating electrodes.

Unit operates on 205-245 v, 60-cycle, single-phase power supply. It has full-load input of 12kva at 90 per cent power factor. Full-load output is 285



# Gaging

## WITHOUT CONTACT



## At a Speed as Fast as Light!

Hot sheets or strips of metal or foil flying from the rolls; paper emerging in a never-ending sheet; or the plastic or rubber blanket flowing from a calender, may be checked instantly for thickness, and this thickness controlled during the process, by the Sheffield Measuray.

Temperature of the material to be checked and its speed of movement do not affect the accuracy of the thickness check. Proximity of gaging head to material is not important—it can be as much as a foot or more distant, depending upon the application. Amplification and sensitivity are available in excess of any known industrial requirements without sacrifice in speed, range, or dependability. For instance, it is possible to amplify one per cent of the thickness of the stock being checked to extend over the full scale range.

The Measuray may be mounted on a production machine, or it may be used at the bench to measure stationary objects, especially those whose surfaces might be marred by a contact gage, or those of such resiliency that the contact gage measurements are not practicable.

See the Measuray demonstrated at the Sheffield plant in Dayton. Bring samples of work to be checked to see for yourself the savings in material and time, elimination of losses in destructive testing, and the increase in uniform quality which the Sheffield Measuray can bring you.

If a visit is not convenient, write us for detailed information. For an early installation, ask for a survey to be made in your plant by Sheffield engineers—no obligation on your part.

*Real job security is only provided by plentiful incoming orders shipped at prices consumers can afford and want to pay . . . modern machine tools help make this possible.*



Write to Department K

2307

## THE SHEFFIELD CORPORATION

Dayton 1, Ohio, U.S.A.

MACHINE TOOLS • GAGES • MEASURING INSTRUMENTS • CONTRACT SERVICES





## Our business is the fabrication and erection of structural steel

★ **BRIDGES...** Unexcelled facilities for the design, fabrication and erection of railway and highway bridges for industry, municipality, state and federal government.

★ **BUILDINGS . . .** Fort Pitt Bridge has an outstanding reputation and long years of experience in designing, fabricating and erecting structural steel for industrial, commercial and public buildings.

★ **POWER PLANTS . . .** Fort Pitt Bridge has played an important role in the fabrication and erection of structural steel for many of America's largest power plants.

★ **INSTITUTIONS . . .** research laboratories, hospitals, local, state and federal buildings all over America stand as memorials to the master craftsmanship, integrity and wide experience of the Fort Pitt Bridge organization.

★ **YOUR JOB . . .** when entrusted to Fort Pitt Bridge gets an *extra-measure* of skill, experience and "know-how" plus prompt, planned delivery, accurate workmanship and service.

*"Steel Permits Streamlining Construction  
with Safety, Endurance and Economy."*



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## —INDUSTRIAL EQUIPMENT—

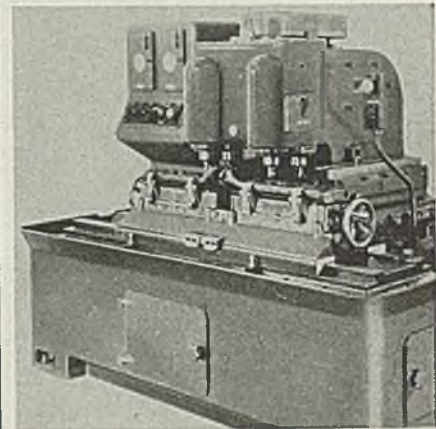
Btu per minute or approximately 5 kw at nominal frequencies of 375,000 cycles per second for induction heating, and 20,000,000 cycles per second for dielectric heating.

Steel 12/16/46; Item No. 9790

## Milling Machine

Hydraulic Machinery Inc., 12825 Ford road, Dearborn, Mich. is offering a special purpose 2-stage machine for milling bosses or cylinder head castings. Machine is hydraulically operated and electrically controlled.

In cycle of operation, operator unloads and loads part in station away from work



position. While this is being done, milling head moves in, machining part. The milling head retracts and newly loaded work moves into work station.

Steel 12/16/46; Item No. 9955

## Vise-Drill

A portable twin-tool vise and drill combination introduced by W. H. Howland, 2533 East 73rd street, Chicago 49, consists of two separate tools that can be used individually, or in combination.

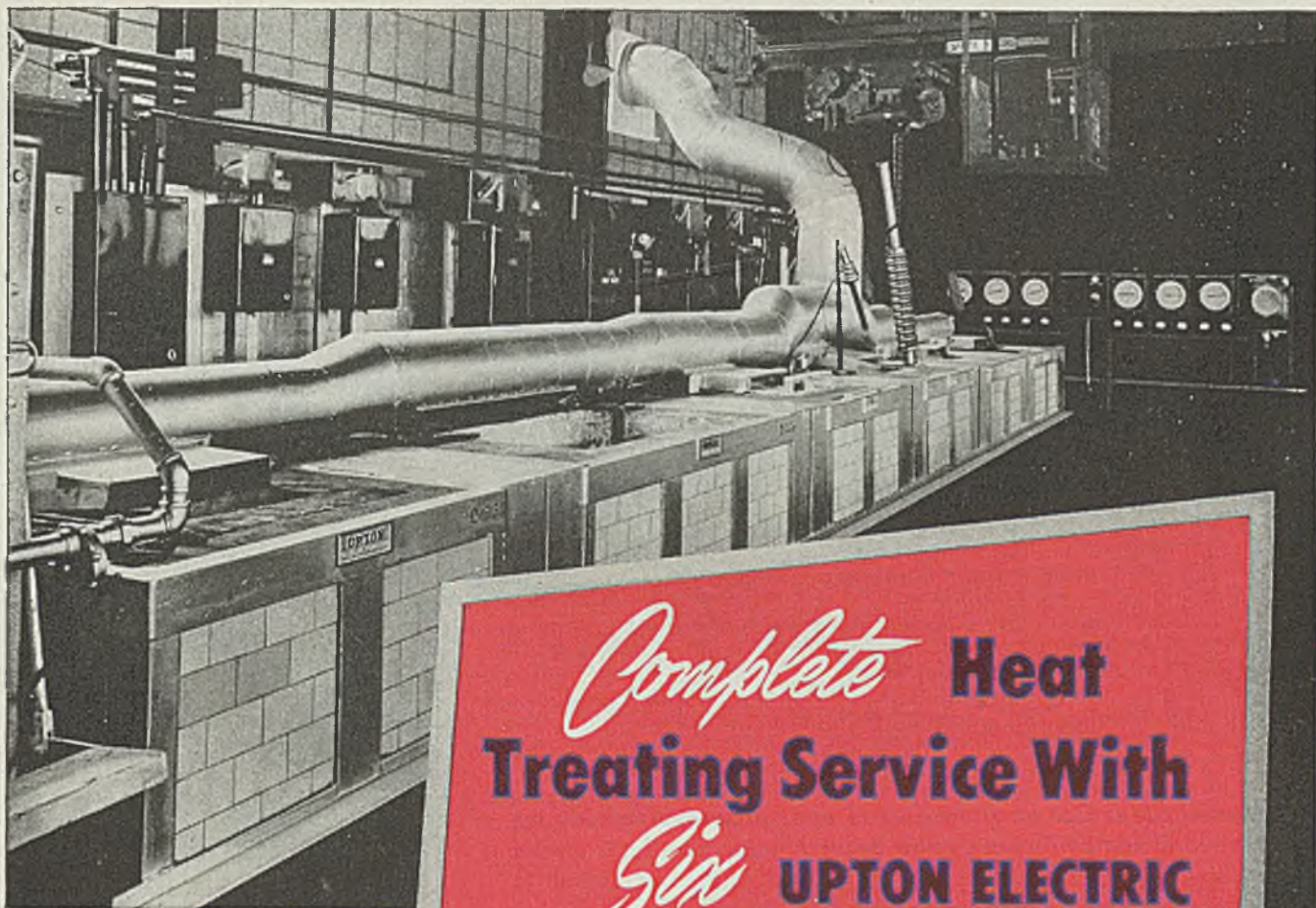
Portable vise swings on a vertical axis that permits turning to any angle. It can be removed from bench plate and fastened to any sturdy base. Jaws are equipped with detachable tool steel jaw plates. Vise is constructed with two sets of integral chill-hardened pipe jaws to handle pipes from 3/8 to 5 in.

The drill, because of its slow speed and 1000 lb pressure, bites into metal without overheating. A ratchet handle permits fractional turns in tight places. Drill also can be used as a wheel-puller, bushing pusher, and for removing broken cylinder studs, pan bolts and plugs.

Two units can be used in combination as a horizontal or vertical drill press. By turning the vise in the bench plate 90° it becomes a vertical drill press.

Steel 12/16/46; Item No. 9792





Furnaces illustrated from left to right: Draw, Isothermal Quenching, Preheating and Neutral Hardening, High Speed High Heat Quenching and Neutral Hardening, Carburizing.

## *Complete* Heat Treating Service With *Six* UPTON ELECTRIC SALT BATH FURNACES

**T**HE Dayton Forging and Heat Treating Co. selected Upton furnaces to provide *complete* heat treating service for its customers. Six Upton Electric Salt Bath Furnaces with Sealed-In Electrodes assure the uninterrupted and uniformly accurate heat treating of any work between 300° and 2500° F.

The six furnaces in this illustration are all 54" deep! Sealed-in electrodes at the bottom of each furnace (24" below floor line) eliminate changing of electrodes, reduce surface area—and resulting losses from radiation—remove all chances of burning or shorting work.

*Upton furnaces can be built to Any Size to accommodate Any Type of work. Send for recommendations—without obligation on your part.*

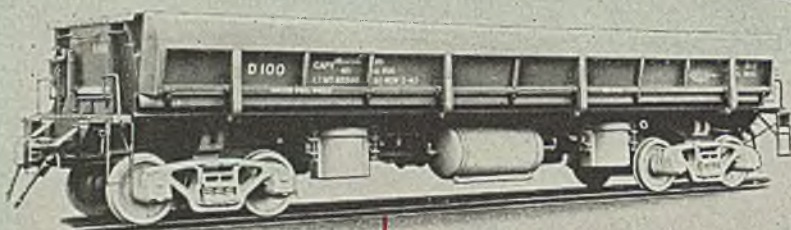
***Upton* ELECTRIC FURNACE DIV.**  
7455 MELVILLE AT GREEN • DETROIT 17, MICHIGAN



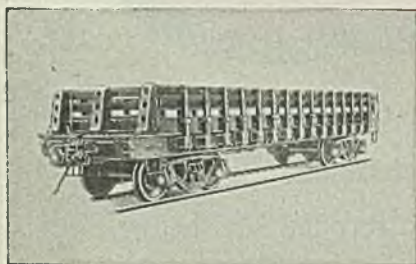
From Raw Material Handling  
to Finished Steel Shipments . . .

*Specify*

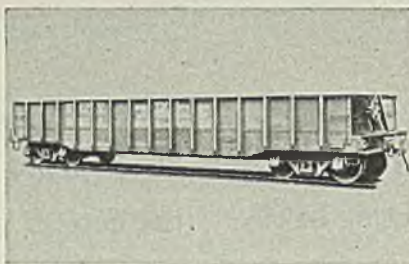
**Steelcar**



*Pressed Steel Car engineering is ever progressive. Always in the forefront by initiating new designs, using new light metals and stressing the importance of improved car construction to provide greater strength, safety, durability, better transportation and lower haulage costs.*



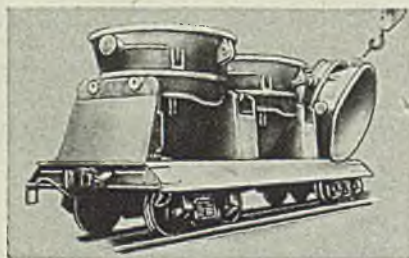
140,000 lb. Capacity Hot Bloom Car



140,000 lb. Capacity Open Hearth Pit Scrap Car



70 Ton Capacity Hopper Discharge Ore Car



Riveted and Welded Cinder Pot Cars

**PRESSED STEEL CAR COMPANY, INC.**

PITTSBURGH 19, PA.

NEW YORK . . . CHICAGO . . . ST. LOUIS . . .

## Diesel-Electric Power

(Concluded from Page 100)

tor field, in effect creating a harder working propeller with increased torque.

When necessary to navigate at decreased speed for reason of fog, docking, etc., the flexibility of the propulsion control is further demonstrated by the two propulsion motors and two main diesel-driven generators which are connected in series in what is called a propulsion loop. Under this system, either generator may be disconnected from the loop, the system being run by one generator, or one engine and one generator disconnected for economical utilization of power during periods of reduced speed.

Maximum utilization of engine power is permitted at all times by a single motor field controller handwheel located in the engine room, which varies the field current of the motors. The latter in turn, varies the speed reduction ratio between the engines and the propeller. Auxiliary control system covers the control of both exciters, rated at 24 kw each, and for engine starting battery charging.

This car, remodeled by American Ship Building Co.'s Lorain, O., yard, will be one mile per hour faster. This factor, along with the additional cargo capacity, it is estimated, will allow two more round trips per shipping season, carrying about 22,000 tons of iron ore.

## Electric Steelmakers

(Continued from Page 120)

sufficient viscosity to maintain the oxide head required.

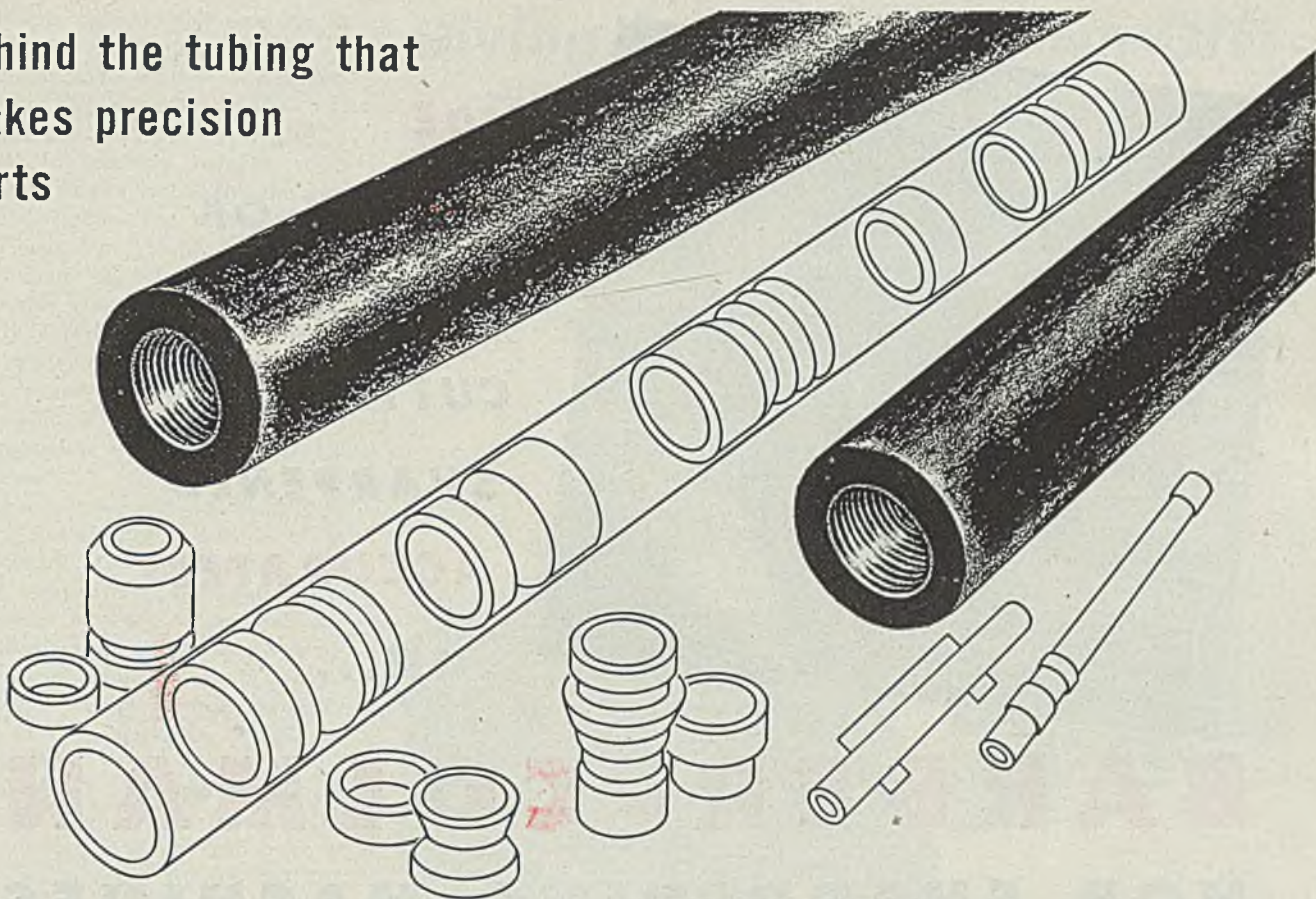
A larger quantity of feed ore is required for equivalent carbon drop in the electric as compared to the open hearth running approximately 30 lb per ton for 10 points of carbon in the electric and 4 lb per ton for 10 points of carbon in the open hearth.

The heat is teemed at temperatures ranging from 2870 to 2900° F. For heats under 0.10 carbon aluminum shot is added bottom to top of ingot as required. From 0.10 carbon upward aluminum is seldom required. In the higher carbon ranges sodium fluoride is used to produce extra fluidity.

While operating during the strike we ran short of lime and had to resort to raw stone of blast furnace size. This practice precluded the use of ore in the charge. No trouble was encountered in meeting requirements with this charge and with no increase in heat time, we apparently gained in lower sulphur



behind the tubing that  
makes precision  
parts



Makers of quality steel tubing know the importance of close production control. In the manufacture of mechanical tubing for precision parts, perfection in every production detail is imperative. For years, leading tube makers have been depending on International Graphite Electrodes as an important factor to electric steel quality. These manufacturers have proved to their satisfaction in the severest tests of all—in actual furnace operation under a wide range of requirements—that International Graphite Electrodes offer physical, electrical, and chemical properties in the combination they most desire.

Check over the qualities *you* want in electric furnace electrodes—the properties you'd see they had if you were *making* electrodes as

## INTERNATIONAL GRAPHITE ELECTRODES

well as *using* them. You'll find, too, that International Graphite Electrodes fully measure up to every exacting standard by which electrodes are judged.

For all around satisfaction and economical performance, specify International the next time you buy electrodes; find out first hand why they are so widely preferred by electric furnace operators. Write for details and prices today.

Specify INTERNATIONAL Electrodes for—Slow consumption—High current capacity—Low rate of oxidation—High thermal conductivity—High degree of purity—Consistently uniform properties and dimensions—Low cost per ton of production.

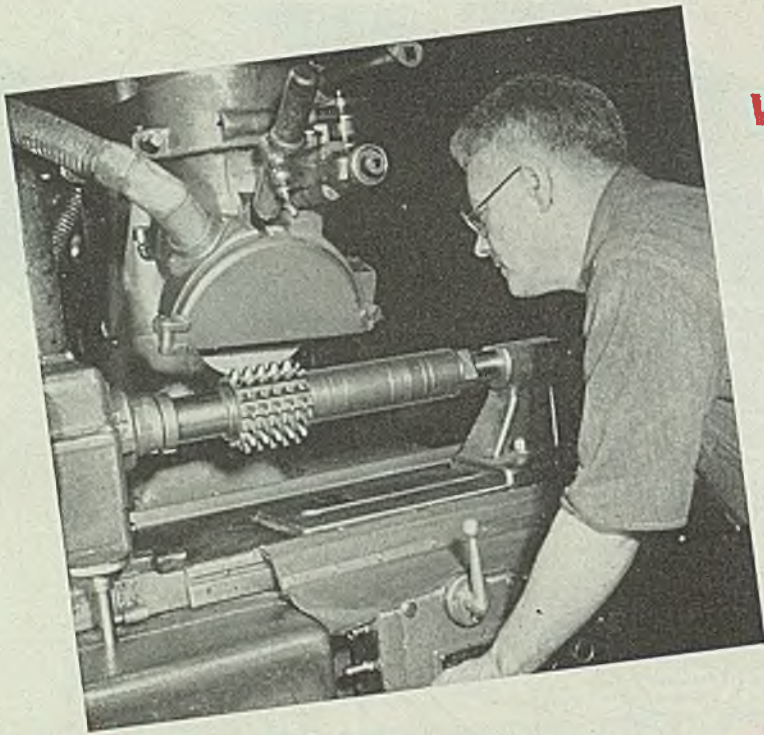
1591



**International  
Graphite &  
Electrode Corp.**

SAINT MARYS, PA.





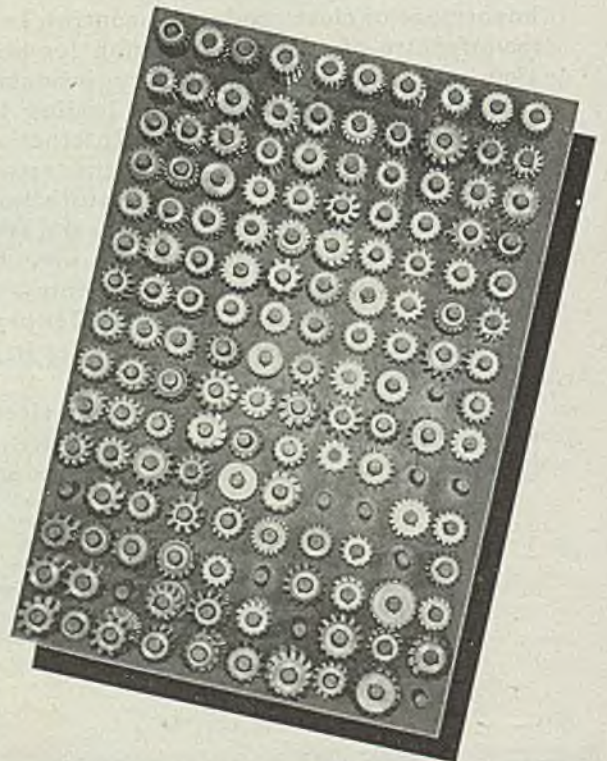
**WIDE  
VARIETY OF  
HOBS AND  
CUTTERS  
SHARPENED  
ACCURATELY  
ON...**

# **BARBER-COLMAN HOB SHARPENING MACHINES**

When hobs and form cutters are resharpened to proper tolerances, consistently accurate work, finer finish and longer tool life result. Barber-Colman *Automatic Hob Sharpening Machines* enable the user to hold original tool accuracy throughout the life of the cutting tool. Tools with high helix angles, right or left hand, with shank or taper forms are all adaptable. Because all sharpening functions are brought under *positive mechanical control*, more accurate, faster sharpening is possible, and machine operators spend less time on the actual sharpening operation. The picture at the right shows the variety of work done on the machine shown above.

## **ONE SHARPENER SERVES ENTIRE DEPARTMENT**

This machine — a No. 4 Automatic — fills all sharpening requirements in a department containing 20 hobbing machines and 2 thread millers. It has been in service for 6 years and the operator says it is the fastest and easiest machine to change over from one job to the next that he has ever handled. If you are interested in reducing your cutting tool costs, ask your Barber-Colman representative to check your needs and recommend a Barber-Colman Automatic Hob Sharpening Machine that will do just that.



# **BARBER-COLMAN COMPANY**

**GENERAL OFFICES AND PLANT • 121 LOOMIS STREET • ROCKFORD, ILLINOIS, U.S.A.**

**HOBS, HOBGING MACHINES, HOB SHARPENING  
MACHINES, REAMERS, REAMER SHARPENING  
MACHINES, MILLING CUTTERS, SPECIAL TOOLS**



residuals and reduced delay time due to cleaner banks and bottom.

**Session on Stainless Steel:** At one electric furnace shop from 300 to 400 cu ft of oxygen per ton (tapping weight) is employed for melting stainless scrap charges though this varies with the percentage of carbon. At present 25,000 cu ft of oxygen at 115 psi is being put in the furnace per hr though it is not felt that this quantity is sufficient. Consequently experiments now are under way to employ higher pressures. At the time of oxygen injection the bath temperature is fairly high for the higher the bath temperature the less chromium will be oxidized.

A dolomite gun has been found to be a help in maintaining the banks of an 80-ton electric while undergoing a consecutive campaign of 340 heats. The average time from tap to tap excluding power delays was 12½ hr. More stratified layers of chromium are present in larger furnaces than in small units, according to the observation of one superintendent.

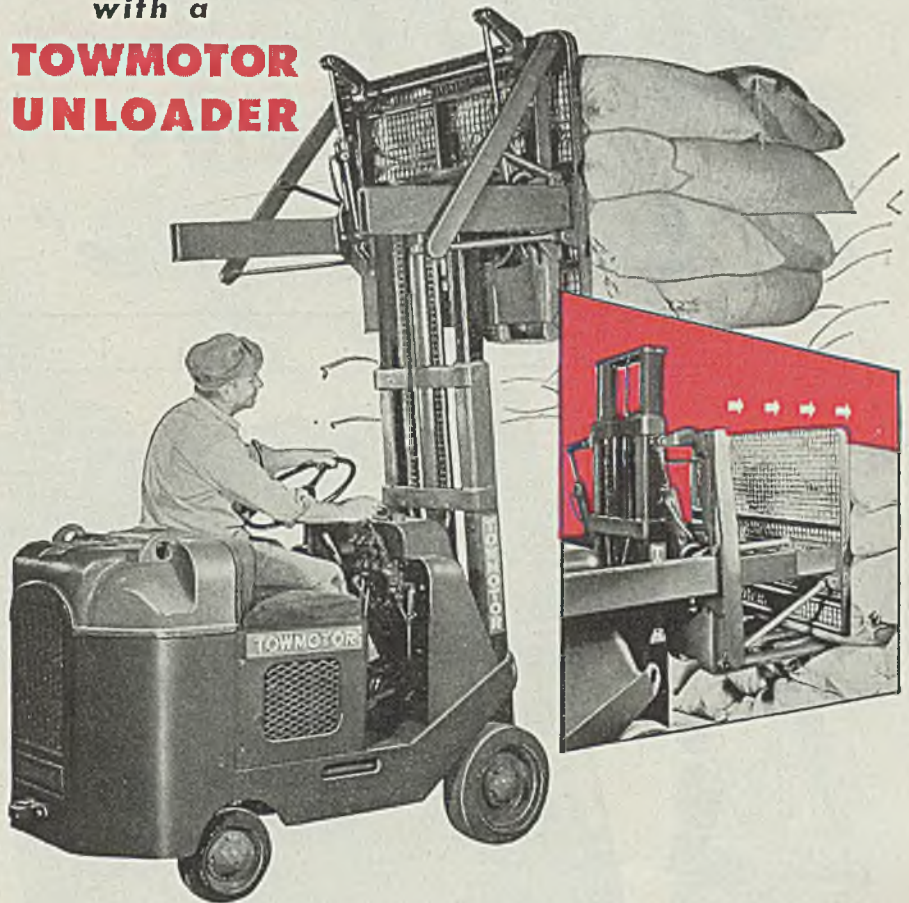
If substantial chromium is charged and an effort is made to oxidize the carbon the operation should take place at high temperature, say 3100 to 3300° F. If this procedure is followed there is no difficulty in obtaining 0.08 to 0.10 carbon. At the critical point of carbon around 0.08 per cent difficulty is experienced in getting it lower; slag depth is an important factor in this connection.

**Progress in the Use of Argon Gas,** by W. M. Farnsworth, Republic Steel Corp., Canton, O.: Argon gas is being used in our plant today and it has proved helpful in controlling bleeding in the furnace prior to tapping but experience has since demonstrated that it will not prevent bleeding on every heat tapped. The gas at 50 psi is run through a plain carbon steel pipe, which is inserted into the bath through an open furnace door, and held as close to the bottom of the bath as the desired agitation of the pipe by the furnace attendant will permit.

Argon has been utilized in every manner imaginable from early in the heat right up to tapping time. Observation made as a result of different attempts at introducing argon during various stages of the heat indicated that adding argon before slag off when a carbon monoxide boil had lowered the hydrogen content is not as effective as making the addition just prior to tap when the hydrogen is at maximum concentration. At this period the rate of hydrogen elimination is highest. It is believed that a hydrogen content close to the solidification value is very difficult to lower at an appreciable rate. This may explain some of the trouble encountered on many stainless heats.

## Giving Loads the "Brush-Off"

with a  
**TOWMOTOR  
UNLOADER**



Here's mechanical handling, from a fork lift truck, that completely eliminates manual unloading of stable loads. The Towmotor Unloader saves time and labor by unloading an entire load with a single, sweeping motion.

Newest of the Towmotor Accessory Group, the Unloader cuts carloading time 50%, permits placing of loads anywhere, with or without pallet. Does not interfere with normal lift truck operation. Screen height and length of unloading stroke furnished as required. Installed at the factory, the Unloader is available for use with most new Towmotor models. Towmotor Corporation, 1223 East 152nd Street, Cleveland 10, Ohio.

SEND FOR SPECIAL BULLETINS  
DESCRIBING THE TOWMOTOR

UNLOADER • UPENDER • SCOOP • CRANE ARM • RAM • HOPPER  
EXTENSION FORKS • EXTENSION BACKREST • OVERHEAD GUARDS



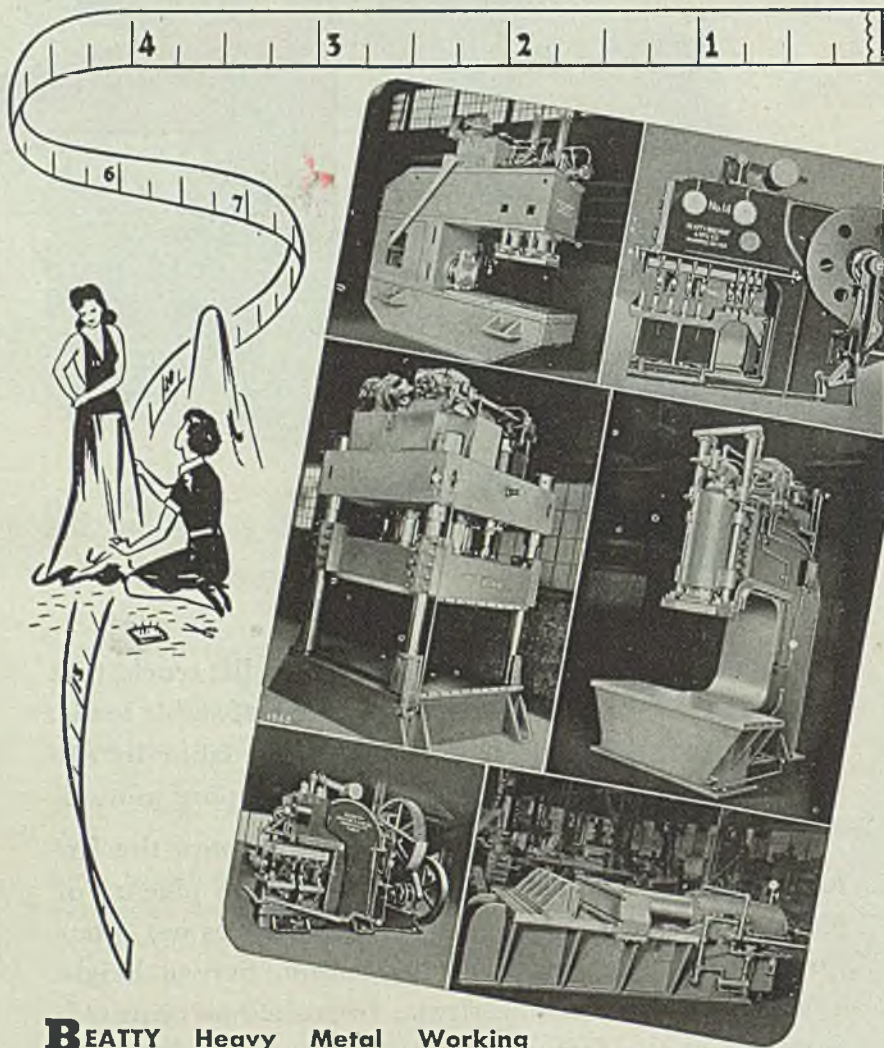
**TOWMOTOR**  
THE ONE-MAN-GANG

**FORK LIFT TRUCKS  
and TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION



# BEATTY machines are "Made to Measure"



**BEATTY** Heavy Metal Working Equipment is built not just to do A job, but to do THE job. Special production problems call for special equipment, and when special equipment must be designed wise industrialists call for a BEATTY engineer. Next time you have a heavy metal fabricating problem, let a BEATTY engineer help you find the answer.

#### BUILDERS OF:

Mechanical and Hydraulic Punches, Presses, Shears, Spacing Tables, Bulldozers, Pipe Benders and Extruding Machines.



**BEATTY MACHINE AND MFG. COMPANY**  
HAMMOND, INDIANA

## Lubricating Mills

(Concluded from Page 96)

switches when the pressure in the pressure tank drops below a predetermined minimum should failure of the operating pump occur or whenever the desired pressure cannot be maintained. If both pumps fail or are unable to maintain sufficient pressure another pressure switch, which is set just below minimum required operating pressure sets off an alarm.

Expansion of the air cushion in the pressure tank forces the oil through the main supply line and the numerous branch lines; these are equipped with orifice plates or valves to provide each bearing or gear unit with its proper share of lubricant. Frequently each of the various points of lubrication are equipped with a pressure switch and light signal to warn the operator should the oil flow be interrupted. The return oil from the gears or bearings flows back to the settling tank by gravity for reconditioning and recirculation. Full-pressure lubrication is highly flexible and widely used on enclosed steel mill machinery.

Illustrations courtesy of United Engineering & Foundry Co., Pittsburgh; Trabon Corp., Cleveland; Falk Corp., Milwaukee.

## Carbide Milling Cutters Designed for Cast Iron

A full line of standard carbide tipped cutters in plain, side, half side, shell and face mill forms is being marketed by Super Tool Co. of Detroit, and Glendale, Calif. Designed especially for cutting cast iron, the most effective high speed milling is attained, the company states, when inserted blade cutters with solid carbide blades are used. Excellent surface finish is claimed for these tools.

## Instruments of Science

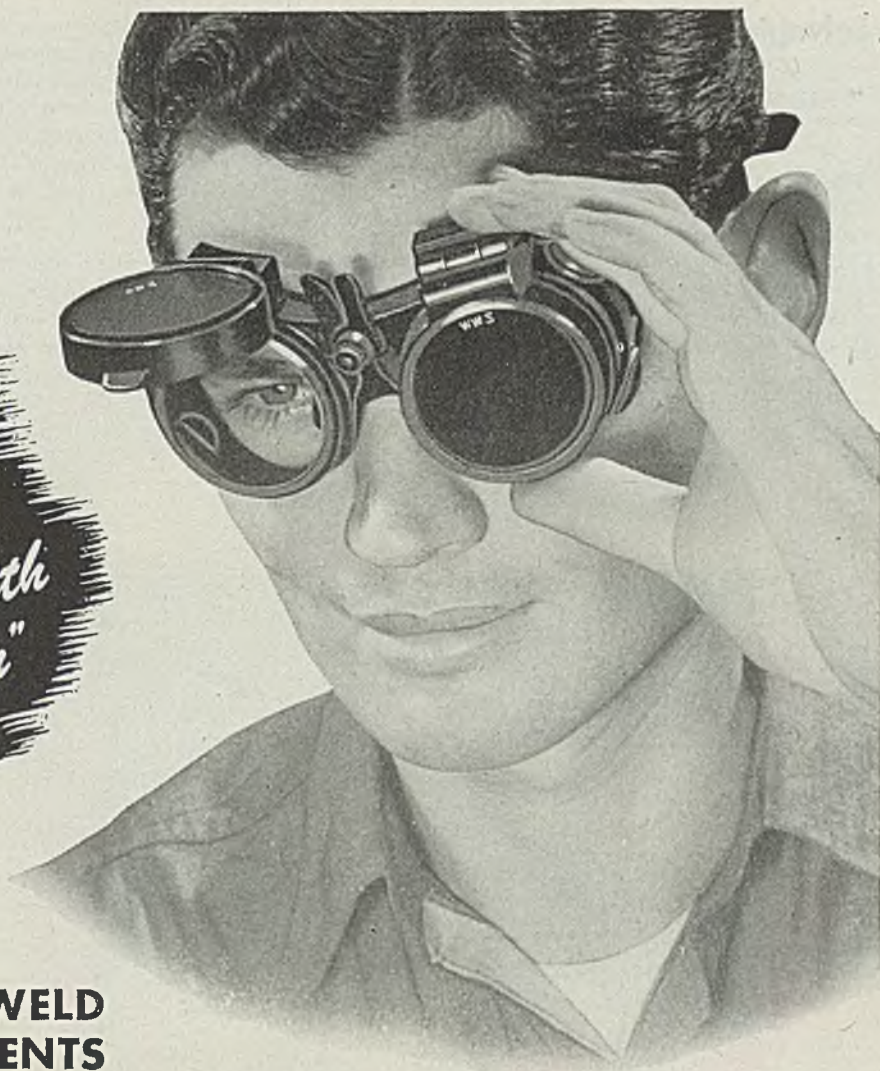
*Scientific Instruments*, by Herbert J. Cooper; cloth, 305 pages, 5½ x 8½ in.; published by Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y., for \$6.

A wide variety of instruments designed for making physical measurements is discussed. Not only laboratory instruments but also those used in the field and in industry are covered. Much space also is devoted to discussion of principles on which they are based and to methods of measurement.

Clear and simple language is used so that not only workers in specialized fields, such as chemists, and technicians, but also nonprofessional readers will find interest and instruction. Diagrams and photographs facilitate understanding of the mechanisms and use.



**FOR ALERT  
SAFETY MEN  
WHO "Sleep with  
One Eye Open"**



## DOUBLE DUTY CHIP-WELD GOGGLES CUT ACCIDENTS *... and their cost!*

Many a worker facing two hazards in welding and chipping for instance—will often take a chance rather than take the trouble to change goggles. In the Willson DC50 Chip-Weld Goggles you have two pairs in one to provide full-time protection and a consequent reduction in eye accidents.

A flip up with a finger and your welder becomes a chipper with eyes

protected by heat treated Super-Tough\* lenses. Another flip down and he's ready to return to welding. The weld lenses, available in eight different shades, are protected from pitting by clear, beveled cover glass.

The eye cups are anatomically shaped; are amply ventilated through indirect ports; and may be worn over prescription spectacles.



Willson-Weld\* lenses down in correct position for welding.



Hinged portion raised for chipping, grinding, peening or other eye hazardous work.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

**WILLSON**  
DOUBLE  
**PRODUCTS, INCORPORATED**  
READING, PA., U.S.A. *Established 1870*

For help with your eye and respiratory problems, get in touch with your Willson distributor or write to Willson Products, Inc., 233 Washington Street, Reading, Pa.

\*T. M. Reg. U. S. Pat. Off.





## Salvaging Scrap

(Continued from Page 90)

the cast-off, worn out and badly damaged material from the entire system.

Almost 50,000 tons of material are handled annually. You may see on the plant sidings locomotives and freight cars awaiting dismantling after a full service life, carloads of used steel rail delivered by the maintenance-of-way department, carloads of structural steel chunks from an ore dock rebuilding job. There are carloads of worn parts from the locomotive and car rebuilding shops, open-top cars of miscellaneous scrap assembled

and loaded by division men, including such miscellaneous items as old lanterns, splintered forks and shovels, worn valves, broken-down signal stands, metal signs and grills originating from a station re-decorating job, and many other of the tens of thousands of items used on a railroad.

Mere physical movement of such material to the reclamation plant represents an important psychological selling job by the Erie men responsible for the plant and its operation. For a division man or a machine shop superintendent concentrating on his operating job, it's much

easier to overlook junked material than it is to carefully collect and ship it when the accumulation warrants. Yet all the using departments on the Erie are scrap conscious, Fig. 1, and make a special effort to see that all such material is gathered and moved regularly to the Meadville plant.

Inbound cars are shunted down a track at one side of the sorting yard, which is served by a 90 x 400 ft crane and runway. The crane unloads miscellaneous material with magnet and chain in the yard where eagle-eyed scrap handlers go to work. First job is segregation. These well-trained workers comb through the entire layer of scrap for various types of material.

Standard practice recognizes forty classes of scrap, all the way from heavy melting steel to semi-precious metals and nonmetallic materials. Every item that is reconditionable is picked out for shop overhaul. Material that is usable for other purposes is also set aside.

### Material Assorted According to Type

Finally the unusable material is sorted according to type, and reduced with torch or alligator shear to the dimensions required by the various scrap classifications. Heavy melting scrap, constituting about half the tonnage of all scrap sold, is left on the ground in place for loading by magnet crane. All scrap is loaded into outbound cars on a track at the opposite side of the yard, while material for reconditioning is accumulated for the nearby reclamation shops, Fig. 3.

Too much emphasis cannot be laid upon the proper segregation and sorting job. The appreciation in value which scrap assumes when it is properly sorted and prepared is very considerable. On the other hand, unsorted scrap is worth less than almost any sorted grade.

Often there are special classifications in which junked material can be sold at a premium. An analysis of the possibilities will often turn up an outlet for certain material with special price gains. At this reclamation plant, old boiler tubes from locomotive boilers are carefully sorted and segregated according to diameters, for sale at a premium in price for such purposes as irrigation pipe lines, posts, etc.

Preparation can, of course, be carried to an uneconomical extreme, and the only safeguard is proper accounting of all expenses for scrap and reclamation work. Reclamation operations at the Erie shops are governed by a cost figure of about 70 per cent of new cost. When reclamation or preparation costs for an item pass this mark, such work is then reconsidered.

With scrap material out of the way, attention is turned to the material in the



**FIVE YEARS SERVICE WITH MINIMUM REPAIRS TO WALLS AND ARCHES!**

**FOR ECONOMICAL SOAKING PIT INSTALLATION SPECIFY BUCKEYE!**

● Buckeye Silica Firestone holds heat longer—provides greater savings in fuel! It has greater than usual strength to resist abrasion—saves repair costs! Its corrosive resistance guards against chemical attacks of slag—makes it last longer!

Other important features make Buckeye Silica Firestone ideal for the solution of your soaking pit problems. Write us for full information.

**THE CLEVELAND QUARRIES COMPANY**  
1125 Guildhall Bldg. Cleveland 15, Ohio

**BUCKEYE**  
"FOR THAT EXTRA SERVICE"  
**SILICA FIRESTONE**

Bulletin 15-B is free. Send for it!



reconditionable and reusable classes which has been set aside on skids and pallets during the sorting. Each year sees more and more items added to the "reclaimable" class. A small percentage of these may be in perfectly good condition, having been "lost" from equipment and picked up along the right of way, or components of damaged or junked parts. These items are made ready for shipment to using points by checking, classifying and cleaning.

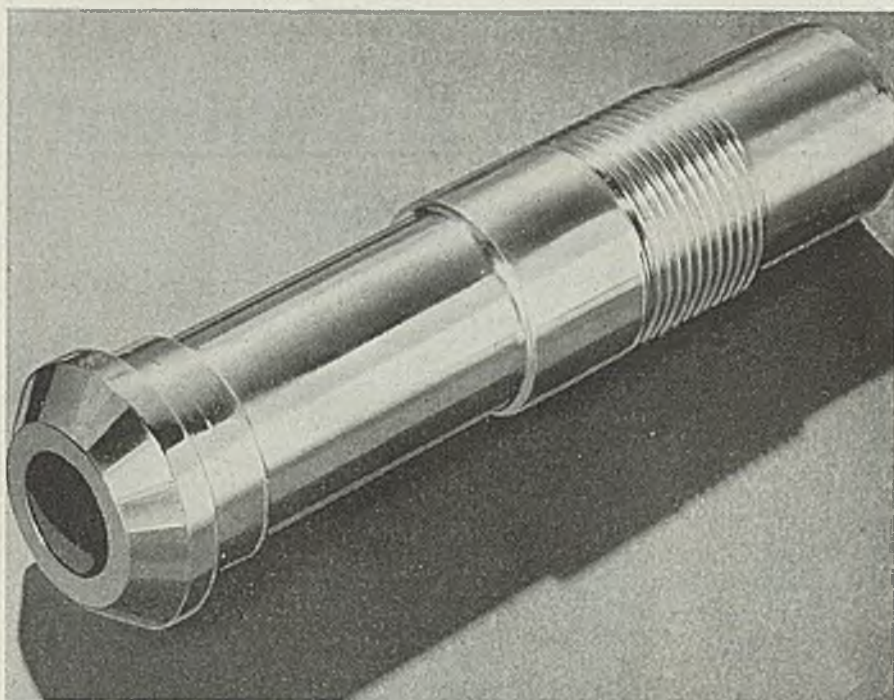
Railroad men claim that special attention given to cleanup is vital to successful operations. It is perfectly natural that no one wants a second-hand item when he can get a shiny, new specimen. Early in the organization of the railroad's scrap and reclamation work it was determined that every second-hand item shipped from the plant must be cleaned and prepared to resemble new condition as much as possible. Once this psychological hurdle was cleared, it was found that reclaimed material was greatly preferred by the using departments on account of its lower cost to them. All "second-hand" material is identified for accounting purposes by a colored paint dot, and is so recognized throughout the system.

#### Material Reconditioned

The good, if dirty, material is only a small proportion of the total reconditionable material, however. The greater part of this classification requires more serious work than cleaning, and goes to the department's shops adjacent to the scrap yard. These shops are beehives of miniature production centers, set up with special tools and equipment devised in a large part by the men themselves.

Some of the operations are comparatively simple. Broken and bent ballast forks and shovels are disassembled and refitted, ends are dip-painted in batches, and the rejuvenated tools are ready for shipment. Such items as cracked couplers, on the other hand, present a major repair problem. One whole shop — equipped with special welding positioners (designed and made up in the shop from salvaged material), 7 electric welding machines, butt-facing machines, and a 6 x 12 ft automatically-controlled heat treating furnace—handles about 5000 of the heavy cast-steel couplers, and 13,000 coupler knuckles each year.

At one time, cracked coupler elements were scrapped. Now, with advanced welding and heat-treating techniques, and under rigid specifications, about 60 per cent of couplers are reclaimed at a substantial saving. Cracks are gouged out with acetylene torches and rewelded; couplers are normalized, then palletized for direct shipment to repair shops for use. Heavy cast-steel truck frames and



## Ampco Metal

### Extruded Rod gives you

#### Production savings of Extruded stock

*plus*

#### Performance advantages of Ampco Metal

1. Cuts production costs.
2. Reduces waste — sizes parallel requirements.
3. Cuts machining time and saves metal.
4. Smooth surface and compact structure cuts rejections for flaws.

1. Higher fatigue and impact values for longer life.
2. Stronger than other bronze parts for less replacement cost.
3. Higher compressive strength for added durability.
4. Lighter than other bronzes — your equipment weighs less.

You get a double benefit when you use Ampco Metal extruded rod. Production economy and operating stamina make Ampco Metal extruded rod the ideal stock for parts subject to wear, impact, fatigue and corrosion.

Extruded Ampco rods are produced in two grades of Ampco Metal and two grades of Ampcoloy bronze — by the largest extrusion press in the Middle West, and one of the few in the world devoted exclusively to the extrusion of aluminum bronze. Specialization by Ampco has resulted in a finished product whose quality is a production advantage to you and a performance advantage to your customers. Ask your nearby Ampco engineer to help you specify the proper grade for your requirements.



A-32 The Metal without an Equal

Write for bulletin 64A.

**Ampco Metal, Inc.**

Department S-12 • Milwaukee 4, Wisconsin

Field Offices in Principal Cities



# Production Screwdrivers

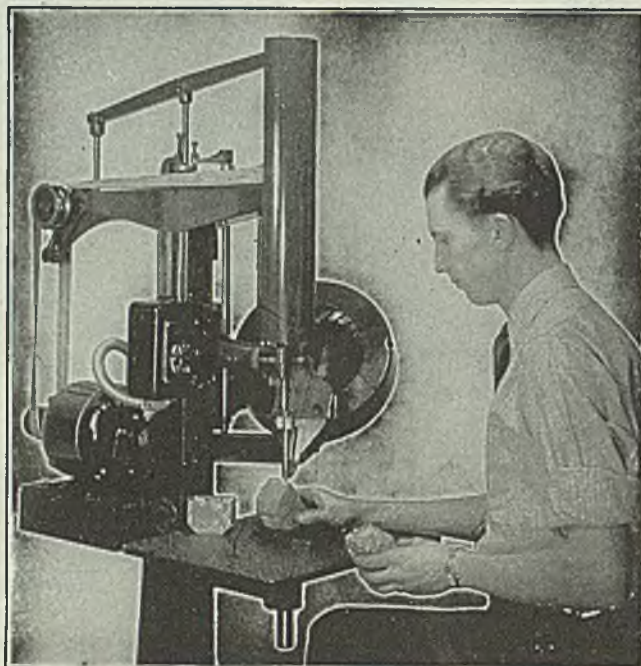
## *Speed up*

### YOUR SCREWDRIVING ASSEMBLIES BY USING THESE MACHINES

Model B  
Will Drive  
Screws from  
No. 6 to  
No. 1/4,  
in Lengths  
3/16 to 1 1/2  
Inches

All Screws  
Driven to  
a Uniform  
Tension

No Marring  
of Heads



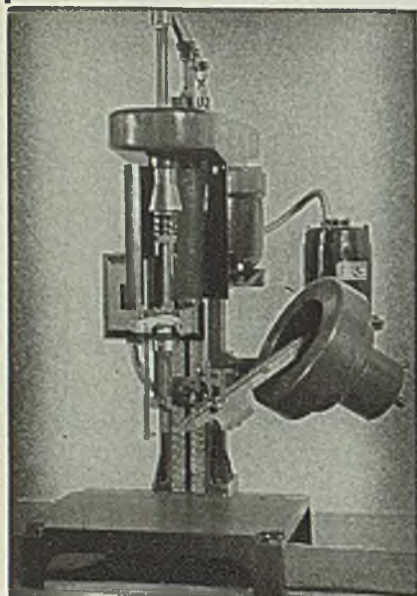
MODEL B

MODEL A

Model A Is Designed  
to Handle Small Screws  
in Sizes  
From No. 2 to No. 6  
In Lengths  
From 3/16" to 3/4".

Driving Time  
One Second Per Screw

Send Sample Assemblies  
for Production Estimates  
and Quotations  
ASK FOR CATALOGUE



## Detroit Power Screwdriver Co.

2813 W. Fort St., Detroit 16, Mich.

miscellaneous castings receive much the same treatment.

A special production line handles rail with worn ends. Located adjacent to the tracks, a continuous process conveyor line receives rail from the car. Ends are cleaned for cutting, Fig. 2; 18 in. is cut from each end of the 39 ft rails by acetylene torch, special drills redrill three fish plate holes at each end, and serviceable 36 ft rails are delivered at the end of the line.

Many other items are reconditioned by special methods for another lease on life. Bolts, as an illustration, are sorted according to diameter, cut shorter to the next standard length and rethreaded. Some of the other major items of reclamation are track fastenings, draft gears, car forgings and brake beams. The reclamation staff keeps constant tabs on the materials received, devises repair techniques, and establishes condition limits for salvaging in session with the using departments.

#### Material For Other Applications

Third phase of complete scrap exploitation as practiced by the railroad, is the salvaging of all possible material for usefulness in other applications than the original. All mild steel roundstock over 5 in. in diameter which comes into the yard is automatically earmarked for hammering into forging billets for the various repair shops, as well as for use at the Meadville production plant. Small diameter locomotive boiler tubes, crimp cut by shears, make ideal fence posts for the right of way. Boiler sections are cut up for plate for various uses. All structural elements are carefully cut apart, resquared, and saved for future construction and freight car repair programs.

Locomotives, cars, work equipment—such as locomotive cranes and wrecking derricks, which are not suitable for further service are dismantled at the plant. As specialized techniques are employed, making a large percentage of the parts of the original units of rolling stock available for reuse and repair, this work is segregated from the other operations of the plant.

Before such equipment is retired, studies are made of the quantities of individual items of material to be saved, with relationship to similar equipment remaining in service, its life expectancy, interchangeability of parts, etc. From retired equipment are saved many items of material such as mounted wheels, forgings, castings, channels, angles, lumber, roof sheets, pumps, feedwater heaters, lubricators, injectors, and many others.

Dismantling of locomotives is rarely completed before the Hornell locomotive shops call to reserve a part of some kind



from the retired engine for immediate repair use, effecting considerable savings in time and money over the purchase of new parts for such use, and highlighting the usefulness of the reclamation activity.

#### By-Products Utilized

The reclamation idea so permeates the organization that scrap by-products of the scrap operation are even utilized. The Meadville shop's acetylene generating plant which provides the large quantities of torch fuel necessary in the plant, also furnishes, from its carbide refuse, whitewash for the entire system.

The scope of the line's salvage operations is, of course, dependent upon the volume and nature of the material and equipment handled. However, in common with other profitable scrap and reclamation activities both large and small, its success is due to management backing and adequate study which produce handling methods, accounting control and employee indoctrination.

#### Manufacturers Offered New Metal Cleaners

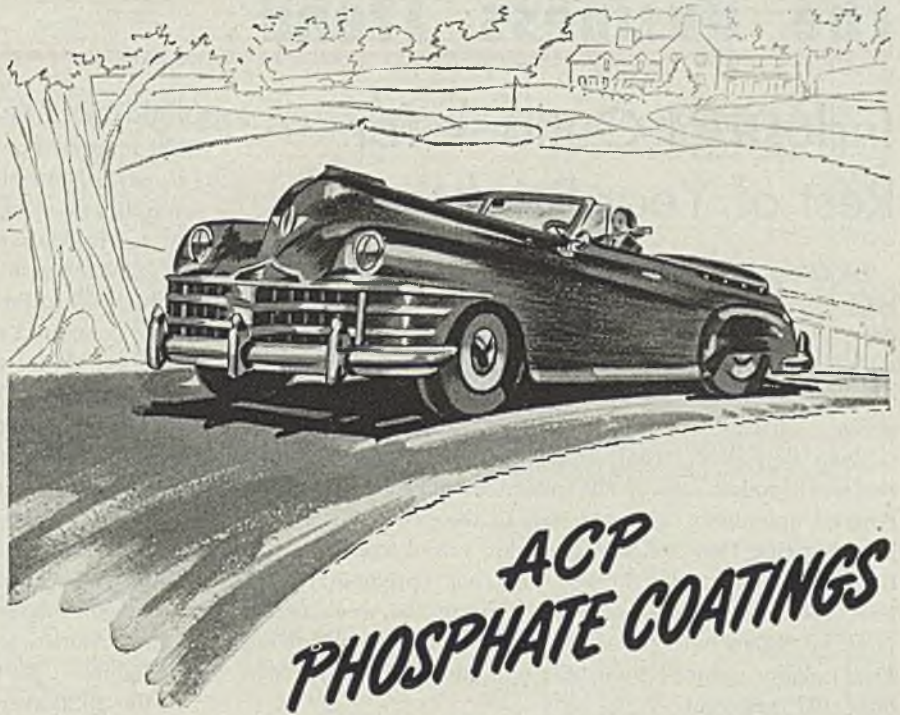
Two new metal cleaners, A-22, a general purpose soak tank cleaner for use on all aluminum alloys, and PM-95, an acid base cleaning and descaling compound, were announced recently by Pennsylvania Salt Mfg. Co., Philadelphia.

Most common applications for the former are before anodizing, chromodizing, phosphatizing and other pre-painting treatment, and before deoxidizing and subsequent spot welding. PM-95 is used for general pickling and metal descaling, especially for oxides that usually result from heat treating and annealing.

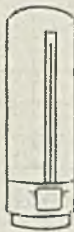
#### New Blind Rivet Has High Strength, Ductility

Combining high strength, unusual ductility and corrosion resistance, the new Monel blind rivet made by Cherry Rivet Co., Los Angeles 13, is offered in two types, self-plugging and pull-through hollow with two head styles, modified brazier and 100 degree countersunk. Diameters of  $\frac{1}{8}$ ,  $\frac{3}{16}$ ,  $\frac{1}{4}$ ,  $\frac{5}{16}$  and  $\frac{3}{8}$ -in. are made in a wide range of grip lengths, with other head styles available on special order.

Self-plugging type has very high strength, the company states, the inner stem expanding the rivet shank to fill the hole tightly, forming the blind head and remaining tightly locked in shank by compression and high friction coefficient. Pull-through hollow type clinches mating sheets and expands during installation to fill hole.



### Positive Protection For Painted Metal Surfaces



ACP phosphate coatings produce an excellent paint-bonding surface on metal parts and provide a foundation for a lustrous and lasting finish. There are various types depending on the kind of metal, its condition and the purpose for which it is to be used as well as the equipment facilities of the manufacturer. Some of these phosphate coatings are briefly described.

**Cold SPRAY-GRANODINE** in a short spray time forms a uniform, smooth, zinc phosphate coating—a superior base for lustrous, enduring paint finish. Cold Spray-Granodine is of special interest to fabricators of automobile bodies, fenders, refrigerators, cabinets and in general for proper preparation of sheet steel products for *durable, lustrous finishes*.

**DURIDINE** *simultaneously cleans and deposits a thin, tight, close-grained phosphate coating* on ferrous surfaces which provide the proper surface preparation for durable paint finish. The Duridine process is simple, economical and effective. Present spray washer installations of mild steel are adequate.

**THERMOIL-GRANODINE** used in an immersion process creates on steel an oil-absorbing, paint-bonding, crystalline coating of iron and manganese phosphate, integrated with the base metal. Treated surfaces, when oiled or painted, provide excellent protection against rust. Thermoil-Granodine furnishes excellent rust protection for tools, nuts, bolts and unpainted replacement machine parts.

Years of actual experience in the metal cleaning field have enabled ACP to develop chemicals and processes which are giving maximum results in cleaning and surface preparation for paint for varied types of metal and under varying conditions. ACP Technicians have had many years' experience in this field and will gladly consult with you and recommend the ACP products and processes which will most effectively and economically meet your requirements.

**AMERICAN CHEMICAL PAINT CO.**  
AMBLER PENNA.



## Industrial Outlook for Rest of Year Brightens

RETURN of the bituminous coal miners to their jobs brightens the industrial outlook for the remainder of the year, although some disruptions to production schedules will be experienced as the result of the unbalancing of supplies by interruptions to operations during the coal strike.

Even though the coal strike was still in effect during the week ended Dec. 7 the return to a full week of industrial operations, as contrasted to the preceding week's Thanksgiving Day holiday schedules, raised STEEL's industrial production index to 134 per cent (preliminary) of the 1936-1939 average of 100. During the week ended Nov. 30, when both the coal strike and the Thanksgiving Day holiday reduced industrial operations, the index was only 127 per cent.

**AUTOS**—A bright spot in the industrial picture during the week ended Dec. 7 was automobile production which rose to a new postwar high of 96,519 passenger cars, trucks and busses. Previous postwar high had been set by output of 96,461 units in the week ended Nov. 23.

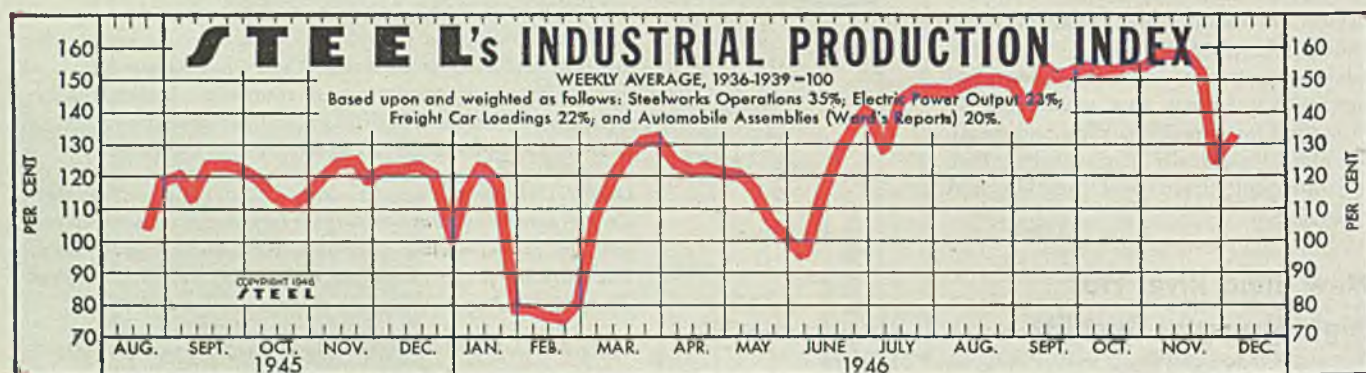
**STEEL**—Steel production which had plunged to 60.5 per cent of capacity in the last week of the latest coal strike is now on the upgrade but the steel tonnage lost during the strike will be reflected later in restricted operations of steel consumers.

**FREIGHT CARS**—Among industries feeling the pinch of the reduced flow of steel are railroad freight car builders. Even in November they were handicapped by insufficient supplies of steel, as well as other materials. Consequently, car builders were able to deliver only 3244 freight cars in November, a decrease from the 3828 delivered in October. Meantime, new orders in November rose to 6705 cars, compared with 3407 in October. At the end of November, there were unfilled orders for 69,294 cars, compared with 65,700 at the end of October.

**RAILROAD INCOME**—A high level of industrial operations and commerce that pushed operating revenues upward helped class I railroads show an estimated net income, after interest and rentals, of \$57 million in October, compared with \$38½ million in September.

**PRICES**—Abandonment several weeks ago of nearly all price controls is being reflected in the U. S. Bureau of Labor Statistics index of wholesale prices. In the week ended Nov. 30 the bureau's index rose to 139.1 per cent of the 1926 average of 100, compared with 137.3 per cent in the preceding week. High prices will further a hand-to-mouth policy in industrial buying, and in fact, industrial buyers are reported already exercising increasing caution.

**CASTINGS**—Shipments of 79,368 tons of malleable iron castings in October were higher than for any month since May, 1945, and were double the monthly average for 1935 to 1939, inclusive. New orders booked, less cancellations, aggregated 50,239 tons, compared with 44,503 tons in September.



The Index (see chart above):

Latest Week (preliminary) 134

Previous Week 127

Month Ago 158

## FIGURES THIS WEEK

### INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	60.5	65.5	91.5	83.5
Electric Power Distributed (million kilowatt hours)	4,673	4,448	4,682	4,097
Bituminous Coal Production (daily av.—1000 tons)	333	1,066	2,067	2,065
Petroleum Production (daily av.—1000 bbls.)	4,695	4,795	4,779	4,469
Construction Volume (ENR—Unit \$1,000,000)	\$105.4	\$32.6	\$53.0	\$80.3
Automobile and Truck Output (Ward's—number units)	96,519	77,222	92,760	14,580

\* Dates on request. † 1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

### TRADE

Freight Carloadings (unit—1000 cars)	695†	661	913	776
Business Failures (Dun & Bradstreet, number)	37	24	25	14
Money in Circulation (in millions of dollars)†	\$28,906	\$28,815	\$28,750	\$28,279
Department Store Sales (change from like wk. a yr. ago)†	+2%	+41%	+17%	+7%

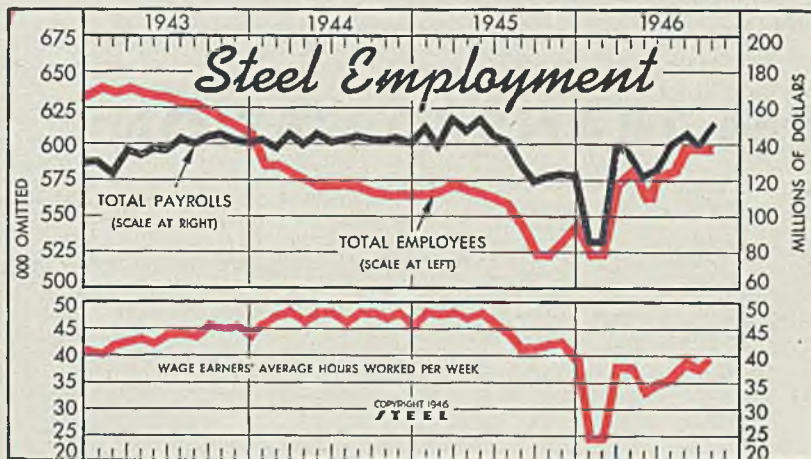
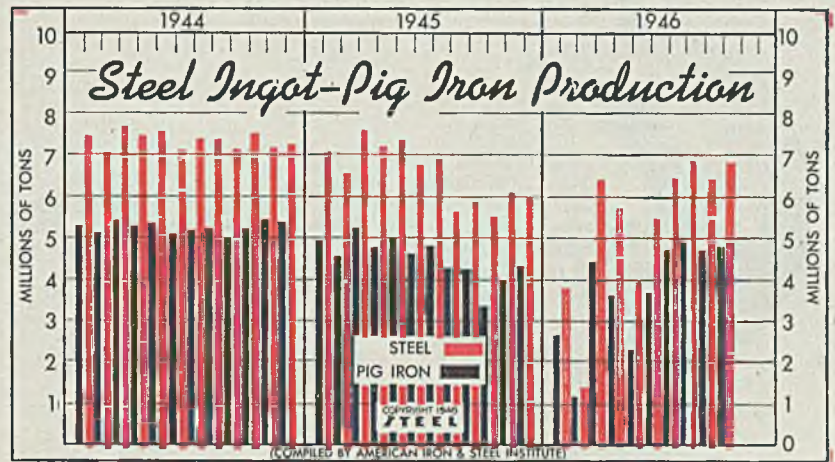
† Preliminary. ‡ Federal Reserve Board.



## Iron, Steel Production

(Net Tons—000 omitted)

	Steel Ingots			Pig Iron	
	1946	1945	1944	1946	1945
Jan. . . . .	3,872	7,206	7,593	2,645	4,945
Feb. . . . .	1,393	6,655	7,194	1,148	4,563
Mar. . . . .	6,507	7,708	7,826	4,424	5,228
Apr. . . . .	5,860	7,292	7,594	3,614	4,786
May . . . . .	4,072	7,452	7,703	2,275	5,016
June . . . . .	5,624	6,842	7,234	3,682	4,605
July . . . . .	6,610	6,987	7,498	4,705	4,812
Aug. . . . .	6,887	5,736	7,499	4,898	4,249
Sept. . . . .	6,518	5,983	7,235	4,687	4,227
Oct. . . . .	6,910	5,598	7,621	4,815	3,388
Nov. . . . .	..	6,201	7,279	..	4,026
Dec. . . . .	..	6,059	7,866	..	4,323
Total . . . . .	79,719	89,642	..	54,167	..



## Steel Employment

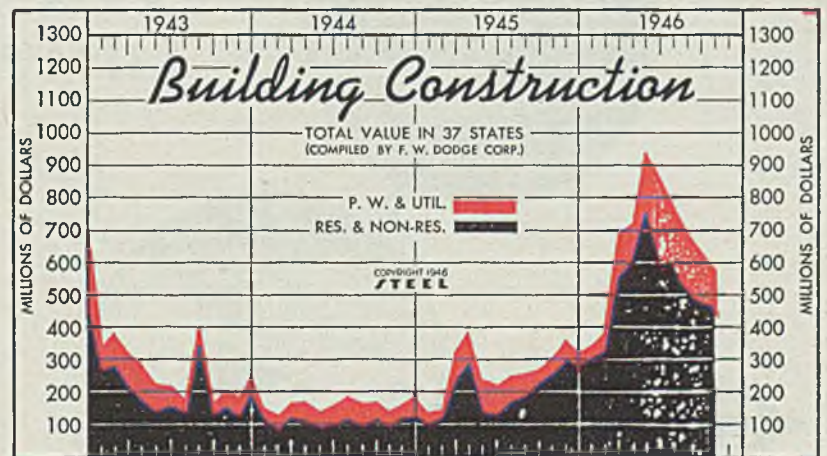
	Employees † (000 omitted)			Total Payrolls (Unit—\$1,000,000)		
	1946	1945	1944 †	1946	1945	1944
Jan. °	522	564	583	\$84.9	\$150.3	\$141.8
Feb. °	522	566	583	84.9	138.4	137.6
Mar. . . . .	570	570	578	138.8	155.0	145.3
April . . . .	582	567	573	134.3	147.0	138.9
May . . . . .	563	565	569	121.4	154.0	145.4
June . . . . .	578	562	570	125.6	144.1	140.5
July . . . . .	585	557	571	138.0	141.0	141.8
Aug. . . . .	596	543	569	145.2	128.1	143.9
Sept. . . . .	596	521	565	139.6	119.1	142.2
Oct. . . . .	596	522	564	150.6	121.3	141.7
Nov. . . . .	..	533	564	..	122.8	143.1
Dec. . . . .	..	545	564	..	122.5	139.9

† Monthly average. ° Figures for January and February, 1946, are merely averages derived from a report that combined those two strike-affected months.

## Construction Valuation in 37 States

(Unit—\$1,000,000)

	Public Works- Utilities		Residential and Non-Residential	
	1946	1945	1946	1945
Jan. . . . .	357.5	50.2	39.8	307.3
Feb. . . . .	387.4	64.7	32.0	322.7
Mar. . . . .	697.6	143.6	90.6	554.0
Apr. . . . .	734.9	128.1	111.9	606.8
May . . . . .	952.4	197.9	107.9	754.6
June . . . . .	807.9	202.5	95.0	605.5
July . . . . .	718.0	153.1	89.9	564.9
Aug. . . . .	679.9	184.4	77.5	495.6
Sept. . . . .	619.9	156.4	54.6	463.5
Oct. . . . .	573.2	112.8	61.1	460.4
Nov. . . . .	..	..	74.0	..
Dec. . . . .	..	..	51.0	..
Total . . . . .	..	885.3	..	2,414.0



## FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions) . . . . .	\$11,911	\$12,059	\$11,888	\$15,265
Federal Gross Debt (billions) . . . . .	\$262.4	\$262.6	\$261.9	\$270.0
Bond Volume, NYSE (millions) . . . . .	\$29.3	\$19.9	\$22.6	\$40.9
Stocks Sales, NYSE (thousands) . . . . .	6,116	4,423	6,560	12,375
Loans and Investments (billions)† . . . . .	\$57.8	\$57.7	\$58.6	\$62.4
United States Gov't. Obligations Held (millions)† . . . . .	\$37,859	\$37,881	\$39,044	\$45,501

† Member banks, Federal Reserve System.

## PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average . . . . .	\$64.45	\$64.45	\$64.45	\$58.27
All Commodities† . . . . .	139.1	137.3	134.8	106.8
Industrial Raw Materials† . . . . .	154.8	155.3	150.9	120.1
Manufactured Products† . . . . .	134.1	131.1	130.4	102.5

† Bureau of Labor Statistics Index, 1928=100.





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# HELPFUL LITERATURE

## 1. Electrical Instruments

Westinghouse Mfg. Corp.—34-page illustrated booklet No. B-3013 describes electrical instruments for industrial, central station, laboratory and general use. Special features, specification data and full scale range of standard ratings are included.

## 2. Exhaust Fans

Buffalo Forge Co.—32-page illustrated bulletin No. 3576 describes Industrial Exhauster heavy duty steel plated exhaust fan. Unit is adjustable and reversible. Removable front and back plates are large enough to provide for rotor removal. Three rotors are available for air and material handling.

## 3. Pipe Materials

Tube Turns, Inc.—9 by 14-inch illustrated chart No. TT98-5-846 deals with carbon, intermediate alloy, stainless and special analysis steels and covers ASTM specifications, chemistry, service limitations and welding procedures for pipe and fitting materials.

## 4. Temperature Control

Taylor Instrument Cos.—18-page illustrated bulletin No. 98166 covers application of automatic control instruments to electroplating and cleaning operations. Diagrammatic sketches illustrate instrument hookups. Recommended bath temperatures and thermal system materials are included.

## 5. Two-Stage Pumps

Economy Pumps, Inc.—8-page illustrated bulletin No. C746 deals with high efficiency ball bearing type DMD two-stage pumps in capacities from 75 to 700 gallons per minute for heads from 175 to 400 feet at 1750 revolutions per minute. Pumps are suitable for all clear water applications where pressures of 100 to 170 pounds are required.

## 6. Roller Hearth Furnaces

Surface Combustion Corp.—4-page illustrated bulletin No. SC-132 describes prepared atmosphere roller hearth furnaces for ferrous and non-ferrous bars, tube and strip. Practical means of minimizing decarburization and preventing scale in continuous furnaces is discussed. Furnace operating data are included.

## 7. Bus Duct System

BullDog Electric Products Co.—24-page illustrated bulletin No. 462 describes Bustrubution Duct for secondary electrical distribution. Composition of standardized ventilated LO-X duct units is charted and cutaway photos show construction of type BD plug-in ducts.

## 8. Sheet Metal Dies

Carboloy Co.—16-page illustrated booklet No. D-120 contains job descriptions of cemented carbide ferrule and eyelet dies, dies and punches for blanking laminations out of abrasive silicon steel and for drawing and cupping steel cylinders 13½ inches in diameter.

## 9. High Silicon Pig Iron

Keokuk Electro-Metals Co.—18-page illustrated brochure "Electro-Silvery" relates special methods of processing and casting of high silicon pig iron. Manufacturing process permits unusually high degree of metallurgical control and this in turn regulates quality and uniformity of pigs and piglets. Also discussed are charging of cupola and the blocking of open hearth heat with addition of Electro-Silvery pig iron.

## 10. Roof Ventilators

Burt Mfg. Co.—62-page illustrated catalog "Burt Roof Elevators" presents design and construction features of Monovent free flow and standard gravity ventilator equipment. Tables of capacities are included.

## 11. Chain Hoists

Chester Hoist Co.—18-page illustrated bulletin G558 covers complete line of spur geared and differential chain hoists for all industrial applications. Specification tables and sectional and photographic views of equipment are included.

## 12. Surface Finishes

United Chromium, Inc.—4-page folder "United Chrome Lacquers" presents data on 14 air drying protective lacquers developed for protecting metal, concrete and wood surfaces against corrosive conditions. Coatings will withstand both acids and alkalis as well as water, gasoline, oil and various chemical solutions and fumes.

## 13. Nonclogging Sewage Pumps

Buffalo Pumps, Inc.—32-page illustrated bulletin No. 984-D presents construction details, dimensions and installation data on Buffalo vertical and horizontal sewage pumps, self-priming pumps, sewage ejectors and single suction pumps for general service.

## 14. Industrial Trucks

Clark Tractor Div., Clark Equipment Co.—16-page illustrated broadside "Clark Tractor Method" describes fork lift truck small enough to maneuver in loading area of highway truck and capable of carrying loads of up to 1000 pounds.

## 15. Tapping Guide

Cleveland Tapping Machine Co.—28-page vest-pocket sized booklet "Production Tapping Guide" presents figures, data and other information to assist estimator, set-up man and operator in employing production tapping to best advantage.

## 16. Recording Materials

Eastman Kodak Co.—44-page illustrated booklet "Kodak Recording Materials" describes sensitized materials for use with cathode ray tube oscillographs, galvanometer oscillographs and similar instruments. Table of relative speeds of films and papers is provided to aid in selecting recording materials having correct photographic speed, spectral sensitivity and contrast.

## 17. Permanent Mold Process

Eaton Mfg. Co.—18-page illustrated catalog "A Quick Picture of the Eaton Permanent Mold Process for Producing Gray Iron Castings" discusses fundamentals of the process and presents description of castings, their qualities and applications.

## 18. Power Presses

Cleveland Punch & Shear Works Co.—16-page illustrated catalog "Modern Power Presses" presents information on series of presses embracing three distinct types, single, two and four-point units. They can be furnished for either hydraulic or pneumatic operation.

## 19. Exothermic Ferroalloys

Chromium Mining & Smelting Corp.—6-page vest pocket sized folder "A Word About Exothermic Ferroalloys in the Foundry" presents specific data relative to Sil-X Nos. 75, 145 and 217 and Chrom-X additives that enable foundrymen to meet rigid specifications for alloy cast irons.

## 20. Machine Tools

Ex-Cell-O Corp.—28-page illustrated bulletin No. 27141 includes features, specifications and advantages of cutting tools, machine tools and miscellaneous parts and equipment. Angular boring, turning and facing machines; broaches; drill jigs; fuel injection equipment; hydraulic power units and special purpose machines are described.

## 21. Tool Care

Celfor Tools Div., Clark Equipment Co.—24-page illustrated booklet "Engineering Data on Care and Operation of Celfor Drills" presents facts of technical nature to aid in selecting proper tools and maintaining correct balance between tool capacity and job requirements.

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## 22. Crane Controls

Electric Controller & Mfg. Co.—8-page illustrated bulletin No. 930 deals with frequency relay magnetic crane control system for alternating current cab-operated cranes. Charts diagram operational efficiency and oscillogram shows acceleration curve. Specifications for reverse plugging bridge or trolley panels and hoist control panels are included.

## 23. Emulsion Cleaner

Enthone, Inc. — 4-page illustrated bulletin "Emulsion Cleaner EC-75" describes cleaner that can be used safely in plating room as pre-cleaner on all types of metals. Advantages and method of use are described.

## 24. Blast Cleaning Equipment

American Wheelabrator & Equipment Corp. —12-page illustrated catalog No. 214 describes general purpose blast cleaning machine designed for handling wide range of large and small castings. Four sizes of available machines and their construction details are covered.

## 25. Fuel Oil Burners

Dempsey Industrial Furnace Corp.—8-page illustrated bulletin No. 1 describes low pressure fuel oil industrial burners applicable to heating processes with either manual or automatic temperature control. Each burner will operate on kerosene, bunker C oil or on any other fuel oil between these extremes.

## 26. Box Drill Jig

Chicago Drillet Corp.—8-page illustrated catalog "The New Drillet Instant Speed Changer for all Drill Presses" reveals specific engineering data regarding design, dimensions and construction of 50 basic sizes of Drillet jig box. Approximately 150 variations in size are available from these basic models.

## 27. Surface Grinder Wheels

Blanchard Machine Co.—4-page folder No. 253 describes three types of wheels for Blanchard surface grinders made with variety of grits and grades for various grinding jobs. Wheel grades and system of wheel marking are discussed.

## 28. Flexible Couplings

American Flexible Coupling Co.—32-page illustrated catalog No. 461 presents engineering data on heavy duty, mill motor type and light duty American flexible couplings; and standard, heavy duty, mill motor type and standard single-engagement Amerigear flexible couplings. Special applications are discussed.

## 29. Clamshell Buckets

Blaw-Knox Co.—46-page illustrated catalog No. 2076 presents specific data regarding two-line buckets in relation to crane capacities for rehandling, hard digging and dredging operations.

## 30. Air Motors

Bellows Senacon Co.—8-page illustrated catalog "Versatile Controlled-Air Power" covers range of operations involving pulling, pushing or lifting by air motors. Units operate on line pressures of up to 175 pounds per square inch and develop thrust force of approximately 4.9 times line pressure. Standard and special stroke lengths are listed.

## 31. Resistance Welding

Ampeco Metal, Inc.—20-page illustrated bulletin No. 68A presents information on Ampcoloy resistance welding electrodes and alloys. Diagrams and data cover new line of water cooled electrode holders. Large selection of spot welder tips and seam welder wheels is listed.

## 32. Motor Generator Sets

Century Electric Co.—8-page illustrated catalog No. 18-1 presents line of generators and motor generator sets to deliver direct current of 50 watts to 200 kilowatts and alternating current sets to deliver 500 watts to 150 kilowatts.

## 33. Protective Coatings

Amercoat Div., American Pipe & Construction Co.—8-page technical bulletin contains factual information in chart form on characteristics and properties of Amercoat plastic protective coatings. It is intended to serve as guide for selecting proper coating, preparation of surface and application methods on steel, concrete and wood.

## 34. Strip Chart Potentiometer

Brown Instrument Co.—24-page illustrated catalog No. 15-10 covers operating principle and resulting advantages of Electronik strip chart potentiometer for recording and controlling instruments. Continuous balance principle is described and other features discussed.

## 35. Testing Machines

Bowser, Inc.—4-page illustrated folder "Utility Units" describes laboratory and production testing equipment which will simulate altitude conditions including subzero cold and relative humidity as well as vacuum conditions. Tests can range between 158 to -90 F.

## 36. Combustion & Heating Data

Bryant Heater Co. — Ten engineering data sheets prepared for combustion and process engineers bring together useful gas combustion and industrial heating information. Mathematical tables; properties of gases, metals and other materials; and gas orifice tables are included.

## 37. Precision Gages

Bryant Chucking Grinder Co.—Composite of four illustrated data sheets and one illustrated catalog covers Bryant portable thread gages, Universal diameter gage, adjustable thread gages and squareness of face gages. Capacities or gages and accuracy are discussed.

## 38. Direct Current Motors

Allis-Chalmers Mfg. Co.—40-page illustrated booklet No. B6002 contains data on large direct current motors and control for heavy duty drives. Details of Frog-Leg armature winding and other features of construction are given. Examples are shown of switchboards and control for all steel mill and general industrial applications.

## 39. Diesel Engine Cooling

Binks Mfg. Co.—20-page illustrated booklet No. 351 is designed to help solve problems encountered in stationary diesel engine cooling. It shows how water jacket scale, overheating and insurance rates can be reduced.

## 40. Speed Reducers

Philadelphia Gear Works, Inc.—58-page illustrated bulletin No. 200 on spiral bevel speed reducers describes single, double and triple reduction and mitre gear units. Full data covering horsepower ratings, capacities, weights and dimensions are included. Tables of load characteristics and service factors are given.

## 41. Metal Castings

Advance Foundry Co. — 8-page illustrated pamphlet "Strenes Metal Castings" shows numerous ferrous alloy castings, particularly those suited for use as drawing and forming dies. Also included are parts castings such as pump shells, impellers, melting pots and bushings.

## 42. Oxyacetylene Processes

Air Reduction Sales Co.—48-page illustrated booklet "Oxyacetylene Flame Processes and Arc Welding in Railroad Mechanical Operations" describes approved methods of performing many shop maintenance and fabrication jobs. Numerous photographs demonstrate techniques and typical applications.

## 43. Induction Heating & Melting

Ajax Electrothermic Corp.—8-page illustrated bulletin No. 27 describes principles and advantages of high frequency heating and melting. Ways to use high frequency to speed production, reduce costs and hold close tolerances in melting, heating for forging, brazing, annealing and other operations are indicated.

## 44. Balancing Machines

Bear Mfg. Co.—Illustrated folder on model 340 balancing machines demonstrates details and typical installations of units. Model 340-R used for balancing armatures, fans, blowers, impellers, propellers, wheels, gears, hubs, shafts, pulleys etc. from 3 to 100 pounds in weight is shown in actual size.

## 45. Ferro Alloys

Electro Metallurgical Sales Corp. — 64-page booklet presents concise review of information about ferro alloys. Description of each grade with typical analyses is included to assist users to select most suitable alloy for specific application. Suggestions are offered for use of ferro alloys in both ferrous and nonferrous industries.

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## Upward Adjustments in Steel Prices Broadening in Scope

*All sellers now quoting higher levels on flat-rolled products . . . Price schedules on several other items revised upward with additional changes pending... Steelmaking operations recovering from coal strike drop*

STEEL price adjustments are broadening in scope, both with respect to the number of products and producers involved. Last week advances were reported by leading producers on such items as sheets, strip, tin plate, terne plate, bars, rails, track accessories, and pig iron, with additional products under review and apparently scheduled for early advances.

Users of flat rolled products will pay substantially higher prices for most items in this classification following upward revisions by leading mills in sheet, including galvanized, and strip price schedules. The price changes, effected by revisions of base prices and extras, range from reductions in a few items to sharp increases in others. Comparisons with former quotations are difficult to determine, due to the comprehensive revamping of the flat rolled pricing system, increases being reflected only partly in base prices.

Higher prices were posted, effective Jan. 1, on tin plate. Contracts for 1947 delivery will be made on the basis of \$5.75 per 100 pound base box, compared with the 1946 contract price of \$5 and the OPA ceiling of \$5.25.

Apart from scattered increases by smaller independents previously reported, no revisions have been made in such major products as plates and shapes. However, price schedules on these items are under review, particularly with respect to extras, and at least one leading producer has announced an increase of \$2 per ton on hot-rolled bars accompanied by a revision in extras. Reinforcing bars also have been increased in price as have rails and various track accessories.

Such changes as have been made in the various products

### DISTRICT STEEL RATES

	Percentage of Ingot Capacity Engaged		in Leading Districts	
	Week Ended Dec. 14	Change	Same Week 1945	1944
Pittsburgh	69	+19	78.5	91
Chicago	78	+3	90	100.5
Eastern Pa.	63	+26	80	95.5
Youngstown	50	+15	81	90
Wheeling	80.5	-2	95	92
Cleveland	95	+3	85	93
Buffalo	83.5	+32.5	88.5	88
Birmingham	55	+10	95	95
New England	90	None	80	90
Cincinnati	81	-3	67	82
St. Louis	72.5	None	65.5	75
Detroit	93	+3	89	87
Estimated national rate	72.5	+12	83.5	96.5

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

to date reflect an effort to bring selling prices more in line with costs and do not anticipate expected cost increases resulting from advances in freight rates, effective Jan. 1, and possible higher wage costs which may result from pending labor negotiations. Price adjustments so far have been long under discussion with OPA.

For the first time since the decontrolling of steel prices, leading warehouses have adjusted their prices in line with mill changes, especially in sheet and strip.

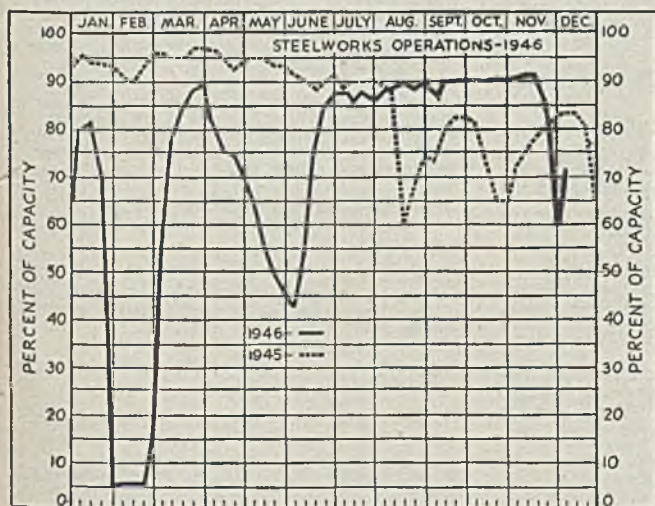
Meanwhile, advances in pig iron have broadened to include practically all producers. A number of ferroalloys have been increased in price, and the price tone of the steel scrap market is stronger. Further advances have been made in low phos scrap and cast grades.

Meanwhile, steel producers are finding that it will take them several weeks to fully recover from the setback occasioned by the soft coal strike. All interests will enter the new year with substantial order backlogs. Certain producers assert arrearages on carbon bars will take them six weeks or longer to work off. The stringency in small sizes of carbon bars is especially pronounced, but some forgers engaged on automotive requirements are not pressing as hard as previously anticipated. Alloy bar shipments remain easy, with January and early February being offered.

Shape extras continue under review and it would not prove surprising to be the trade if revisions were announced in the near future, with the possibility that some base prices may also be changed. To date only one shape mill has changed its base prices, or rather in this case its base equivalent prices, and that was the Phoenix Iron Co., Phoenixville, Pa., as announced a few weeks ago.

STEEL's composite market averages advanced last week to \$64.73 from \$64.45 on finished steel, to \$29.50 from \$27.75 on steelmaking pig iron, and to \$27 from \$24.25 on steelmaking scrap. Semifinished steel price average held unchanged at \$40.60.

Steelmaking operations are recovering rapidly from the effects of the coal strike and further gains are expected this week. The estimated national ingot rates rose 12 points last week to 72.5 per cent of capacity.





## COMPOSITE MARKET AVERAGES

	Dec. 14	Dec. 7	Nov. 30	One Month Ago Nov., 1946	Three Months Ago Sept., 1946	One Year Ago Dec., 1945	Five Years Ago Dec., 1941
Finished Steel .....	\$64.73	\$64.45	\$64.45	\$64.45	\$64.45	\$58.27	\$56.73
Semifinished Steel .....	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron .....	29.50	27.75	27.50	27.50	27.50	24.75	23.00
Steelmaking Scrap .....	27.00	24.25	24.25	22.22	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

## COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

## Finished Material

	Dec. 14, 1946	Nov., 1946	Sept., 1946	Dec., 1945
Steel bars, Pittsburgh .....	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia .....	2.86	2.86	2.86	2.57
Steel bars, Chicago .....	2.50	2.50	2.50	2.25
Shapes, Pittsburgh .....	2.35	2.35	2.35	2.10
Shapes, Philadelphia .....	2.48	2.48	2.48	2.215
Shapes, Chicago .....	2.35	2.35	2.35	2.10
Plates, Pittsburgh .....	2.50	2.50	2.50	2.25
Plates, Philadelphia .....	2.558	2.558	2.558	2.30
Plates, Chicago .....	2.50	2.50	2.50	2.25
Sheets, hot-rolled, Pittsburgh .....	2.50	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh .....	3.20	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh .....	13.55	4.05	4.05	3.70
Sheets, hot-rolled, Gary .....	2.50	2.425	2.425	2.20
Sheets, cold-rolled, Gary .....	3.20	3.275	3.275	3.05
Sheets, No. 24 galv., Gary .....	13.55	4.05	4.05	3.70
Hot-rolled strip, Pittsburgh .....	2.50	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh .....	3.20	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh .....	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh .....	3.75	3.75	3.75	2.90
Tin plate, per base box, Pittsburgh .....	\$5.25	\$5.25	\$5.25	\$5.00

\* Nominal. † Base changed to 10 gage.

## Semifinished Material

	Dec. 14, 1946	Nov., 1946	Sept., 1946	Dec., 1945
Sheet bars, Pittsburgh, Chicago .....	\$38.00	\$38.00	\$38.00	\$36.00
Slabs, Pittsburgh, Chicago .....	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh .....	39.00	39.00	39.00	36.00
Wire rods, No. 5 to 3/4-in., Pitts. ..	2.30c	2.30c	2.30c	2.15c

## Pig Iron

	Dec. 14, 1946	Nov., 1946	Sept., 1946	Dec., 1945
Bessemer del. Pittsburgh .....	\$31.77	\$29.77	\$29.77	\$26.94
Basic, Valley .....	30.00	28.00	28.00	25.25
Basic, eastern del. Philadelphia .....	31.93	29.93	29.93	27.09
No. 2 fdry., del. Pgh. N. & S. sides ..	31.27	29.27	29.27	26.44
No. 2 fdry., del. Philadelphia .....	32.43	30.43	30.43	27.59
No. 2 foundry, Chicago .....	30.50	28.50	28.50	25.75
Southern No. 2, Birmingham .....	26.88	24.88	24.88	22.13
Southern No. 2, del. Cincinnati .....	30.94	28.94	28.94	26.05
Malleable, Valley .....	30.50	28.50	28.50	25.75
Malleable, Chicago .....	30.50	28.50	28.50	25.75
Charcoal, low phos., fob Lyles, Tenn. ..	37.50	33.00	33.00	33.00
Gray forge, del. McKees Rocks, Pa. ..	30.61	28.61	28.61	25.80
Ferromanganese, fob cars, Pittsburgh ..	140.00	140.00	140.00	140.00

## Scrap

	Dec. 14, 1946	Nov., 1946	Sept., 1946	Dec., 1945
Heavy melting steel, No. 1, Pittsburgh ..	\$25.00	\$23.00	\$20.00	\$20.00
Heavy melt, steel, No. 2, E. Pa. ....	24.00	21.90	18.75	18.75
Heavy melting steel, Chicago .....	23.75	21.75	18.75	18.75
Rails for rolling, Chicago .....	27.25	22.75	22.25	22.25
No. 1 cast, Chicago .....	35.00	29.00	23.75	20.00

## Coke

	Dec. 14, 1946	Nov., 1946	Sept., 1946	Dec., 1945
Connellsville, furnace ovens .....	\$8.75	\$8.75	\$8.75	\$7.50
Connellsville, foundry ovens .....	9.50	9.50	9.50	8.25
Chicago, ty-product fdry., del. ....	15.10	15.10	15.10	13.75

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

## Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, \$33, fob mill; forging quality, \$38, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, Coatesville, uncrop. \$48.69.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$39; Detroit, del., \$41.50; Duluth (billets), \$41; Pac. ports (billets), \$51.50 (Andrews Steel Co., carbon slabs, \$41.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$47; Detroit, del., \$49.50; Duluth, billets, \$49; forging billets fob Pac. ports, \$59.50.

(Andrews Steel Co., carbon forging billets, \$50 gross ton at established basing points.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$58.43; del. Detroit \$60.93; eastern Mich. \$61.93.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon, sheet bars, \$39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb., 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—3/4 in. inclusive, per 100 lb, \$2.30. Do., over 3/4—1 1/2 in., incl., \$2.45; Galveston, base, \$2.40 and \$2.55, respectively. Worcester add \$0.10; Pacific ports \$0.535. Pittsburgh Steel Co., No. 5—3/4 in., \$2.65; over 3/4 in., \$3; Portsmouth Steel Corp., No. 5—3/4 in., \$2.55; Keystone Steel & Wire Co., \$2.70.

## Bars

Hot-rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.635c; eastern Mich., 2.685c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports,

dock, 2.885c; Pac. ports, dock, 3.185c (Joslyn Mfg. & Supply Co., 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.056c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300 .....	\$0.108	4300 .....	\$1.839
2300 .....	1.839	4600 .....	1.298
2500 .....	2.759	4800 .....	2.326
3000 .....	0.541	5100 .....	0.379
3100 .....	0.920	5130 or 5152 ..	0.494
3200 .....	1.461	6120 or 6152 ..	1.028
3400 .....	3.462	6145 or 6150 ..	1.298
4000 .....	0.487	8612 .....	0.703
4100 (.15-.25 Mo) ..	0.757	8720 .....	0.757
(.20-.30 Mo) .....	0.812	9830 .....	1.407

\* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.624c; Detroit, del., 3.759c; eastern Mich., 3.809c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.85c; Detroit, del., 2.485c; eastern Mich. and Toledo, 2.535c; Gulf ports, dock, 2.735c; Pacific ports, dock 2.785c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo, del., 2.535c; Gulf ports, dock, 2.735c.

Iron Bars: Single refined, Pitts., 6.15c; double refined, 7.00c; Pittsburgh, staybolt, 7.85c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

## Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.635c; eastern Mich., del., 2.685c; Philadelphia, del., 2.69c; New York, del., 2.72c; Pacific ports, 3.085c.

(Andrews Steel Co. quotes on Middletown, O., base for shipment to Detroit area; Alan Wood Steel Co., Conshohocken, Pa., quotes 3.25c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.335c; eastern Mich., del., 3.385c; New York, del., 3.54c; Philadelphia, del., 3.56c; Pacific ports, 3.885c.

Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 3.55c; New York, del., 3.77c; Philadelphia, del., 3.74c; Pacific ports, 4.135c.

Corrugated Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, base, 3.55c per square.

Culvert Sheets, No. 16, not corrugated, copper alloy: Pittsburgh, Chicago, Gary, Birmingham, 4.15c; Granite City, 4.25c; Pacific ports, 4.635c; copper iron, 4.50c; pure iron, 4.50c.

Aluminized Sheets, No. 20 hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

Long Terns, No. 10: Pittsburgh, Chicago, Gary, base, 3.55c; Pacific ports, 4.335c.

Enameling Sheets, No. 10: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit,



del., 3.685c; eastern Mich., 3.735c; Pacific ports, 4.235c.

Electrical Sheets, No. 24: (Prices nominal pending revision)

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.685c	4.00c
Armature	4.25c	5.035c	4.35c
Electrical	4.75c	5.535c	4.85c
Motor	5.425c	6.21c	5.525c
Dynamo	6.125c	6.91c	6.225c
Transformer			
72	6.625c	7.41c	
65	7.625c	8.41c	
58	8.125c	8.91c	
52	8.925c	9.71c	

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 2.50c; Detroit, del., 2.635c; eastern Mich., del., 2.685c; Pacific ports, 3.185c. (Superior Steel Corp., 3.30c, Pittsburgh.)

Cold-Rolled Strip, 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del., 3.335c; eastern Mich., 3.385c; Wooster, base, 3.75c. Superior Steel Corp., 4.70c, Pittsburgh.)

Cold-Finished Spring Steel, 0.20-0.50 carbon: Pittsburgh, Cleveland, base, 3.03c; add 0.20c for Worcester.

## Tin, Terne Plate

(Maximum nominal tin plate prices permitted under OPA; actual market 25 points lower due to contract commitments. Effective Jan. 1, coke tin plate, \$5.75; tin mill black plate, 3.50c.)

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, \$5.25; Granite City, Birmingham, Sparrows Point, \$5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box 0.25 lb tin, \$4.60; 0.50 lb tin, \$4.75; 0.75 lb tin, \$4.90; Granite City, Birmingham, Sparrows Point, \$4.70, \$4.85, \$5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-aga and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed 4.335c.

Long Terns: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.835c.

Manufacturing Terns (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, \$4.55; Granite City, Birmingham, Sparrows Point, \$4.65.

Roofing Terns: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb \$12.50; 15-lb \$14.50; 20-lb \$15.50 (nom.); 40-lb \$20.00 (nom.).

## Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; Geneva, Utah, 2.65c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, del., 2.74c; Boston, del., 2.86c; Pacific ports, 3.085c; Gulf ports, 2.885c.

(Granite City Steel Co., carbon plates, 2.65c fob Chicago or Birmingham; Central Iron & Steel Co., Harrisburg, Pa., 3.05c, basing points; Lukens Steel Co., Coatesville, Pa., and Worth Steel Co., Claymont, Del., 2.80c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c, base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.435c; Gulf ports, 4.135c.

Open-Heath Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.308c; Pacific ports, 4.525c.

Clad Steel Plates: Coatesville, 10% cladding: nickel clad, 18.72c; Inconel-clad, 26.00c; monel-clad, 24.96c.

## Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; Geneva, Utah, 2.50c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.035c; Gulf ports, 2.735c.

(Phoenix Iron Co., Phoenixville, Pa., 3.05c, Bethlehem, Pa.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.235c.

## Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads  
Bright, basic or bessemer ..... \*\$3.05  
Spring (except Birmingham) ..... \*\$4.00

Wire Products to Trade

Nails and Staples  
Standard and cement-coated ..... \$3.75  
Galvanized ..... \$3.40  
Wire, Merchant Quality  
Annealed ..... \$3.50  
Galvanized ..... \$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 1½ gage and heavier... \*\*72  
Barbed wire, 80-rod spool ..... ††79  
Barless wire, twisted ..... ††79  
Fence posts ..... 74  
Bale ties, single loop ..... 72½

\* Add \$0.10 for Worcester, \$0.05 for Duluth and \$0.535 for Pacific ports. Portsmouth Steel Corp., \$3.425, bright, basic.

† Add \$0.30 for Worcester, \$0.535 for Pacific ports. Nichols Wire & Steel, \$4.25; Pittsburgh Steel Co., \$4.10.

‡ Add \$0.535 for Pacific ports.

§ Add \$0.10 for Worcester; \$0.735 Pacific ports.

\*\* Pittsburgh Steel Co., 77.

†† Pittsburgh Steel Co., 89.

## Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Welded					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
¾	53	30	¾	21	0½
1	56	37½	1	27	7
1¼	60½	48	1-1¼	31	13
1½	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3¼-6	63	51½	2	27½	9
7-8	62	49½	2½-3¼	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

Roller Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut length 4 to 24 feet, inclusive.

Seamless					
Hot Rolled			Elec. Weld		
O. D.	B. W. G.	Hot Rolled	O. D.	B. W. G.	Hot Rolled
1"	13	\$9.90	1"	13	\$9.65
1¼"	13	11.73	1¼"	13	11.43
1½"	13	12.96	1½"	13	12.64
1¾"	13	12.41	1¾"	13	12.10
2"	13	13.90	2"	13	13.53
2¼"	13	15.50	2¼"	13	15.06
2½"	12	17.07	2½"	12	16.57
2¾"	12	18.70	2¾"	12	18.11
3"	12	19.82	3"	12	19.17
3¼"	12	20.79	3¼"	12	20.05
3½"	11	26.24	3½"	11	25.30
4"	10	32.56	4"	10	31.32
4½"	9	43.16	4½"	9	41.29
5"	9	49.96	5"	9	47.86
6"	7	76.71	6"	7	71.14

Pipe, Cast Iron: Class B, 6-in. and over, \$60 per net ton, Birmingham; \$65, Burlington, N. J.; \$62.80, del., Chicago; 4-in. pipe, \$5 higher, Class A pipe, \$3 a ton over class B.

## Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, \$43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, \$49.18. West Virginia Steel & Mfg. Co., \$55, light rails.

Relaying rails, 35 lb and over, fob railroad and basing points, \$31-\$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates, \$51 net ton, base. Standard track spikes, 3.65c-4.50c; screw spikes, 5.30c-6.40c.

## Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago, Lebanon, Pa. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Base prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

Carriage and Machine		
½ x 6 and smaller	.....	65½ off
Do., ¾ and ¾ x 6-in. and shorter	.....	63½ off
Do., ¾ to 1 x 6-in. and shorter	.....	61 off
1¼ and larger, all lengths	.....	59 off
All diameters, over 6-in. long	.....	59 off
Tire bolts	.....	50 off
Step bolts	.....	56 off
Plow bolts	.....	65 off

Stove Bolts  
In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts		
Semifinished hex	U.S.S.	S.A.E.
¾-in. and smaller	.....	64
1½-in. and smaller	.....	62
1½-in.-1-in.	.....	60
¾-in.-1-in.	.....	59
1¼-in.-1½-in.	.....	57
1¼-in. and larger	.....	56
Additional discount of 10 for full kegs.	.....	

Hexagon Cap Screws  
Upset 1-in., smaller ..... 64 off  
Milled 1-in., smaller ..... 60 off

Square Head Set Screws  
Upset 1-in. and smaller ..... 71 off  
Headless, ¼-in. and larger ..... 60 off  
No. 10 and smaller ..... 70 off

## Rivets

Fob Pittsburgh, Cleveland, Chicago  
Birmingham, Lebanon, Pa.  
Structural ..... 5.25c  
¼-inch and under ..... \*55-5 off

## Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, incl ..... \$2.75-\$3.00 off

## Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	72.49c
1.5	4	1	8.5	58.43c
...	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

## Stainless Steels

Base, Cents per lb					
CHROMIUM NICKEL STEELS					
	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	31.38	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.50
312	38.95	43.28	53.02	...	...
316	43.28	47.61	51.94	43.28	51.94
321	31.38	36.79	44.36	31.65	41.12
347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35

STRAIGHT CHROMIUM STEEL					
	403	23.93	26.51	31.92	22.99
**410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
4420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
4430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.19	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)  
(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	19.48	20.56	...
410	17.31	18.39	...
430	17.85	18.94	...
446	19.48	20.56	...

\* With 2-3% molybdenum. † With columbium. \*\* Plus machining agent. †† High carbon. ‡‡ Free machining.

## Metallurgical Coke

Price Per Net Ton		
Beehive Ovens		
Connellsville, furnace	.....	*\$8.75
Connellsville, foundry	.....	9.25-9.75
New River, foundry	.....	10.25-10.50
Wise county, foundry	.....	9.00-9.50
Wise county, furnace	.....	8.50-9.00

By-Product Foundry		
Kearney, N. J., ovens	.....	14.40
Chicago, outside delivered	.....	14.35
Chicago, delivered	.....	15.35
Terre Haute, delivered	.....	14.85
Milwaukee, ovens	.....	15.10
New England, delivered	.....	16.00
St. Louis, delivered	.....	15.10
Birmingham, delivered	.....	12.25
Indianapolis, delivered	.....	14.85
Cincinnati, delivered	.....	14.60
Cleveland, delivered	.....	14.50
Buffalo, delivered	.....	14.75
Detroit, delivered	.....	15.10
Philadelphia, delivered	.....	14.65

\* Operators of hand-drawn ovens using trucked coal, \$9.35.  
† \$5.68 from other than Ala., Mo., Tenn.

## Coke By-Products

Spot, gal, freight allowed east of Omaha	.....	15.00c
Pure and 90% benzol	.....	22.00c
Toluol, two degree	.....	22.00c
Industrial xylol	.....	22.00c
Per pound fob works		
Phenol (car lots, returnable drums)	.....	11.25c
Do., less than carlots	.....	12.00c
Do., tank cars	.....	10.25c
Eastern plants, per pound		
Naphthalene flakes, balls, bbl, to jobbers, "household use"	.....	9.00c
Per ton, bulk, fob plants	.....	
Sulphate of ammonia	.....	\$30.00



## WAREHOUSE STEEL PRICES

Base delivered prices, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets† (10-gage base)	Hot-rolled strip† (14-gage and lighter, 6-in. and narrower)	Hot-rolled strip† (12-gage and heavier, wider than 6-inch)	Galvanized flat sheets 24-gage base†	Cold-rolled sheets† (17-gage base)	Cold finished bars	Cold-rolled strip†
Boston	4.356 <sup>1</sup>	4.203 <sup>1</sup>	4.203 <sup>1</sup>	6.039 <sup>1</sup>	4.050 <sup>1</sup>	5.548 <sup>1</sup>	4.418 <sup>1</sup>	5.725 <sup>12</sup>	5.031 <sup>14</sup>	4.656 <sup>21</sup>	4.965
New York	4.134 <sup>1</sup>	4.038 <sup>1</sup>	4.049 <sup>1</sup>	5.875 <sup>1</sup>	3.856 <sup>1</sup>	4.375 <sup>1</sup>	4.275 <sup>1</sup>	5.501 <sup>12</sup>	4.838 <sup>14</sup>	4.584 <sup>21</sup>	5.075
Jersey City	4.155 <sup>1</sup>	4.018 <sup>1</sup>	4.049 <sup>1</sup>	5.875 <sup>1</sup>	3.856 <sup>1</sup>	4.375 <sup>1</sup>	4.275 <sup>1</sup>	5.501 <sup>12</sup>	4.890 <sup>14</sup>	4.605 <sup>21</sup>	5.075
Philadelphia	4.114 <sup>1</sup>	3.937 <sup>1</sup>	3.875 <sup>1</sup>	5.564 <sup>1</sup>	3.774 <sup>1</sup>	4.664 <sup>1</sup>	4.554 <sup>1</sup>	5.499 <sup>15</sup>	5.139 <sup>23</sup>	4.564 <sup>21</sup>	5.064
Baltimore	4.093 <sup>1</sup>	4.05 <sup>1</sup>	3.865 <sup>1</sup>	5.543 <sup>1</sup>	3.64 <sup>1</sup>	4.293 <sup>1</sup>	4.193 <sup>1</sup>	5.365 <sup>17</sup>	5.118 <sup>20</sup>	4.543 <sup>21</sup>	
Washington	4.232 <sup>1</sup>	4.22 <sup>1</sup>	4.067 <sup>1</sup>	5.632 <sup>1</sup>	3.842 <sup>1</sup>	4.432 <sup>1</sup>	4.332 <sup>1</sup>	5.667 <sup>17</sup>	5.007 <sup>24</sup>	4.532 <sup>21</sup>	
Norfolk, Va.	4.377 <sup>1</sup>	4.303 <sup>1</sup>	4.262 <sup>1</sup>	5.777 <sup>1</sup>	4.037 <sup>1</sup>	4.927 <sup>1</sup>	4.477 <sup>1</sup>	5.862 <sup>17</sup>	4.552 <sup>24</sup>	4.677 <sup>21</sup>	
Bethlehem, Pa.		3.70 <sup>1</sup>									
Claymont, Del.			3.70 <sup>1</sup>								
Coatesville, Pa.			3.70 <sup>1</sup>								
Buffalo (city)	3.60 <sup>1</sup>	3.65 <sup>1</sup>	3.92 <sup>1</sup>	5.55 <sup>1</sup>	3.575 <sup>1</sup>	4.21 <sup>1</sup>	4.11 <sup>1</sup>	5.20 <sup>15</sup>	4.625 <sup>16</sup>	4.20 <sup>21</sup>	4.96
Buffalo (country)	3.50 <sup>1</sup>	3.55 <sup>1</sup>	3.55 <sup>1</sup>	5.15 <sup>1</sup>	3.475 <sup>1</sup>	3.85 <sup>1</sup>	3.750 <sup>1</sup>	5.10 <sup>15</sup>	4.525 <sup>16</sup>	4.10 <sup>21</sup>	4.60
Pittsburgh (city)	3.60 <sup>1</sup>	3.65 <sup>1</sup>	3.65 <sup>1</sup>	5.25 <sup>1</sup>	3.575 <sup>1</sup>	3.95 <sup>1</sup>	3.850 <sup>1</sup>	5.327 <sup>12</sup>	4.625 <sup>24</sup>	4.20 <sup>21</sup>	4.70
Pittsburgh (country)	3.50 <sup>1</sup>	3.55 <sup>1</sup>	3.55 <sup>1</sup>	5.15 <sup>1</sup>	3.475 <sup>1</sup>	3.85 <sup>1</sup>	3.750 <sup>1</sup>	5.10 <sup>12</sup>	4.525 <sup>24</sup>	4.10 <sup>21</sup>	4.60
Cleveland (city)	3.60 <sup>1</sup>	3.88 <sup>1</sup>	3.65 <sup>1</sup>	5.48 <sup>1</sup>	3.575 <sup>1</sup>	3.95 <sup>1</sup>	3.850 <sup>1</sup>	5.347 <sup>12</sup>	4.625 <sup>24</sup>	4.20 <sup>21</sup>	4.70
Cleveland (country)	3.50 <sup>1</sup>	3.55 <sup>1</sup>	3.55 <sup>1</sup>		3.475 <sup>1</sup>	3.55 <sup>1</sup>	3.750 <sup>1</sup>		4.525 <sup>24</sup>	4.10 <sup>21</sup>	4.00
Detroit	3.735 <sup>1</sup>	3.987 <sup>1</sup>	3.935 <sup>1</sup>	5.607 <sup>1</sup>	3.710 <sup>1</sup>	4.085 <sup>1</sup>	3.985 <sup>1</sup>	5.526 <sup>15</sup>	4.760 <sup>24</sup>	4.25 <sup>21</sup>	4.985
Omaha (city, del.)	4.32 <sup>1</sup>	4.37 <sup>1</sup>	4.37 <sup>1</sup>	5.97 <sup>1</sup>	4.045 <sup>1</sup>	4.52 <sup>1</sup>	4.42 <sup>1</sup>	6.00 <sup>15</sup>	5.72 <sup>24</sup>	4.945 <sup>21</sup>	
Omaha (country)	4.22 <sup>1</sup>	4.27 <sup>1</sup>	4.27 <sup>1</sup>	5.87 <sup>1</sup>	3.945 <sup>1</sup>	4.42 <sup>1</sup>	4.32 <sup>1</sup>	5.90 <sup>15</sup>			
Cincinnati	3.902 <sup>1</sup>	3.983 <sup>1</sup>	3.952 <sup>1</sup>	5.583 <sup>1</sup>	3.671 <sup>1</sup>	4.046 <sup>1</sup>	3.946 <sup>1</sup>	5.296 <sup>15</sup>	4.271 <sup>24</sup>	4.602 <sup>21</sup>	
Youngstown								4.85 <sup>12</sup>			
Middletown, O.					3.475 <sup>1</sup>	3.85 <sup>1</sup>	3.750 <sup>1</sup>	5.10 <sup>15</sup>			
Chicago (city)	3.75 <sup>1</sup>	3.80 <sup>1</sup>	3.80 <sup>1</sup>	5.40 <sup>1</sup>	3.475 <sup>1</sup>	3.95 <sup>1</sup>	3.850 <sup>1</sup>	5.40 <sup>15</sup>	4.425 <sup>24</sup>	4.20 <sup>21</sup>	4.90
Milwaukee	3.908 <sup>1</sup>	3.958 <sup>1</sup>	3.958 <sup>1</sup>	5.558 <sup>1</sup>	3.633 <sup>1</sup>	4.108 <sup>1</sup>	4.008 <sup>1</sup>	5.558 <sup>15</sup>	4.583 <sup>24</sup>	4.358 <sup>21</sup>	5.058
Indianapolis	3.83 <sup>1</sup>	3.88 <sup>1</sup>	3.88 <sup>1</sup>	5.48 <sup>1</sup>	3.743 <sup>1</sup>	4.118 <sup>1</sup>	4.018 <sup>1</sup>	5.368 <sup>15</sup>	4.793 <sup>24</sup>	4.43 <sup>21</sup>	5.080
St. Paul	4.092 <sup>2</sup>	4.142 <sup>2</sup>	4.142 <sup>2</sup>	5.742 <sup>1</sup>	3.817 <sup>2</sup>	4.292 <sup>2</sup>	4.192 <sup>2</sup>	5.666 <sup>15</sup>	4.767 <sup>24</sup>	4.852 <sup>21</sup>	5.398
St. Louis	3.918 <sup>1</sup>	3.968 <sup>1</sup>	3.968 <sup>1</sup>	5.568 <sup>1</sup>	3.643 <sup>1</sup>	4.118 <sup>1</sup>	4.018 <sup>1</sup>	5.622 <sup>15</sup>	4.593 <sup>24</sup>	4.522 <sup>21</sup>	5.222
Memphis, Tenn.	4.296 <sup>1</sup>	4.346 <sup>1</sup>	4.346 <sup>1</sup>	6.071 <sup>1</sup>	4.221 <sup>1</sup>	4.596 <sup>1</sup>	4.496 <sup>1</sup>	5.746 <sup>15</sup>	4.821 <sup>21</sup>		
Birmingham	3.75 <sup>1</sup>	3.80 <sup>1</sup>	3.80 <sup>1</sup>	6.153 <sup>1</sup>	3.675 <sup>1</sup>	4.05 <sup>1</sup>	4.05 <sup>1</sup>	5.20 <sup>15</sup>	5.077 <sup>24</sup>	4.99 <sup>21</sup>	5.465
New Orleans (city)	4.358 <sup>1</sup>	4.408 <sup>1</sup>	4.408 <sup>1</sup>	6.329 <sup>1</sup>	4.283 <sup>1</sup>	4.658 <sup>1</sup>	4.508 <sup>1</sup>	5.808 <sup>15</sup>	5.304 <sup>24</sup>	5.079 <sup>21</sup>	
Houston, Tex.	4.00 <sup>2</sup>	4.50 <sup>1</sup>	4.50 <sup>1</sup>	5.75 <sup>1</sup>	3.988 <sup>2</sup>	4.668 <sup>2</sup>	4.563 <sup>2</sup>	5.763 <sup>24</sup>	5.819 <sup>15</sup>	4.10 <sup>21</sup>	
Los Angeles	4.65 <sup>4</sup>	4.70 <sup>4</sup>	5.80 <sup>4</sup>	7.05 <sup>4</sup>	4.95 <sup>4</sup>	5.30 <sup>4</sup>	5.200 <sup>4</sup>	6.55 <sup>12</sup>	6.60 <sup>4</sup>	6.105 <sup>21</sup>	5.868
San Francisco	4.235 <sup>7</sup>	4.185 <sup>7</sup>	4.185 <sup>7</sup>	5.885 <sup>7</sup>	4.16 <sup>7</sup>	5.885 <sup>7</sup>	4.535 <sup>7</sup>	6.385 <sup>15</sup>	6.91 <sup>15</sup>	5.783 <sup>21</sup>	7.588
Portland, Ore.	4.70 <sup>27</sup>	4.70 <sup>27</sup>	5.00 <sup>27</sup>	6.75 <sup>27</sup>	4.875 <sup>27</sup>	6.65 <sup>27</sup>	5.000 <sup>27</sup>	6.20 <sup>15</sup>	6.825 <sup>15</sup>	5.983 <sup>15</sup>	
Tacoma, Wash.	4.60 <sup>4</sup>	4.70 <sup>4</sup>	5.00 <sup>4</sup>	6.75 <sup>4</sup>	4.87 <sup>4</sup>	5.80 <sup>4</sup>	4.60 <sup>4</sup>	6.40 <sup>15</sup>	6.55 <sup>15</sup>	6.23 <sup>21</sup>	
Seattle	4.60 <sup>4</sup>	4.70 <sup>4</sup>	5.00 <sup>4</sup>	6.75 <sup>4</sup>	4.87 <sup>4</sup>	5.80 <sup>4</sup>	4.60 <sup>4</sup>	6.40 <sup>15</sup>	6.55 <sup>15</sup>	6.23 <sup>21</sup>	

\* Basing point cities with quotations representing mill prices, plus warehouse spread.

† Prices nominal pending establishment of new quotations to reflect mill increases.

## BASE QUANTITIES

<sup>1</sup>—400 to 1999 pounds; <sup>2</sup>—400 to 14,999 pounds; <sup>3</sup>—any quantity;  
<sup>4</sup>—300 to 1999 pounds; <sup>5</sup>—400 to 8999 pounds; <sup>6</sup>—300 to 9999 pounds;  
<sup>7</sup>—400 to 39,999 pounds; <sup>8</sup>—under 2000 pounds; <sup>9</sup>—under 4000 pounds;  
<sup>10</sup>—500 to 1499 pounds; <sup>11</sup>—one bundle to 39,999 pounds; <sup>12</sup>—150 to 2249 pounds; <sup>13</sup>—150 to 1499 pounds; <sup>14</sup>—three to 24 bundles; <sup>15</sup>—450

to 1499 pounds; <sup>16</sup>—one bundle to 1499 pounds; <sup>17</sup>—one to nine bundles;  
<sup>18</sup>—one to six bundles; <sup>19</sup>—100 to 749 pounds; <sup>20</sup>—300 to 1999 pounds;  
<sup>21</sup>—1500 to 39,999 pounds; <sup>22</sup>—1500 to 1999 pounds; <sup>23</sup>—1000 to 39,999 pounds; <sup>24</sup>—400 to 1499 pounds; <sup>25</sup>—1000 to 1999 pounds;  
<sup>26</sup>—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base;  
<sup>27</sup>—300 to 4999 pounds.

## ORES

Lake Superior Iron Ore	48% 2.8:1	\$39.75
Gross ton, 51½% (Natural)	48% 3:1	41.00
Lower Lake Ports	48% no ratio	31.00
Old range bessemer		\$5.45
Mesabi nonbessemer		5.05
High phosphorus		5.05
Mesabi bessemer		5.20
Old range nonbessemer		5.30

## Eastern Local Ore

Cents, units, del. E. Pa.		
Foundry and basic 56-63% contract	13.00	

## Foreign Ore

Cents per unit, cfi Atlantic ports		
Manganiferous ore, 45-55% Fe., 6-10% Mn.,	Nom.	
N. African low phos.	Nom.	
Swedish basic, 60 to 68%	13.00	
Spanish, No. African basic, 50 to 60%	Nom.	
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50-8.00	

## Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	\$24.00	
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## Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash.		
(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)		

## Indian and African

48% 2.8:1	\$39.75
48% 3:1	41.00
48% no ratio	31.00

## South African (Transvaal)

44% no ratio	\$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

## Brazilian—nominal

44% 2.5:1 lump	\$33.65
48% 3:1 lump	43.50

## Rhodesian

45% no ratio	\$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

## Domestic (seller's nearest rail)

48% 3:1 less \$7 freight allowance.	\$43.50
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## Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo,

Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

## Molybdenum

Sulphide conc., lb., Mo. cont., mines	\$0.75
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## NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

## Chemical Composition Limits, Per Cent

Designation	Carbon	Mn	Si	Cr	Ni	Mo	Bars per 100 lb	Billets per GT	Bars per 100 lb	Billets per GT
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	\$0.812	\$16.230	\$1.353	\$27.050
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.132
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542

Basic open-hearth Electric furnaces

Extras are in addition to a base price of 2.921c per pound on finished products and \$58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.



# PIG IRON

Maximum prices per gross ton. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Beilchem, Pa., base	\$31.50	\$31.00	\$32.50	\$32.00
Newark, N. J., del.	33.20	32.70	34.20	33.70
Brooklyn, N. Y., del.	34.28			34.78
Birdsboro, Pa., base	31.50	31.00	32.50	32.00
Birmingham, base	26.88	25.50	31.50	
Baltimore, del.	32.22			
Boston, del.	31.62			
Chicago, del.	30.72			
Cincinnati, del.	30.94	30.06		
Cleveland, del.	30.62	29.74		
Newark, N. J., del.	32.82			
Philadelphia, del.	32.05	31.55		
St. Louis, del.	30.62	31.54		
Buffalo, base	30.50	30.50	31.50	31.00
Boston, del.	36.51	36.01	37.51	37.01
Rochester, del.	32.03		33.03	32.53
Syracuse, del.	32.58		33.58	33.08
Chicago, base	30.50	30.00	31.00	30.50
Milwaukee, del.	31.73	31.23	32.23	31.73
Muskegon, Mich., del.	34.05			34.05
Cleveland, base	30.50	30.00	31.00	30.50
Akron, Canton, del.	32.04	31.54	32.54	32.04
Detroit, base	30.50	30.00	31.00	30.50
Saginaw, Mich., del.	32.81	32.31	33.31	32.81
Duluth, base	31.00	30.50	31.50	31.00
St. Paul, del.	33.13	32.63	33.63	33.13
Erie, Pa., base	30.50	30.00	31.50	31.00
Everett, Mass., base	31.50	31.00	32.50	32.00
Boston, del.	32.00	31.50	33.00	32.50
Granite City, Ill., base	30.50	30.00	31.00	30.50
St. Louis, del.	31.00	30.50		31.00
Hamilton, O., base	30.50	30.00		30.50
Cincinnati, del.	31.68	31.18		31.68
Neville Island, Pa., base	30.50	30.00	31.00	30.50
*Pittsburgh, del., N.&S. sides	31.27	30.77	31.77	31.27
Provo, Utah, base	28.50	28.00		
Sharpsville, Pa., base	30.50	30.00	31.00	30.50
Sparrows Point, Md., base	31.50	31.00		
Baltimore, del.	32.60			
Steelton, Pa., base		31.00		
Swedeland, Pa., base	31.50	31.00	32.50	32.00
Philadelphia, del.	32.43	31.93		32.93
Toledo, O., base	30.50	30.00	31.00	30.50
Troy, N. Y., base	31.50			31.00
Youngstown, O., base	30.50	30.00	31.00	30.50
Mansfield, O., del.	32.66	32.16	33.16	32.66

\* To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Alliquippa; 97c (water), Monongahela; \$1.24, Oakmont, Verona; \$1.38, Brackenridge.

Exceptions to above prices: Kaiser-Frazer Parts Corp., Struthers, O., charges 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron.

## Open Market Prices of Leading Ferroalloy Products

(Prices increased, effective Jan. 1 on contract sales, on ferroalloy alloys: high-carbon ferrochrome; siliconmanganese; chromium, silicon and manganese briquets. See page 167)

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., \$40; Pittsburgh, \$40.50; Chicago, \$40.60.

Ferromanganese, standard: 78-82% c.i. gross ton, duty paid, \$135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); \$140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add \$6 for packed c.i., \$10 for ton, \$13.50 for less ton; \$1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone; Special, 21c; regular, 20.50c; medium, 14.50c; central zone; special, 21.30c; regular, 20.80c; medium, 14.80c; western zone; Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed: 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, \$1.90; contract, \$1.88; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton

lots \$1.23; less-ton lots \$1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots \$1.35; less-ton lots \$1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C \$142.50; 3-5% C \$157.50.

Ferrovandium: V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of \$3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.i. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.i. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.i. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.i. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy con-

High Silicon Silvery  
6.00-6.50 per cent (base) . . . \$36.00  
6.51-7.00 . . . \$37.00 9.01-9.50 . . . 42.00  
7.01-7.50 . . . 38.00 9.51-10.00 . . . 43.00  
7.51-8.00 . . . 39.00 10.01-10.50 . . . 44.00  
8.01-8.50 . . . 40.00 10.51-11.00 . . . 45.00  
8.51-9.00 . . . 41.00 11.01-11.50 . . . 46.00  
Fob Jackson, O., per gross ton. Buffalo base \$1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01-14.50%, \$50, Jackson, O.; \$53.25 Keokuk, Iowa; \$51.25 Niagara Falls, N. Y. Add \$1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; \$1 a ton for 0.045% max. phos.

Bessemer Ferrosilicon  
Prices same as for high silicon silvery iron, plus \$1 per gross ton.

Charcoal Pig Iron  
Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. \$37.50 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge  
Neville Island, Pa. . . . . \$30.00

Low Phosphorus  
Steelton, Pa., Buffalo, Troy, N. Y., \$36, base; \$35.38, del., Philadelphia. Intermediate phosphorus, Central furnace, Cleveland, \$31.

Differentials  
Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, \$2 a ton; for each additional 0.25% nickel, \$1 a ton.

## Refractories

Per 1000, fob shipping point  
Net prices

Fire Clay Brick  
Super Duty  
Pa., Mo., Ky. . . . . \$81.00  
High Heat Duty  
Pa., Ill., Md., Mo., Ky. . . . 65.00  
Ala., Ga. . . . . 65.00  
N. J. . . . . 70.00

Intermediate Heat Duty  
Ohio . . . . . 57.00  
Pa., Ill., Md., Mo., Ky. . . . 59.00  
Ala., Ga. . . . . 51.00  
N. J. . . . . 62.00

Low Heat Duty  
Pa., Md., Ohio . . . . . 51.00

Malleable Bung Brick  
All bases . . . . . 75.00

Ladle Brick  
(Pa., O., W. Va., Mo.)  
Dry Press . . . . . 42.00  
Wire Cut . . . . . 40.00

Silica Brick  
Pennsylvania . . . . . 65.00  
Joliet, E. Chicago . . . . . 74.00  
Birmingham, Ala. . . . . 65.00

Magnesite  
Domestic dead-burned grains, net ton, fob Chewelah, Wash.  
Bulk . . . . . 22.00  
Bags . . . . . 26.00

Basic Brick  
Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick . . . . . 54.00  
Chem. bonded chrome . . . . 54.00  
Magnesite brick . . . . . 76.00  
Chem. bonded magnesite . . . 65.00

## Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF<sub>2</sub> content, 70% or more, \$33; 65% to 70%, \$32; 60% to 65%, \$31; less than 60%, \$30.

zone, freight allowed, c.i. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. and 1.05c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.15c; ton lots 21.00c, less ton lots 22.00c eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.i. 9.50c, ton lots 9.50c less than ton 10.10c, central zone, add 0.3c for c.i. and 0.5c for smaller lots; western zone, add 0.70c for c.i. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.i., 79.50c, 2000 lb to c.i. 80c, central 81c and 82.60c; western 82.25c and 84.75c fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; east: Contract ton lots or more \$1.35, less \$1.80, pound of metal; \$1.36 and \$1.61



central, \$1.40 and \$1.65, western; spot up 5c.

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

**Calcium - Silicon:** (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, carlot, lump 13.00c, ton lots 14.50c, less 15.50c, eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western, spot up 0.25c.

**Silicon Metal:** Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

**Silicomanganese,** containing exactly 2 lb Mn and about 1/4 lb Si eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Fe-silicon,** weighing about 5 lb and containing exactly 2 lb Si, or about 2 1/4 lb and containing exactly 1 lb Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and

0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

**Manganese Metal:** (Min. 96% Mn, max. 2% Fe), per lb of metal eastern zone bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

**Electrolytic Manganese:** 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c. drum lots 36c, less than drum lot 38c. Add 1 1/4c for hydrogen-removed metal.

**Manganese-Boron:** (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, \$1.89, less \$2.01, eastern; freight allowed; \$1.903 and \$2.023, central, \$1.935 and \$2.055 western; spot up 5c.

**Nickel-Boron:** (B 15-18%, Al 1% max., Ni 1.50% max., C 0.50% max., Fe 3% max., Ni balance), per lb of alloy. Contract, 5 tons or more, \$1.90, 1 ton to 8 tons, \$2.00, less than ton \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

**Borosil:** 3 to 4% B, 40 to 45% Si, \$6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Boritan:** B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

**Carbortan:** B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11% Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

**Silvaz Alloy:** (Si 35-40%, Ca 9-11% Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western spot up 0.25c.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c, central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

**CMSZ Alloy 4:** (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

**CMSZ Alloy 5:** (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c,

packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

**Zirconium Alloy:** 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton \$102.50; packed \$107.50; ton lots \$108; less-ton lots \$112.50. Spot up \$5 per ton.

**Zirconium Alloy:** Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up 1/4c.

**Alaifer:** Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; less 7.25c. Spot up 1/4c. **Simalan:** Approx. 20% each Si., Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, less-ton lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Tungsten Metal Powder:** Spot, not less than 97%, \$2.50-\$2.60; freight allowed as far west as St. Louis.

**Grainal:** Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

**Vanadium Pentoxide, technical grade:** Fused, approx. 89-92% V<sub>2</sub>O<sub>5</sub> and 5.84% Na<sub>2</sub>O; or air dried, 83.85% V<sub>2</sub>O<sub>5</sub> and 5.15% Na<sub>2</sub>O, \$1.10 per lb contained V<sub>2</sub>O<sub>5</sub>, fob plant freight allowed on quantities of 25 lb and over to St. Louis.

## OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, excluding broker's commission, delivered at consumer's plant except where noted.

### OPEN HEARTH AND BLAST FURNACE GRADES

	—Heavy Melting—		No. 1 Busheling		Bundles			Machine Shop Turnings	Mixed Borings, Turnings	Short Shovel Turnings	Cast Iron Borings
	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2	No. 3				
Pittsburgh	25.00	25.00	25.00	25.00	25.00	25.00	23.00	20.00	20.00	22.00	21.00
Philadelphia	23.75-24.25	23.75-24.25	23.75-24.25	23.75-24.25	23.75-24.25	21.75-22.25	21.75-22.25	18.75-19.25	18.75-19.25	20.75-21.25	18.75-19.25
Cleveland	24.50	24.50	24.50	24.50	24.50	24.50	23.00	19.50	19.50	21.50	20.50
Buffalo	24.25	24.25	24.25	24.25	24.25	24.25	22.25	18.75	18.75	18.75	17.75
*Boston	20.35	20.35	20.35	20.35	20.35	20.35	18.35	14.00-15.00	14.00-15.00	16.00-17.00	14.00-15.00
Valley	25.00		25.00		25.00			17.50		19.50	18.50
Mansfield								17.50			
Chicago	25.00	25.00	25.00	25.00	25.00	25.00	23.00	18.75	18.75	20.75	19.75
Birmingham	22.00-22.50	22.00-22.50	22.00-22.50	22.00-22.50	22.00-22.50	20.00-20.50	20.00-20.50	14.50-15.00	14.50-15.00	16.50-17.00	15.50-16.00
San Francisco	19.50	19.50	19.50	19.50	19.50	19.50	10.00	8.00			
Cincinnati	24.50	24.50	24.50	24.50	24.50	24.50		18.20	18.20	20.00	17.00
†Detroit	22.32	22.32	22.32	22.32	22.32	20.32	20.32	17.32	17.32	19.32	18.32
†New York	20.33	20.33	20.33		20.33	18.33		15.33	15.33	17.33	
St. Louis	22.22	22.22						14.72		16.72	
Seattle	17.00	17.00		17.00				9.50	9.50		
Los Angeles	16.50	15.50		14.50		14.50		8.00	8.00		

### ELECTRIC FURNACE, FOUNDRY AND SPECIAL GRADES

	Bar Crops and Plate		Punchings and Plate Scrap		Electric Furnace Bundles		Heavy Turnings		Alloy Free Turnings		Cut Structural and Plate Scrap		No. 1 Chemical Borings		Tin Can Bundles	
	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	1 ft and under	2 ft and under	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Pittsburgh	27.50	27.50	27.50	27.50	26.00	26.00	24.50	24.50	23.00	23.00	27.50	27.00	24.00	24.00	21.00	21.00
Philadelphia	28.75-29.25	28.75-29.25	28.75-29.25	28.75-29.25	27.25-28.25	25.75-26.25	25.75-26.25	24.00	22.50	22.50	28.75-29.25	28.75-29.25	22.75-23.25	22.75-23.25	20.50	20.50
Cleveland	27.00	27.00	27.00	27.00	27.00	27.00	24.00	22.50	22.50	22.50	27.00	27.00	23.50	23.50		
Buffalo	27.00	27.00	27.00	27.00	27.00	27.00	24.00	22.50	22.50	22.50	27.00	27.00	23.50	23.50		
*Boston	22.85	22.85	22.85	22.85	21.35	18.00-19.00	17.00-17.50	17.00-17.50	8.00	8.00	22.85	22.85	18.00	18.00		
Chicago	26.25	26.25	26.25	26.25	24.75	23.25	23.25	23.25			26.25	25.75				
San Francisco	18.00	18.00									20.50	20.00			17.00	17.00
†Detroit			24.82	23.82	23.82						25.33	25.33	19.33	19.33		
†New York			25.00	21.33	21.33						24.50-25.00	24.50-25.00				
Birmingham	24.50-25.00	24.50-25.00	24.50-25.00	24.50-25.00												

### STEEL GRADES OF RAILROAD ORIGIN

	No. 1 Heavy Melting R.R. Steel		Railroad Malleable		Axles		Random Lengths		Cut 3-ft. and under		Cut 18-in. and under		Railroad Specialties		Uncut Tires		Angles, Splice Bars	
	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Pittsburgh	26.00	27.00	27.00	27.00	31.00	28.50	26.50	26.50	28.50	28.50	29.50	29.50	29.50	29.50	28.50	28.50	28.50	28.50
Valley	23.50																	
Chicago	26.00	29.00	29.00	29.00	30.75	27.25	25.25	25.25	27.25	27.25	28.50	28.50	28.50	28.50			27.25	27.25
Cincinnati	25.50	29.00	29.00	29.00	27.00	25.00	24.00	24.00	27.50	27.50					23.50	23.50	23.50	23.50
St. Louis	28.00	28.00	28.00	28.00	27.00	25.00	24.00	24.00	27.50	27.50					25.50-26.00	25.50-26.00	25.50-26.00	25.50-26.00
Birmingham	23.00-23.50				26.50	26.00	24.00-24.50	24.00-24.50	26.50-27.00	26.50-27.00	27.50-28.00	27.50-28.00			23.00	23.00		
San Francisco							21.00	21.00										
Seattle	17.00	17.00																

### CAST IRON GRADES

	No. 1 Cupola Cast		Charging Box Cast		Heavy Breakable Cast		Stove Plate		Unstripped Motor Blocks		Malleable		Brake Shoes		Clean Auto Cast		No. 1 Wheels		Burnt Cast	
	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Pittsburgh	33.00-35.00	27.00-29.00	26.00-28.00	26.00-28.00	29.00-31.00	26.00-28.00	26.00-28.00	26.00-28.00	30.00-32.00	30.00-32.00	23.75-25.75	23.75-25.75	33.00-34.00	33.00-34.00	28.00-30.00	28.00-30.00	23.75-25.75	23.75-25.75	23.75-25.75	23.75-25.75
Philadelphia	40.00-41.00	37.00-39.00	37.00-39.00	37.00-39.00	26.00-28.00	26.00-28.00	26.00-28.00	26.00-28.00	37.00-37.50	36.00	20.75-22.75	20.75-22.75	40.00-41.00	40.00-41.00	40.00	40.00	20.75-22.75	20.75-22.75	20.75-22.75	20.75-22.75
Buffalo	29.50				24.00	24.00	24.00	24.00												
*Boston	38.00-40.00	36.00-38.00	35.00-37.00	35.00-37.00									38.00-40.00	38.00-40.00						
Chicago	30.00-40.00								30.00-40.00	30.00					30.00					
*Seattle	25.00																			
Cincinnati	33.00	31.00	30.00	30.00	31.00	29.00	29.00	29.00					23.00	23.00			24.50	24.50		
†Detroit	35.00-37.00		28.00-30.00	28.00-30.00									35.00-37.00	35.00-37.00						
†St. Louis	25.00-30.00	25.25	22.75	22.75	27.00	27.00	27.00	27.00					20.25	20.25			26.00	26.00	20.25	20.25
†New York	36.00-37.00	33.00-34.00							34.00	32.00							30.00	30.00		
Birmingham	30.00		25.00	25.00	28.00	28.00	28.00	28.00	25.00	25.00			22.75	22.75			27.00	27.00		
Los Angeles	30.00																			

\* Fob shipping point; † fob tracks; ‡ dealers buying prices.



## NONFERROUS METAL PRICES

**Copper:** Electrolytic, carlots 19.50c, del. Conn.; Lake, 19.62½c, del. Conn. Dealers may add ¼c for 5000 lb to carload; 1c, 1000-4999 lb; 1¼c, 500-999 lb; 2c, 0-499 lb. Casting, 19.25c, refinery, 20,000 lb or more; 19.50c, less than 20,000 lb.

**Brass Ingot:** 85-5-5-5 (No. 115) 20.50c; 88-10-2 (No. 215) 24.75c; 80-10-10 (No. 305) 23.50c; No. 1 yellow (No. 405) 16.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

**Zinc:** Price western 10.50c, select 10.60c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 11.65c, chemical 11.70c, corroding 11.75c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester, Springfield, New Hampshire, Rhode Island.

**Primary Aluminum:** 99% plus, ingots 15.00c del., plus 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ¼c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 16.25c; No. 12 foundry alloy (No. 2 grade) 16.12½c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1 (95-97½%) 16.75c; grade 2 (92-95%) 16.25c; grade 3 (90-92%) 15.75c; grade 4 (85-90%) 15.31½c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.i. Extruded 12-in. sticks 34.00c-38.00c.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1¼c 1000-2239, 2¼c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straights, 70.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 69.87½c; Grade C, 99.65-99.79% incl. 69.62½c; Grade D, 99.50-99.64% incl., 69.50c; Grade E, 99.49-99% incl. 69.12½c; Grade F, below 99% (for tin content), 69.00c.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 23.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 24.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ¼c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.9%, fob refinery 38.50c lb; pig and shot produced from electrolytic cathodes 39.50c; "F" nickel shot or ingot for additions to cast iron, 37.50c. Prices include import duty.

**Mercury:** Open market, spot, New York, \$89-93 per 76-lb flask.

**Arsenic:** Prime, white, 99%, carlots, 4.00c lb.

**Beryllium-Copper:** 3.75-4.25% Be, \$14.75 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms \$1.50 lb, del.; anodes, balls, discs and all other special or patented shapes, \$1.55.

**Cobalt:** 97-98%, \$1.50 lb. for 550 lb (keg); \$1.52 lb for 100 lb (case); \$1.57 lb under 100 lb.

**Gold:** U. S. Treasury, \$35 per ounce.

**Indium:** 99.9%, \$2.25 per troy ounce.

**Silver:** Open market, N. Y. 87.00c per ounce.

**Platinum:** \$67.50 per ounce.

**Palladium:** \$24 per troy ounce.

**Iridium:** \$125 per troy ounce.

## Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 19.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

**Sheet:** Copper 30.93c; yellow brass 27.53c; commercial bronze, 95% 31.07c, 90% 30.56c; red brass, 85% 29.53c, 80% 29.02c; best quality 28.44c; Everdur, Duronze, Herculoys or equiv., cold-drawn, 35.79c; nickel silver, 18%, 39.82c; phosphor bronze, grade A, 5%, 48.82c.

**Rods:** Copper, hot rolled 27.28c, cold drawn 28.28c; yellow brass, free cutting, 22.28c, not free cutting 27.22c; commercial bronze, 95% 30.76c, 90% 30.25c; red brass, 85% 29.22c, 80% 28.71c; best quality 28.13c.

**Seamless Tubing:** Copper 30.97c; yellow brass 30.29c; commercial bronze 90% 32.97c; red brass 85% 32.19c, 80% 31.68c; best quality brass 30.85c.

**Copper Wire:** Bare, soft, fob eastern mills, carlots 25.52c, less carlots 26.02c; weatherproof, fob eastern mills carlot 26.42c, less carlots 26.92c; magnet, delivered, carlots, 28.93c, 15,000 lb or more 29.18c, less carlots 29.68c.

**Aluminum Sheets and Circles:** 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

**Lead Products:** Prices to jobbers: Full sheets 14.90c; cut sheets 15.40c; pipe, full coils 14.15c, cut coils 14.65c.

**Zinc Products:** Sheet fob mill 15.40c, 36,000 lb and over deduct 7%, Ribbon and strip 14.50c; 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 13.25c; 1-3 tons 14.25c; 500-2000 lb 14.75c; 100-500 lb 15.25c; under 100 lb 16.25c. Hull plate (over 12") add 1c to boiler plate prices.

## PLATING MATERIALS

**Chromic Acid:** 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

**Copper Anodes:** In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 27.34c; flat untrimmed, 27.84c; electro-deposited, 27.09c.

**Copper Carbonate:** 52-54% metallic Cu, 250 lb barrels nom.

**Copper Cyanide:** 70-71% Cu, 100-lb kegs or bbls. nom., fob, Niagara Falls.

**Sodium Cyanide:** 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

**Nickel Anodes:** 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

**Nickel Chloride:** 100-lb kegs or 275-lb bbls 18.00c lb, del.

**Tin Anodes:** 1000 lb and over nom. del.; 500-999 nom.; 200-499 nom.; 100-199 nom.

**Tin Crystals:** 400 lb bbls nom., fob Grasselli, N. J.; 100-lb kegs nom.

**Sodium Stannate:** 100 or 300-lb drums nom., del.; tons lots nom.

**Zinc Cyanide:** 100-lb kegs or bbls 33.00c fob Niagara Falls.

## Scrap Metals

## BRASS MILL ALLOWANCES

Prices for less than 15,000 lb fob shipping point. Add ¼c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	17.125	17.125	16.375
Yellow brass	13.750	13.250	12.875

## Commercial Bronze

95%	15.875	15.625	15.125
90%	15.750	15.500	15.000

## Red brass

85%	15.500	15.250	14.750
80%	15.375	15.125	14.625
Best Quality (71-79%)	14.625	14.375	14.125
Muntz metal	12.875	12.625	12.375
Nickel silver, 5%	14.500	14.250	13.750
Phos. bronze, A, B	18.125	17.875	16.875
Naval brass	13.250	13.000	12.500
Manganese bronze	13.250	13.000	12.375

## BRASS MAKERS' BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.25, No. 2 copper 16.25, light copper 15.25, composition red brass 15.50, auto radiators 13.00, heavy yellow brass 11.75, brass pipe 11.75.

## DEALERS' BUYING PRICES

(Cents per pound in ton lots or more)

**Copper and Brass:** Heavy copper and wire, No. 1 15.00-15.50; No. 2 14.00-14.50; light copper 12.50-13.00, No. 1 composition red brass 14.00-14.50, No. 1 composition turnings 13.00-13.50, mixed brass turnings 9.50-10.00, new brass clippings 12.50-13.00, No. 1 brass rod turnings 11.50-12.00, light brass 8.00-8.50, heavy yellow brass 10.00-10.50, new brass rod ends 11.75-12.00, auto radiators, unsweated, 11.00-11.50, clean red car boxes 12.50-13.00, cocks and faucets 11.00-11.50, brass pipe 11.00-11.50.

**Lead:** Heavy lead 10.00-10.25, battery plates 5.25-5.50, linotype and stereotype 12.00-12.50, electrotype 10.50-11.00, mixed babbitt 12.00-12.50, solder joints 13.50-14.00.

**Zinc:** Old zinc 5.50-6.00, new die cast scrap 5.50-6.00, mixed die cast scrap 4.00-4.50.

**Tin:** No. 1 pewter 44.00-45.00, block tin pipe 60.00-62.00, auto babbitt 35.00-36.00, No. 1 babbitt 35.00-38.00, siphon tops 38.00-40.00.

**Aluminum:** Clippings, 2S, 9.00-9.50, old sheets 7.00-7.50, crankcases 7.00-7.50, turnings 3.00-3.25, pistons, free of struts, 6.00-6.50.

**Nickel:** Anodes 19.50-20.00, turnings 16.50-17.00, rod ends 19.00-20.00.

**Monel:** Clippings 14.00-15.00, turnings 9.00-10.00, old sheet 12.00-13.00, rods 12.50-13.00, castings 9.50-10.00.



# Leading Steel Producers Revise Sheet and Strip Prices Upward

*Adoption of new base prices and extra lists results in overall increase to consumers though some base gages are quoted lower. New extra cards reflect higher costs and largely conform with schedules discussed over past months with OPA*

Sheet & Strip Prices, Page 152

REVISION in base prices and extra lists on the flat rolled steel products was effected last week by leading producing interests, resulting in a general overall increase to the consuming trade.

Actually the price changes stemming from the combined base price and extra revisions range from slight reductions in base on some items, to sharp increases in some instances if extra revisions are considered. Comparisons with former price levels are difficult to determine immediately, increases being only partly reflected in base quotations.

For the most part the revised flat rolled steel extra schedule culminates from discussions over the past two years with the Office of Price Administration. It will be recalled various product committees had been appointed to work out new lists, and it is understood that the revised sheet card now being adopted actually had been agreed to by OPA though not authorized up to the time price control was removed.

These changes were first revealed in new price lists issued by Newport Rolling Mill Co., Sharon Steel Corp., American Rolling Mill Co. and several other producers shortly after government price decontrol and were followed last week by Carnegie-Illinois Steel Corp., Bethlehem Steel Co., Republic Steel Corp. and other leading producers.

The new base price on cold-rolled sheets is 3.20c plus new extras for gages and compares with the former base price of 3.275c, principal basing points. The new price represents an advance on most of the lighter gages because of a revision in extras, but a reduction on some of the heavier gages, such as Nos. 11, 12 and 13.

The new base price for hot-rolled sheets is 2.50c, principal basing points, compared with 2.425c previously but this does not reflect completely the increase. New extras have been established for gages up to No. 18 and a new extra card is being prepared for 19 gage and lighter. When the final schedule is determined, some lighter gages will be priced at a higher level than corresponding cold-rolled items. The 19 gage and lighter sheets will likely be classified as "hot-rolled annealed."

Galvanized sheets are now priced on a No. 10 gage base with new extras for gage and coating, the latter fluctuating with the price of zinc. The former schedule was set up with No. 24 gage as the base price. Corrugated galvanized sheets were based on 29 gage, while the new schedule is based on 10 gage at 3.55c with 10 cents per 100 pounds extra for corrugating and with additional specified extras for gage and coating.

Enameling sheets, previously having 10-gage and 20-gage base prices, now have a single 12-gage base. Up to late last week, new price lists on electrical

sheets had not been issued.

Hot-rolled strip was placed early this year on a split price basis, having a separate base price for 6-inch and narrower and another one for over 6 inches. This latter practice is now eliminated and a single base price of 2.50c for all widths, has been effected, resulting in increases of \$1 on 6-in. and narrower and \$3 on over 6 inches. Revisions in extras add further to actual increases to consumers.

In the case of long ternes, new prices are based on 10 gage, commercial coating, at 3.55c, principal basing points. This compares with a base price of 4.05c for No. 24 unassorted which had prevailed previously.

Selective selling has been crystallized as a definite policy of the leading producers. In releasing their new price lists, producers named only one to three basing points. These generally were restricted to points close to the mills producing the particular product. Producers are concentrating their sales efforts to "home" districts but reserve the privilege of quoting on other basing points where necessary to meet competition.

## Sheets, Strip . . .

New York — Delivered prices here on principal grades of sheets have advanced, as a result of revisions by an increasing number of leading producers. Delivered prices on hot-rolled and galvanized sheets from Sparrows Point, the governing base on shipments of this material here, are now 2.72c, New York, and 3.77c, New York, respectively, the latter for No. 10 gage, as compared with 4.31c for No. 24 gage, which was formerly the base gage. Cold rolled sheets delivered from Buffalo, the governing base for this district, is now 3.54c, New York, on commercial quality, as against 3.615c, New York, previously. However, as most trading heretofore had been in the so-called "mill run" material, which was 10 cents a hundred pounds under the base price, the new figure to all practical intents and purposes represents an increase of 2½ cents per hundred pounds.

With at least the temporary abandonment of the issuance of ratings which came just before the end of the coal strike, no priority tonnage has been reported recently. However, practically 90 per cent of the rated tonnage required for first quarter had already been placed, much of it falling during the latter part of November and the first few days of this month.

Boston — Advances in base prices and extras on carbon sheets and strip by more producers is accompanied by geographical considerations in sales policies affecting distribution in New England. Continuance of this trend will mean the development of new sources of supply. Some consumers are already confronted

with this necessity and new connections are difficult in view of heavily sold position of mills. Cold-rolled strip producers, notably in narrow sizes, are probably most extended in the flat-rolled category; carryovers are even heavier than foreseen with cold reduction schedules depending on erratic supply of hot-rolled. Following a prolonged shutdown due to strike, Newman-Crosby Steel Corp., Pawtucket, R. I., cold strip mill, has resumed operations. Trenton, N. J., strip producer granted 4.05c, Worcester, by OPA continues on that level for cold strip. Starting Jan. 1, tack plate tonnage will be sold direct by the largest producer; this is a large tonnage hot-rolled sheet classification in this area. For many years tack plate has been sold through a distributor.

St. Louis — Sheet production here escaped the coal strike largely unscathed, rollers shifting to other fuel. The change-over required about 3 days, however, during which time there was loss of an irrecoverable tonnage. Railroad cars were adequate for flat steel shipments. Mills last week adopted a set of extras which involves a price increase on certain light gages, although it amounts to a decrease on some items. These were the extras tentatively approved by an OPA committee before decontrol.

Pittsburgh — Leading producers have revised sheet prices upward in line with that announced recently by American Rolling Mill Co., including revisions in extras for size, gage, quality, processing and packaging. Carnegie-Illinois Steel Corp. announced last week the following price changes for sheets and strip: Hot-rolled sheets, \$2.525 per 100 pounds, Pittsburgh; \$2.53 at Chicago, and \$2.525, Youngstown. Cold-rolled commercial quality, \$3.225, Pittsburgh; \$3.23, Chicago. Galvanized, 10 gage, \$3.575, Pittsburgh; \$3.58, Chicago. Galvanized, Dulkote, 10 gage, \$3.975, Pittsburgh; \$3.98, Chicago. Flat culvert sheets, 16 gage, copper steel, \$4.175, Pittsburgh; \$4.18, Chicago. Galvannealed, 10 gage, \$4.125, Pittsburgh. Long ternes commercial coating, 10 gage, \$3.575, Pittsburgh; \$3.58, Chicago. Vitreous enameling, 12 gage and heavier, \$3.575, Pittsburgh; \$3.58, Chicago. Hot-rolled strip prices have been established on a \$2.50 per 100-pound base, with no distinction for over or under 6 inches wide.

Chicago — Inland Steel Co. has adopted new prices in line with those announced by Sharon Steel Co. and Republic Steel Corp. Hot-rolled sheets are advanced from 2.425c to 2.50c, Chicago. Cold-rolled sheets are reduced from 3.275c to 3.20c, with No. 15 becoming base gage instead of No. 17. Hot-rolled strip is advanced from 2.45c for 6-in. and narrower and 2.35c for 6-in. and over to 2.50c. Cold-rolled strip is advanced from 3.15c to 3.20c with No. 15 becoming base instead of 17 gage. The 10c discount for acceptance of mill runs has been discontinued.

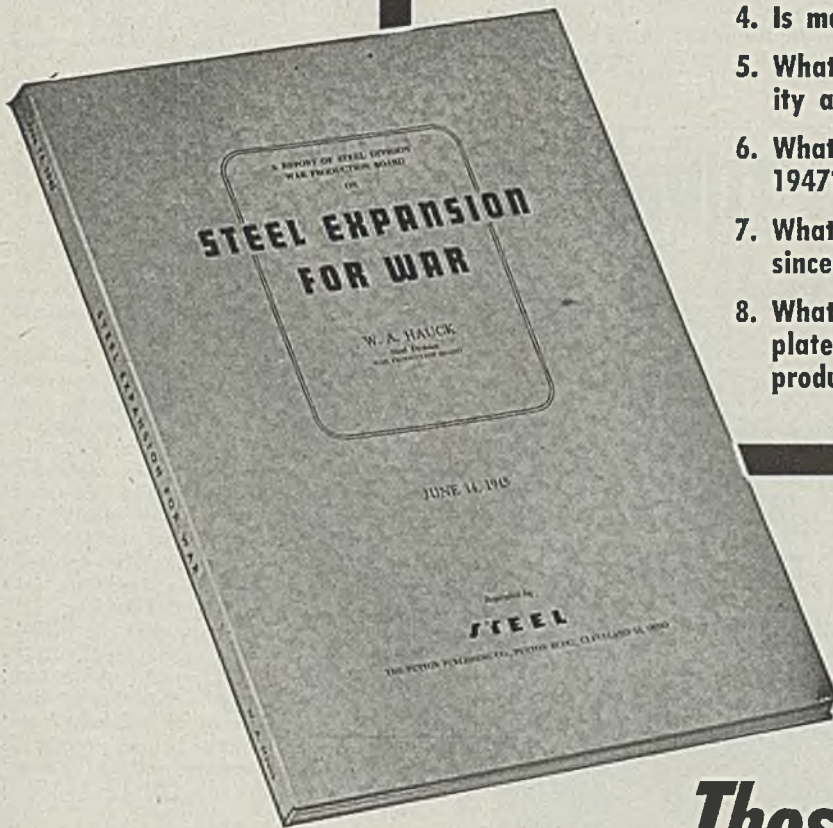
Enameling sheets are advanced from 3.20c to 3.55c for 12 gage and heavier, with only one base gage instead of two. Galvanized sheets are changed from 4.05c for 24 gage to 3.55c for 10 gage. On all, new gage and size extras apply, and in the case of galvanized sheets, coating extras.

Wisconsin Steel Co., which produces a small amount of hot-rolled strip, has increased its prices to correspond to those of other mills.



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## Prices on Some Bars, Rails, Track Accessories Advance

A major steel producer announced price advances last week on hot-rolled and carbon bars and reinforcing bars, effective Dec. 16; also on rails and track accessories, effective Dec. 13. Other sellers are expected to follow.

This producer advanced hot-rolled bars \$2 per ton to \$2.60 per 100 pounds. Extras on this item were completely revised, resulting in an average increase of about \$2 per ton.

Carbon reinforcing bars, mill lengths, were also advanced \$2 a ton to \$2.45 per 100 pounds. This producer has eliminated the \$5 per ton discount to jobbers

and fabricators, but at the same time has raised the extras from \$5 to \$10 a ton for fabricated concrete bars.

The price basis for rails has been changed. Rails are now quoted at \$2.50 per 100 pounds, equivalent to \$50 per net ton. The previous price was \$43.40 per net ton. On light rails, this major producer is now quoting \$2.85 per 100 pounds compared with \$49.18 per net ton, or \$2.45 per 100 pounds on the old basis. This is equivalent to an increase of \$8 per ton.

Splice bars are now quoted at \$3 per 100 pounds, representing an increase of \$3 per ton.

Tie plates are quoted at \$2.80 per 100 pounds, fob mill, or an increase of \$5 per ton.

## Steel Bars . . .

Bar Prices, Page 152

Boston—Dearth of carbon bars in small sizes, one-inch and under, is affecting operations and acceptance of new orders for finished products fabricated from bars in that range. Some producers are taking no new volume in half-inch fastenings, being booked far ahead with future small-size bar supply uncertain. Mill schedules are undergoing further revisions for first quarter based on finished tonnage lost late this quarter. Some allotments have been canceled or reduced in small sizes. Consumer inventories are better balanced in heavier carbon bars and alloys.

Birmingham — Republic Steel Corp. will modernize its bar mill at Gadsden, Ala., by installation of new equipment to cost \$200,000, the company announced here last week. Present capacity is about 10,000 tons.

St. Louis—Merchant bar supplies were affected relatively little here by the coal strike, since most open hearths use, or were converted to, gas or oil. Tonnage was scheduled for shipment on only one day of the embargo and most of this was sent by truck. Drawers have been operating on such a narrow margin in raw materials, however, they fear a backlash may reach them later in lime, old rails and pig iron. Production has remained at capacity for several weeks. Demand continues steady at a high point but some easing of pressure is noted. Consumer goods manufacturers are reported taking a more cautious attitude on inventories and occasionally holding off for tax reasons or to appraise the effect of price increases. A schedule of extras on merchant bars, of possibly \$2 a ton over list, is expected in this district before Jan. 1. Deliveries of merchant bars are two to three months behind promises, but reinforcing bars are practically current.

## Tubular Goods . . .

Tubular Goods Prices, Page 153

Pittsburgh — Producers have not yet raised prices on standard steel pipe or alloy and carbon steel tubing. However, a revision in pipe discount cards is believed imminent.

A. M. Byers Co. has raised wrought iron pipe 14 per cent on butt weld and 12 per cent on lap weld. Cast iron pipe interests are booked 12 to 15 months ahead. With exception of wrought iron pipe, little headway has been made against order backlogs in recent months.

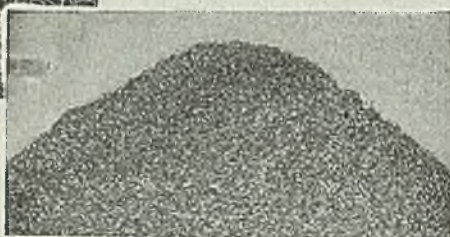
Output of seamless pipe rebounded sharply since termination of the coal strike. In most instances deliveries on oil country goods are extended through the first half.

Youngstown — Youngstown Sheet & Tube Co. has booked a pipe order, said to involve thousands of tons of material, from the Magnolia Pipe Line Co. for part of a 650-mile 20-inch crude oil line. National Tube Co. also shares in the order. Delivery will start in spring. It is understood Sheet & Tube also is being considered for another big pipe order for a 632-mile 20 inch line for Stanolind Pipe Line Co., which will be built in 1947.

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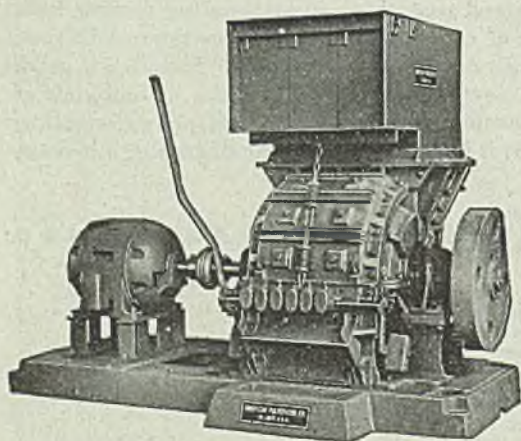


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## Tin Plate . . .

**Effective Jan. 1, coke tin plate prices to advance to \$5.75**

Tin Plate Prices, Page 153

Pittsburgh — Carnegie-Illinois Steel Corp. and other leading sellers last week raised tin plate prices to \$5.75 per base box, effective Jan. 1, for full year 1947. This price is 50 cents above that granted by OPA and 75 cents above that charged by producers the last half of 1946. Sellers also increased deductions from tin plate base on canmaking quality black plate 25 cents per base box. They also increased export tin plate prices \$1 to \$6.60 per base box.

Tin mill black plate, 29 gage and lighter advanced to 3.50c, Pittsburgh, effective Jan. 1. Prices at other basing points were proportionately higher.

Early revision of tin plate conservation order M-81 is expected, applicable on first-quarter shipments. It is indicated present regulations requiring the channeling of 70 per cent of tin plate production into containers for perishable foods, pharmaceutical and related items will be dropped. However, the industry is confronted with a 4.3 million-ton tin mill product demand next year, against a 3.8 million-ton estimated output, which makes it necessary to continue overall tin coating controls. Although tin plate output wasn't adversely affected by the coal strike to extent of other steel products, it appears improbable that industry's fourth-quarter production goal of 850,000 tons will be reached. Carnegie-Illinois Steel Corp. was able to maintain full production schedules during the coal strike but Jones & Laughlin Steel Corp. was not so fortunate. The Maritime strike has resulted in a carryover of 75,000 tons of export quota tonnage scheduled for this quarter, which has to be made up next period. This tonnage will bring the industry's first-quarter export quota load to 130,000 tons, compared with 136,000 tons for current period.

Birmingham—Tennessee Coal, Iron & Railroad Co. announced an advance last week in coke tin plate for delivery and consumption in the United States and applicable to shipments during 1947 to the basis of \$5.85 per base box of 100 pounds, plus applicable switching or transportation charges. The former price was \$5.35.

Chicago—Carnegie-Illinois Steel Corp. has announced that price of coke tin plate will be advanced 50 cents per base box of 100 pounds, from the former ceiling of \$5.25 to \$5.75, Chicago, effective Jan. 1. In part, the increase reflects higher tin prices since the demise of OPA. If 1947 contracts are made at the \$5.75 level, it will mean an increase of 75 cents per box to consumers, for major 1946 contracts were made at the \$5 price in effect at the beginning of that year. It has been customary to make contracts on an annual basis and at a firm price, therefore the 25-cent increase granted by OPA effective Feb. 15, 1946, was not charged.

Washington—Tin Plate Industry Advisory Committee has recommended that the Civilian Production Administration continue its decontrolling policy and remove present restrictions which channel

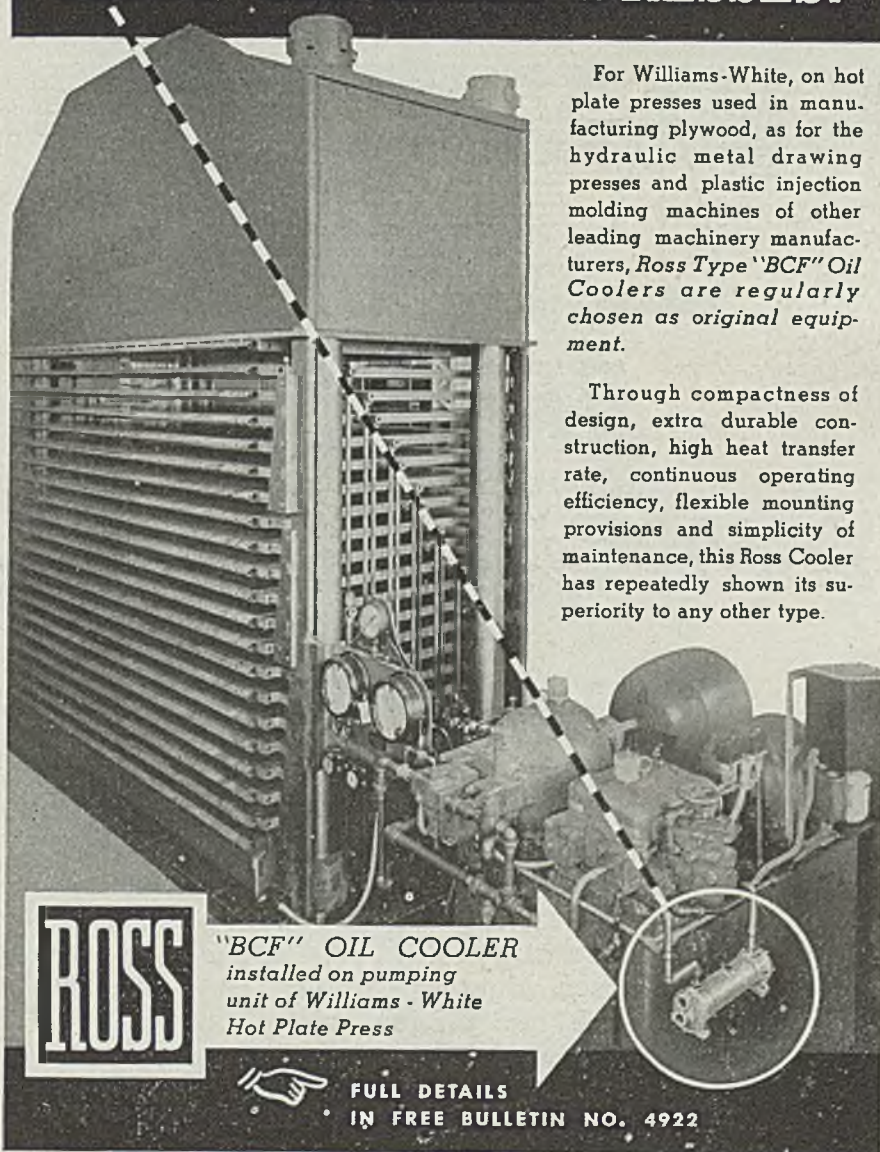
70 per cent of tin mill output into the packaging of perishable and seasonable foods and pharmaceuticals. Confronted with CPA estimates of demand for 4,300,000 tons of tin mill products in 1947, compared with an estimated production of 3,800,000 tons, the committee reaffirmed its previous position that overall tin-coating controls should be continued through next year. The world tin supply will not be sufficient to meet unrestricted demands until late in 1948, E. V. Vogelsang, chief, Tin-Lead-Zinc Branch, CPA, said.

Allocation of tin to the United States for the last half of 1946 has been raised from 6400 to 7280 tons, the Combined Tin Committee has announced. This includes the quantity already allocated on

an interim basis for the period and does not include domestic smelter production. Supplies of tin may be obtained from the following sources: Belgian, British or Dutch; South African and Japanese stocks in the United States. For Latin American countries, the United States is an additional source for limited quantities, and supplies will also be available to France from Indo-China and to the United States from China. China was formally represented on the committee for the first time at its recent meeting and the membership of the committee now consists of representatives of Belgium, China, France, the Netherlands, the United Kingdom, and the United States.

New York—While 136,000 tons of tin

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plate was originally scheduled for export in the current quarter, disruptions in production and transportation have resulted in a situation which points to a substantial carryover at the end of this period. Consequently export allocations of tin plate for next quarter will likely be off considerably. So far only 55,000 tons of additional tin plate have been allocated for shipment during the first three months of next year and some trade interests doubt if this figure will be increased in important degree.

Incidentally, Australia, which has been receiving more tin plate than any one country during the past year, is scheduled to get 15,000 tons of the 55,000 tons now set up. During the current quarter she was scheduled to receive

30,000 tons of the 136,000 tons originally allocated.

Meanwhile, most leading sellers have advanced their price on tin plate for export \$1 a ton, to \$6.60 per base box of 107 pounds.

## Wire . . .

Wire Prices, Page 153

New York—Extra on welding quality wire, 0.13-0.18 carbon, has been advanced 35 cents to 50 cents per 100 pounds and other price adjustments are in the making, but no general increase in wire or rods has developed. Wool wire, quality extra one cent per pound, is under study. Rod shipments are being resumed

where halted by the coal strike, but supply of semi finished, on a quota basis, is restricted. Finished wire allocations for first quarter are held down by heavy carry overs in certain products, notably flat wire. Pressure for delivery is unabated, from wire formers especially without regular sources of supply. Inquiry is shunted about and only spot openings are available for firm orders on numerous grades. Many new consumers have entered the field since the war ended without an established source. Supply of nails on the eastern seaboard is not reflecting the large increase in production, better than 70,000 tons monthly; midwest-produced nails are not moving east because of freight absorption.

Boston—Price structure on low-margin wire products is under review and advances in addition to scattered increases already operative are in prospect around Jan. 1. While higher prices are likely for items on which production is low, some specialties are also in for adjustments, probably clock spring material. Clock-makers are expanding capacity, a factor in heavy demand and pressure for this grade. Mills will start the new year with heavy backlogs with first quarter capacity for some products filled despite efforts to eliminate tonnage long overdue. Producers are limited in ability to accept new volume and consumer quotas are under estimated requirements in most instances. Screw manufacturers, among others, need more material, both rods or wire, and cold-drawn screw stock inventories are low. Consumers requiring a wide range of sizes and grades, as do screw producers, are especially hampered by unbalanced inventories.

## Pig Iron . . .

Producers advance prices generally \$2 a ton; Buffalo basic rises \$2.50

Pig Iron Prices, Page 155

New York — Although Eastern Pennsylvania furnaces generally have now advanced their prices on all grades \$2 a ton, the leading Buffalo furnaces have since increased their prices \$2.50 on basic and \$2 a ton on the other grades. This also applies to the Troy, N. Y., furnace which is now quoting on an f.o.b. basis, as noted in last week's issue. One of the Troy furnace's principal grades is low phosphorus, which is now being quoted at \$36.

As a result of the \$2 advance on all grades at Bethlehem, Pa., the Newark, N. J., delivered price on No. 2 foundry is \$33.20; on basic, \$32.70; bessemer, \$34.20; and malleable, \$33.70; and the Brooklyn delivered price on No. 2 foundry is \$34.28, and on malleable, \$34.78. Two dollar advances in the South bring the delivered Newark, N. J., price on No. 2 foundry iron from Birmingham, Ala., up to \$32.82.

Meanwhile melting operations in the New York metropolitan area are being stepped up, now that the coal strike has been called off. Improvement is going to be gradual for a while, however, particularly in view of the acute shortage of coke. By-product ovens are stepping up their operations, but slowly.

Chicago — Several furnace interests here have advanced pig iron prices by



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\$2 a ton. The advances were effective Dec. 5, and raise No. 2 foundry and malleable to \$30.50, basic to \$30 and bessemer to \$31, Chicago base. In addition, the switching charge for local delivery has been advanced from the arbitrary 60 cents per ton previously in effect to \$1 a ton. With end of the coal strike, suppliers have been pressed by customers for delivery of iron. Foundries lost little production because of the strike and the shipping embargo was not in effect long enough to be felt. By end of last week, all but two of the 13 blast furnaces banked during the coal strike had been restored to production. These two are Inland Steel Co. stacks one of which was making merchant iron for the veterans housing program. Another week or two is expected to see their resumption.

**Boston** — Production at the Mystic furnace was resumed last week. With December half gone it is doubtful if rated tonnage assigned Everett for delivery this month can be shipped.

Deliveries from outside furnaces, notably Buffalo will be lower this month and more foundry closings and curtailments in melt are ahead. Melter have reached the limit in filling gaps with scrap. Not only are foundry and other melters confronted with raw material shortages but increased costs through price advances and higher freights, latter due to producers supplying this are going on shipping point basis. Iron is as short as any time during the many periods of crisis in recent years. Not until Mystic is in blast is relief in sight and this depends on solid fuel administration.

**Pittsburgh** — Pig iron output has rebounded sharply following termination of coal strike. By week-end near normal production had been resumed, with about 45 out of 54 furnaces back in operation. At the time the coal strike was called off but 20 out of 54 furnaces were pouring iron and many of those still in operation were not being pushed to capacity. Many foundries resumed normal operations by close of last week following resumption of full scale output of by-product and beehive foundry coke. Shortage of coke rather than pig iron was major factor in reducing foundry operations during coal strike.

All merchant foundry operators have followed the \$2 price advance initiated by E. & G. Brooke Iron Co., Birdsboro, Pa. New England interests are reported to be pricing their iron on an fob shipping point basis rather than an Everett, Mass., base. Resignation of Wyatt, NHA administrator, leaves in doubt whether or not government's premium payment and directive tonnage programs for veterans housing will be continued.

**Birmingham** — Return to near normal operations has been phenomenal in this district following conclusion of the coal strike. The state's mines were virtually back to 100 per cent operations in the most spectacular return-to-work movement in the history of Alabama coal mining.

Sloss-Sheffield Steel & Iron Co., placed its idle blast furnace in operation last week while Republic resumed production at its two East Thomas furnaces, while Woodward Iron Co. has blown in one idle furnace, making two in production and one under repairs.

The district's foundries went back into

production Tuesday with restoration of gas service.

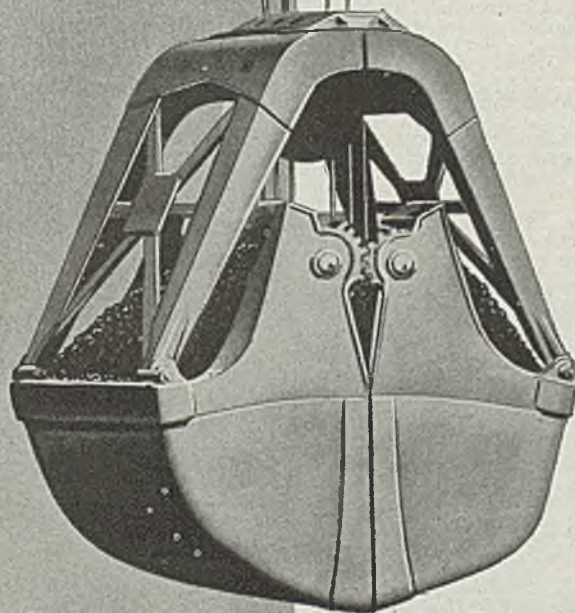
Pig iron prices on the Birmingham base now are \$26.88 for No. 2 foundry, \$25.50 for basic, and \$31.50 for bessemer.

**St. Louis**—Pig iron remains scarce with some mills unable to obtain their allocations in full. Local iron production has been near the 50 per cent rate several weeks due to repairs on one blast furnace. Scarcities at other production points has reduced some foundries to a hand-to-mouth basis, with the result they are increasing use of scrap and making a further drain on the already tight scrap market. A number of foundries are reported offering premium prices for scrap that mills are unwilling to meet. Ground stocks of pig are virtually nonexistent and

CPA a month ago cut off one mill's allocation until it used a reserve it had accumulated. The gap created in pig production by the rail embargo is not expected to reach here for several weeks.

**Buffalo** — Shipping and switching charges were added to price increases of \$2 to \$2.50 a ton on pig iron by area producers. Sellers are getting the full basing point price on shipments to the seaboard and the New England territory. Freight and shipping costs have been absorbed by sellers for more than 15 years. While extra costs will be added, Eastern consumers will be in a better position to get deliveries as producers will be more inclined to ship to them now that prices received will be the same all over. Grades advanced \$2 were found-

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dry at \$30.50, malleable at \$31, and silvery with prices gaged according to silicon content. Basic was advanced to \$30.50, a \$2.50 jump, the extra 50 cents bringing the local market in line with markets elsewhere. Producers reported that higher prices did not check the pressure for deliveries. Coke supplies, however, threatened to retard foundry operations in some cases. Iron output rebounded from the coal strike curtailment with Bethlehem's Lackawanna plant re-lighting three furnaces.

**Philadelphia**—Price structure in eastern pig iron market continues to undergo revision, with Sparrows Point being dropped completely as a base and Steelton, Pa., being set up as a base on foundry, bessemer and malleable, as well as basic and low phos. Prices at Steelton are at the \$2 advanced level on all grades, as was established throughout the market.

The smaller of the two stacks at Swedeland, which was blown out recently for repairs, is expected to be in operation again by Jan. 1, and the furnace at Birdsboro, which was blown out because of a stringency in coke, may be back in operation by latter part of this week, should sufficient coke materialize. Some other district furnaces, which were only banked, are now back in production.

**Washington**—Certification plan under which foundries receive preference in purchasing pig iron to be used for housing products and for railroad brakeshoes has been extended through the first quarter of 1947. Under this plan, foundries which have orders for railroad brakeshoes or for any of the housing products listed in direction 13 to order M-21 may obtain preference by certifying to this effect in applying to their suppliers for pig iron to be shipped in the first three months of 1947. The direction also authorizes a change in the sizes of the various housing products, such as bathtubs, which are entitled to this certification assistance to conform to the same sizes of housing products which are entitled to receive priorities assistance in obtaining steel. The latter group is listed in schedule A of direction 18 to PR-28.

## Structural Shapes . . .

Structural Shape Prices, Page 153

**Chicago**—Activity in structural steel awards and inquiries lessened appreciably during the recent coal strike and there is little indication that it will revive before early next year. Fabricators suffered little by the freight embargo, because it was of short duration. However, mill production of plain shapes suffered from reduced rolling operations during the strike.

**New York**—While a fair amount of structural tonnage is being figured, recent orders are light and are featured by the award of 525 tons for a brewery in Brooklyn. Bids have been opened on two schools in the Bronx, but figures so far exceed appropriations, it is said. There is question as to whether action will be taken at this time.

**Boston**—Thirteen small bridges, but two requiring 100 tons or more, will be bid to the state highway commission, Dec. 18; inquiry for 12 is for furnishing structural steel, while for the 13th, Presque

Isle, erecting estimates are also requested. Active bridge inquiry for the district is just under 1000 tons. Although shape mill schedules are again being revised, warehouses had been led to the belief more structural tonnage would be delivered in first quarter. This now appears to be dependent on replenishing semi-finished supplies. Buffalo has been withdrawn by one mill as a base for wide-flanged material.

## Steel Plates . . .

Plate Prices, Page 153

**Boston**—Deliveries on fourth quarter plate quotas will fall short. Fabricators and distributors are getting but small portion of allocations and are piecing out requirements to maintain production with difficulty. Substantial part of the quotas will go into the year-end carry over, resulting in revisions in first quarter schedules. Fabricators have managed to keep going by drawing on warehouse sources, but with the latter getting less tonnage, operations are endangered. Tightness in plates contributes to the relatively wide range of base and delivered prices; while this range is a factor in fabricator estimates, temporarily at least, the main object is to acquire steel with price secondary to delivery or even space on schedules.

## Scrap . . .

Scrap Prices, Page 156

**Pittsburgh**—Scrap supply for winter months remains critical despite the sharp reduction in steel ingot production during the coal strike. Shipments of scrap to consumers' yards are somewhat heavier than just prior to lifting of price controls but are still substantially below indicated requirements. Decline in finished steel shipments, due to the coal strike, will adversely affect metalworking operations in the weeks ahead and, consequently, will result in a reduction of scrap generated at industrial plants.

Cast iron scrap prices continue to tend upward with a few sales reported as substantially above the general market for No. 1 cupola cast, now selling between \$30 and \$35 a ton. The smaller foundries are particularly short of cast scrap.

Extensive trading for unprepared material to be used as exchange for badly needed finished steel has forced unprepared scrap prices up sharply in recent weeks.

**New York**—Dealers have advanced their prices on No. 1 cupola scrap to \$36 to \$37 a ton, on charging box cast to \$33 to \$34 and on unstripped motor blocks to \$34. Trading in malleable is light but nominally higher at \$32. Punchings and plate scrap have advanced to \$25 and cut structural and plate scrap to \$25.33, for all sizes two feet and under. Heavy melting steel grades are unchanged but strong. Demand is active, but movement is improving gradually.

**Philadelphia**—The steel scrap formula, involving a \$5 increase over former OPA ceilings, is undergoing serious strain. Consumers' buying prices so far have held fairly steady, but the underlying tons is exceedingly strong, with some speculative buying by dealers at higher levels. The low phos grades have gone up about \$2.50 a ton, and the cast iron grades are



generally higher. The two leading consumers of chemical borings are still paying \$22.75 to \$23.25, delivered, but higher prices are reportedly being paid in other directions.

**Buffalo**—Mild weather has increased the movement of scrap in this area. Dealers report a standing demand to take whatever material is available. Complaints, however, are heard among some dealers that an increased volume of reciprocal deals, by-passing the dealer and broker, are reflected in current transactions. One of the leading yard dealers notes higher prices promoting an increased flow of material. Coming before the current navigation season closes, two more boatloads, one with 5000 tons of heavy melting and the other with a similar tonnage of rails, arrived for the Duluth section last week.

**Boston**—Cast grades are erratic in price on the strong side, but some consumers are resisting advances while others have bought cast outside, paying high freights. As high as \$50 has been asked for best cast and one sale at Watertown Arsenal brought a high of \$46.18 for No. 1 cupola cast. Many refuse to pay better than \$40, but other grades of cast are bringing prices above recent tops in scattered sales, including \$38 for heavy breakable, an increase of \$3. Steel making grades are more stable and prices for most part are unchanged.

**Detroit** — It appeared for a time, following release of certain automotive scrap lists for open bids, that the former free market was being restored, but a change of policy, forced no doubt by pressure from steel company sales departments, resulted in the continued channeling of scrap tonnages to specific mills. The market in general has stabilized at the new higher levels, with most brokers and dealers holding to prices. Cast grades are an exception, although even these have eased somewhat in the past two weeks. A slight lag in shipments has been noted, probably the result of the brief rail embargo.

## Coke By-Products . . .

Coke By-Product Prices, Page 153

**Chicago** — By-product foundry coke, delivered Chicago, has been advanced 25 cents a ton, from \$15.10 to \$15.35, by virtue of an increase in the former arbitrary switching charge from 75 cents per ton to \$1 a ton. Cokemakers in the district are restoring rapidly the ovens which were idled by the coal strike. There is some question as to how rapidly full capacity can be achieved, this being dependent upon how fast coal arrives from the mines and whether the government diverts any of the shipments to keep essential industries fueled up.

## Warehouse . . .

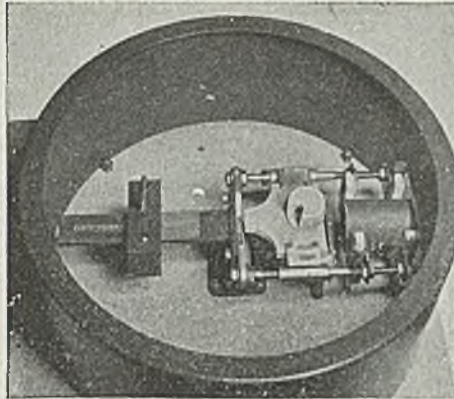
Warehouse Prices, Page 154

**Cleveland**—Following upward revision in sheet prices by mills, several warehouses here made corresponding adjustments last week. Hot-rolled sheets at the warehouse level generally are quoted as follows: No. 7 gage, 3.85c; No. 8, 3.95c; No. 10, 4.00c; No. 11, 4.10; No. 12, 4.15c; No. 14, 4.30c; No. 16, 4.45c; and No. 18, 4.60c. Width extras for 48 inches through 60 inches are 10 cents

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for Nos. 7 and 8 gages; 15 cents for Nos. 9 through 14 gages; 10 cents for No. 15 gage; and 5 cents for Nos. 16 through 18. Extras for widths 60 inches through 72 inches are: 20 cents for Nos. 7 and 8 gages; 25 cents for Nos. 9 through 12; 30 cents for Nos. 13 and 14; 25 cents for No. 15; 20 cents for No. 16; and 40 cents for Nos. 17 and 18.

Length extras for 16 gage and heavier are: 168 to 192 inches, inclusive, base; over 192 inches through 240 inches, 10 cents; over 240 inches, 25 cents. Length extras for 17 gage and 18 gage are: Over 168 inches through 240 inches, 10 cents.

Cold finished sheet is quoted by warehouses on the basis of 5.15c for 10 gage and 4.60c for 17 gage plus extras for widths and lengths.

Galvanized sheet, 10 gage, is quoted 5.197c Cleveland delivered.

Washington — Allocation of 50 per cent of surplus metals "across the board" for disposal to established steel warehouses was recommended to the War Assets Administration last week by Surplus Usable Steel Industry Advisory Committee, to offset low supplies of steel mill products. W. H. Kelley, chief, Metal Sales for WAA, advised the committee that he anticipated 75 per cent of present inventories of government-owned surplus steel and nonferrous products would become available within 60 days.

New York — Spreads in warehouse prices are confusing; most independent distributors have advanced plates, shapes and bars or rather restored quotations on products on which absorption was required by previous OPA ruling. In gal-

vanized sheets secondary price advances range from 10 cents to \$1.50 per 100 pounds. Scattered increases also follow individual mill markups in various other products. Demand for steel from ware-

Philadelphia — Warehouses here have advanced prices on light flat rolled products in line with mill price changes, with a new system of prices for gages. Also on all products they are dropping the third digit beyond the decimal, with one-half and above being converted into a full unit. Further change in terms is being applied in accordance with mill practice on various products. Thus, one-half per cent discount in 10 days is being allowed by jobbers on virtually all items. Practically the only major exception to the rule is a 2 per cent discount on tubular goods, which allowance is still being made by the mills. District jobbers are returning to a pre-OPA method of quoting all shipments outside the free delivery zone on an fob Philadelphia basis, 10 cents per 100 pounds under the list.

Current prices in cents per pound are: Hot bars, 4.11; shapes, 3.94; plates, 3.88; floor plates, 5.56; hot rolled sheet, 10 gage, 4.20; hot strip, 14 gage and lighter and six inches and narrower, 4.66; hot strip, 12 gage and heavier and wider than six inches, 4.56; galvanized, 24 gage, 6.50; cold sheets, 17 gage, 5.06; cold bars, 4.56; and cold strip, 5.06.

Boston — Warehouse steel prices are reflecting mill advances on some products, but no general increase has been made. Revised quotations are frequent-

ly on products short in supply and mean little in dollar sales volume as in the case of galvanized sheets

## Nonferrous Metals . . .

Nonferrous Prices, Page 157

New York—Although there have been bids of 19.00c, fas New York, by foreign copper buyers there is no metal available for first quarter sale. While the spot price is unchanged at 19.50c, valley, forward volume is accepted only on open price basis at time of shipment. Effect of the freight rate increase of 17.6 per cent Jan. 1 is subject of study by producers as to whether this will be passed on to consumers. Additional volume of foreign copper to supplement domestic production is being released this month.

Tin—Allocation of tin to the United States for the last half of 1946 has been raised from 6400 to 7280 long tons, the Combined Tin Committee has announced. This allocation includes the quantities already allocated on an interim basis for the period, and does not include domestic smelter production. The committee said supplies of tin may be obtained from the following sources: Belgian, Dutch, or British; South African and Japanese stocks in the United States. For the United States, supplies will be available also from China.

Zinc — While some prime western is being booked for delivery through January at 10.50c, East St. Louis, other producers are accepting forward business only on basis of price at time of shipment. Production of all grades of slab zinc increased 2680 tons to 66,818 in November and shipments were also up, 91,397 tons or 17,482 tons over October. Domestic consumers got 75,749 tons and 15,648 tons were exported. Producers' unfilled orders Dec. 1 totaled 49,317 tons. Stocks of slab zinc fell 24,579 tons to 195,805 tons.

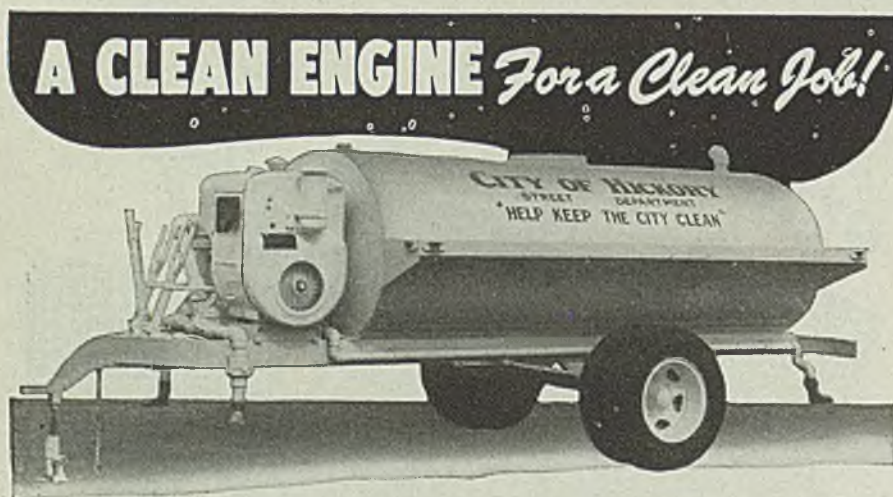
Lead — Close to 15,000 tons will be available for government allotment next month and the 25 per cent pool will be eliminated. Higher price for domestic metal would not be surprising in view of fact remelted lead has already sold higher than new metal. When price was increased to 11.80c, New York, quotation was based on a world price of 10.25c, fas Gulf ports. Subsequent competition for metal has raised this to 11.00c.

## Rivet Price Rise Covers Heading Steel Advance

Cleveland—Champion Rivet Co. has increased prices on rivets, effective as of Dec. 2, due to the establishment by steel companies of an extra of \$10 a ton on heading quality steel. The company is absorbing other increases in the cost of raw materials.

The new prices are: Large rivets, ½-inch diameter and larger, \$5.25 base per 100 pounds, fob Cleveland or Chicago, or freight equalized with Pittsburgh or Birmingham. Small rivets, 7/16-inch diameter and smaller, 55-5 per cent off standard list, fob basing points as above.

In the case of small rivets, former manufacturing extras have been deleted and, in substitution all nonstock sizes when ordered in quantities of less than 600 pounds will be subject to an extra of \$10 per item. All prices are subject



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## Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 153

Pittsburgh — Producers of fasteners here have not yet issued new price cards, although they are expected to this week, incorporating a revised set of size ranges. The new schedules are expected to show advances ranging from 6 per cent for smaller sizes down to 3 per cent. There is a wide disparity in new price schedules recently announced by producers in the eastern and western states, and some interests believe it will take six months before the industry will return to a uniform price basis. Output of fasteners was cut substantially during the coal strike and until mill shipments are returned to normal, no significant improvement in industry's production schedules is likely. Present order backlogs range between six to eight months.

## Ferroalloys . . .

Ferroalloy Prices, Page 155

New York—Electro Metallurgical Sales Corp., this city, has advanced prices for some ferroalloys, due to substantially increased production costs. Products affected by the increases include the ferrosilicon alloys; high-carbon ferrochrome; silicomanganese; and chromium silicon, and manganese briquets. The revised prices become effective Jan. 1 for contract users and immediately for non-contract users. The weighted average price increase for those materials to which adjustments apply is between 5 and 6 per cent.

No price increases are being made in low-carbon ferrochrome, chromium metal, calcium-silicon, calcium-manganese-silicon, and the vanadium, tungsten, and titanium alloys.

Some examples of the increases for carload lots of lump size material in bulk are as follows with prices in cents per pound:

	Old Price	New Price
High-carbon Ferrochrome (per pound contained chromium) . . . . .	14.50	15.60
Ferrosilicon, 50% (per pound contained silicon) . . . . .	7.05	7.45
Ferrosilicon, 75% (per pound contained silicon) . . . . .	8.55	9.25
Silicomanganese . . . . .	6.05	6.45

The percentage increases on the principal products affected is shown in the following list, all percentages applying to carload lots in lump size material in bulk: High-carbon ferrochrome, 7.6; ferrosilicon (50%), 5.7; ferrosilicon (65%), 7.4; ferrosilicon (75%), 8.2; ferrosilicon (85%), 10; ferrosilicon (90%), 2.1; silicon metal, 5.8; silicomanganese, 6.6; ferrocolumbium, 11.1; zirconium alloys 12 to 15% and 35 to 40%, 5.4 and 3.6, respectively; silicomanganese briquets, 6; ferromanganese briquets, 5.8; chromium briquets, 7.1; ferrosilicon briquets, small, 6.9; large, 2.8.

Prices for carload, lump, bulk standard ferromanganese, medium-carbon ferromanganese, low-carbon ferromanganese, and manganese metal show no increase.

Necessarily higher increases, ranging in maximum amounts from 10 to 15 per cent, are being made in the crushed and ground sizes and the less-carload, packed

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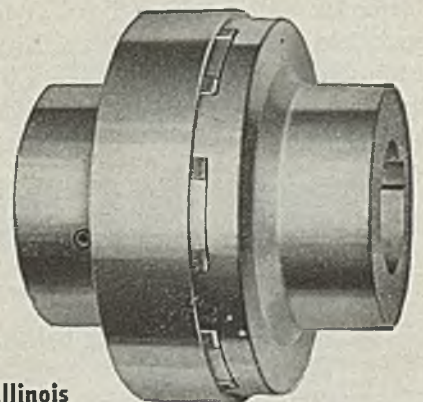
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quantities in all cases where revisions apply to offset the relatively much higher crushing and packing costs.

## Truman Sets Up New Agency To Liquidate War Bureaus

Creation of the Office of Temporary Controls to handle the liquidation of remaining war agencies was announced last week by President Truman. Consolidated in this office will be the Office of War Mobilization & Reconversion, the Office of Economic Stabilization, the Office of Price Administration and the Civilian Production Administration. The National Wage Stabilization Board has been terminated and the Office of Contract Settlement has been transferred to the Treasury Department.

Maj. Gen. Philip B. Fleming, federal works administrator, will head the Office of Temporary Controls in addition to carrying out his FWA job. Reconversion Director John Steelman has been appointed assistant to the President and will co-ordinate White House policies with those of the executive agencies. Frank Creedon was appointed federal housing administrator.

## Steelworkers' Union To Make New Wage Demands

(Concluded from Page 58)  
steel industry, and the total sum involved is expected to reach "fantastic" size.

Similar suits have been filed by the

steelworkers' union in federal court at Cleveland against Republic Steel Corp., American Steel & Wire Co. and Ohio Crankshaft Co. In the suit against Republic Steel \$28 million in portal-to-portal pay is asked, while \$38 million is sought from American Steel & Wire and \$12,500,000 from Ohio Crankshaft.

The suits are based on a decision last June of the United States Supreme Court upholding portal-to-portal claims of employees of the Mt. Clemens Pottery Co., Mt. Clemens, Mich., entitling them to pay for all time spent in getting to the job on company property, including standing in line to punch a time clock, walking through the plant to the employee's regular job, time spent in changing clothes, etc.

Labor lawyers claim the decision is applicable to all manufacturers engaged in interstate commerce.

## Industry Spokesmen Hold Nathan's Analysis Faulty

Industry's reaction to the Nathan report was unfavorable. George Romney, general manager, Automobile Manufacturers Association, said that general profit forecasts such as that released by the CIO obstruct genuine collective bargaining

and promote the type of industrial strife which similar reports generated a year ago.

George Terborgh, research director, Machinery & Allied Products Institute, said Nathan's use of the 1936-39 averages was inaccurate and misleading because industry was then in a sort of "never-never land," between depression and prosperity.

The Nathan report was described as an invitation for a new round of wage demands, possibly followed by another series of strikes, by Walter B. Weisenburger, executive vice president, National Association of Manufacturers. He held that the theory wages can be increased while prices are held at present levels or lower is just as false today as it was when first promulgated a year ago.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

5000 tons, manufacturing building, Kansas City, Kans., for Sunshine Biscuits Inc., to Gage Structural Steel Co., Chicago, for fabrication by Allied Structural Steel Co.

1500 tons, stockhouse, Milwaukee, for Blatz Brewing Co., to Milwaukee Bridge Co., Milwaukee; Thompson-Starret Co. Inc., contractor.

260 tons, manufacturing building, Aurora, Ill., for Independent Pneumatic Tool Co., to Joseph T. Ryerson & Son Inc., Chicago.

525 tons, Schaeffer Brewery Co., Brooklyn, through Turner Construction Co., New York, to Bethlehem Fabricators, Bethlehem, Pa.

### STRUCTURAL STEEL PENDING

715 tons, 13 state bridges, including Fryeburg, 190 tons, and Gouldville bridge, Presque Island, 100 tons, Maine; bids Dec. 18, state highway commission, Augusta, for furnishing structural steel, most units; Gouldville both furnishing and erecting.

550 tons, public school No. 106, Bronx, N. Y.; T. G. K. Construction Co., and Harry Jereski, Manhattan, low jointly on the general contract.

475 tons, continuous girder highway bridge, Stratford, Iowa, for state.

450 tons, new factory, Skokie, Ill., for Light-house Trailer Co.

400 tons, maintenance and service buildings, San Antonio, Tex., for San Antonio Transit Co.

350 tons, fertilizer plant, Saginaw, Mich., for Farm Bureau Service.

250 tons, beam bridge, Fannington, N. Mex., for State Highway Department.

220 tons, public school No. 102, Bronx, N. Y.; Caristo Construction Co., Brooklyn, low on general contract.

120 tons, bridge, Sec. 43F, Pike county, Ill., for State Highway Commission; bids Nov. 15, with Illinois Steel Bridge Co., Jacksonville, Ill., low, rejected.

Unstated, cranes, shapes for various buildings, Columbia Basin and Coulee Dam projects; bids to Bureau of Reclamation, Denver, various dates.

Unstated, \$410,000 plant addition to St. Regis Paper Co., Tacoma, Wash.; steel frame; approved by CPA.

## REINFORCING BARS . . .

### REINFORCING BARS PENDING

3100 tons, Clark Hill dam and appurtenances, Savannah river basin, Georgia-South Carolina; bids Jan. 6, U. S. engineer, Augusta, Ga.; also 835 tons, miscellaneous structural steel; 745 tons, tainter gates; 275 tons, trash racks; 845 tons, penstocks; and large tonnages of pipe



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"Shur-Site" Treads and  
Armorgrids.



and other miscellaneous fabricated metal.

1600 tons, superstructure, diesel engine plant, Peoria, Ill., for Caterpillar Tractor Co.; general contract to S. N. Nielsen Co., Chicago; bids Nov. 21.

1000 tons, portion of Enid dam, Yocona river, Mississippi; bids Jan. 3, U. S. engineer, Vicksburg, Miss.; also 25,650 square feet steel sheet piling and 110 tons structural steel, spillway bridge.

785 tons, portion of Grenada dam, Yalobusha river, Mississippi; bids Jan. 10, U. S. engineer, Vicksburg, Miss.; also 51,550 square feet steel sheet piling and 120 tons, structural steel, spillway bridge.

450 tons, women's residence hall, Urbana, Ill., for University of Illinois; George A. Fuller Co., Chicago, low on general contract; bids Dec. 6.

120 tons, Morgan City floodwall; bids Dec. 16, U. S. engineer, New Orleans; also 38,400 square feet steel sheet piling.

105 tons, substructure, fixed highway bridge over Calumet river at 130th St., Chicago, for Department of Public Works; bids of Dec. 5 returned unopened; project believed postponed.

Unstated, 10 buildings, University of Washington, Seattle; application made for Civilian Production Administration approval.

Unstated, classroom building, University of Washington, Seattle; Strand & Sons, Seattle, low, \$510,000.

Unstated, classroom building, Washington State College, Pullman, Wash., estimated at \$1½ million; bids soon; plans by John W. Maloney, Seattle.

## PLATES . . .

### PLATES PENDING

Unstated, 5600 feet 12-inch 10-gage, steel water pipe; bids to Wiley Crook, city clerk, Renton, Wash., Jan. 7.

Unstated, two large vacuum pressure treating cylinders for proposed plant of American Lumber & Treating Co., Everett, Wash.; J. F. Linthicum, president; early construction planned.

## PIPE . . .

### CAST IRON PIPE PENDING

600 tons, 4 to 6-inch pipe, Home water district, Portland, Oreg.; bids in.

Unstated, pipe line and tank for Manchester, Wash.; Superior Construction Co., Seattle, low, \$55,182.

Unstated, 31,000 feet, class 150, 6 to 12-inch, for Ellensburg, Wash.; bids to F. T. Hofmann, city clerk, Dec. 16.

Unstated, 25,000 feet, 4 to 12-inch and fittings; bids Dec. 18 to E. J. Beard, city clerk, Bremerton, Wash.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Central Railroad of Pennsylvania, 1250 fifty-ton box cars, to American Car & Foundry Co., New York.

Chicago & Great Western, 500 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

### RAILS PLACED

Atlantic coast line, 43,000 tons of rail, 30,000 tons going to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and 13,000 tons to Bethlehem Steel Co., Bethlehem, Pa.

Bangor & Aroostook, 6,045 tons of rail, 5,445 tons going to Bethlehem and 600 tons to Carnegie-Illinois Steel Co., Pittsburgh.

### RAILROAD CARS PLACED

Missouri Pacific, 1400 freight cars, placed, with 800 50-ton box cars going to Pressed Steel Car Co., Pittsburgh, 500 70-ton hoppers to American Car & Foundry Co., New York, and 50 70-ton mill type gondolas and 50 40-ton stock cars to own shops.

SHEAR IT CLEVERLY WITH A

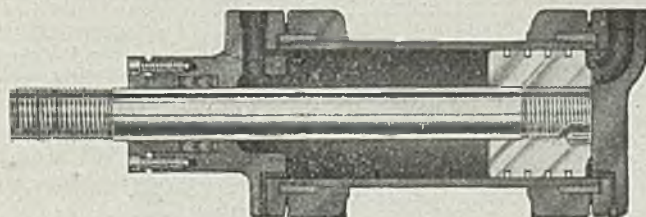
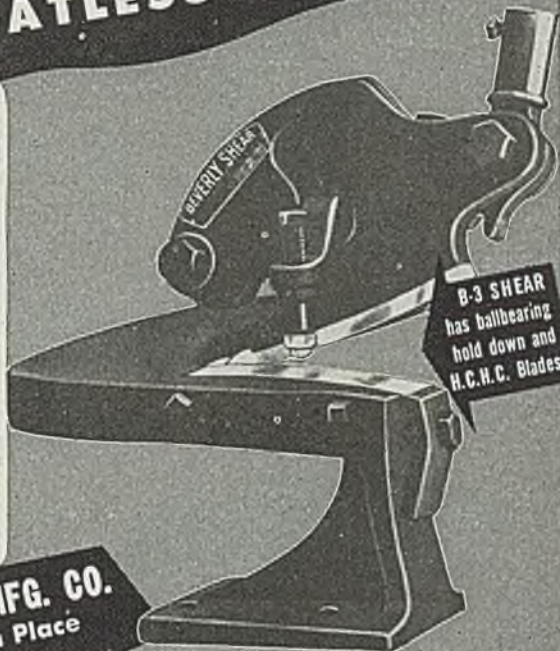
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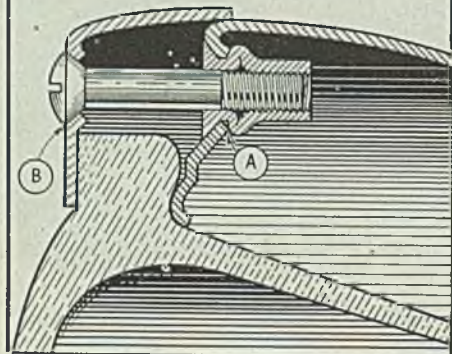


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## CONSTRUCTION AND ENTERPRISE

### ALABAMA

**BIRMINGHAM**—Virginia Bridge Co., Harold W. Morgan, manager, is planning construction of plant adjacent to present facility fronting North 39th St., consisting of main shop building, office building and separate paint house, to cost about \$1 million. CPA approval has been obtained.

**BIRMINGHAM**—Southern Precision Pattern Works has recently been formed with Lewis S. Moncrief as president. Other officers are: J. L. Corley, vice president; and J. P. Bryant, secretary-treasurer.

### ARKANSAS

**LITTLE ROCK, ARK.**—Magnolia Pipe Line Co., Magnolia Bldg., Dallas, Tex., has asked for bids for \$500,000 electrically-operated pumping station, and storage facilities, to cost \$350,000.

### CALIFORNIA

**MOUNT DIABLO MERIDIAN, CALIF.**—Permanente Metals Corp., Kaiser Bldg., Oakland, Calif., has obtained CPA approval for construction of office, laboratory and repair shop buildings, to cost about \$21,400.

### CONNECTICUT

**BRIDGEPORT, CONN.**—General Electric Co., Boston Ave., has awarded contract for one-story, 35 x 200-foot wire drawing plant, Bond St. and Boston Ave., to Gellatly Construction Co., 25 Housatonic Ave., for an estimated \$55,000.

### FLORIDA

**MIAMI, FLA.**—Sea Shores Realty Inc., Joseph Cohen, 420 Lincoln Rd., Miami Beach, Fla., president, has let contract to Maurer & Freberg Construction Co., 2511 N. W. Second Ave., Miami, Fla., for construction of one-story iron works building to cost \$14,500.

**JACKSONVILLE, FLA.**—Ivy H. Smith Construction Co. plans erection of plant to produce prefabricated houses, at a cost of \$125,000. Owner will build.

**JACKSONVILLE, FLA.**—National Container Corp., Talleyrand Ave., has awarded contract for additions to manufacturing facilities and equipment to its own forces for \$1,225,000.

**ORLANDO, FLA.**—Florida Pipe & Supply Co. is having plans prepared by Donovan Dean & Associates, architects, for addition to house machine repair shop. Addition will be 30 x 75 feet and will cost \$15,000.

**PENSACOLA, FLA.**—International Minerals & Chemical Corp. has completed negotiations for purchase of a 10-acre plot for construction of a 180 x 210-foot fertilizer plant.

### GEORGIA

**ATLANTA**—Pittsburgh Plate Glass Co., 172 Marietta St. N. E., is planning construction of one-story and basement, 137 x 192-foot office and warehouse, to cost approximately \$300,000. Tucker & Howell, Rhodes Haverly Bldg., architects.

**ATLANTA**—Electric Storage Battery Co., 19th St. and Allegheny Ave., Philadelphia, contemplates construction of manufacturing building to cost over \$250,000.

**AUGUSTA, GA.**—John P. King Mfg. Co. has received CPA approval for construction of \$57,000 building to house air humidification equipment.

**THOMASTON, GA.**—Knox Corp., P. O. Box 311, plans construction with own forces of plant for manufacturing prefabricated houses, to cost approximately \$145,000.

### ILLINOIS

**EAST ST. LOUIS, ILL.**—Magnolia Pipe Line Co., Magnolia Bldg., Dallas, Tex., has asked for bids for local pumping station, to cost

\$700,000, and electrically-operated pumping station at Alton, Mo., to cost \$400,000.

### INDIANA

**COLUMBUS, IND.**—Reeves Pulley Co., 1225 Seventh St., has awarded contract for one-story, 83 x 231-foot factory addition to Luke Taylor, E. Riverside Dr., for an estimated \$60,000.

**INDIANAPOLIS**—Indianapolis Gear & Machine Co. Inc., 912 East 21st St., has been incorporated with 1000 shares of no par value stock to manufacture gears and machinery, by J. Russell Williams, Noel E. Cord and Roy E. Thayer.

**LOGANSPORT, IND.**—K. L. K. Mfg. Co. Inc., Peters and Richardville Sts., has been formed with 300 shares of \$100 capital stock to manufacture tools and dies, by Jesse W. Layman, Roy C. Kleckner and Donald L. Kleckner.

**NOBLESVILLE, IND.**—Firestone Industrial Products Division, Firestone Tire & Rubber Co., Akron, has awarded contract for one-story, 80 x 187-foot factory and warehouse and 50 x 187-foot loading dock to Carl M. Geupel Construction Co., 1109 Hume Mausur Bldg., Indianapolis, at an estimated cost of over \$150,000. F. Narszi, c/o owner, is engineer.

### IOWA

**WATERLOO, IOWA**—John Deere Tractor Co., Niles Rd., has awarded contract for two 120 x 200-foot, one 80 x 300-foot, one 120 x 220-foot and one 120 x 530-foot buildings to Jens Olesen & Sons Construction Co., 321 W. 18th St., for an estimated \$3 million.

### KENTUCKY

**ASHLAND, KY.**—Ashland Oil & Refinery Co. has leased a \$16 million refinery at Leach, Ky., and has started a \$100,000 improvement program at the facility.

**LOUISVILLE**—B. F. Goodrich Chemical Co., Cleveland, has CPA approval for additions to its Geon plant to cost \$188,000.

**RUSSELL, KY.**—Chesapeake & Ohio Railway, L. T. Nuckols, chief engineer, 823 E. Main St., Richmond, Va., has awarded contract for car and blacksmith shops and storehouses to Hughes Foulkrod & Co., 1505 Race St., Philadelphia, for \$300,000.

### LOUISIANA

**MONROE, LA.**—Mississippi Fuel Corp., 407 N. Eighth St., St. Louis, has postponed indefinitely natural gas plant improvements, to have cost \$1 million.

**NEW ORLEANS**—Paragon Tool & Mfg. Co., 1544 Florida Ave., plans construction of new factory building near Bremer Rd. and Highway 30, to cost \$25,000. CPA approval has been received.

**STERLINGTON, LA.**—Commercial Solvents Corp., J. E. Wheeler, P. O. Box 1471, Monroe, La., plant manager, has let contract to Ford, Bacon & Davis Construction Corp., Monroe, for erection of new plant building to cost \$174,630.

### MARYLAND

**BALTIMORE**—Charles T. Brandt Inc., Bush and Ridgely Sts., has awarded contract for one-story factory addition to George S. Awalt & Co., Morris Bldg., for an estimated \$120,000.

### MICHIGAN

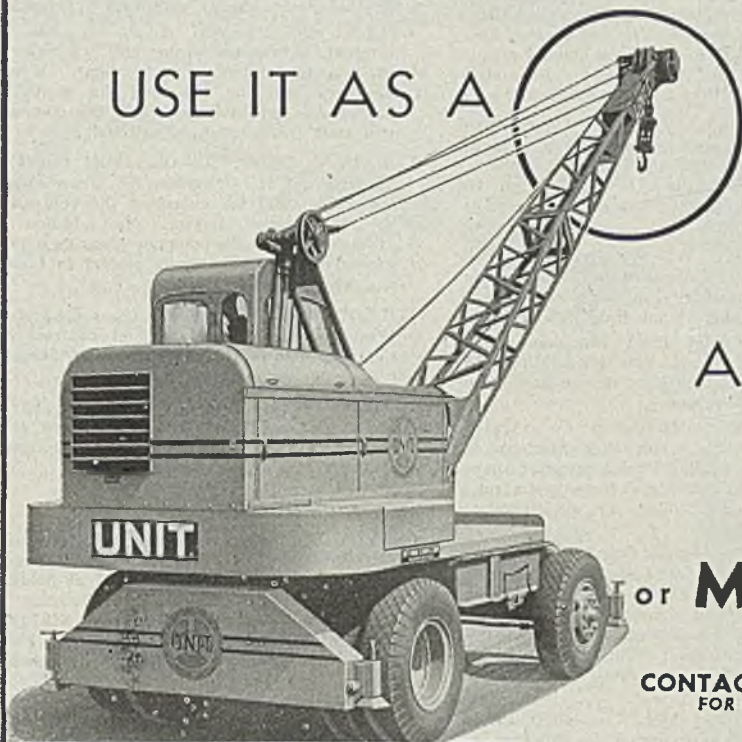
**CHARLOTTE, MICH.**—Aluminum Extrusions Inc., 530 W. Lovett St., has been formed with \$100,000 capital to conduct a foundry and metalworking business, by Ralph W. Sullivan, 319 W. Henry St.

**DETROIT**—American Metal Refining Co., 13133 Greeley, has been formed to smelt and refine nonferrous metals, by Harry B.



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Grevin, same address. The company is capitalized at \$100,000.

**DETROIT**—Electro Engineering & Mfg. Co., 627 W. Alexandrine, has been formed with \$100,000 capital to manufacture electrical devices, by J. Douglas Chirite, 5010 Burns Ave.

**MONROE, MICH.**—Woodall Industries Inc., Detroit, has awarded contract for construction of \$55,000 factory to Kriehoff Co., Detroit.

**MUSKEGON, MICH.**—Michigan Foundry Supply Co., 1352 Division St., has been organized with \$200,000 capital to conduct a general foundry and machine shop business, by Paul M. Wiener, 1001 W. Summit Ave., Roosevelt Park.

**PORT HURON, MICH.**—Ring Tools Inc., 1417 Water St., has been organized with \$100,000 capital to conduct a general manufacturing business, by Keith E. Brooks, same address.

**WALLED LAKE, MICH.**—General Machine & Tool Works Inc., 40261 Thirteen-Mile Rd., has been organized with \$150,000 capital to engage in a general manufacturing business, by George Kovacs, same address.

#### MISSOURI

**ST. LOUIS**—Johnston Tinfoil & Metal Co., 6106 S. Broadway, will soon let contract for one-story, 109 x 122-foot factory addition. P. M. O'Meara Associates, 4908 Delmar Blvd., architects.

**ST. LOUIS**—M. J. Sullivan, 2308 S. Seventh St., has awarded contract for one-story, 60 x 125-foot factory, 1509 Sublette Ave., to Smith-Cooke Construction Co., 4829 Easton Ave., for an estimated \$55,000. J. A. Grunik, 6635 Delmar Blvd., University City, St. Louis, is architect.

#### OHIO

**AKRON**—Portage Machine & Engineering Co.,

1031 Sweitzer Rd., is planning erection of \$19,000 building to be used for the manufacture of machine tools and machinery.

**BARBERTON, O.**—Brubaker Gear & Mfg. Co. has been incorporated by Ferdinand Brubaker of Brubaker Gear & Engineering Co., 973 Wooster Rd., to conduct a general manufacturing business. The company is capitalized with 1500 shares of no par value.

**CANTON, O.**—Canton Tool Mfg. Co., Nassau St., producer of special machinery and tools, has been incorporated by Thomas J. Roberts, Thomas W. Edwards III and Warren G. Smith. The company plans building another plant in the future.

**CLEVELAND**—W. W. Williams Co., 835 Goodale Blvd., Columbus, O., dealer in heavy road machinery, has plans to construct a \$38,000 warehouse on Brookpark Rd.

**CLEVELAND**—Euclid Road Machinery Co., 1361 Chardon Rd., is planning addition to plant to provide facilities for manufacture of production machinery.

**CLEVELAND**—Steel Fabricators Co., Sprace and Center Sts., is planning erection of one-story, 60 x 83-foot steel fabricating shop, at a cost of \$15,000, and three crane runways will be extended to accommodate four 5-ton cranes.

**CLEVELAND**—Die Supply Co., 5345 St. Clair Ave., manufacturer of large steel die sets, has been incorporated with J. R. Fitzsimmons as president. Other incorporators are: Joseph T. and W. H. Fitzsimmons. The company is planning expansion which will include additional manufacturing space and a warehouse.

**CLEVELAND**—Ridge Mfg. Co., 4900 Ridge Rd., has been incorporated by Michael J. Nolan, who heads the firm as president. The company will soon begin installation of machinery in a new plant at W. 130th and Brookpark Rd. Construction of another plant is contemplated.

**DAYTON, O.**—Dayton Power & Light Co., Gas & Electric Bldg., has awarded contract for power plant and substation, 11 miles south of town, to Maxon Construction Co., 131 N. Ludlow St., for an estimated \$12 million.

**EUCLID, O.**—Diamond Alkali Co. has requested permission from city officials to build a \$2 million research center. If city approves rezoning 43-acre plot south of Euclid Ave. at Richmond Rd., the company will start construction immediately.

**LORAIN COUNTY, O.**—Ohio Fuel Gas Co., 99 N. Front St., Columbus, O., plans spending \$3,370,000 for enlarging the company's gas transmission system. In addition to 16-inch gas lines the company plans an underground natural gas storage project in Lorain and Medina counties.

**TOLEDO, O.**—Owens-Illinois Glass Co., 1510 Westwood Ave., will soon let contract for pilot plant, to cost over \$55,000. W. Schmid, c/o owner, is engineer.

**YOUNGSTOWN**—McKay Machine Co., Rayen and Foster Sts., plans office alterations at a cost of \$52,000. Additional manufacturing space is also contemplated.

#### OREGON

**PORTLAND, OREG.**—Fibreboard Products Inc., San Francisco, has asked for CPA approval for proposed plant to be located at Schiller and 24th Aves. Plans call for building to be 200 x 600 feet, and to cost \$441,000 in addition to \$122,158 for equipment. Plans have been prepared by Leland S. Rosener & Co., San Francisco.

#### PENNSYLVANIA

**CHESTER, PA.**—Philadelphia Electric Co., 900 Sansom St., Philadelphia, has awarded machine shop alteration contract to J. A. Robbins Co. Inc., 10 S. 18th St., Philadelphia, for \$88,250. R. J. Milligan Co. is chief engineer.

**CRESSONA, PA.**—Aluminum Co. of America has awarded separate contracts for aluminum plant alterations, to cost \$220,000. Day & Zimmerman Inc., Packard Bldg., Philadelphia, is engineer.

**DUQUESNE, PA.**—Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh, has awarded contract for one-story spectrographic laboratory to Edward Crump Jr., 4031 Bigelow Blvd., Pittsburgh, for an estimated \$70,000.

**GROVE CITY, PA.**—W. Bashline & Co. has awarded contract for two-story, 80 x 110-foot manufacturing building to Shago Construction Co., for an estimated \$80,000. W. Holmes Crosby, Oil City, Pa., is architect.

**KING OF PRUSSIA, PA.**—Jones Machine & Tool Works Inc. has awarded separate contracts for factory and office building repairs and addition, to cost over \$55,000. Manuel Greenberg, 4211 Ludlow St., Philadelphia, is architect.

**MCKEES ROCKS, PA.**—Federal Enameling & Stamping Co. has awarded contract for five-story manufacturing building to P. S. Edwards, R. D. 1, Library, Pa., for an estimated \$60,000.

**NEW EAGLE, PA.**—Pittsburgh Coal Co., Oliver Bldg., Pittsburgh, will soon let contract for one-story coal preparation plant, to cost \$300,000.

#### WASHINGTON

**HILLYARD, WASH.**—Inland Empire Refineries Inc., H. D. Moyle, Salt Lake City, Utah, president, is planning an \$800,000 expansion of its local refinery. Equipment will be installed for production of petroleum coke using crude oil from Montana oil fields.

#### CANADA

**MONTREAL, QUE.**—Ross, Paterson, Townsend & Henghan, architects, Dominion Sq. Bldg., will soon let contract for truck division plant, Upper Lachine Rd., for International Harvester Co. of Canada Ltd., 5615 St. Lawrence Blvd., to cost \$300,000.

# HERE IT IS PAXSON HYDRAULIC PAY OFF REEL



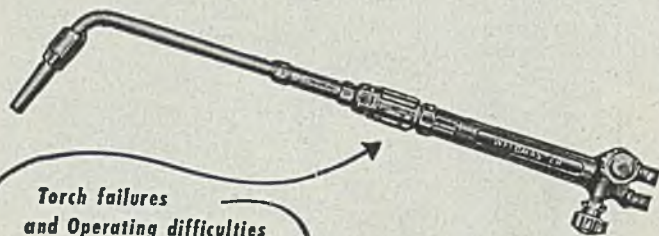
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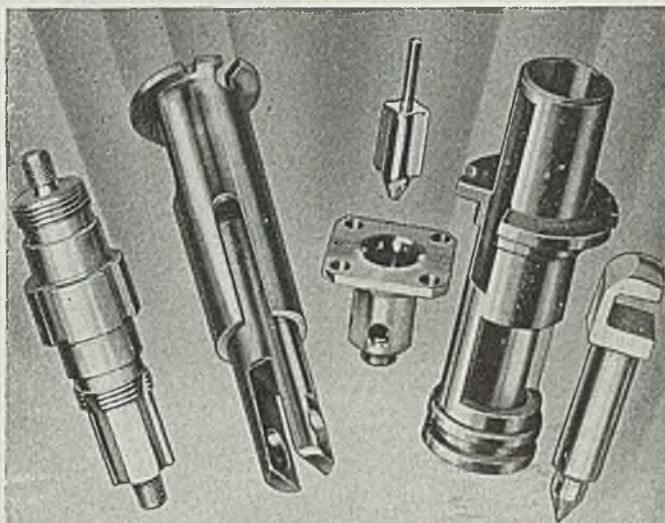
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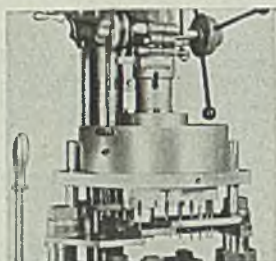
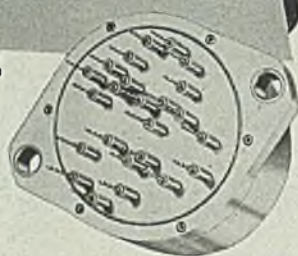
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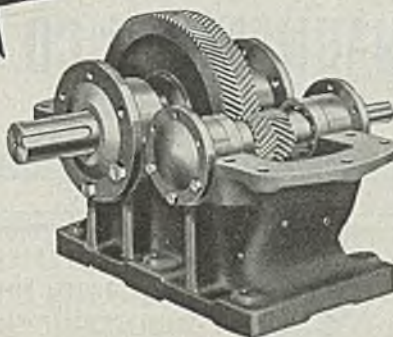
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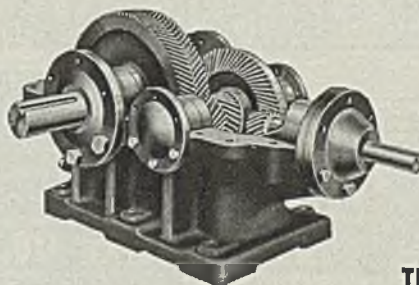
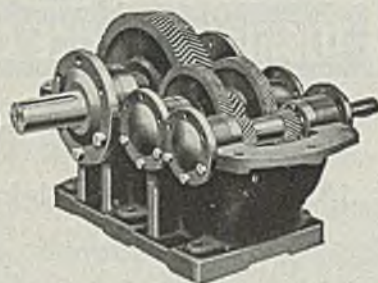
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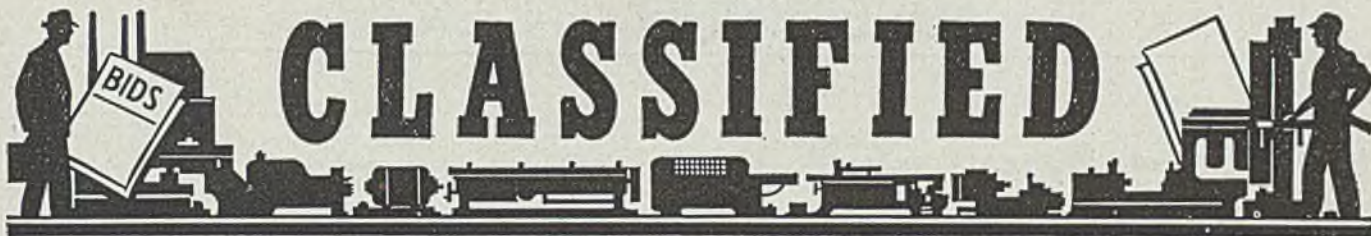
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# ADVERTISING INDEX

## A

Aetna-Standard Engineering Co., The	.....	Inside Front Cover
Agerstrand Corp.	.....	180
Air Reduction	.....	23
Allegheny Ludlum Steel Corp.	.....	33
Allis-Chalmers Mfg. Co.	.....	7, 25
Aluminum Company of America	.....	40
American Bridge Co.	.....	39
American Chemical Paint Co.	.....	145
American Petrometal Corp.	.....	176
American Pulverizer Co.	.....	160
Ampco Metal, Inc.	.....	143
Atlantic Steel Products Co.	.....	176
Atlas Metal Stamping Co.	.....	24

## B

Babcock & Wilcox Co., The, Refractories Division	.....	121
Baker-Raulang Co., The	.....	126
Barber-Colman Co.	.....	138
Barnes, Wallace, Co., Division of Associated Spring Corp.	.....	22
Basic Refractories, Inc.	.....	5
Beatty Machine & Mfg. Co.	.....	140
Belmont Iron Works	.....	176
Bethlehem Steel Co.	.....	1
Beverly Shear Mfg. Co.	.....	169
Birdsboro Steel Foundry & Machine Co.	.....	41
Bixby, R. W., Inc.	.....	181
Blaw-Knox Co., Pittsburgh Rolls Division	.....	127
Blaw-Knox Division of Blaw-Knox Co.	.....	163
Brooke, E. & G., Iron Co.	.....	176
Browning, Victor R., & Co., Inc.	.....	174

## C

Cadman, A. W., Mfg. Co.	.....	162
Chicago Perforating Co.	.....	174
Chisholm-Moore Hoist Corp.	.....	132
Cincinnati Grinders, Inc.	.....	68, 69
Cincinnati Milling Machine Co., The	.....	68, 69
Cleveland Automatic Machine Co., The	.....	30
Cleveland-Cliffs Iron Co., The	.....	148
Cleveland Quarries Co., The	.....	142
Cleveland Twist Drill Co., The	.....	106
Climax Molybdenum Co.	.....	75
Columbia Steel Co.	.....	39
Cowles Tool Co.	.....	177
Cunningham, M. E., Co.	.....	177

## D

Detroit Power Screwdriver Co.	.....	144
Detroit Sheet Metal Works	.....	46
Differential Steel Car Co.	.....	174
Dodge Manufacturing Corp.	.....	34

## E

Economy Co., Inc.	.....	178, 179
Electro Metallurgical Co.	.....	37
Enterprise Galvanizing Co.	.....	177
Erdle Perforating Co., The	.....	177

## F

Federal Machine & Welder Co., The	.....	10, 11
Follansbee Steel Corp.	.....	83
Faote, Brad, Gear Works	.....	175
Faote-Burt Co., The	.....	43
Fort Pitt Bridge Works	.....	134
Foster, L. B., Co.	.....	179, 180

## G

General Electric Co.	.....	21, 111
Gerding Bros.	.....	180
Goodrich, B. F., Co., The	.....	170
Granite City Steel Co.	.....	42
Gulf Oil Corporation	.....	47
Gulf Refining Co.	.....	47

## H

Hanlon-Gregory Galvanizing Co.	.....	99
Hannifin Manufacturing Co.	.....	169
Hanson-Van Winkle-Munning Co.	.....	44
Harnischfeger Corporation	.....	18, 19
Harrington & King Perforating Co., The	.....	165
Haynes Stellite Co.	.....	49
Heil Process Equipment Co.	.....	176
Hendrick Manufacturing Co.	.....	168
Hobart Brothers Co.	.....	174
Holden, A. F., Co., The	.....	Front Cover
Homestead Valve Mfg. Co.	.....	36
Hubbard, M. D., Spring Co.	.....	171
Hyatt Bearings Division, General Motors Corp.	.....	72
Hy-Test Division, International Shoe Co.	.....	8

## I

Industrial Gear Mfg. Co.	.....	177
Industrial Ovens, Inc.	.....	123
Inland Steel Co.	.....	56
International Graphite & Electrode Corp.	.....	137
International Nickel Co., Inc., The	.....	52
International Shoe Co., Hy-Test Division	.....	8

## J

James, D. O., Manufacturing Co.	.....	171
Jones & Laughlin Steel Corp.	.....	101

## K

Kandor Products Corp.	.....	130
-----------------------	-------	-----

## L

Landis Machine Co.	.....	9
Latrobe Electric Steel Co.	.....	45
Lepel High Frequency Laboratories, Inc.	.....	12
Leschen, A., & Sons Rope Co.	.....	175
Lewis Machine Co., The	.....	174
Lovejoy Flexible Coupling Co.	.....	167

## M

Mahan, R. C., Co., The	.....	50
Master Electric Co., The	.....	109
Mathews Conveyor Co.	.....	128
Midwest Steel Corp.	.....	179
Modern Engineering Co., Inc.	.....	173

## N

National Cylinder Gas Co.	.....	14, 15
New Britain Machine Co., The	.....	6
Niagara Machine & Tool Works	.....	112

## O

Oakite Products, Inc.	.....	164
Ohio Galvanizing & Mfg. Co., The	.....	176
Ohio Locomotive Crane Co., The	.....	174
Ohio Steel Foundry Co., The	.....	17

## P

Pangborn Corporation	.....	131
Paxson Machine Co.	.....	172
Pittsburgh Commercial Heat Treating Co.	.....	176
Pittsburgh Rolls Division of Blaw-Knox Co.	.....	127
Pittsburgh Steel Foundry Corp.	.....	103
Pressed Steel Car Co., Inc.	.....	136

## R

Rathborne, Hair & Ridgway Co.	.....	16
Ready-Power Co., The	.....	174
Revere Copper & Brass, Inc.	.....	115, 116
Reynolds Metals Co.	.....	29
Ross Heater & Mfg. Co., Inc.	.....	161
Ryerson, Joseph T., & Son, Inc.	.....	55

## S

Salem Engineering Co.	.....	28
Saunders, Alexander, & Co.	.....	165
Seaboard Steel Co.	.....	178, 179, 180
Sheffield Corporation, The	.....	133
Simonds Abrasive Co.	.....	129
Simonds Gear & Mfg. Co., The	.....	176
SKF Industries, Inc.	.....	20
Sommer & Adams Co., The	.....	48
Stokerunit Corporation	.....	97
Sun Oil Co.	.....	81

## T

Taylor-Wharton Iron & Steel Co.	.....	173
Taylor-Winfield Corp., The	.....	125
Tide Water Associated Oil Co.	.....	32
Timken Roller Bearing Co., The	.....	Back Cover
Toledo Stamping & Manufacturing Co.	.....	176
Towmotor Corporation	.....	139
Tubular Service Corporation	.....	176

## U

Union Carbide & Carbon Corp.	.....	37, 49
Union Pacific Railroad	.....	31
Unit Crane & Shovel Corp.	.....	171
United Engineering & Foundry Co.	.....	13
United States Steel Corp., Subsidiaries	.....	39
United States Steel Export Co.	.....	39
Upton Electric Furnace Div.	.....	135
Utica Radiator Corporation	.....	177

## W

Walker-Turner Co., Inc.	.....	35
War Assets Administration	.....	38
Warner & Swasey	.....	2, 3
Western Automatic Machine Screw Co.	.....	173
Westinghouse Electric Corporation	.....	26, 27
Williams, J. H., & Co.	.....	176
Willson Products, Inc.	.....	141
Wilson, Lee, Engineering Co., Inc.	.....	.....
.....	.....	Inside Back Cover
Wisconsin Motor Corporation	.....	166
Wrought Washer Mfg. Co.	.....	167
Wyckoff Steel Co.	.....	105

## Z

Zagar Tool, Inc.	.....	174
Zeh & Hahnemann Co.	.....	176

Table of Contents, Page 51

Classified Advertising, Pages 178, 179, 180, 181