STEEL

The Magazine of Metalworking and Metalproducing

VOL. 117 NO. 22 NOV. 26, 1945

NEWS

TECHNICAL

FEATURES

MARKETS

NEXT WEEK...

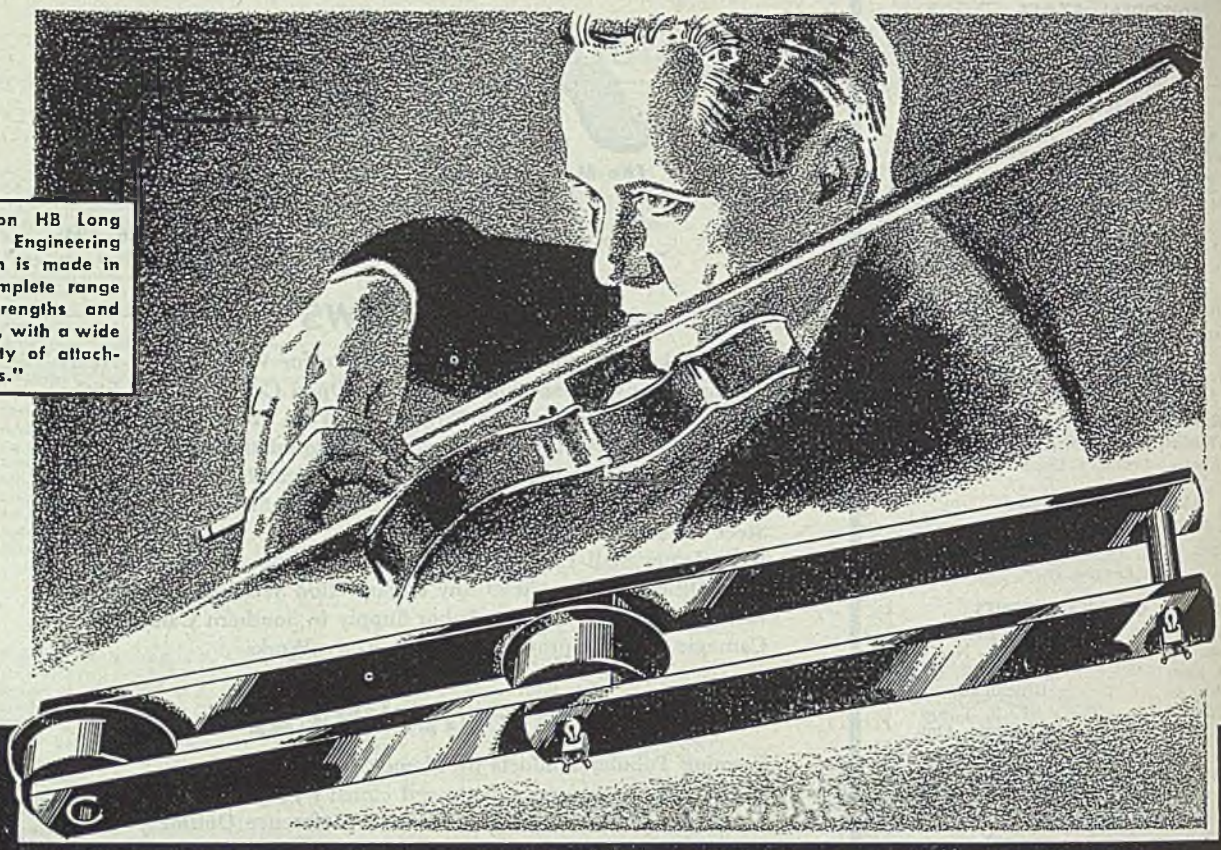
Technique Developed for Underwater Welding

Effects of Deoxidation and High Temperatures

Inspection Routine for the Small Plant

Extruding Aluminum at Reynolds Metals

Two of World's Largest Hydraulic Presses



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Another Note On Specialization

☆ While many musicians are accomplished on more than one instrument, the great virtuoso invariably has a lifetime of study and practice behind his mastery of only one medium of expressing his musical genius.

The opportunities for offering exceptional service to industry are such that here, too, specialization is often productive of a superior result. For example our Union Chain organization finds sufficient challenge and interest within the limits of designing and manufacturing a complete line of steel chains for the transmission of power and the mechanical handling of materials. Some chain users find that this specialization makes a difference, both in product and service. Call a Union representative on your next chain requirement and look for a new note in the result.

The Union Chain and Manufacturing Company, Sandusky, Ohio, U. S. A.

Catalog A-2 covers Drive and Conveying Chain. B-2 covers Finished Steel Roller Chain. FC-1 covers Flexible Couplings. Ask for your copies.

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Finished Steel Roller Chains and Sprockets
- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
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Silent Chain and Sprockets
- All sizes ⅜ in. to 1½ in. pitch

★

Flexible Couplings
- Roller chain type
- Silent chain type

UNION CHAINS

STEEL
November 26, 1945

Respect for Contracts

In recent weeks numerous developments on the labor front have focused attention upon the failure of many unions to live up to contracts they have signed.

Morden Frog & Crossing Works, Chicago Heights, Ill., entered suit against United Mine Workers of America, United Construction Workers and officials of these unions for $150,000 which amount the company claims it lost as a result of a strike called in violation of contract.

Ford Motor Co. informed the United Automobile Workers (CIO) that its experience since 1941 with its union contract, which provides for a union shop and the checkoff as measures of security for the union, has been "unhappy." The Ford company pointed out that 773 work stoppages had occurred, "work productivity per man is at the lowest mark ever" and the cost to the company of maintaining the checkoff system has been "huge." The company proposed that union officials "come to our forthcoming negotiations prepared to give us some better plan for giving the company the same degree of security as we have given the union."

Republic Steel Corp. and numerous other employers have pointed out to the National Labor Relations Board that under the present union contracts the unions agreed not to strike. These contracts do not expire until Oct. 15, 1946. The companies protest that NLRB, in using its facilities for conducting a strike vote on Nov. 28, is assisting in the breaking of contracts. Youngstown Sheet & Tube Co. has notified NLRB that it will not co-operate in the conduct of a strike vote because to do so would make the company a party to an illegal act.

These and many other developments indicate that today a contract with many unions is nothing more than a scrap of paper. Not only do the top leaders of the union movement authorize the breaking of contracts with reckless abandon but the highest authorities in the federal government give contract breaking tacit approval.

A foretaste of what could be accomplished if union leaders and government officials could come to their senses is indicated in an agreement negotiated Nov. 14 between the Aluminum Co. of America and the International Union of Mine, Mill & Smelter Workers (CIO). In this contract the union pledges its members to co-operate with the employer "to increase and improve productivity."

More of this co-operative attitude on the part of unions, plus a higher sense of responsibility for a contract, will be necessary before harmony between employers and employees can be established.

CALAMITY HOWLING: Many observers believe that much of the social security type of legislation advocated by the Truman administration will not be acted upon by Congress before it recesses for the holidays and that when these bills are considered later they will be modified substantially.

There are several reasons why the lawmakers are hesitant and cautious about heeding the President's desire for prompt enactment of these bills. One is that they are not convinced that the legislation is as important as Mr. Truman declares it to be.

A case in point is the Murray-Patman Full Employment Bill. It was advocated by the administration as a "must" at a time when the New Deal-CIO advisers were predicting that an alarming degree of unemployment would result from the cancellation of war contracts. Thus far the number of jobless is only a mere fraction of the figures predicted. Labor shortages are widespread. Employment actually is increasing.

Of course the real test is ahead, but it is rather disturbing to see government policies which at times

(OVER)

seem to be directed toward making the unemployment situation worse instead of better. Congress has good reason for being cautious about committing the nation to costly guarantees on the basis of evidence no more convincing than the calamity howling of leftists, some of whom would be delighted to plunge the nation into a new wild orgy of deficit spending for projects of dubious merit. —p. 74

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LONGEVITY OF DIES: Manufacturers who are concerned with the life of dies for cold working will be well advised not to place too much emphasis solely upon the characteristics of the steel from which the dies are formed. That other factors are extremely important has been demonstrated by tests involving about 800 dies, in which 2500 tons of wire were cold-headed into 40,000,000 bolts.

This study indicated that factors other than the qualities of the die steel which should be considered carefully are the characteristics of the material being cold headed, the design of the dies, the operation of the cold heading machines, the design of the blanks and the quality of workmanship which enters into the making and finishing of the dies. Particularly important as to the characteristics of the material being cold drawn is its surface finish. The variations in die life traceable to surface finish as revealed by exhaustive tests are surprisingly wide. —p. 101

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NO MARITAL BLISS HERE: By far the most effective broadside thus far fired in the labor relations war of nerves is the reply of Ford Motor Co. to UAW-CIO. The company rejected the demand for a 30 per cent wage increase and explained how unsatisfactory has been Ford's experience with its union contract since 1941. Accompanying the letter were 31 suggestions for modifying the CIO contract.

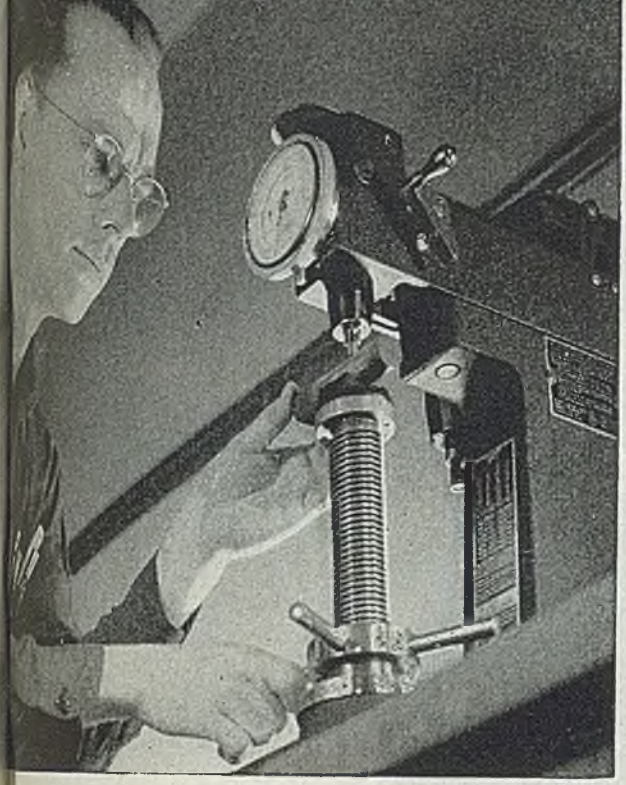
These suggestions reflect glaring deficiencies. No. 3 proposes a guarantee by the union against work stoppages and for increased productivity. No. 5 proposes that the number of union committeemen be reduced sharply and that they be paid by the union. (Ford is paying salaries for more than 1000 men who spend all or part time on union business). No. 21 proposes that the company be reimbursed for damages suffered by violation of provisions prohibiting strikes and interference with production.

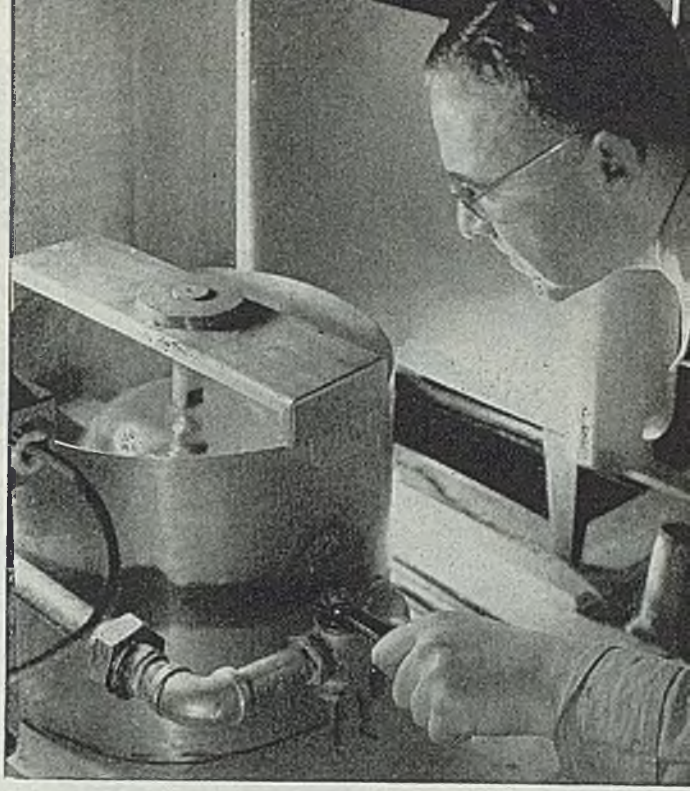
Ford Motor deserves credit for revealing the seamy side of a shot-gun marriage with a union. The public can understand this kind of language. —p. 79

POSTWAR POSTSCRIPTS: Housing shortage, now acute in many sections of the country, will grow worse. The head of the USES office in Southern California (p. 77) says lack of homes is the chief bottleneck to labor supply in the area. It is a serious factor in many other industrial communities. . . . At the same time, F. W. Dodge Corp., in a study on "Construction Revival," concludes that shortage of manpower (p. 91) is the most threatening barrier to full-scale recovery in the construction industry. The study includes a breakdown of 99,638 construction projects in design or preliminary stages involving an estimated cost of more than $15 billion. . . . Hundreds of reports prepared by members of "missions" who went to Germany after V-E Day to investigate Nazi wartime technology (p. 72) are being made available to American industrialists by the new Office of the Publication Board of the Department of Commerce. . . . Tabulation of the earnings statements of 320 industrial corporations by the National City Bank of New York (p. 69) shows that net profit in the third quarter declined 12 per cent from that of the second quarter and 10 per cent from that of the third quarter last year. . . . Tabulation by this publication of the earnings of 15 steel companies representing 82 per cent of the nation's ingot capacity shows that profit in the third quarter (p. 68) was down 34 per cent from that of the second quarter. Profit of these steel companies for nine months in 1945 was down only slightly from that for nine months in 1944. . . . Sen. Kenneth S. Wherry of Nebraska told members of the National Metal Trades Association that "getting the country into maximum production" and helping returning veterans and small businessmen "to establish one million new businesses, services and professions" (p. 66) can be accomplished only by "taking government controls off the necks of business". . . . Decision of UAW-CIO to call its members in General Motors plants in 20 states off their jobs just before Thanksgiving day (p. 65) precipitates a contest of strategy and endurance in which the union is gambling for high stakes. A union victory would mean little more than a license to consolidate the union's wartime gains; a defeat would result in serious losses in union membership and prestige. In either event, industry and the public would be penalized heavily by the resultant delay in reconversion.

E. L. Shaner

EDITOR-IN-CHIEF





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IN STEEL FROM STOCK

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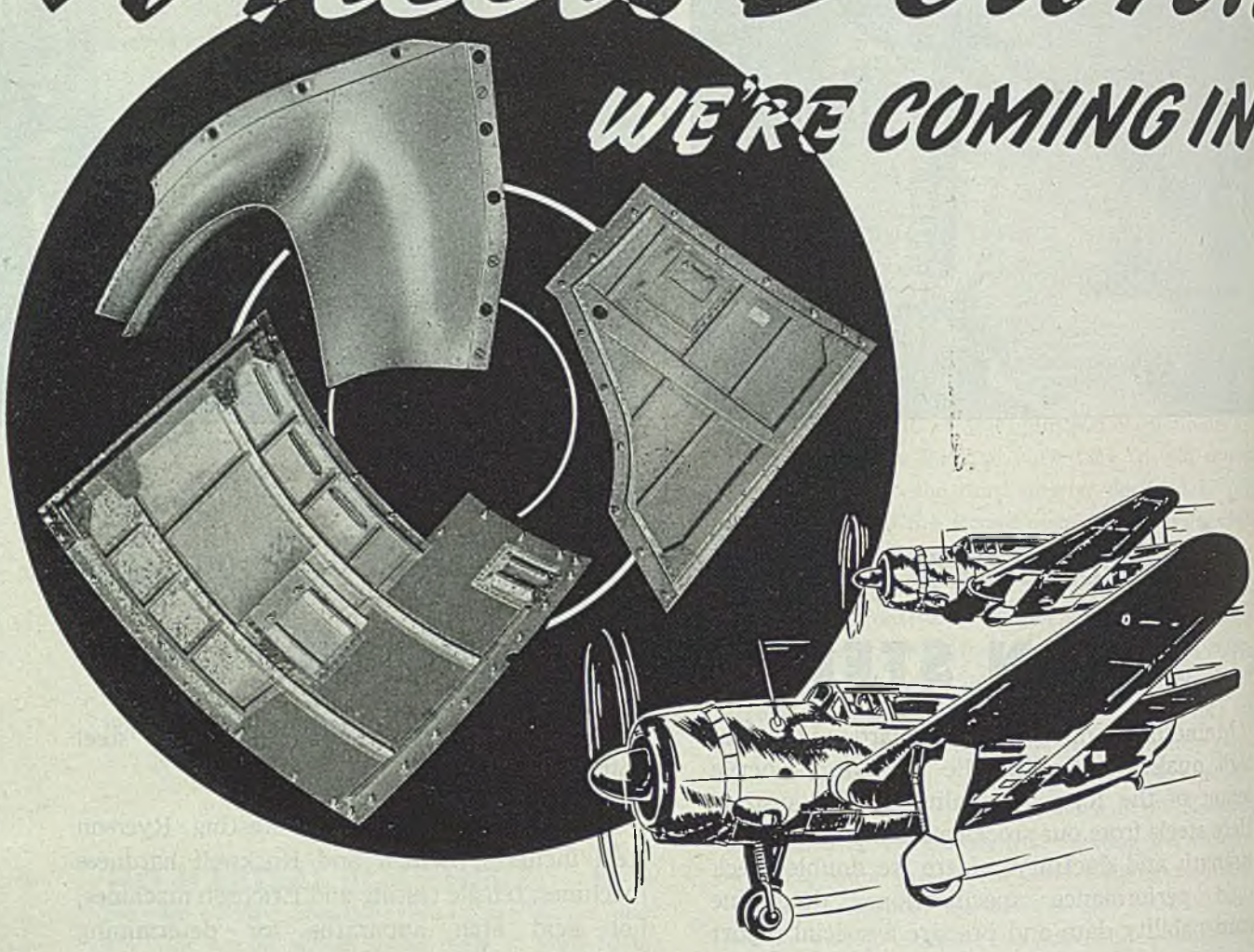

Words proudly spoken by men who know, men who have the utmost confidence in the craft they handle. These men know that America has given them the best that engineering skill and modern manufacturing techniques can produce. PARISH is proud also to have a part in producing these planes. Illustrated above are examples of fighter plane wing fillet and aircraft cowling assembly parts produced by PARISH to conform to rigid inspection standards. Our modern plant facilities include every process from original design and manufacture of dies, to the completed product. Non-ferrous as well as ferrous metals are ably handled by our staff of engineers and laboratory analysts, assuring quality, economy and speed in production. Post-war planners will do well to consider the importance of PARISH planning and production in relation to their peacetime requirements. Our greatly expanded plant facilities are at your service. Why not write us today and see what PARISH can do and save for you.

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Subsidiary of SPICER MANUFACTURING CORPORATION

WESTERN REPRESENTATIVE: F. SOMERS PETERSON, 57 CALIFORNIA ST., SAN FRANCISCO, CAL.

STEEL
November 26, 1945

Thousands of war veterans have already returned to their jobs in the steel industry and thousands more are on their way back. Here is shown a former B-24 engineer and gunner at his new job as burner at the Vandergrift, Pa., plant of the Carnegie-Illinois Steel Corp. His job of cutting up battlefield scrap, which will be converted into peacetime steel products, is symbolic of the transition of steel and the men who make steel, from war to peace

Steel Strike Uncertainty Increases As Date for Workers' Poll Nears

General view in industry is that only time will provide answer to question whether widespread work stoppage impends. "War of nerves" continues unabated. Legality of poll questioned by producers

WHETHER there will be a nation-wide strike of some 500,000 workers in the steel industry in the near future is a question that only time will answer. As the date for the strike vote nears, Nov. 28, divergent views are expressed with majority opinion leaning more to the view that the "war of nerves" being waged by the labor unions at the present does not necessarily mean there will be a widespread stoppage of work.

For one thing it is not certain that a strike vote will be taken in all of the steel plants as requested by the steelworkers' union. At least such a possibility could be read into a letter from the National Labor Relations Board to the Allegheny Ludlum Steel Corp., Pittsburgh, stating it had asked the steelworkers' union to show cause why a strike vote should be conducted despite the existence of a contract containing a no-strike pledge. John E. Lawler, chief of the NLRB Order Section, in the letter advised Ralph C. Edgar, Allegheny-Ludlum personnel director, that unless the union shows sufficient reason why the strike vote should be held, the board will not conduct the vote.

Most spokesmen for steel management are of the opinion that an early tie-up in steel is not certain. They point out that the unions, specifically the CIO unions, are more likely to center their attention first on the automotive industry and will not attempt to tie up steel at the same time.

While it is possible that the steel industry may be the first to be hit, this is doubted for the simple reason that the

controversy over wages is further along in the automobile field. Some sporadic walkouts at individual steel plants might follow upon the taking of a strike vote, it is agreed, but generally it is felt such walkouts would be more or less spotty and certainly a far cry from a general strike.

The demand by the CIO steelworkers' union for a strike vote throughout the steel industry is in complete disregard of specific no-strike clauses in its contracts with the companies, said Edward L. Ryerson, chairman, Inland Steel Co., speaking last week on a radio program sponsored by the American Iron and Steel Institute.

The charge of "hidden profits" in the steel industry, which was "exploded and explored" last year by the fact-finding panel of the War Labor Board, is being reiterated by the union to make the public believe the industry has a vast pool of money from which it can pay a spectacular wage increase, asserted Mr. Ryerson. He termed the union's statements about swollen profits "entirely false" and said that the entire steel industry averaged less in the three full years of war, 1942 through 1944, than in any good peacetime year.

Points Out Increases

William E. Hitchcock Jr., vice president, the Atlantic Wire Co., Branford, Conn., who also participated in the program, pointed out that while steel prices have remained low, costs have soared, with wages alone advancing 34 per cent during the war years.

Conceivably the issue in the steel industry might be resolved quickly in event the Office of Price Administration permitted steelmakers to advance prices sufficiently to cover accumulated higher costs. Raising of prices to a level which would permit producers to return a profit on present operations at existing wage rates would possibly open the door for resumption of wage negotiations. At least this has been indicated in influential quarters in the industry, although it has been emphasized from time to time that any wage increase granted would have to be offset by further increases in steel prices.

No matter which turn the question of wages takes, it is certain that industry-wide bargaining, should it be demanded by the union, will not likely get anywhere with the steelmakers. So far as known not a single producer has expressed willingness to agree to such procedure.

In connection with the strike vote which has been ordered by the NLRB in various steel plants Nov. 28, a new angle has crept into the picture. While declaring that the strike vote at this time is a violation of the union's contracts with the various firms, a number of the larger steelmakers have indicated they will cooperate with the Labor Board in conducting the strike poll. All large producers, however, have not expressed such willingness, an outstanding exception being the Youngstown Sheet & Tube Co., Youngstown, which last week in a letter by J. C. Argetsinger, vice president and general counsel of the company, to Oscar S. Smith, director of NLRB's field division, said the Youngstown company will not co-operate in the proposed strike vote.

SYMPATHY PARADE: Employees of the Atlas Powder Co. staged a sympathy parade around Yale & Towne Mfg. Co., Stamford, Conn., whose workers are out on strike. Returned war veterans, still in uniform, led the demonstration which was joined by employees of other concerns. NEA photo

Mr. Argetsinger's letter questions the legality of the board's action in ordering the vote and conducting the election and says that if the vote is taken and a strike results, it would be a violation of the contract between the company and the union and "said agreement including each and all terms and provisions thereof, would be terminated and cancelled."

This is the second letter sent by Mr. Argetsinger, voicing the company's protest at the proposed election. In a letter Nov. 1 he questioned the board's right to hold an election on grounds that the country is not now engaged in war and the company is not a war contractor.

In a letter five days later Mr. Smith said that the board feels that under Section 8 it has the right to conduct a strike ballot.

Mr. Argetsinger, in his letter last week, said, "It is my opinion, that you do not have any legal right to conduct a strike vote in the plants of this company unless or until you have determined after a hearing that the company is a war contractor within the meaning of the law.

"In view of this fact the company will not participate in any manner in what it believes would be an illegal act by your board in the conduct of a strike vote. Co-operation by the company in this illegal act, as per request, in itself would be an illegal act by the company and we do not propose to be in that position. Therefore, the company cannot authorize the conduct of a so-called legal strike vote on company property and we will not furnish lists of employees for the purpose of such an illegal vote.

"Another reason why the company should not be a party to an election of this kind is the well-known fact that the union and company have entered into a written agreement whereby the union has agreed that there shall be no interruption or impeding of work, work stoppage or strike."

Mr. Argetsinger urged that if the vote is taken, all eligible employees should participate in the vote.

"We would like very much to see all eligible employees participate in the vote, if taken, even though it is illegal because experience has shown that a relatively small percentage of employees in other companies have participated in votes of this kind. As a consequence such votes have not been representative and in each case the many have sacrificed control over their actions to the few.

In the Allegheny-Ludlum case the Labor board's position was prompted by a letter from Mr. Edgar protesting

(Please turn to page 182)

hipment Suspensions Follow At nce Upon Calling of GM Strike

MPACT on the national economy of strike called last week in 115 Gen- Motors Corp. plants, involving some 00 workers, was immediately re- ed when suppliers began receiving ent suspension orders from various of the corporation.

e extent of shipment suspension ot immediately clear but it was ently indicative of the serious in- tions to a wide area of the econ- which will result should the strike ngthened and shipment suspension fan out to hundreds of parts and terial suppliers forcing such plants ughout the country to close down nge space becomes taxed to the

k check about a week ago by the obile Manufacturers Association es production volume in the in- has been "hammered down more 50 per cent" below anticipated by a wave of strikes and slow- s in supplier plants.

of Nov. 20, the industry faced strike or slowdown interferences production, five plants being closed e of tieups at suppliers, and 111 being slowed for similar reasons. automotive plants, strikes are ted at any moment, while in e key supplier plants slowdowns are used to enforce union demands.

Cites Reasons for Labor Troubles

e AMA, through its general manager, ge Romney, has sent a letter to ident Truman outlining the current ion and citing seven reasons at ct of present labor troubles. Said Romney:

e no time in America's peacetime since the Civil War, has the faced a more anxious winter than critical days ahead. At a time earliest possible resumption of production is necessary to our welfare and to that of the as a whole, large scale strikes America's key industries.

cause it is clear that the people and need more information about ture of our domestic crisis, we prepared an analysis of the major of the difficulties in the automo- industry, the first major industry cut for large scale strike action. is our view that labor troubles industry result primarily from the ving causes:

1) Our country's outdated national labor policy and the partisan- ship of government agencies and officials in matters where unions are involved.

2) Misuse of its excessive monopo- listic power by the auto union.

(3) The substitution by the auto union of revolutionary economic and political objectives for the legitimate objectives of collective bargaining.

(4) The auto union's use of false ideas in organizing workers, such as the idea that loafing will increase purchasing power.

(5) Because control of the auto union is the biggest prize in unionism, and the intra-union factional fights are intense, bitter and perpetual.

(6) Because almost every strike has meant a gain by the union and even children multiply their tantrums if by so doing they can rule the roost.

(7) Because the auto industry is the national proving ground for CIO unions.

"Contrary to union propaganda, these troubles are not the result of the 'speed-up,' nor any effort to destroy the unions, nor because human engineering lags in the auto industry, nor because of disproportionate shortcomings, and abuses between managements and workers in automotive plants.

"The basic question we face is 'How can decentralized competitive industry bargain collectively with centralized monopolistic industrial unions without losing the individual freedom and responsibility on which competitive enterprise is based?'

"The remedy: Make unions and union officials subject to the same laws and policies which apply to all other Americans.

"The automotive industry recognizes that the labor unions have a potentially permanent and constructive part to play in the American economy. As its record

(*Please turn to Page* 181)

Present, Past and Pending

■ PLANS LARGE OUTPUT OF AVIATION GAS TURBINE ENGINES

PITTSBURGH—Westinghouse Electric Corp. plans to handle up to $15 million of aviation gas turbine engine production annually at its South Philadelphia plant and expects to derive 80 per cent of its future gas turbine business from the Army and Navy.

■ REPUBLIC AVIATION BUYS AIRCOOLED MOTORS CORP.

FARMINGDALE, N. Y.—Republic Aviation Corp. has entered the aircraft engine field through purchase of Aircooled Motors Corp., Syracuse, manufacturer of Franklin air-cooled engines.

■ EASTERN RAILROADS SEEK HIGHER FREIGHT RATES

NEW YORK—Announcing suspension of a proposed 10 per cent increase in freight rates filed on behalf of eight railroads, the Public Service Commission disclosed last week that 34 other railroads had filed new tariffs providing for a similar raise.

■ REYNOLDS RESEARCH CORP. BUYS LOUISVILLE PLANT

RICHMOND, VA.—Reynolds Research Corp., subsidiary of Reynolds Metals Corp., has purchased all the government interest in a Louisville plant operated by it for ordnance during the war.

■ NATIONALIZATION OF STEEL IN ENGLAND UNCERTAIN

LONDON—(By Cable)—No decision concerning nationalization of the iron and steel industry will be made until the industry's five-year plan has been considered according to a government statement to Parliament.

■ PULLMAN SUES UNION ON WORK STOPPAGE

BIRMINGHAM—Pullman Standard Car Mfg. Co. filed a damage suit last week against the International Brotherhood of Electrical Workers as a result of the current work stoppage at the company's Bessemer plant.

■ FARM MACHINERY PRODUCTION DROPS 10 PER CENT

WASHINGTON—Farm machinery production dropped 10 per cent, or $17,707,697, in the third quarter from $163,551,380 for the like 1944 period because of peacetime transition difficulties, Civilian Production Administration reported last week. Production is expected to rise moderately in November.

■ STAINLESS STEEL PRODUCTION TESTS PROVE SUCCESSFUL

WASHINGTON—Pure electrolytic manganese from low-grade domestic ores produced in a Bureau of Mines' pilot plant has definite advantages as a substitute for low-carbon ferromanganese in manufacture of stainless steels, the Bureau said in reporting on tests at plants of Rustless Iron & Steel Corp. and Universal Cyclops Steel Corp.

Metal Trades Meeting Told Government Yoke Hampers Reconversion

Senator Wherry, speaking at association's forty-sixth annual convention in Cleveland, declares controls must be removed from neck of business to permit returning veterans and others to establish new enterprises

THE BATTLE of reconversion, "getting the country into maximum production," can only be won by "taking government controls off the necks of business" so that returning veterans and small businessmen may be able to "establish 1 million new businesses, services and professions," Sen. Kenneth S. Wherry (Rep., Nebr.) declared last week speaking before the forty-sixth annual convention of the National Metal Trades Association in Cleveland.

Senator Wherry said the "American way toward real full employment lies in forthright legislation that will actually help instead of hinder the real sources of wealth and prosperity—free labor and free industry."

As a member of the Senate Small Business Committee, he said that small business, particularly the service trades, offers "the firmest keystone for postwar prosperity."

"Small business is the chief user of employment," he declared. "It is the chief consumer of all business itself. Yet it is small business that suffers most from red tape, paper work and restrictions. Its own employment and its employing cannot be guaranteed."

Senator Wherry said that full employment cannot be realized unless Congress and the administration "assure the opportunity for the success and legitimate profit of 1 million brand new businesses, services and professions, plus a fresh chance for the thousands of small businesses which were war casualties."

Because of the administration's approach to the problem, Senator Wherry proposed a four-point program:

"1. Congress should take the bull by the horns and set up whatever government machinery is necessary to clarify the administration attitude on a standard of wages, working conditions and labor disputes so that business and labor can know where it stands and adjust itself accordingly.

"2. Collective bargaining must be restored to the American industrial scene. A continuation of compulsory arbitration means a continuation of government controls. But if labor is to be free to bargain collectively, some direct penalties must be provided by an act of Congress against labor's own violation of its obligations.

"3. The government must stay out of business. Both established and potential business is just plumb scared to take a risk in view of what the 'planners' may cook up next.

"4. Revise the tax structure so that present inflationary trends are eliminated and venture and risk investment is not jeopardized by antagonistic fiscal management. Every business and every individual should be required to pay some tax even though it is a small tax. If our debt is to be paid, and if we are to eliminate unnecessary appropriations, people should become tax conscious."

Coercion Replaces Bargaining

"Shotgun bargaining and collective coercion" have replaced "true collective bargaining" because of a "communistic minority" within the ranks of organized labor, Louis Ruthenburg, president, Servel Inc., Evansville, Ind., told the convention.

"American labor has repeatedly and conclusively demonstrated its fine patriotism and adherence to American ideals," he said, "but labor is being increasingly victimized by the communists' subtle and effective technique of boring from within.

"Under such conditions 'true collective bargaining' is impossible. Shotgun bargaining and collective coercion are the order of the day."

Mr. Ruthenberg told the more than 500 leaders of management from metal trades plants throughout the East and Middle West that the "basic thing wrong at the very roots of our national structure" is the "violation of our fundamental principle that all men must stand equal before the law."

"Organized labor," he declared, "has been given special privileges under the law at a great potential cost to the American public.

SEN. KENNETH S. WHERRY

"Under the National Labor R
Act the employer may be heavily
ized for certain unfair labor p
But that law is completely silen
unfair practices on the part o
That is un-American class legisl

"Wholly inconsistent with th
of the Wagner Act, the courts
U.S. have granted organized lab
munity from various provisions
law affecting monopoly, intimidat
tortion and riotous assembly.'

"Through such measures has t
to oppression and anarchy been
After such violation of the fund
basis of orderly government d
the daily violation of labor c
follow as the natural course of an
cause?"

Mr. Ruthenburg declared that
all men stand equal before the
petty procedures for collective bar
can have real meaning—no se
or remedial legislation can have e
force."

He called upon "an aroused
formed public opinion to deman
gress" to:

"Revise the Wagner Act, pre
labor's equitable rights of organiz
collective bargaining, but ba
every unfair labor practice for wh
employer is held responsible
equally weighted practice for
organized labor must assume re
bility.

"Enact such legislation as m
needed to rescind all of organized
immunities and special privileges
all laws of the land, not excluding
monopoly measures, tax laws

other laws which apply to business corporations."

The modern business organization should have an effective two-way communication system between worker and management to develop "mutual trust and confidence" throughout the plant, George S. Dively, vice president and general manager of the Harris-Seybold-Potter Co., Cleveland, said.

Speaking on "Are Your Foremen Cost Conscious?" Mr. Dively said such a system, built around foremen and supervisors, would "stimulate, encourage and streamline procedures" for obtaining suggestions, recommendations and grievances through the entire supervisory force. Likewise, he explained, it would serve as an effective medium for transmitting management decisions, policies, and procedures rapidly down through all sections of the supervisory force affected.

To set up such a communication system, Mr. Dively said it would require these things from top management:

Weekly meetings to tell supervisors of current new orders, order cancellations, company agreements and other vital information; discussion with foremen of changes to employees well in advance before they're sent; advising supervisors promptly of any changes in labor relations before they're put into effect; acquainting supervisors with broad management policies by personal contact; outlining supervisors in writing their responsibilities, authority and duties; consulting supervisors in the formation of those policies; and giving supervisors budgetary and other expense reports so they can better determine how economically their departments are being run.

Supervisor's Obligations

The supervisor, in turn, Mr. Dively declared should: Familiarize himself with operations of his department and other departments from which he gets staff or functional guidance; cultivate a close, understanding, personal relationship with each employee under him, finding out what his workers think, feel and want and let them know what the management plans are that affect them, all the while keeping himself technically up-to-the-minute informed, doing the best possible running-the-department job.

George Romney, general manager, Automobile Manufacturers Association, told the convention that the future peace of the world, the future economic welfare of every American and the successful reconstruction of Europe and Asia depended on bringing American management and labor together on a basis "that will perpetuate full opportunity for free management and free labor to produce goods and jobs in abundance."

Another speaker on the program was Brig. Gen. Leonard P. Ayres, economist and vice president, Cleveland Trust Co., Cleveland, who said the administration's over economic policy that puts costs up and prices down was delaying reconversion.

Machine Tool Distributors Urge Prompt Liquidation of Surpluses

Speakers at annual meeting of national association in Cleveland advocate early scrapping of worn-out tools permitting quick replacement of more efficient equipment which will deteriorate in storage otherwise

AT ITS first general meeting in more than a year, held at Hotel Statler, Cleveland, Nov. 19 and 20, National Machine Tool Distributors Association discussed problems arising from transmission from wartime to peacetime operations. Attendance was 133.

Tell Berna, general manager, National Machine Tool Builders Association, bore down on the seriousness of the government surplus—estimated at 300,000 machines—now overhanging the market. However, he feels that now is the time to get the useful part of this surplus into use. Aside from adequate resources for military security and machines assigned to educational institutions, Mr. Berna believes that the place for the cream of the surplus is in American industry, replacing what he referred to as the "clunkers."

His advice to the distributors was: "Get yourself around on the customer's side of the desk" in this instance, bearing in mind that a well tooled shop is going to be a better customer later on for new machines. Therefore, urge customers who are not quite ready for new machines to replace all their "clunkers" with good government surplus machines—and help them to get those good machines. If the surplus can be liquidated in two years, the decks will be cleared for a lot of new business. Both the government and machine tools users need all possible help in this situation.

Another paper of paramount interest was that presented by A. G. Bryant, vice president, Cleereman Machine Tools Co. and president, Bryant Machinery & Engineering Co. Mr. Bryant has been of great service in Washington both to the distributors and to the builders. Now that the war is over, don't allow the machine tool business to become "the forgotten industry," urged Mr. Bryant.

A. B. EINIG

The following seven recommendations were proposed by Mr. Bryant:

1. Let the President and Congress order the setting aside immediately of one-half of government-owned machine tools, in all of their classifications, as a military reserve subject to review within two years for disposition at that time, in the light of international conditions.

2. Let the State and Commerce Departments immediately facilitate and expedite channels for export machine tool trade, permitting free and private commercial relations so that the industry may compete for the markets now being absorbed by England and other commercially-minded nations.

3. Let OPA immediately suspend price control as applied to the machine tool industry in view of the industry's highly competitive status and because more new machine tools sold will lower the cost of goods and counteract inflation.

4. Let Congress initiate a provision making possible a carry-back of losses of machine tool companies in 1946 and subsequent years against renegotiation refunds which were paid to the government during the war, and which weakened companies whose normal postwar business was absorbed by war requirements.

5. Let the Surplus Property Administrator and the RFC initiate at once the proposed plan for the participation of machine tool builders and distributors in the sale of surplus through the instrument of a properly established commission arrangement and let the administrator and the RFC establish immediately an advisory committee composed of machine tool builders, machine tool distributors and used machinery dealers for regular counsel with regard to its policies in the disposal of machine tools.

6. Let the industry itself with every constructive resource at its command proceed with the education of the general public in the economics of machine tools, their importance in creating em-

(*Please turn to Page* 182)

Net Profit of Steel Industry Drops 34 Per Cent in Quarter

Income of companies representing 82 per cent of industry declines due to cancellation of war contracts and change in nature of orders from wartime to peacetime basis. Profits expected to continue downward unless prices can be raised

EARNINGS of steel companies representing 82 per cent of the country's ingot capacity dropped over 34 per cent during the three months ended Sept. 30 compared with the preceding three months, amounting to $29,101,992 and $44,227,267, respectively. During the third quarter of 1944, net profit totaled $38,561,992.

This sharp drop in earnings is attributed to unsettlement in the industry which has been growing steadily since midyear. It is only partly due to the termination of war contracts, the bulk of which was made in the July-September period. Chief cause of the decline in profit has been the unfavorable price-cost situation which has been accentuated by a change in the nature of orders from a wartime to a peacetime basis.

The steel industry requested permission to advance prices $7 per ton several months ago to cover increases in costs which had accumulated during the war period. No relief so far has been granted by price officials in Washington. One leading producer, for instance, is authoritatively reported as saying that the costs of producing steel in his company have risen more than $11 a ton in a cross-sectional average of all its production since 1940, "yet there has been no compensating increase in price to cover this increased cost."

Large tonnages of steel products were sold below cost by most companies throughout the entire period of the war. These losses could be absorbed at a time when certain relatively low-cost products which carried a higher price and generally produced a higher rate of profit were being sold in volume for war purposes. Now that this wartime demand has disappeared the industry is confronted with the necessity of marketing a high percentage of tonnage in the form of products which are being produced at a loss.

The financial reports which will be issued by members of the industry for the current quarter are expected to show a further decline in earnings. During the early part of this final quarter of the year, operations have been adversely affected by a shortage of fuel arising from a strike of coal miners. In addition, several strikes have occurred in steel plants. This downward trend in earnings is expected to continue as the situation progresses unless prices can be advanced.

Net profit of the fifteen reporting companies, as compiled in the accompanying table, for the nine months ended Sept. 30 declined to $114,199,182 from $115,462,486 for the like 1944 period.

Hourly Earnings in Steel Industry Higher than in 1944

Hourly earnings of wage earners in the steel industry in September averaged 123.4 cents, compared with 121.0 cents in September, 1944, the American Iron & Steel Institute reports. Every month this year the average earnings of employees receiving hourly, piecework or tonnage wages have been above 123 cents an hour. In August, the figure for average earnings was 125.3.

Average number of employees in the industry in September was close to the level of early 1940. The employment average of 521,200 in September was below the August average of 542,700 employees, partly because of the temporary period of adjustment which followed V-J Day. In September, 1944, the employment average was 565,200.

Monthly payrolls declined during September to a total of $119,107,500, compared with $128,117,000 in August and $142,209,500 in September, 1944.

Wage earners worked an average of 40.9 hours a week in September against 40.4 hours a week in August and 47.2 hours in September, 1944.

Third Quarter Net Profit Of Sharon Steel Declines

Third quarter net earnings of Sharon Steel Corp., Sharon, Pa., decreased 50 per cent below those of the second quarter but were 5 per cent higher than in the third quarter of 1944.

Net profit in the third quarter of 1945 was $176,856 against $364,793 in the second quarter of 1945 and $167,388 in the third quarter of 1944. For the first nine months of 1945 net profit was $843,409 compared with $475,138 for the corresponding period of 1944.

Stronger Steel Drum May Replace Wooden Nail Keg

The Navy's need for a nail keg that would stand up under the severity of overseas shipment led to development of a steel drum that may eventually replace the traditional wooden one, the American Iron & Steel Institute reports.

A loss of nails, varying from 10 to 20 per cent, following the breakage of conventional kegs in overseas shipments, spurred the search for better kegs, and of the various types of containers tested, one, a cylindrical steel drum, was outstanding.

COMPARISON OF STEEL PRODUCERS' EARNINGS

	Third Quarter 1945	Second Quarter 1945	Third Quarter 1944	Nine Months 1945	Nine Months 1944
U. S. Steel Corp.	$11,624,420	$16,774,202	$16,924,356	$43,777,793	$49,306,889
Bethlehem Steel Corp.	7,761,667	8,041,682	6,621,944	23,499,258	19,788,385
Republic Steel Corp.	1,617,675	3,271,703	2,195,526	7,973,927	6,470,792
American Rolling Mill Co.	1,460,795	2,071,925	916,350	5,408,223	3,357,841
Rustless Iron & Steel Corp.	227,430	638,381	369,975	1,314,726	1,394,964
Jones & Laughlin Steel Corp.	1,343,295	2,357,524	1,889,847	5,714,308	5,478,034
Continental Steel Corp.	138,567	208,672	120,522	499,131	443,902
Inland Steel Co.	2,016,017	2,841,652	2,499,491	7,228,617	7,670,909
Keystone Steel & Wire Co.	285,139	464,263	306,451	1,085,894	1,047,031
Youngstown Sheet & Tube Co.	1,697,943	2,190,260	1,818,768	5,847,615	5,253,154
National Steel Corp.	2,027,502	3,453,183	2,667,515	8,910,673	8,080,974
Allegheny Ludlum Steel Corp.	537,079	1,027,097	926,400	2,500,866	2,591,575
Crucible Steel Co. of America	1,734,895°	397,721	976,905	533,616°	3,738,724
Sharon Steel Corp.	176,856	364,793	167,388	843,409	475,138
Granite City Steel Co.	77,498°	124,209	160,554	128,358	364,209
	$29,101,992	$44,227,267	$38,561,992	$114,199,182	$115,462,486

°Deficit.

Third Quarter Income Decline of 12 Per Cent Shown by Industry

Tabulation of quarterly statements of 320 leading industrial corporations indicates three out of every five had lower net incomes than year ago. Many income reports distorted from normal by war-end charges and credits

BIG BUSINESS sustained a 12 per cent decline in net profit in the third quarter compared with the second quarter of this year, and contrasted with the third quarter of 1944, net earnings in the third quarter of 1945 were down 10 per cent.

Tabulating statements of 320 leading industrial corporations, the National City Bank of New York found that three out of every five had lower third-quarter earnings than a year ago. Those 320 corporations are representative mainly of the larger manufacturing organizations in the country and are not necessarily typical of the smaller corporations, partnerships and individual proprietorships, the bank pointed out.

Total net income of the group, after taxes, and after deduction of deficits of 15 companies, amounted to approximately $244 million, compared with $271 million in the preceding quarter and was 10 per cent below the $271 million in the third quarter, 1944. Although the bank's tabulation for the first half of 1945 showed a 12 per cent increase over the corresponding period of 1944, the third quarter narrowed the gain in cumulative total for the nine months to 2 per cent. Cumulative net income for the first three quarters of 1945 was $797 million against $779 million for the corresponding period of 1944.

The corporations' statements showed a marked divergence, the bank says, between the trends of sales and earnings of the companies that had been engaged largely in the production of war materials and which experienced contract cancellations during the latter part of the third quarter, and of those companies in the consumers' goods lines where activity has continued at a high level.

Two out of every three manufacturers reporting sales figures showed decreases as compared with the third quarter, 1944, with decreases of 20 to 50 per cent or more in the one group contrasting with increases up to 10 per cent or more in food products, petroleum, building materials and some other lines. The combined total of sales was down 23 per cent for the third quarter, but only 9 per cent for the first nine months.

The New York bank's tabulation indicates that 24 iron and steel companies had a third quarter net income of $29,081,000, or 17.4 per cent less than for the corresponding period of 1944. Net income of those companies for the first nine months was $106,545,000, or 1.4 per cent above that for the same period of 1944. Net worth of those 24 iron and steel companies on Jan. 1, 1945, was $2,991,240,000, an increase of $26,293,000 over net worth on Jan. 1, 1944, the New York bank's report indicates.

Of the 320 corporations tabulated, only 13 in the petroleum products group, 22 in miscellaneous manufacturing, and 16 in the wholesale and retail trade group showed increases in third-quarter net income in 1945 over the same period in 1944. All of the other industrial groups, comprised of 269 corporations, showed losses ranging from 0.9 per cent to 45.2 per cent.

For the first nine months, nine industrial groups consisting of 207 corporations showed losses in net income compared with the same period of 1944, while six groups comprised of 113 firms had increases.

The high wartime tax rates still in effect this year (85½ per cent, net on excess profits, with an 80 per cent overall ceiling on total federal taxes, including normal and surtax) tend to stabilize net income by offsetting to a large extent the changes in earnings before taxes, the New York bank pointed out. At the same time, many of the income statements are greatly distorted by war-end charges and credits. In a number of cases the third quarter reports reveal that a sharp drop in operating earnings, or an actual deficit, was offset by tax credits arising from charge-offs of war plant and equipment, and by adjustment of tax reserves to lower earnings levels.

Brazilian Textile Industry Plans $25 Million Expansion

Brazilian textile industry may spend as much as $25 million in a modernization and re-equipment program now contemplated, according to a report to the Department of Commerce.

Based on past history, American sources may be called on to meet this new machinery demand, the department indicated. The new machinery purchases would be financed in part or in whole, by a number of Brazilian exporters, under one plan that is now being considered.

NET INCOME OF LEADING CORPORATIONS FOR FIRST NINE MONTHS, 1944-1945

Net Income is Shown After Depreciation, Interest, Taxes, and Other Charges and Reserves, but Before Dividends.—Net Worth Includes Book Value of Outstanding Preferred and Common Stock and Surplus Account at Beginning of Each Year.
(In Thousands of Dollars)

Industrial Groups	Net Income Third Quarter 1945	% Chge.	Net Income Nine Months 1945	% Chg.	Net Worth January 1 1944	1945	Annual Rate of Return % 1944	1945
Food products	$ 19,283	— 1.2	$ 62.520	+ 6.9	$ 738,983	$ 743,656	10.5	11.2
Textiles and apparel	1,816	—12.3	7,804	+ 8.3	121,380	138,197	7.9	7.5
Pulp and paper products	5,545	— 1.2	16,660	— 0.9	370,128	378,307	6.1	5.9
Chemicals, drugs, etc.	45,106	—14.9	143,668	— 1.6	1,699,988	1,754,698	11.5	10.9
Petroleum products	50,348	+ 1.6	159,937	+21.0	1,978.243	2,063,655	8.9	10.3
Stone, clay and glass	7,490	—19.4	26,188	— 8.8	394,525	411,189	9.7	8.5
Iron and steel	29,081	—17.4	106,545	+ 1.4	2,964,947	2,991,240	4.7	4.7
Electrical equipment	18,128	—17.9	60,224	— 3.7	712,191	781,145	11.7	10.3
Machinery	4,638	—17.3	18,090	—11.1	223.040	235,621	12.2	10.2
Autos and equipment	4,144	—45.2	20,249	—14.7	223,992	240,162	14.1	11.2
Other metal products	25,191	—11.0	80,555	— 3.0	1,028,829	1,067,133	10.8	10.1
Miscellaneous mfg.	9,990	+ 6.9	28,726	+ 5.9	309,139	332.003	11.7	11.5
Total manufacturing	220,760	—10.7	731,166	+ 2.8	10,765,385	11,137,906	8.8	8.8
Mining and quarrying	13,204*	—11.1	38,990*	— 5.1	621,097	647,642	8.8	8.0
Trade (whol. and retail)	7,220	+10.2	19,541	+13.2	284,979	282,140	8.1	9.2
Service	2,641	— 0.9	7,702	— 5.8	141,440	139,971	7.7	7.3
Total	$243,825	—10.1	$797,399	+ 2.5	$11,812,901	$12,207,659	8.8	8.7

*Before depletion charges in some cases. (Data from National City Bank of New York).

Steel Price Action Still Delayed

OPA policy still undecided as rumors of impending increase continue to circulate. Single producer granted some relief

ALTHOUGH rumors continue to circulate of an impending increase in steel prices, up to late last week the Office of Price Administration had taken no official action. As a result the settlement of the price issue, which is tied closely to the wage controversy, remains as unsettled as ever.

Steelmakers decline to express any view as to when the price increase will come. Announcement of the advance has been deferred so long that producers have taken the view they cannot count on it until it is actually announced. As a matter of fact the rumors coming out of Washington are confusing, some indicating that the increase will be announced any day, and others that the announcement will be deferred for two or three weeks.

One of the rumors going the rounds last week was to the effect that OPA was going to allow price increases amounting to around $23 million. This would work out to about 30 cents per ton, far under anything previously predicted. Most of the gossip has been that an increase of $2 to $2.25 per ton would be allowed.

Possibly a straw in the wind is provided by OPA's action last week in allowing an individual company price increase. In the case of the Phoenix Iron Co., Phoenixville, Pa., OPA granted in full the company's application for increased prices on its structural shapes and carbon steel bars, the increases being made retroactive to Nov. 5. The increases authorized amount to $2.45 per 100 pounds f.o.b. for carbon steel shapes; $2 per 100 pounds of carbon steel merchant bars and an extra of $2 in addition to the base price increase on structural beams and channels in sizes 4-in. to 10-in. inclusive.

The industry has asked for an increase of up to $7 per ton to cover accumulated higher wage and production costs. This increase, if granted, would not take into consideration any wage increase which might come from the present demands of the steelworkers. For that matter, the steel producers have made it clear any wage increase granted will have to be compensated for by an additional hike in steel prices. One producer says to meet the wage demands of the union would mean an additional $7 per ton increase in prices over the original $7 per ton asked by the industry.

Manufacturers of bolts, nuts, screws and rivets were provided last week by the Office of Price Administration with a procedure for applying for individual ceiling price adjustments.

To be eligible, an applicant for price adjustment must show: (1) that he is currently suffering financial hardship, and (2) that either his established maximum prices are below the general level of prices of other producers, or that they impede production needed for an orderly reconversion to peacetime economy.

OPA also said that manufacturers apply to the price agency for appr of price schedules that were not in e during Oct. 1 to 15, 1941, the base of the regulations.

Another change made in the pr of bolts, nuts, screws and rivets is discontinuance of the provision tha quired manufacturers to recom maximum prices upon the basis actual production experience.

JOBLESS: Sleek gray destroyers being deactivated at the U. S. nava repair base, San Diego, Calif., form a reserve fleet. Among the vessel being decommissioned are some of the recent war's most famous NEA photo

Basic Issues Stall Progress in Management-Labor Conference

WASHINGTON

INDICATIONS last week were that the Management-Labor Conference, after more than two weeks' deliberations, was getting nowhere on President Truman's 2-point demand that it set up collective bargaining procedure that will permit settlement of industrial disputes without resort to strikes, and that it establish arbitration procedure for use when ordinary collective bargaining fails.

Alarmed by failure to date to make progress on these points, two groups met last week to tackle the basic problems presented. One group, known as the Big Six, was comprised of Eric Johnston, president, Chamber of Commerce of the United States, Ira Mosher, president, tional Association of Manufacturers, liam Green, president, AFL, Philip ray, president of the CIO, John L. L president, United Mine Workers, Thomas Cashen, chairman, Rai Labor Executive Association.

The other group was composed public members, Judge Walter P. St George W. Taylor, Commerce Secre Henry Wallace and Labor Secre Lewis Schwellenbach.

Both groups met at length but ap ently reached no conclusions. Howe they were expected to hold subseq meetings and possibly make recommen tions to the six working committees of

...ference, which committees apparently have not yet agreed on any concrete ...grams.

Clearly one of the chief obstacles to ...ement on various principles is the ...kiness of the unions over any sug...ions that would curb the right to ...e. Another touchy subject is that of ...isdictional disputes. Another is arbitra... as union leaders dislike any curbs on ... freedom of action. The main ob...le to progress, however, is over ...ether the conference should enunciate ...sition on the current demands for in...ased wages. The executive committee ...et up a special committee to consider ...ether the wage controversy should ... any place in the proceedings but ...committee is slow to reach a deci... probably because it fears that any ...n it might take might cause the ...up of the conference.

...s a general thing Washington ob...ers at the moment are none too ...itive of success for the conference. ...pointed out that only one of six ...ing committees filed a progress re... indicating that difficulty is being ...untered in developing a pattern on ...ich to build amicable labor relations. ...s said in informed circles that if all of ...recommendations so far made in these ...mittees were accepted by the con...ress and adopted and lived up to by ...ness and labor, they would not aid ...any measurable degree in the resolu...n of the strikes now "cooking" in the ...ecessile and steel industries. Nor had ...ey been adopted two months ago would ...ey have aided in settling the oil dis...te that led to government seizure of ...e refineries.

...shington observers now feel that ...ess more progress is made toward ...ing the basic issues the representa...s of the government will have to step ...d play a more active role in the show.

...d Open Hearth Research ...oup Meets at Pittsburgh

...he bi-monthly meeting of the Acid ...n Hearth Research Association Inc. ...held recently at the University of ...sburgh, Pittsburgh. During the busi...s session, F. C. T. Daniels, secretary, ...ounced the results of a survey of pro... statistics for the entire acid open ... industry during 1944. The com... indicated that the value quoted ...e American Iron & Steel Institute ...99,000 net tons) was actually only 60 ...cent of the total acid open hearth ...duction. The actual 1944 figures ...e as follows (one small non-member ...t not reporting):

	Net tons	Per cent
...ic	946,034	49.07
...ic	981,696	50.93
...tal	1,927,730	

...further breakdown indicated that ... total represented 2.17 per cent of ...total U. S. steel production during 1944, and that 69 per cent of all acid open hearth steel was produced by members of the association.

Completion and distribution of the first Research Bulletin, "Acid Open Hearth Slag Fluidity and Its Significance," was announced.

At the technical session, Dr. G. R. Fitterer, director of research, outlined the research program for the coming period.

B. B. Rosenbaum discussed a correlation between microstructures, inclusion content, and notched bar impact values at various temperatures for 34 casting grade heats made in association plants under research staff supervision.

J. B. Kopec described Jominy hardenability test values and corresponding calculated values for the same series of heats. A complete series of physical and chemical tests is being conducted on these heats in an effort to correlate furnace practice with physical properties, composition and structure.

J. W. Linhart concluded the meeting with the description of a rapid control method for predicting manganese recovery in acid practice. The method has been applied in one plant of the association with a large measure of success in meeting chemical specifications more closely and increasing the manganese yield.

Industry Gets Last Chance To Provide Full Employment

Industry may be having its last chance to find a way to full employment and to preserve the present economic system, David F. Austin, vice president in charge of sales, United States Steel Corp., warned members of the Industrial Training Directors Association of the Cleveland Chamber of Commerce at a dinner meeting in that city last week.

"Full employment," he said, "may actually be more important to you and to me than the success or failure of our own companies. . . . If this time we fail to find a means of staving off wide unemployment, I'm afraid that the world will turn to some other method. And that will not be good for you, nor for me, nor for the people who will be persuaded to take the other road."

The future prosperity of the nation rests in the hands of less than a half-million salesmen, he added, because full employment will remain a mythical hope unless they sell the nation's output.

Scrap Men to Meet in Chicago, Jan. 20-21

Handling surplus war material will be emphasized at the annual convention of the Institute of Scrap Iron & Steel to be held in Chicago, Jan. 20-21.

MEETINGS...

Nov. 26-27, Packaging Institute Inc.: Seventh annual meeting, Hotel Commodore, New York. Major Albin P. Dearing, 342 Madison Ave., New York 17, is executive director.

Dec. 3-4, Steel Products Warehouse Association: Fourth annual conference, Hotel Cleveland, Cleveland. Clayton Grandy, 1060 Union Commerce Building, Cleveland, is president.

TRANSITION TOPICS

STEEL EARNINGS— Income statements of producers representing 82 per cent of nation's steel ingot capacity show 34 per cent drop in net earnings in third quarter compared with preceding three months. See page 68.

PRICES— Office of Price Administration continues to defer announcement of expected increases on steel products. See page 70.

TECHNICAL DATA— Government agency preparing for early availability to the public a mass of data collected by European missions showing what made Germany "tick." Technical and other information which was secret or restricted during the war also will be made available. See page 72.

FULL EMPLOYMENT— Enactment of full employment bill likely to be delayed. Immediate passage held up by inability of legislators to reach agreement on provisions of measures. See page 74.

AIRPLANE PRODUCTION— Personal plane manufacturers planning a $100 million business in next 12 months. See page 86.

FLAME SPINNING— Method coming to forefront of approved forming techniques is flame spinning. Tube end rotates under oxyacetylene flame, followed by closing while hot with hard-faced forming shoe. See page 92.

PRODUCTION LAYOUTS— Layout reproduction system creates direct-contact negatives and prints with high accuracy to help the reconverted plant get started on multiple production of parts. No camera or projector required. See page 96.

Data As To What Made Germany "Tick" To Be Made Public Soon

New Publication Board in Department of Commerce now one of busiest spots in nation's capital. Preparing technical and other data collected by European missions for early publication. First group of U.S. restricted reports to be available soon

ONE OF the busiest spots in Washington, now that most of the wartime agencies have withdrawn from the spotlight, is the new Office of the Publication Board, Department of Commerce. It was appointed by the President to make public a vast array of technical and other information which was restricted or secret as long as this country was at war.

First activity of the Publication Board was to classify and publish the information gathered by hundreds of Americans who traveled to Europe after V-E Day to study German industry and technology. Under the sponsorship of the Army, the Navy, the State Department, the Foreign Economic Administration, the War Production Board and other agencies, they usually went in groups that were known as "missions." Up to the present time these missions have turned in some 500 reports, and many more are in preparation.

In general, these reports reveal what made Germany "tick." They set forth the details as to how Germany prepared industrially and technologically for the war, how that nation mobilized and supervised her industries during the war, and they give the facts about the various German secret weapons.

The Publication Board so far has prepared 377 of these reports for distribution to industry. They are listed by title in an index which may be obtained by writing to the board at Room 1318 Commerce Building, Washington 25. Or the reports themselves may be read in a space which has been partitioned off in the auditorium of the Commerce building. They are available in multigraphed typewritten form, at a charge ranging from 10 cents to as much as $2 for the more comprehensive reports.

Many of the 377 reports now available are only an evaluation of plants investigated or interviews with German scientists, and contain little technical information as to processes used; only 23 run pages or over. Later on those rep describing new processes will be leased; they are being edited at the p ent time by competent men so that may be read by men in industry maximum informative value.

By way of illustration, a few of th ports available now are the follow

German Tool and Special Steel dustry, listing all German tool steel brand names and by composition. report consists of 31 pages of si spaced typewritten pages.

Information Obtained by Questio Dr. A. Scheibe, Dr. Ernst Wilhelm H holz, Dr. Werner Kappel and Dr Adelsberger on High Frequency velopment Attenuators—3 single-sp typewritten pages.

Design of Radar Test Equipme Siemens-Halske Plant, Munich—3 s spaced typewritten pages.

Manufacture of Glass-Fabric Im nated Fiber for Use as a Substitut Mica Insulation between Commu Segments in Motors and Generato single-spaced typewritten pages.

Investigation of Felton & Guille Kabel Werke, Plants at Cologne-K heim and Nordenham. This repor scribing operations of the leading manufacturer of Germany, compri single-spaced typewritten pages.

Information on Forgings, Castin

Other reports contain information the German oil, plastic, chemical, ber, textile, synthetic fuel, electr forging, casting, die-casting, extr radio, dental, electrical, medical, canning, diesel engine, aviation i ment, airplane, refrigeration, al tungsten carbide, forest product numerous other industries.

One report now available is en "Steel Making in Belgium and L bourg During German Occupation comprises 25 single-spaced typew pages and its cost is 25 cents; its number, for mail-order purposes, i

Reports covering the German iro steel industry will be made availa a later date. Still to be made ava also, are reports covering German manufacturing machine tools and production equipment.

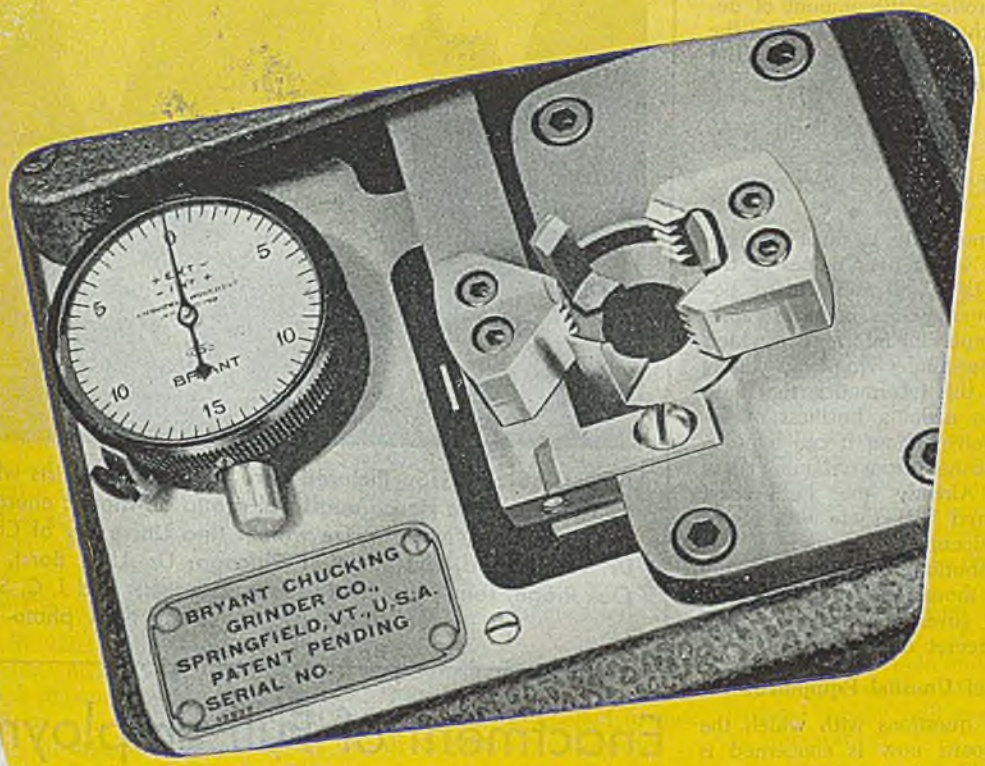
First batch of United States w restricted reports to be made av to the public will be some 400 pre on projects performed for the Wa duction Board's Office of Productio search and Development. These r were delivered to the Publication Nov. 21 and will be duplicated an dexed shortly to make copies of available to industry. Quite a few of reports are expected to be highly ficial to industry, since much of th formation that helped the war effo help make industry more efficient ing the period of peace.

Just to illustrate, the subject mat a few of these reports follows:

Results of high top pressure e

ASK END OF OPA: National Association of Manufacturers reconversion council recently presented to Congress a program which called for elimination of wage controls and OPA price ceilings by Feb. 15, 1946. Three witnesses who appeared before the House Committee on Postwar Economic Policy and Planning were, left to right: Clarence B. Randall, vice president, Inland Steel Co., Chicago; Robert R. Wason, Manning, Maxwell & Moore Inc., New York; and John Airey, president, King-Seeley Corp., Ann Arbor, Mich. International News Photo

How to speed thread inspection . . .



Bryant Thread Gages

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ments on the DPC blast furnace operated by the Republic Steel Corp. at Cleveland;

Metallurgy of high-alloy steels for use with low pressures and temperatures;

Hot-forming of aluminum, there being 27 reports on sheet forming and 22 on other forming of aluminum airplane parts;

Quality control of manufacturing processes so as to reduce the amount of defective work, these reports covering the system so widely used by the Army and Navy in cutting costs at contractors' plants;

Fluoroscopic investigations and techniques;

Methods of making spectrographic analyses.

It will be practically a "must" for enterprising firms to get their names on the mailing list of the Publication Board, because otherwise they are bound to miss out on much important information which hitherto has been under wraps. So vast is the volume of this information that only companies who make a business of informing themselves about it can hope to derive full advantage from obtaining these war secrets. Already the Publication Office is assured that there will be at least 25,000 documents to prepare for general distribution. There probably will be many thousands more, for practically every government agency produced many secret documents.

Problem of Unusual Equipment

One of the questions with which the Publication Board now is concerned is what to do about unusual German industrial equipment different from anything produced in this country. The Germans have some novel die-casting machines, also some novel extrusion presses, including a 50-ton extrusion press. The board plans to make arrangements with the State Department whereby a number of such unusual machines will be brought to the United States for study to determine whether they are potentially useful to our industry. In view of the fact that there are no appropriations under which such study could be conducted by the government, it is felt that this research work should be done by private industry—by representative manufacturers or by private research organizations. Just how such arrangements can be worked out without placing any one interest in a favored position so far has proved a baffling question. The board may unload such problems by calling in representatives of the interested industries, leaving it to them to reach a mutually satisfactory agreement as to who will do the work, who will pay the costs, and how the industry will benefit from the results.

So far very little information has been collected about Japanese industry and this lack is to be remedied by dispatching delegations of scientific and production men to Japan in the near future. It is expected that the board members will deal with this matter very shortly, deciding particularly what agencies should sponsor the study of Japan's industries.

ATOM SCIENTISTS: Pictured here are four scientists who appeared r cently before the House unofficial group on atomic energy. Left to rig Dr. H. C. Urey, Nobel prize winner and University of Chicago profess Dr. Leo Szilard, University of Chicago; Dr. L. B. Borst, chairman of t Oak Ridge, Tenn., group of atomic scientists; and J. C. Stearns, Washin ton University, St. Louis. NEA photo

Enactment of Full Employment Bill Will Likely Be Delayed

Immediate passage being held up by difficulty of House mittee to reach agreement on bill's provisions and unacc ability to the House of Senate-passed version. Represent Gossett claims bill would cost $9 billion in normal times

CHANCES for immediate enactment of the Murray-Patman Full Employment Bill are not regarded as very bright in the House for two reasons. One is the difficulty of the House Committee on Expenditures to reach an agreement on the bill. The other is that the Senate-passed version appears to be totally unacceptable to the House.

The Committee on Expenditures held hearings for a period of seven weeks, examining many factors that contribute to employment and unemployment and then referred the entire matter, without report, to a subcommittee of five which Rep. Carter Manasco (Dem., Ala.), the committee chairman, "hoped" would be able to draft some sort of a compromise. Inquiries on the Hill indicate that the subcommittee is making little headway on its assignment and will have no report in the immediate future.

The Senate-passed bill is regarded by numerous House leaders on both sides as highly unsound. While it expresses full allegiance to maintenance of the free enterprise system in the United S it contains absolutely no provisio encouraging free enterprise. In fac original inadequate wording in resp encouraging private enterprise was ened by instructing the President to make "recommendations for legislation as he may deem necess advisable," which is a right the dent already enjoys without any ne special legislation. The original tion specifying taxes as among th jects on which the President was ommend legislation was deleted final wording.

Reason for the unsatisfactory ment accorded this bill by the Senat due in large measure to the contr over the extent to which full em ment should be assured or guarante the government. After a great de labor, the Senate rewrote this para as follows:

"The Federal government has th sponsibility, with the assistance and certed efforts of industry, agriculture

bor, and state and local governments, nd consistent with the needs and obligaons of the federal government, and ther essential considerations of national olicy, to assure continuing full employ-ent, that is, the existence at all times f sufficient employment opportunities r all Americans able to work and seek-g work."

Analysis of expressions of a number of ouse leaders who studied the Full Em-loyment Bill indicates that failure of the ouse to evolve a satisfactory bill results om a present lack of information as to e causes of unemployment.

Rep. Ed Gossett (Dem., Tex.), a mem-r of the Expenditures Committee, ex-ained to the House at some length at opposition to the bill was not based opposition to full employment..

'To ask a man, 'do you favor full em-oyment?' is an insult both to his in-ect and his character. All of us favor employment," declared Mr. Gossett. e are for full employment just like are for God, home, and country. nty-nine per cent of those who now ste our committee and demand im-diate and favorable action on the bill e never read it and have no idea what means.

Bill Is Merely Ground Work

'Mr. Speaker, H. R. 2202 is an unem-oyment bill. Mr. Phil Murray, president the CIO, in a frank statement support-g this bill, said 'I am sure this bill is the last word, but the first. We in the O regard the Murray-Patman bill as inimum legislation.' In other words, is bill is simply the ground work for ecific and comprehensive overall gov-ment planning and expenditures. If acted and carried out, according to its visions and implications, this bill uld require regimentation and would in bureaucracy far greater than ever known heretofore in this coun-, even in time of war.

Full employment, as guaranteed in this if at all possible, is possible only a completely regimented economy. . . s bill, as written, is a highway into ional socialism."

The warmest advocates of the bill, Mr. sett went on, agreed that even in mal times we would have a minimum rce of 3,000,000 unemployed who uld have to be employed through gov-ment expenditures "at $3000 per job year, that would mean government enditures of $9 billion a year," he d. 'If we should add this guaranteed employment cost onto our other mal obligations, there would be no ge from extensive deficit financing." One of the reasons why he opposes the ., went on Mr. Gossett, was that he d heard of a pink or a red individual organization that is not enthusiastically porting this legislation; that makes e all the more suspicious of the pur-ses and intentions of some of those who so anxious for passage of the bill." Chairman Manasco took up the cudgels to remark that passage of the Full Employment Bill in its present form would, in his opinion, "wreck our system of private enterprise." He saw a lot of perils in the bill.

"Do you not think," he asked, "that if the President in transmitting his budget to the Congress in January, which would not take effect until July, at the beginning of the next fiscal year, were to predict that 4,000,000 to 6,000,000 or 8,000,000 people would be out of work in November of the following year that that statement in itself would not accelerate or precipitate a depression, but it would cause all the people of industry to reduce their inventories and it would scare purchasers and they would start tightening up their belts immediately, and immediately it would throw millions of Americans out of work?

"Then the federal government under this bill would have to take these people and put them on federal public works projects. And anybody knows that when you get a man on a federal project it is almost impossible to get him off it."

Stressing the opposition to the bill by those who have studied it in the House, Rep. Walter H. Judd (Rep., Minn.) reported that of the 15 Expenditures Committee members who voted, only two were in favor of the House bill as originally written.

Government Operation of Surplus Plants Opposed by Oil Industry

MEMBERS of the Special Senate Committee Investigating Petroleum Resources were told last week by W. Alton Jones, president, Cities Service Co. and president of War Emergency Pipelines, Inc., that the oil industry believes the government should not attempt postwar operation of surplus plants, pipelines and other facilities.

The views of the industry were revealed in a statement of several principles which it feels should be applied in disposing of surplus petroleum properties.

That these principles have the strong support of the industry was indicated by Mr. Jones in his remarks. He told the committee that he spoke as chairman of an industry group appointed to provide the senators with material regarding postwar disposal of pipelines, refineries and tankers. Members of this group include executives from more than two dozen representative companies and associations.

Calls for Sale of Facilities

In summary, the program advocated by the oil industry calls for sale of all facilities which can be used economically in peacetime, the sales to be handled so as not to disrupt normal operations. Properties not commercially usable, or the sale of which would force the abandonment or displacement of existing industrial facilities should be retained by the government in idle reserve. Long-term leases to private operators should be avoided since these would, in effect, keep the government in business.

No sales should be made, under the suggested principles, which would tend to create monopolies or which would give the purchaser an unfair competitive advantage, since this would demoralize industry. Where the government cannot obtain a fair price, equal to the value to the purchaser, it should hold the property inactive until needed.

Coupled with this statement of principles was a warning note, emphasizing the possibility that the broad peacetime program could be lost under any short-sighted policy in the disposal of surplus properties. Government-built plants have served their purpose now that victory has been won, Mr. Jones observed, and they are, in a sense, expendable. It is proper to reclaim what we can from the waste of war but, he contended, this desire should not cause us to lose our perspective. To do so would endanger the greater objective of national solvency, increased national income, and productive work for all who want it.

In opening his testimony, the Cities Service president praised the objectives set forth in Section 2 of the Surplus Property Act, but he advised a watchfulness by Congress over the activities of the administrators under this act. He urged that the responsible congressional committees deliberate frequently and publicly on all phases of surplus property disposal.

Referring directly to the war effort of the oil industry, Mr. Jones reported that domestic production increased from 4 million to about 5 million barrels a day; that refining facilities were built at a cost of $1,300,000,000, of which $540 million is government investment, and that exclusive of tankers, transportation facilities costing about $425 million were constructed, with the government investing $225 million.

Pointing out that the government interest in all plants and equipment amounts to about $20 billion and that it has tremendous supplies of materials and products, the industry committee chairman asserted that these surpluses constitute a serious and continuing threat to postwar expansion, unless intelligently and promptly handled. The decision as to what shall be done with the vast productive facilities, he declared, may determine the future of America.

"It is possible," Mr. Jones concluded, "that after spending 300 billions of dollars to insure free enterprise, we may, in an effort to save a few millions at the spigot, lose the greater objectives."

Utah Officials Offer Aid to Any Organization Seeking Geneva Plant

Believe citizens of state should have benefit from production of steel from local raw materials. Possibility of state operation of Geneva discounted in industry. Bethlehem's expansion of bolt and nut plant at Seattle well under way

SAN FRANCISCO

STEEL industry observers here do not take too seriously a statement reported recently from Salt Lake City that the state of Utah may take over operation of the Geneva steel plant.

According to reports reaching here, Gus P. Backman, secretary, Salt Lake City Chamber of Commerce, said "the state of Utah may have to enter the picture if politics or monopoly prevent the sale of the Geneva steel plant."

Mr. Backman also said he and Gov. H. B. Haw had discussed the possibility of state operation. "Both the governor and I are for free enterprise and will do all in our power to help any organization obtain the plant," he said.

Regarding his reference to "monopoly," Mr. Backman is reported to have said:

"I mean the fact that a structure has been established in the United States whereby steel is manufactured in a certain area. We are sick and disgusted of providing the raw materials for steel production and not being able to gain the benefits of that production for the people of this state. We're fed up.

"Both the governor and I believe the plant to be economically sound."

Geneva Activity Continued

Meanwhile, although operations at the Geneva plant have been curtailed sharply since V-J Day, and the working force has been reduced from 4000 to about 700, a recently signed contract between U. S. Steel Corp. (which operates the plant) and the government (which owns it) will result in activity being maintained for a period of one year. Output, however, will be only a small part of its wartime rate. At present Geneva's pig iron production is being sent to Henry Kaiser's Fontana plant for further processing.

Bethlehem Pacific Coast Steel Corp. announced that it now has well under way the first step of a $400,000 expansion and modernization program at the company's bolt and nut plant at Seattle. Foundations for the first new building of the project now are being installed by General Construction Co. Bolt and nut making machinery is scheduled to be moved into the new plant by early spring.

According to H. H. Fuller, president of Bethlehem Pacific Coast Steel Corp., the improvement program will enable the Seattle plant to meet all the major bolt and nut requirements of the jobbing trade, railroads and other industries in the Seattle and Portland areas.

"The remodeled and expanded plant," he said, "will have an annual production capacity of approximately 10,000 tons of bolts, nuts and rivets, and will be operated as the Bolt & Nut Division of the company's Seattle steel plant.

"Production will be completely integrated from steelmaking to the packaged products. Output capacity of the Seattle plant when added to Bethlehem's bolt and nut production at the South San Francisco and Los Angeles plants will aggregate well over 30,000 tons annually, making Bethlehem the largest producer of these items west of the Mississippi. Present expansion and modernization of our bolt and nut plants at San Francisco and Los Angeles includes the construction of two small buildings and the addition of bolt and nut making machinery."

The Seattle program which contemplates the eventual replacement of all buildings will be carried out in three steps, all planned so there will be no interruption of present production. The first step already started is construction of an 80-foot by 415-foot building to house bolt and nut production machinery. The second step will be to dismantle the present operating building and replace it with a building similar to the one now under construction. This building will serve chiefly as a warehouse. The third step will consist of operating changes to conform to the new plant layout.

Bethlehem acquired its Seattle bolt and nut plant from the Pacific Coast Forge Co. on Dec. 1, 1944.

Western Pipe & Steel Co. stockholders at a special meeting ratified the proposal to sell the assets of the company, including its name, to Consolidated Steel Corp. for a cash price of $6,217,373. It is believed the transfer will be completed by Nov. 30.

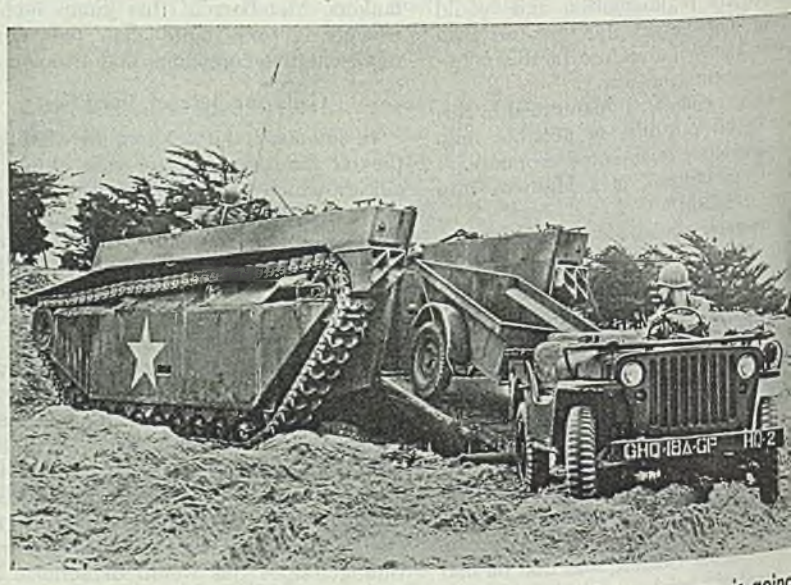
Western Pipe will be entirely liquidated with retirement of 12,940 shares of $5 par preferred at par and accumulated dividends. This retirement will require about $147,000 of the purchase price, leaving about $6,070,000 for liquidation expenses and a liquidating dividend of around $40 a share on the 147,587 shares of common stock.

Seattle Survey Indicates Bright Industrial Future

SEATTLE

An industrial survey by the Seattle Chamber of Commerce gives an optimistic picture of the manufacturing field in this area. It is predicted that the Seattle payroll will total $125 million in 1946, which compares with $107,183,108 in 1941. In 1948, it states, 56,000 workers will be industrially employed here. Industrial payrolls for 1943 were $83,838,464, and in 1945 the total is $92,103,705.

Following an arbitrator's decision



"WATER BUFFALOS" TO BE TAMED: The amphibious tractor is going to be stripped of armor and weapons and produced for commercial purposes by its creator, Food Machinery Corp., Riverside, Calif. Two models will be made for carrying loads up steep inclines or through water and marshland

...ently that employees cannot be transferred from nonunion work to jobs under union jurisdiction, Boeing Aircraft Co. has been forced to lay off about 1000 employees. The dispute has affected mostly office men and others in higher positions whom the company wished to retain. The decision applied even to those workers who had maintained union membership while in nonunion jobs. Unless an early settlement is reached the number laid off will probably total 2000. The company at present employs 7117 including 2809 union members.

Wing sections, tanks, nacelles and other fabricated parts that would have been built into 196 B-29 Superfortresses had the war continued have been consigned to the scrap heap at Boeing Aircraft Co. This represents approximately $5 million worth of materials. Final decision to scrap was left to a panel of seven men representing the industry, government and labor. "What we are scrapping," said Maj. J. S. Binder, air force material clearance chief, "is not so much materials as it is man-hours of labor."

At the end of October the aluminum reduction plant at Troutdale, Oreg., operated by Aluminum Co. of America during the war, was locked up. Pot lines were halted in early September.

Albina Engine Works, Portland, recently launched two steel steamers for the Netherlands government. They will be used in the East Indies.

State Department Aiding Businessmen in Far East

Prompt resumption of American business operations in the Pacific area is encouraged by the Department of State. Regular steamship service was started between this country and the Far East Oct. 1, and private shipments will be accepted by the lines. Air transportation across the Pacific will soon be available also.

Communications have been restored on a commercial basis with principal cities, efforts are being made to reestablish banking services, American consular officers are on duty at Hong Kong, Manila, Singapore, and the principal of these cities, and passports are being issued at the State Department to American business representatives in recognition of the fact that their presence abroad is necessary to restoration of normal business. Moreover, Chinese consulates in this country have been authorized by their home government to grant visas to American businessmen without delay referring these to the Chunking office, as a further expediting service.

Living and business conditions in the Far East are not yet normal, according to reports to the department, it was said, but at the request of the department, the military authorities have agreed to make available food, quarters, and local transportation when such facilities are not available through the normal way.

Housing Shortage Reduces Labor Supply in Southern California

Ferrous metals industries in that section require 10,750 additional workers although employment dropped 16,000 during month ended Oct. 15. Industrial expansion in Los Angeles county continues at high rate

LOS ANGELES

IN A REPORT prepared for STEEL last week, Raymond Krah, acting director of the USES offices in Southern California, said that ferrous metals industries in the area now need 10,003 male workers and 747 female.

Nonferrous industries there listed jobs for 752 men and 20 women.

The figures for women, Mr. Krah pointed out, include clerical help as well as industrial.

Other data released by Mr. Krah indicated trends rather than definite needs or conditions, since only about 60 per cent of business establishments in nonferrous and ferrous industries replied to questionnaires sent out. These statistics are as follows:

In ferrous plants about 161,000 persons were employed on Sept. 15. By Oct. 15, this figure had dropped to 145,000. Reporting companies anticipate little change in employment in the immediate future.

Firms tabulated in the Los Angeles office of the 40 offices maintained by USES in Southern California—this being the largest office—show employment of 1117 for Sept. 15 and a drop to 1028 by Oct. 15, thus bearing out evidence of the trend downward in actual employment.

Occupational Breakdown

Occupational breakdown of USES listings as released by Mr. Krah covering present labor needs in Southern California metals industries are:

Ordnance, 23 men, 8 women; iron and steel products, 2077 men, 126 women; railway equipment, 216 men, 14 women; aircraft and parts, 2275 men, 118 women; shipbuilding and repair, 2426 men, 20 women; other machinery, 1100 men, 98 women.

The housing shortage remains the chief bottleneck in labor supply, he pointed out.

More than 8000 jobs will be provided in additional industrial operations arising from industrial expansion in Los Angeles county last month. Thirty new factories were built and 33 existing plants were expanded in that county during October at a total investment of $23,639,000, largest amount of private capital ever invested here within a single month, according to the Los Angeles Chamber of Commerce.

The figures for October bring the year's total investment in new capacities to $63,627,230, of which $41,960,230 was for expansion and the balance for new factories.

Ground-breaking ceremonies were held last week for construction costing $250,000 for the Pacific Coast's first washing machine factory, being built by the Hurley Machine Division of Electric Household Utilities Corp. at Valley Blvd. and Arden Drive, El Monte, a Los Angeles suburb.

Completion of buildings early in February will mark employment of from 250 to 300 persons. According to Orville Mohler, general manager, ultimate construction will total more than $1,000,000, with employment for 1200. First units will contain 45,000 square feet of space.

A reported reduction in freight rates on scrap from the Pacific Coast to Illinois points, expected to be published by the Interstate Commerce Commission shortly upon recommendation of the Transcontinental Freight Bureau, has stirred wide interest among scrap dealers in Southern California.

With most mills virtually out of the market here, surpluses are piling up, one dealer reporting 300 tons of prepared No. 1 melting scrap without takers. Dealers hope for $7 to $8 a ton here from consumers in Chicago and other Illinois steel centers.

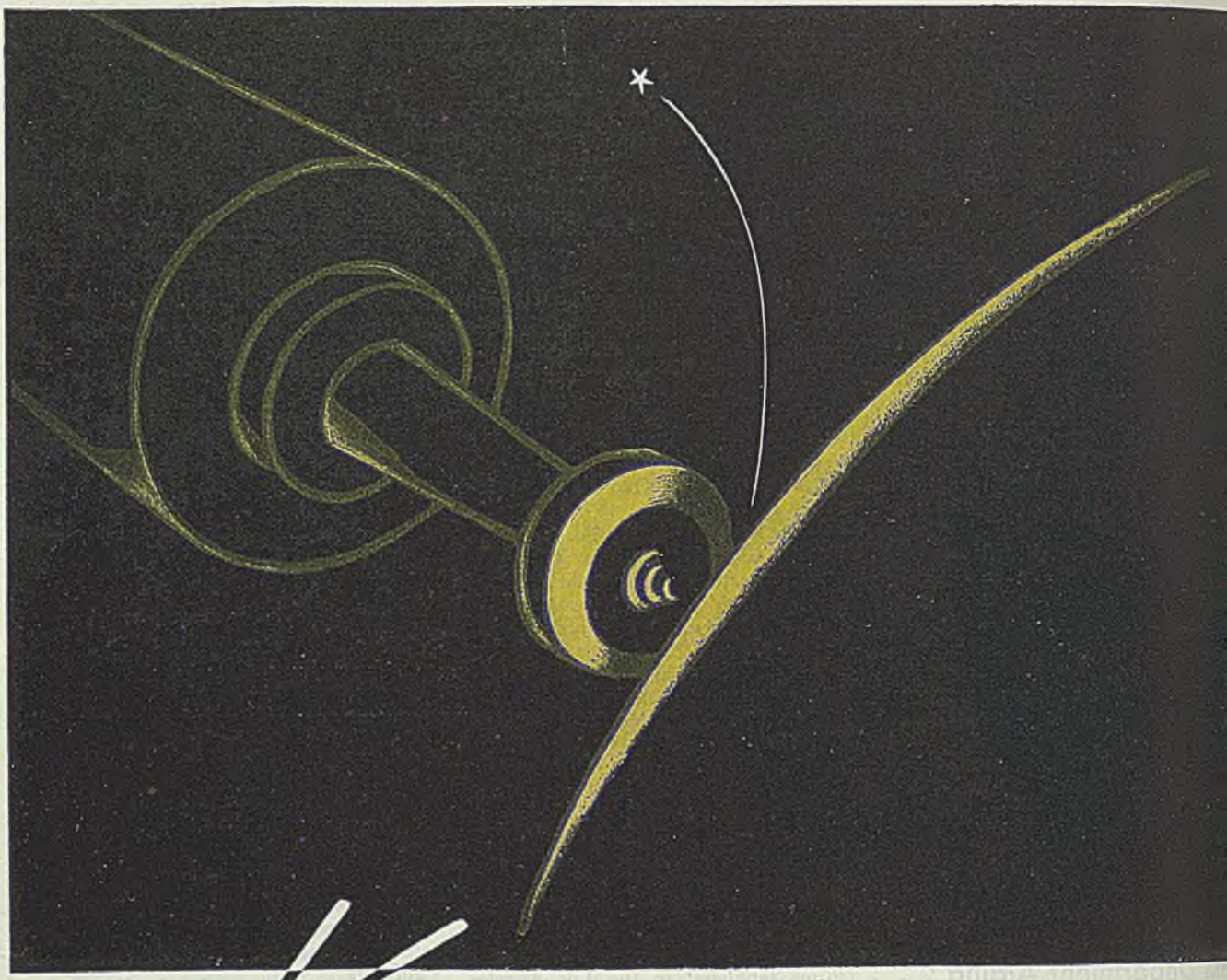
Tentatively set as the new rate is $12.32, a reduction of nearly $2.50 from the present figure of $14.78 on scrap iron and steel.

Railroads Will Challenge Airline, Bus Competition

SAN FRANCISCO

With current assets exceeding their liabilities by more than $1.75 billion dollars, the railroads of the country can be counted on to combat the competitive challenge of the air and bus lines through heavy purchases of new and modern passenger equipment, Stephen Early, former White House secretary and now vice president of Pullman-Standard Car Mfg. Co., said at a recent meeting of the San Francisco Advertising Club.

"Our railroads are fully awake to the fact that we have entered a period of rapid and fundamental change. They know that their future facilities, operations and expenditures must be of a character capable of meeting new conditions, especially competitive conditions." Mr. Early said.



Kissing AT 50,000 R.P.M.

"Osculation" and "oscillation" just don't go together when the kissing steps up to 50,000 r.p.m. and better . . . and the work is measured in the ten-thousandths of an inch. Bearings must be as frictionless as possible . . . and yet rigid enough to hold accurate peripheral limits. The only bearing that can function with minimum friction and necessary rigidity within such tolerance limits is a ball bearing.

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MOST COMPLETE LINE IN AMERICA

FAFNIR BALL BEARINGS

A. H. ALLEN Detroit Editor, STEEL

MIRRORS of MOTORDOM

Threat of early strike in automotive industry appears fading with the war of nerves between union leaders and managements continuing unabated. Ford's position stated in letter to union officials. OPA car ceiling prices not believed final word

DETROIT

AR of nerves between automobile union leaders and plant manage- continues unabated, with the of any early strike fading a little. meeting last week of 200 delegates UAW locals in General Motors a proposal was presented by the strategy committee to postpone action pending further efforts to the wage controversy. This came heels of a sharply worded state- delivered to union officials by Ford ich it was pointed out the "very of the Ford Motor Co." was de- upon union effort to curb work es and wildcat strikes. Since a union contract in 1941, granting ckoff system, Ford has experienced ikes and other interruptions. of maintaining the dues checkoff was reported to have exceeded illion and while it has given the complete membership and financial ity, the company has received ing in return except interruptions in oduction. On the question of wage ds Ford said, "We will pay higher whenever we are sure that we can em and still maintain this company a sound and growing business. Now the time to settle on a general increase which would have to be on guesses as to volume of pro- costs and earnings."

Ford Truck Production Cut

uck production at Ford has been re- by two-thirds, because Kelsey- Wheel Co. is discontinuing ship- of wheel parts. The supplier's was explained in a telegram which "We regret to inform you that as day we are discontinuing shipments original equipment truck parts. decision is necessary due to the in the Automotive Branch of the in acting on price relief or suspen- of ceilings for these parts. Until action is taken by this agency by we can recover in our selling prices creased labor and materials costs ve been compelled to add since 1942, we will be unable to serve

L. Bricker, Ford manufacturing said his buyers were seeking other ers to make the necessary parts, conceded "the search is just about ssible." About 3000 Ford employees be affected, along with 12,000 more suppliers' plants.

The fixing of ceiling prices on auto- les by the OPA last week is re- ed as anything but final, since they not reflect wage increases already granted and others certain to come. Such increases may be given consideration in determining prices according to the recent executive orders by the President. Furthermore, dozens of material and parts suppliers as yet have been unable to quote firm prices to car manufacturers, since they do not know what their own labor costs are going to be, or what further increases may be coming in basic raw materials such as steel.

Briefly, the announced OPA ceilings require an across-the-board reduction of dealer discounts by 2.5 percentage points, resulting in the case of Ford, in a 2 per cent increase in retail price, about 1 per cent for the Chrysler line, a reduction in General Motors lines by 2.5 per cent, and an increase of 9 per cent in Studebaker. Some scattered further increases were permitted on the basis of "engineering allowances," to cover specific improvements in specifications.

In attempting to hold the 1942 line on prices, the OPA repeatedly has emphasized the fact volume of production by next summer will be up to around 500,000 cars a month, or 45 per cent above the peak 1941 level, thus permitting lower unit costs, higher profits and higher wages. This is the same type of fallacious reasoning used by labor unions, and "pseudo-scientific" analyses produced by government bureaus. It is by no means certain that any such high level of output will even come close to realization. In fact, if car assemblies can be pushed to a rate equivalent to the 1941 peak, the industry will consider itself extremely lucky.

Proof of this point is contained in telegraphic replies from the heads of practically all principal producers, solicited by the National Automobile Dealers Association. The Packard reply, for example stated: "Labor disturbances in many lines of manufacture are so uncertain as to their outcome that it is impossible at this time to accurately forecast new car production for the balance of this year and certainly for next year. Strikes are tieing up ball and roller bearings and glass, major items in automobile manufacture. If these strikes were cleared up, many others would hamper production."

Other replies were in similar vein. C. E. Wilson of General Motors observed, "Our production to date is only 17,000 cars, or fewer than we expected to produce in September . . . our expected capacity for 1946 should be substantially the same as for 1941, as it is clear now that additional capacity resulting from the construction of new facilities will not be available until the latter part of 1946, too late to be used in the production of 1946 models. Whether our production in 1946 will be as great as in

Seeking to break the strike which has kept the Ford Motor Co. plant at Windsor, Ont., closed for more than ten weeks are, left to right: Roy England, president of local United Automobile Workers union; Acting Ontario Labor Minister Leslie Blackwell; Labor Minister Humphrey Mitchell; Mayor Arthur J. Reaume of Windsor; and Alderman Ernest Davenport of Windsor. NEA photo

1941 will depend on the availability of necessary raw materials and the peaceful solution of labor troubles."

Many plant expansion projects which in earlier planning were supposed to have been well under way by now have not even been touched. One reason is the serious lack of outside engineering and layout services. Organizations normally handling this work are loaded down with previously booked programs and simply cannot touch anything new. It is doubtful if many of these automotive expansion plans will have reached the production stage before 1947.

First proposals for revisions in its union contract to appear from Chrysler have been made public, after presentation to the UAW-CIO. The most important is an amendment relating to union responsibility, the company requesting the union to agree to include the following in its contract: "The corporation reserves the right to discharge or otherwise discipline any employee causing or taking part in any unauthorized strike, and the union agrees it will not take any step to oppose such discharge or discipline."

Additional suggestions were made in the interest of making collective bargaining work better. Under the present contract, dated Sept. 10, 1943, bargaining procedure failed to avert strikes in 487 cases, or an average of 41 strikes per month over a two-year period. However, prior to 1943, when an appeal board was the final step in the bargaining procedure, strikes averaged only 16 per month, suggesting that the appeal board again should be made the final step in bargaining. Chrysler also proposes its contract shall cover no supervisory employees, and that the union shall pay its representatives for time spent on union business, and not the company as in the past.

Discussing the impact of war contract cancellation, K. T. Keller, Chrysler president, told stockholders that at the beginning of the third quarter, unfilled orders for war materials amounted to $972 million, while three months later they had been cut to $6 million. On the question of new car output, the Chrysler president said it was hoped to make a good start on assemblies in December, and reach full production in March, 1946. By full production is meant a rate close to the peak of 1941.

Tree Loss Revealed

First word to appear on the state of natural rubber plantations in the Far East has come from the United States Rubber Co. which prior to the war operated 131,000 acres planted with 10 million trees with capacity of 75 million pounds of rubber per year. Located in British Malaya and Dutch Sumatra, the plantations are estimated to have suffered to the extent of 1,800,000 trees, from neglect of up-keep and from destruction by the Japanese to provide acreage for planting food. This is a loss of about one out of every 5½ trees standing before the war.

Such a loss is considered a serious item in the light of early production, where the yield was about 400 lb per acre, but there is a redeeming feature in that the acreage can be replanted to high yielding stock which produces as much as 2000 lb. per acre.

Loss of mechanical equipment has been heavy, early reports indicating most of it will have to be replaced. A central factory in Sumatra appears in good operating condition, but on some of the outlying estates all machinery, motors, tanks, piping and valves have been remo Fifty miles of narrow-gage railroad out of a total of 100 miles, also has torn up. Much of the prewar labor of 31,500 has disappeared, about ha Japanese slave labor camps in B and Siam. Their restoration will difficult.

Political disturbances in the Far now make it impossible for U. S. R experts to predict when private e prise can re-enter the Indies. As as possible, however, the company to send competent groups into the to make plans for immediate allevi of suffering and to estimate the da more accurately with a view to reh tation. A survey party originally s uled to leave in October has bee layed until clearance can be given b Army. Information now availab based on written reports from con employees released from prison and from a survey made by W. E. head of the company's scientific re on plantations, who also has been prisoner.

Characteristics of the mess into disposal of surplus property has fal the announcement from Chicago tha new four-wheel 5 and 6-ton truck been withdrawn from a two-day sale because of the refusal of any 500 buyers present to meet the ceiling price of $6728 each, highe being $2500.

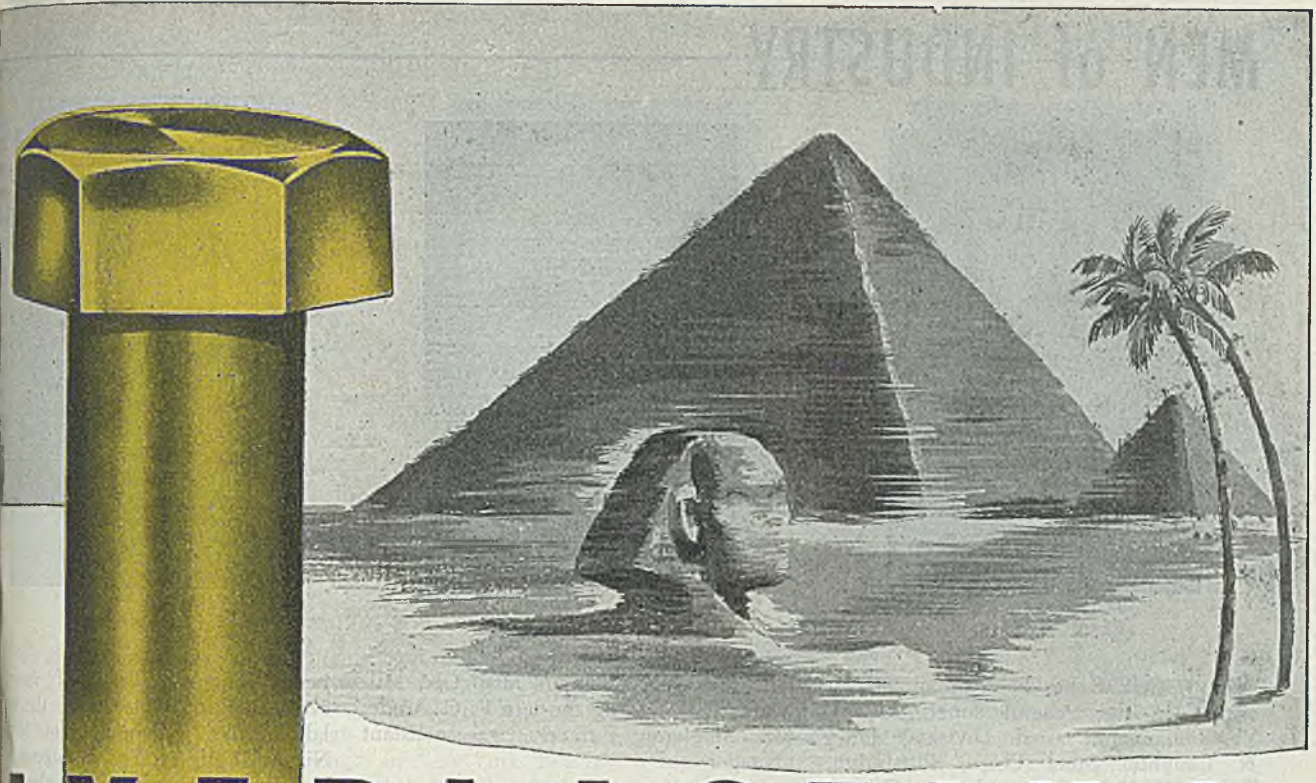
Feature of a new Chevrolet parts house and assembly building t erected at Van Nuys, Calif., is a of "sunshade" construction, used in for several years, but not common i country. It involves deeply set wi on the sides exposed to the sun an construction, outside the window fixed panels so located that they off direct rays of the sun without ting off the light. Thus the sun heat the glass of the window pane transmit heat to the interior. Ass building will measure 710 x 850 one side being a Fisher body oper supplying bodies to the Chevrol sembly line on the other side.

JAP "DUCK": U. S. soldiers inspect what is believed to be the Japanese version of the American "duck," a land and sea-going vehicle. Japs apparently put a boat atop four wheels and hoped for the best. NEA photo

Tire Researchers Find Tractor Market Bright

The trend toward "more horse and fewer horses" on American farm mean an annual demand for nearly 000 new tractors for the first five war years, it was predicted by Jam Newman, vice president, B. F. Goo Co.

Basing his estimate on a survey of vehicle tire sales prospects, Mr. New said that during the period from 19 1944 the number of draft animal American farms declined from 24 m to 12 million, while in the same p the number of farm tractors grew 400,000 to about 2,100,000. Peak for new tractor output will be 1946, and 1948, Mr. Newman said.



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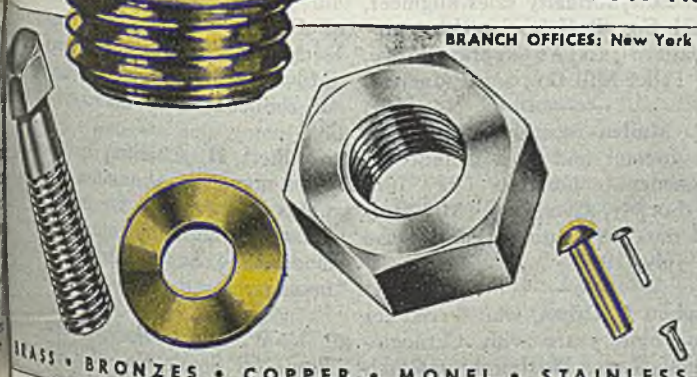

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Chicago

MEN of INDUSTRY

FRANK W. KELSEY

E. U. LASSEN

LEWIS CLARE

H. J. Griffith has been appointed assistant to the general superintendent, Vesta-Shannopin Coal Division, Jones & Laughlin Steel Corp., Pittsburgh. **Frank W. Kelsey** succeeds Mr. Griffith as manager of safety and welfare, Jones & Laughlin Steel Corp. Mr. Kelsey formerly held that position at the company's Aliquippa works.

—o—

James A. Cain, formerly assistant manager, Pittsburgh Division, A. M. Byers Co., has been appointed manager of a new division which the company recently established at Atlanta. The territory served by the new division includes Georgia, North Carolina, South Carolina, Florida, Alabama and parts of Tennessee.

—o—

Joseph B. Patton has been named manager of industrial relations, Oliver Iron & Steel Corp., Pittsburgh. For the past 24 years, Mr. Patton has been associated with Carnegie-Illinois Steel Corp., serving in the industrial relations department of the corporation's plants in the Vandergrift, Pa., district.

—o—

Clinton R. Hanna, director of research laboratories, Westinghouse Electric Corp., Pittsburgh, and inventor of the gyroscopic tank gun stabilizer, was honored by Purdue University, Lafayette, Ind., from which he was graduated in 1922.

—o—

Firman G. Hoyt, salesman for the past six years at the Los Angeles branch, John A. Roebling's Sons Co., Trenton, N. J., has been promoted to the position of product sales manager, Woven Wire Fabrics Division, with headquarters at Trenton, N. J. He succeeds **W. K. Paff** who is retiring after 50 years' service.

—o—

Frederick W. Roth has been named works manager, Storage Battery Division, Trenton, N. J., Philco Corp.

—o—

J. L. Singleton has been named manager for the 60 general machinery sales offices of Allis-Chalmers Mfg. Co., Milwaukee, succeeding the late **F. C. Angle.** Mr. Singleton formerly was assistant manager.

—o—

Cutler-Hammer Inc., Milwaukee, announces the following engineering appointments: **E. U. Lassen,** assistant chief engineer; **J. L. Defandorf,** general engineering supervisor over rubber mill, synchronous motor, valve control, public works, short order, textile, paper and printing equipment divisions; **J. M. Newman,** general engineering supervisor over steel mill, machine tool, brake and drum controller divisions; **E. H. Laab,** general supervisor over product quality, and **W. R. Milburn,** supervisor of marine and navy control.

—o—

Lt. Col. H. A. Stevenson, now distributor in Michigan for Baker Industrial Truck Division, Baker-Raulang Co., Cleveland, recently was awarded the Legion of Merit for his services with the general staff corps, Army Service Forces.

—o—

V. G. Scott has been appointed manager of sales, Wood Shovel & Tool Co., Piqua, O., succeeding the late **N. T. Jacobs.** Mr. Scott formerly was production manager, being appointed to the position in December, 1944. He joined the company in January, 1942 as assistant manager of sales.

—o—

E. Reed Low, formerly sales engineer, R. C. Neal Co., Buffalo, has been appointed eastern sales representative, California Pellet Mill Co., San Francisco.

—o—

John P. Mullen recently resigned as education director and as a member of the management committee, Gray Iron Founders' Society, Cleveland. Mr. Mullen joined the Washington offices of the society in July, 1943.

—o—

Dr. Stephen F. Urban, who served for more than nine years with Carnegie-Illinois Steel Corp., Pittsburgh, research laboratories in South Chicago, Ill., has been named director of research charge of all divisions of the rese laboratories, Titanium Alloy Mfg. Niagara Falls, N. Y. Dr. Eugene Wai formerly in charge of the chemical ceramic divisions of the research lab tory, has been appointed associate di tor of research. William Baldwin been named chief of the ceramic sion.

—o—

Lewis Clare has been appointe represent the Cosa Corp., New Yor the New England territory. The Corp. represents in the United S many machine tool and instrument m facturers of Switzerland.

—o—

R. J. Swing recently has been na general sales manager, Industrial sion, Monarch Aluminum Mfg. Cleveland. Mr. Swing formerly was ciated with E. F. Houghton Co., P delphia.

—o—

James B. Rosser has been elected president in charge of eastern sale railroad equipment, Pullman-Stan Car Mfg. Co., Chicago. He will m his headquarters in New York.

—o—

Maxwell F. Rather, New York, been elected vice president, Joh Service Co., Milwaukee, manufacture automatic temperature and air con ing control systems.

—o—

O. H. Kessler Jr., comptroller secretary, Stolper Steel Products C Milwaukee, has been elected a mem of the company's board of director

—o—

Albert H. Charlton has been na sales manager, Aluminum Division, nolds Metals Co., Louisville, Ky. Charlton joined the company in 1936 since 1944 has served as eastern manager for the Aluminum Division

—o—

L. W. Delhi, vice president, Wes Pipe & Steel Co. of California, Francisco, has been elected presid

JAMES E. SWEENEY

JOHN W. MOCK

LARRY S. ANDRICH

lifornia Metal Trades Association. **A. E. McIntyre**, general manager, Mercoid Nelstrom Valve Co. at Oakland, Calif., is elected vice president, and **George Hunt**, California Steel Products Co., Redmond, Calif., treasurer.

—o—

James E. Sweeney has been appointed vice president and general sales manager, Hupp Forge Co., Chicago. He joined the company in 1931, acting as sales engineer in the Indiana, Ohio and Kentucky territory. Since the beginning of the war, Mr. Sweeney has been works manager.

—o—

I. G. Baker has returned to the Indianapolis office, Wagner Electric Corp., St. Louis, as field engineer after serving three years with the Army.

—o—

Col. Willard F. Rockwell, chairman of the boards, Timken-Detroit Axle Co., Standard Steel Spring Co., Hupp Motor Car Corp., and Pittsburgh Equitable Meter Co., has been elected a director of Le Roi Co., Milwaukee.

—o—

Charles M. Sutlive has been appointed southeastern representative with headquarters in Savannah, Ga., for the Pittsburgh Screw & Bolt Corp., Pittsburgh. His territory includes Georgia, Florida, Alabama, North Carolina and South Carolina.

—o—

Clark B. Kingery has been appointed assistant director of personnel, Hercules Powder Co., Wilmington, Del. **John M. Austin** is manager of the Pittsburgh office explosives department, succeeding LeRoy Keane, who has been named director of sales for that department with headquarters in Wilmington.

—o—

Harry Armbright, eastern sales manager, American Central Manufacturing Corp., Connersville, Ind., has been transferred to Connersville to head a newly-created contract kitchen equipment department. Succeeding him in New York as regional sales manager is **Leo J. Dougherty**, who has been district manager in the Kansas City territory. **Willis M. Marshall**, formerly manager in Cleveland, moves to Kansas City and **A. J. McEwan**, who has been district manager in New York, becomes a regional manager with headquarters in Buffalo. **Larry Coen**, midwestern sales manager moves to Connersville as assistant sales manager, kitchen equipment department. **James A. Craig**, Washington, **Clyde T. Graham**, Dayton, O., and **Lon Evans**, Dallas, Tex., become regional managers in their respective territories.

—o—

John W. Mock recently was appointed sales manager, Protectoseal Co., Chicago. He has served since 1939 until recently as sales manager, Turner Brass Works, Sycamore, Ill.

—o—

Charles E. Erb has been named manager of production efficiency, Standard Varnish Works, Port Richmond, N. Y. He will make his headquarters in the company's Chicago plant. **Landon Browne** has been named technical sales representative for the company in upper New York state and northwestern Pennsylvania.

—o—

Warner R. Over has been named treasurer, Pennsylvania Salt Mfg. Co., Philadelphia, following retirement of **L. A. Smith**, who served as vice president and treasurer. Mr. Over will now act as secretary-treasurer.

—o—

William A. Blees has been named vice president in charge of sales, Consolidated Vultee Aircraft Corp., San Diego, Calif.

—o—

Harry Markowitz, Abe Cooper Inc., Syracuse, N. Y., has been re-elected president of the Western New York chapter, Institute of Scrap Iron & Steel Inc. Other officers re-elected include: Vice president, **Saul Frankel**, Rochester Iron & Metal Co., Rochester, N. Y., and secretary-treasurer, **Leo Chapin**, Chapin & Fagin Inc., Buffalo.

—o—

Gordon W. Monfort has been appointed to the advertising department, Caterpillar Tractor Co., Peoria, Ill., as director of the company's news bureau. **James L. Geddes**, Governmental Sales Division, has been appointed representative in charge of the Washington office.

—o—

Larry S. Andrich has been named vice president and general manager, Snyder Tool & Engineering Co., Detroit. **George H. Whitehouse** has been appointed sales manager, assisted by **George D. Melling Jr.** and **William F. Pomeroy**, sales engineers. **William C. Oberem** is chief engineer and **John F. Benner**, assistant chief engineer. Mr. Andrich has been associated with the company for the past 16 years.

—o—

Ray P. Johnson has been appointed assistant to the general manager with offices in Detroit, Morse Chain Co., a division of Borg-Warner Corp. Mr. Johnson is rejoining the Borg-Warner Corp., of which he has been a director since 1936, after serving as a major in the ordnance department of the Army.

—o—

Col. Thomas A. Murphy has been named aviation industry manager, Reynolds Metals Co., and will have his headquarters in the company's New York offices.

—o—

A. P. De Vita, East Paterson, N. J., has joined the equipment sales staff, Robins Conveyors Inc., Passaic, N. J. For the past 10 years Mr. De Vita has been with Wright Aeronautical Corp. as general foreman of foundry maintenance and engineering for all plants in the Paterson area.

—o—

Two engineers of the Small Motor Division, Lima, O., Westinghouse Electric Corp., have been awarded the corporation's Order of Merit for distinguished service to the electrical industry. They are, **Cyril G. Veinott**, special products section engineer and **Clyde T. Packer**, manufacturing engineer. Another who has received the award is **Edmund N. Bowles**, northen district apparatus sales

P. E. FLOYD

Who recently was named manager, Carbide Alloys Sales Division, Allegheny Ludlum Steel Corp., Brackenridge, Pa., noted in STEEL, Nov. 19, p. 106

PAUL TAMPLIN

Who is manager, Sharon, Pa., industrial sales and service office, National Malleable & Steel Castings Co., Cleveland, noted in STEEL, Nov. 19, p. 106.

JAMES K. SUTHERLAND

Who has been appointed superintendent, ro ing mills and open-hearth plant, Ford Mo Co., Dearborn, Mich, noted in STEEL, Nov. p. 108.

manager for the Westinghouse Electric Supply Co. in Milwaukee. **William J. Williams** has been appointed assistant manager of the company's Lamp Division, equipment department. **Chester F. Gilbert** has been named manager of the newly created Retail Finance Division.

—o—

L. D. Greene, for many years in charge of purchases of scrap and nonferrous metals, Bethlehem Steel Co., Bethlehem, Pa., is retiring as of Jan. 1. He first became associated with the Bethlehem company in 1917 at its Fore River Yard, Quincy, Mass., assuming his present duties with headquarters in Bethlehem, Pa., in 1926.

—o—

Louis Shattuck Cates, president, Phelps Dodge Corp., New York, has been elected president and director, American Institute of Mining & Metallurgical Engineers, New York. Vice presidents and directors are: **Holcombe J. Brown,** consulting engineer, West Newton, Mass., **Erle V. Daveler,** vice president, American Zinc, Lead & Smelting Co., New York. Directors are: **W. E. Brewster,** general superintendent, Wisconsin Steel Works, International Harvester Co., Chicago; **Dr. Augustus B. Kinzel,** vice president, Union Carbide & Carbon Research Laboratories Inc., New York; **Philip Kraft,** mining engineer, Newmont Mining Co., New York; **David D. Moffat,** president, Utah Copper Co., Salt Lake City, Utah; **Russell B. Paul,** mining engineer, New Jersey Zinc Co., New York; **William B. Pank,** head of the mining department, Lafayette College, Easton, Pa.

—o—

Chester V. Nass has been elected vice president, Pettibone Mulliken Corp., Chicago. Mr. Nass joined the company as manager of its Foundry Division.

—o—

Avery C. Adams, recently vice president in charge of sales and member of the board of directors and executive committee, United States Steel Corp. of Delaware, Pittsburgh, has joined Charles A. Koons & Co., New York, as an executive with the parent company and its subsidiaries and affiliates.

—o—

Frederick C. Schranz, for the past 30 years affiliated with Baldwin Southwark Division, Baldwin Locomotive Works, Philadelphia, serving as vice president, has established his own office in Ne York to act as consulting engineer a manufacturers' representative.

—o—

Frank St. Vincent has been appointe sales engineer, Pittsburgh district, V nadium Corp. of America, New York.

—o—

S. D. Mahan has been appointed vi president of the Crosley Corp., Cinci nati, and general sales manager of Manufacturing Division. Mr. Mahan one time served as general advertisi manager for Westinghouse Electr Corp., Pittsburgh.

—o—

A. H. McDonald has been named W consin representative for the Gene Steel Warehouse Co. Inc., Chicago. McDonald has recently been releas from duty with the Navy prior to whi he was associated with Central Steel Wire Co., Chicago. Mr. McDonald w have offices in Milwaukee.

—o—

C. D. Scully Jr., formerly head of t Iron & Steel Scrap Section, Office Price Administration, Washington, transferred to the Reconstruction Finan Corp.

OBITUARIES . . .

Walter C. Allen, 68, former president and chairman of the board, Yale & Towne Mfg. Co., Stamford, Conn., died recently in New York. Mr. Allen served as president from 1915 until 1932 when he was elected chairman of the board. He retired in 1939.

—o—

Nicholas G. Gordon, 57, founder and president, Cleveland Steel Erecting Co., Cleveland, died recently while on business in Indianapolis.

—o—

Paul Bradshaw, production manager, Noblitt-Sparks Industries Inc., Columbus, Ind., was killed recently in an automobile accident.

—o—

Stewart D. Lewis, 76, for forty years traffic manager, Duluth, South Shore & Atlantic Railroad, previous to his retirement in 1938, died Nov. 8 at his home in Duluth, Minn.

—o—

John A. Leschen, 88, vice president, A. Leschen & Sons Rope Co., St. Louis, died Nov. 13. He was elected a vice president in 1898.

—o—

John H. Locke, who retired in 1943 as vice president, General Steel Castings Corp., Eddystone, Pa., died at home in Bryn Mawr, Pa., Nov. 12.

—o—

Bryon H. Elliot, 63, assistant distr sales manager in Chicago, Republic St Corp., Cleveland, died Nov. 15 in C cago. Mr. Elliot had been associat with the company and its subsidia Union Drawn Steel Division, since 19

—o—

Henry A. Rice, 80, vice president, I nois Iron & Bolt Co., Carpentersvil Ill., died Nov. 16 in Elgin, Ill.

—o—

William L. Wilson, 62, owner of No Texas Iron & Steel Co., Ft. Worth, Te died Nov. 16.

Carnegie Plans Improvements at Its Gary Works

Program supplements postwar project announced last June. Will increase capacity for cold-rolled production

CARNEGIE-ILLINOIS Steel Corp. last week announced expanded postwar plans to further improve facilities for cold-reduced sheet and tin plate manufacture at its sheet and tin mill at Gary, Ind. The new program supplements a previous postwar project announced last June 15 and was outlined by J. L. Perry, president of this United States Steel subsidiary company.

When completed, these new improvements will increase the plant's annual capacity for cold-rolled products by 232,000 tons to a total of more than 1,250,000 net tons annually.

Mr. Perry pointed out these improvements will enable Carnegie-Illinois to give better service to midwestern manufacturers who use cold-reduced steel sheets in making auto bodies, refrigerators, household appliances, enamelware and similar sheet steel products as well as users of tin plate for cans. The Gary sheet and tin mill, without postwar improvements, already ranks as the largest of its kind in the world.

Costs of the Carnegie-Illinois postwar projects were not disclosed. However, Irving S. Olds, chairman, U. S. Steel, announced earlier that improvements in Gary subsidiaries' plant operations would cost more than $50 million.

Hot Strip Mill Capacity Increased

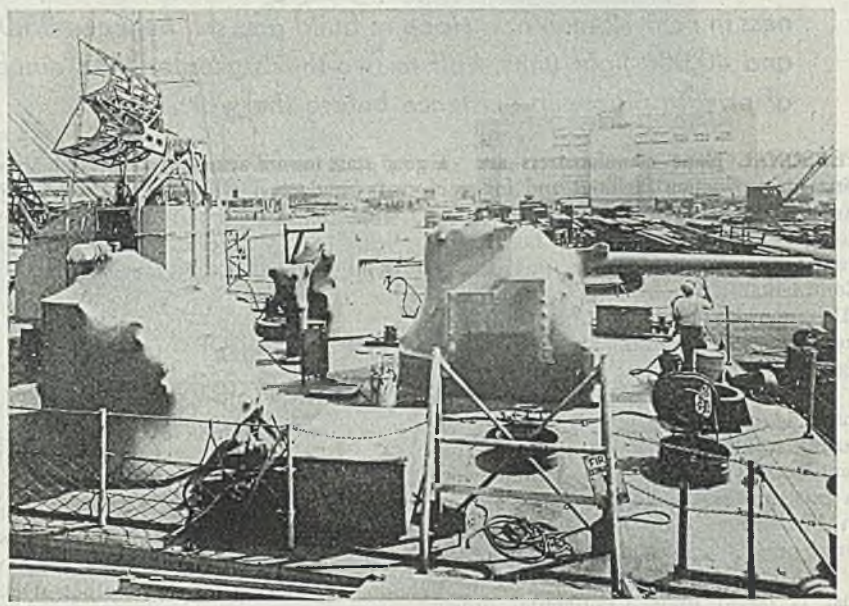
Included in the supplemental program is the increase of capacity of the plant's 80 in. hot strip mill. In this mill, which was completed in 1936, slabs of steel, which average 5½ inches thick, 40 inches wide and 105 inches long, pass through a series of rolls, known as roughing and finishing stands, where they are reduced in thickness until they emerge ready for coiling as strip 1/16 inch thick and about 800 feet long.

During the war years this 80 in. hot strip mill was converted in record time to also produce heavy steel plates for ships.

As part of the improvement program a new 54 in. four-stand cold reduction mill will be installed and improvements made on the present 84 in. three-stand cold reduction mill. In this type of mill the coiled strip from the hot strip mill is further reduced in thickness and receives the smooth surface required in finished steel products.

Other improvements at the plant are new coating facilities, additional annealing capacity for large coils and further improvements in handling and processing methods.

In the earlier announcement of Carnegie-Illinois postwar plans, rebuilding and enlarging of the No. 6 blast furnace at the Gary steel works and the No. 7 and No. 9 blast furnaces at the South Chicago plant were included. Work on these furnaces will be started within the next few weeks. Rebuilding includes new stoves, additional gas washing capacity and other auxiliary equipment as well as a belt conveyor coke handling system and other stockhouse iron and cinder handling equipment. The capacity of each of these furnaces will be increased to 1508 tons daily.



PROTECTED: To protect valuable equipment from moisture, rust and corrosion, Navy experts have developed a preservative plastic which is sprayed on the object to be protected. Result is a moisture-proof "cocoon" which later can be stripped off. Wrapped in plastic coats, three gun mounts are prepared to face the weather on the deck of a former destroyer escort. NEA photo

Republic Blast Furnace at Warren, O., Relighted

The Republic Steel Corp. blast furnace at Warren, O., shut down for relining for the past 60 days, was relighted Nov. 19. Relining was done in record time.

For many years the world's largest blast furnace, the Warren furnace operated continuously during World War II, producing as much as 44,000 tons of pig iron in a single month. Total production since the war started in Europe in 1939 exceeded 2,685,000 tons.

Built shortly after World War I, the furnace was enlarged in 1930 and again in 1939. At the present time the rated capacity of the furnace is 1275 net tons per day. Greatest production for a single day occurred in February, 1944, when 1675 net tons were produced.

Tube Turns Leases Some Government Equipment

George O. Boomer, president, Tube Turns, Inc., Louisville, Ky., announces the board of directors has approved leasing from the Reconstruction Finance Corp. of $3,000,000 worth of Defense Plant Corp. equipment, which had been installed for war work. At the same time, he said the board also authorized the purchase of additional equipment costing $500,000, to round out the company's production facilities.

When the plant expansion program is completed, Tube Turns will be $3,500,000 bigger than in prewar years and will have one of the largest and most complete manufacturing establishments of its kind in the United States.

Steel Containers for War Equipment Made by Dravo

All-steel hermetically sealed containers for storage of delicate and expensive war equipment are being produced at the Dravo Corp.'s Neville Island plant near Pittsburgh. The size and shape of the container is determined by the item to be stored.

Weapons thus canned may be stored almost anywhere.

WING TIPS

Personal plane manufacturers planning on $100 million business in next 12 months. Hope to build and sell between 35,000 and 40,000 light units, half to two-thirds greater than number of private planes in existence before the war

PERSONAL plane manufacturers are setting up production facilities and formulating sales plans in anticipation of doing close to a $100 million business in the coming year, C. J. Reese, president of Continental Motors Corp., Muskegon, Mich., has stated. They plan to build and sell between 35,000 and 40,000 light planes in the next 12 months.

Achievement of this goal would mean that in the first postwar year the industry would make from 50 to 66 per cent more personal planes than were in existence in the U. S. before the war. In 1941 there were only 24,134 registered private planes in the country.

Mr. Reese explains this industry forecast is based upon Continental orders for 34,739 four- and six-cylinder aircraft engines to be delivered within the next 12 months and on an industry survey showing that Continental engines ranging from 65 to 185 horsepower will power approximately 90 per cent of all personal planes to be made next year.

The forecast of close to $100 million as the value of personal planes which the industry plans to market within the next year assumes an average sales price of approximately $2500, although several personal planes will be priced at approximately $2000.

If the personal plane industry reaches its goal next year, it will be able to make a good start toward achieving advantages of mass production which were impossible on the limited output of prewar years. Six producers plan to build from 3000 to 6000 planes apiece.

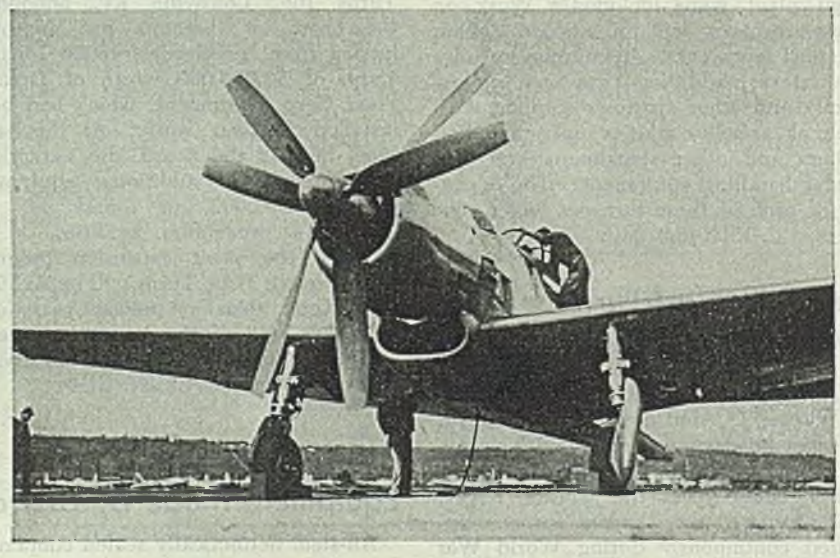
Steel-Strapped "Bombs" Protect Fragile Cargo

A new technique of dropping fragile cargo by plane without the use of a parachute—secretly used to supply isolated combat troops in the Pacific theater—was revealed recently when six specially-constructed "bombs" containing blood plasma flasks and other delicate emergency supplies were dropped from heights up to 1000 feet by the Army Air Forces in a demonstration of their peacetime application in disaster fighting.

Staged for the American Red Cross, in co-operation with the United States Steel Corp., which developed the cargo container with the Air Technical Service Command, the test demonstrated the practicability of dropping medicines and food to communities cut off by floods, forest fires, snow and other forms of disaster.

The cargo bomb is constructed of heavy wood, 36 inches long and 12 inches square, with a laminated snub nose at each end. However, it is the steel strapping that makes it impact-proof. The steel is a special alloy with sufficient elasticity to absorb the shock of the fall without breaking—despite a bounce of 30 feet under certain ground conditions.

It can be opened in a matter of seconds, as demonstrated by Harry Walter president of the Gerrard Steel Strapping Co., a U. S. Steel subsidiary, who developed the container with the Air Forces. A wire cutter in the form of a washer is secured to the outside of each container. Once the strapping has been cut, the lid of the bomb lifts freely. The container can be made for less than $3, a tenth of the cost of comparable parachute-type cargo container Mr. Walter said.



NEW NAVY FIGHTER: Claimed to be one of the most revolutionary fighters developed to date, this XF8B-1, built by Boeing Aircraft Co., Seattle, has a 3600-horsepower engine which drives two 13½-foot contra-rotating propellers. Bomb load is 6400 pounds, speed is in excess of 450 miles an hour, and the plane mounts six cannon or machine guns in its wings. NEA photo

Solar Gets Atomic Bomb Contract; Diversifies

Announcing an expanding program for diversification of Solar Aircraft Co. products, Edmund T. Price, president said that the company has received contracts from the Oakridge ordnance plant near Knoxville, Tenn., for fabrication of stainless steel parts used in the manufacture of the atomic bomb.

The order has been allocated to the Solar plant in Des Moines, Iowa.

Among the new products offered by the company are stainless steel parts for midget auto racers and a triple unit exhaust system combining the functions of muffler and heater for use on personal and commercial aircraft.

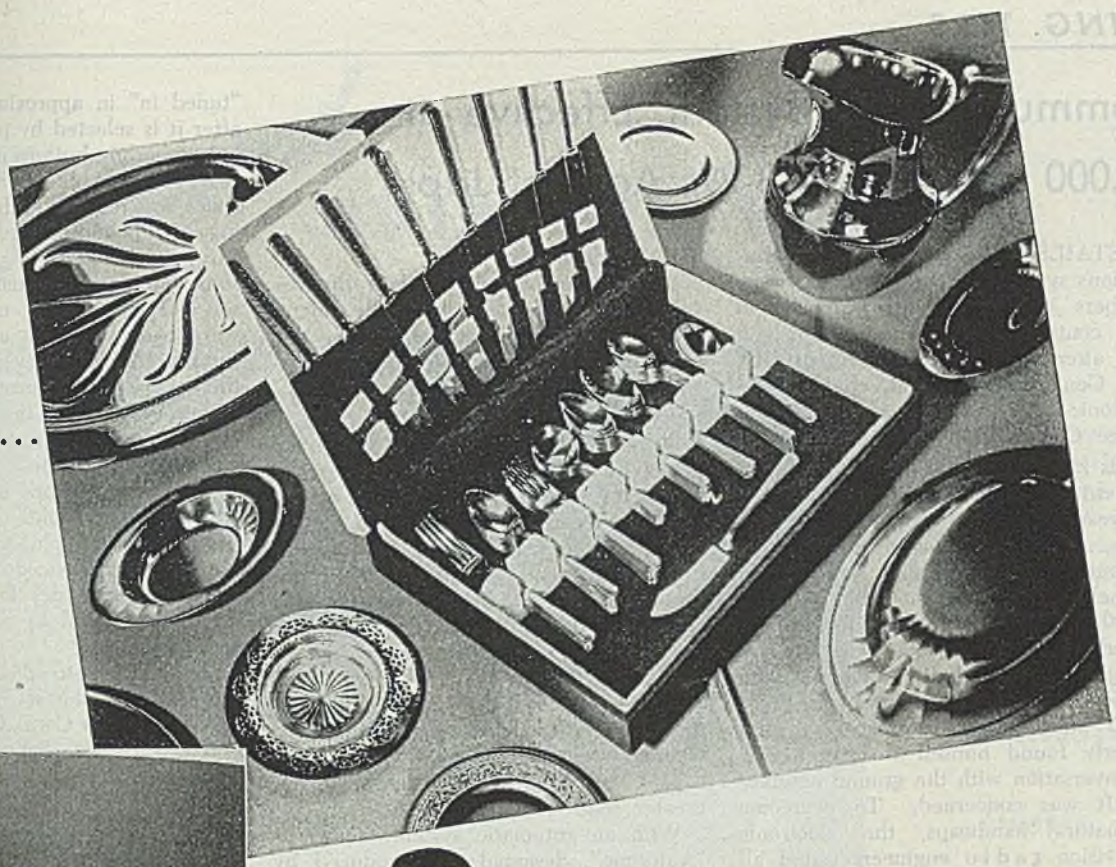
Recently Solar announced the purchase of equipment for casting stainless steel. This equipment, which is now being installed, will be used in supplying articles for marine use, sanitary fittings, dairy equipment and other uses.

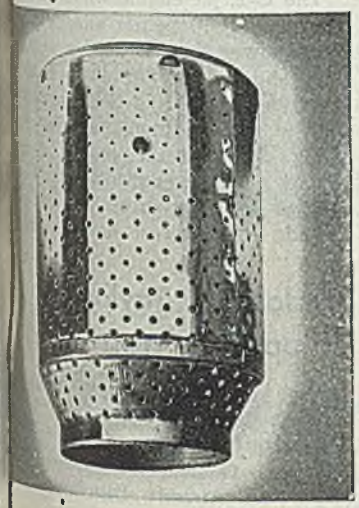
Mr. Price said that at the end of October unfilled orders totalled $6,402,8[illegible] covering both San Diego and Des Moines plants, and added that more orders for commercial exhaust manifolds are expected.

Air Transport Engineering Needs To Be Reviewed

Engineering requirements of commercial air transportation over global routes from ground servicing equipment and methods to navigation and traffic control, will be reviewed in detail at the SAE National Air Transport Engineering Meeting to be held Dec. 3-5 in the Edgewater Beach Hotel at Chicago.

Announcing the program for the sponsors, SAE Air Transport Engineering Activity and SAE Chicago Section, John A. C. Warner, general manager of the Society of Automotive Engineers, explained the meeting will concentrate attention upon basic mutual and pressing engineering problems of the air transport industry.





Do you need

COLD ROLLED STAINLESS STRIP?

The need for greater serviceability and sales appeal in products of tomorrow underscores the advantages of ARMCO Cold Rolled Stainless Steel Strip.

Before the war, this rustless steel helped make many products look better and last longer. Today more and more designers are putting to profitable use the corrosion resistance, high strength and attractiveness of ARMCO Stainless Steels in many kinds of architectural, commercial, and household products.

Among these products and product-parts for which stainless strip is used are refrigerator evaporators, oil burner sleeves, furnace humidifiers, architectural trim, hospital equipment, cooking ware, flatware, cream separators, metal furniture, and gutters and downspouts.

PROMPT DELIVERY

Armco's mills are rolling to capacity now—making special sheet steels for new beauty, and better service in equipment of all kinds. We can offer you prompt delivery of ARMCO Cold Rolled Stainless Strip in coils or cut lengths.

If your products (or parts of them) are suited to this special steel, get in touch with us. Wire, phone or write the Armco district office nearest you—or The American Rolling Mill Company, 2981 Curtis Street, Middletown, Ohio.

STAINLESS ARMCO STEEL

THE AMERICAN ROLLING MILL COMPANY

Special-Purpose Sheet Steels

Communications System, Effective at 40,000 Feet, Aided B-29s Against Japs

DETAILS of a high altitude communications system to keep pilots and crew members of strato-flying airplanes in radio contact with ground stations and other aircraft were revealed recently by Brig. Gen. Tom C. Rives, chief of the electronic subdivision, Air Technical Service Command, Wright Field, O.

This radio communications equipment, standard but highly secret for almost two years in the B-29s operating against Japan, features automatic tuning with pushbutton control through 11 different channels. It operates at altitudes from 25,000 to 40,000 feet, where former sets proved ineffective.

High-altitude flying had long posed a serious communications problem. Eight or 10 miles up in the ozone a pilot formerly found himself isolated as far as conversation with the ground or other aircraft was concerned. To overcome the natural handicaps, the electronic subdivision radio engineers tested all possibilities, eventually achieving success with the long-range transmitting liaison set, with its 11 channels and its modern push-button control box.

"Coming coincidentally with the development of new high-altitude microphones and improved amplifiers, the modern receiver-transmitter is a tremendous improvement over earlier methods," he added.

"Co-ordination of air and ground forces by means of radio was a prerequisite for successful bombings of enemy territory," General Rives explained. "Much of the major success of the B-29 bombing missions can be attributed to our superior airborne radio equipment, which kept pilots in constant touch with their ground bases and other planes in the formations."

Highly efficient, yet simple in design, the set operates effectively at 40,000 feet, whereas the radio formerly used was capable of performance at heights not greater than 25,000 feet.

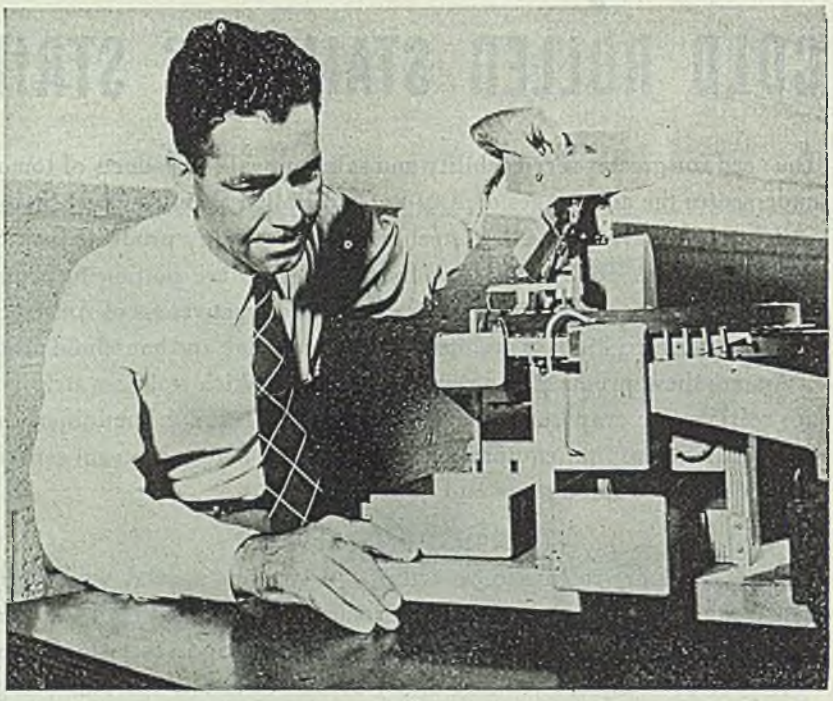
With an automatic system known as "Autotune", designed and produced by the Collins Brothers Radio Corp., under contracts with ATSC, any one of the selected frequency channels can be "tuned in" in approximately 20 seconds after it is selected by pushing one of the corresponding buttons on the control box.

A considerable saving of weight and space was realized with a new set weighing 110 pounds as compared with the 215-pound old set. Installation problems were cut down, too, because the new set had only a few major parts which were easily set into a small space. The compact design relieved the operators of the worry they encountered with the numerous parts of the old set scattered throughout the aircraft and placed in any available space.

Maintenance work is further facilitated because the units of the new device were made to "plug-in" and are easily removed and serviced separately.

The set provides for transmission of the spoken word by voice or of Morse code signals.

In addition to the Collins Brothers Radio Corp., the set was produced by the Stewart-Warner Corp., Chicago, and General Electric Co., Schenectady, N. Y., subcontractors.



ELECTRONIC RIVET SORTER: An electronic device has been developed by Walter H. Bankard, Glenn L. Martin Co., Baltimore, which, when attached to a standard rivet sorter, provides an improved method for anodizing rivets. The device has a magnetically operated lever which is energized by completing an electrical circuit between the plate and the contact point. As the rivets pass through the separator, the contact point touches the head of the rivet and if the rivet does not come up to anodic specifications, a small relay is energized and the relay throws the rivet out

Predicts Aircraft Engines Of 10,000 Horsepower

Aircraft engines of 10,000 horsepower more than the combined power of four engines on B-29s, may be developed on the basis of present gas-turbine engines, according to Harry A. Winne, vice president, General Electric Co., Schenectady, N. Y.

Mr. Winne explained that in making his prediction of 10,000 horsepower gas-turbine engines he was not establishing a limit to their development. Research and engineering alone will determine this, but the horizons appear to be limitless, he said.

The G-E jet engine which powers the Lockheed P-80 fighter already generates more power than any other aircraft engine and drives the plane faster than any other will fly, G-E engineers explained. In addition, intensive work is being done on the propjet, a revolutionary new power plant which uses gas turbine force to drive a propeller and provide a jet thrust simultaneously.

Carload of Taylorcraft Shipped to West Coast

First carload shipment of airplanes for private flying since 1941 left the Taylorcraft Aviation Corp.'s plant at Alliance, O., recently, consigned to Northwest Aircraft Distributing Co., Vancouver, Wash.

There were six complete Taylorcraft Model BC12D 2-passenger 65 horsepower planes in the shipment.

The airplanes in the first shipment are for the purpose of delivery to customers in the states of Washington, Oregon and Idaho.

Improved AVIATION VALVES

In addition to aviation valves, Weatherhead plants make all types of fittings, valves, flexible hose assemblies and other parts for these industries:

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Weatherhead plants have been making a variety of valves for the aviation industry that have met the requirements of the largest aeronautical manufacturers in the country as well as the Army and Navy. We have specialized in making all types of valves to customers' specifications in all sizes and for use in gasoline, oil, air and hydraulic systems. Weatherhead valves have proved themselves in thousands of installations as light-weight, heavy-duty products. For information or literature write any Weatherhead branch office.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • DETROIT • CHICAGO • ST. LOUIS • LOS ANGELES

Distributor of Steel Buys Ship Building Plant

Part of American Ship Building Co.'s Cleveland property acquired at public auction by Nottingham Steel Co.

THE American Ship Building Co. has ended its building of ships in Cleveland by sale at public auction of its plant there to Nottingham Steel Co., steel warehouse firm with headquarters in Cleveland. Sale price was $142,000.

The property sold includes several work sheds spread over 9 1/3 acres, a mile of railroad siding, and 1750 feet of dredged channel. The purchaser has not disclosed what use will be made of the property where ships have been built since 1882. The Nottingham firm operates a steel warehouse in Detroit as Steel Products Corp. and one in Chicago as Nottingham Steel Co. A warehouse the company operated in Cleveland was taken over by the Navy.

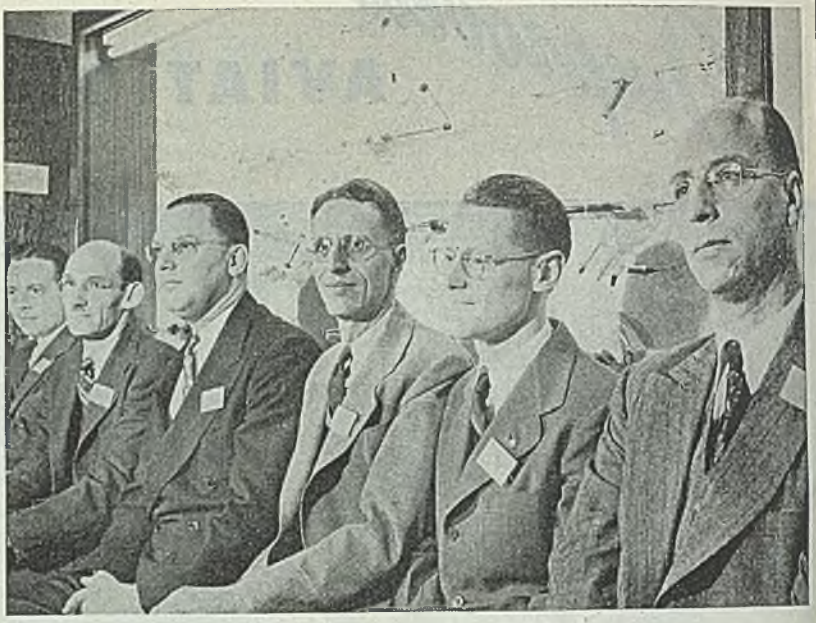
With the sale of its Cleveland yards, the American Ship Building Co., whose main office is in Cleveland, will limit its ship building and repair operations to Toledo and Lorain, O., Chicago, and Buffalo. The ship building firm retained an office building and a drydock adjoining the property it sold to Nottingham, although the company indicates no intention of using the retained facilities for ship repair work. By Feb. 1 when the shipbuilding company's lease on office space in a downtown Cleveland office building expires, the firm will consolidate all of its Cleveland activities in an administration building on the property it retained.

During the war, the Cleveland ship building plant employed 2000 workmen in construction of ore freighters for use on the Great Lakes and a number of small ships for the Navy.

Machinery in the abandoned plant was auctioned separately from the real estate.

Industrial Advertisers Name Fulltime Executive

To provide industrial advertising men with greater services, the National Industrial Advertisers Association has announced election of a full-time executive head who will have offices at the NIAA headquarters in Chicago. W. Lane Witt, formerly executive secretary, is now president and general manager. A. O. Witt, advertising manager, Schramm Inc., West Chester, Pa., was elected chairman of the board of directors of the association.



ELECTED AT X-RAY JUBILEE: Newly elected officers of the American Industrial Radium & X-ray Society are shown at a Milwaukee meeting in observance of the fiftieth anniversary of the discovery of x-ray. Left to right are: Don A. Johnson, Bendix Products Corp., South Bend, Ind., director for two years; Dr. Dana W. Smith, Glenn L. Martin Co., Baltimore, director for one year; Philip D. Johnson, Canadian Radium & Uranium Corp., New York, secretary; Don M. McCutcheon, Ford Motor Co., Detroit, treasurer; Roy W. Emerson, Pittsburgh Piping & Equipment Co., Pittsburgh, retiring president; and Alvin F. Cota, A. O. Smith Corp., Milwaukee, vice president. NEA photo

BRIEFS . . . .

Paragraph mentions of developments of interest and signifi cance within the metalworking industry

American Road Builders' Association, Washington, is entertaining a commission of highway engineers from Chile, Ecuador and Bolivia.

—o—

Westinghouse Electric Corp., Pittsburgh, has opened a laboratory in Los Angeles to which western industry may bring its problems of speeding production by use of high frequency heating.

—o—

Marsh Tritrol Co., Chicago, has changed its name to Marsh Heating Equipment Co., and has broadened its operations in the heating equipment field.

—o—

American Locomotive Co., Schenectady, N. Y., built a total of 8000 tanks and tank destroyers and produced other war materiel amounting to more than $850 million, according to the Rochester Ordnance District.

—o—

Monsanto Chemical Co., St. Louis, has established an advisory group of chemists and engineers, known as the Plastics Technical Council, to study problems and proposed applications of plastics as submitted to Monsanto by various businesses.

—o—

Dresser Industries Inc., Cleveland, has acquired Security Engineering Co. Inc., Whittier, Calif., which will continue producing for the oil and gas industry.

—o—

Jacobsen Mfg. Co., Racine, Wis., has purchased Worthington Mower Co., Stroudsburg, Pa., and will continue production of power mowing equipment.

—o—

Walter J. Greenleaf Co., Pittsburgh, has become reorganized as the Greenleaf Corp., with headquarters at the Penn building, Wilkinsburg (Pittsburgh 21), Pa.

—o—

Globe Products Mfg. Co., Los Angeles, has purchased the Machine Tool Division, Clayton Mfg. Co., Alhambra, Calif.

—o—

Adel Precision Products Co., Burbank, Calif., will manufacture metering devices for filling station gas pumps, an

named Shields-Harper Co. West Coast dealer.

—o—

Buffalo Bolt Co., N. Tonawanda, N. Y., borrowed $1,500,000 to fund obligations incurred in the acquisition of S. M. Co., Toledo, O., and Eclipse Lawn Mower Co., Prophetstown, Ill.

—o—

Willis Engineering Co. has moved its general offices to Burton, O., and has opened an office at 206 Plymouth Bldg., Cleveland.

—o—

Reconstruction Finance Corp. is offering for sale or lease the government-owned plant formerly operated by N. A. Woodworth Co., Ferndale, Mich. The factory, designed to manufacture gages and tools, contains 20,800 sq ft of floor space.

—o—

Standard Steel & Wire Corp., 1900 N. Rockwell Ave., Chicago, has opened an office at 759 N. Milwaukee St., Milwaukee 2. Roy H. Smith is district manager.

—o—

Pullman-Standard Car Mfg. Co., Chicago, has received a $2 million order for sixty-four deluxe passenger cars from the Boston & Maine and Maine Central railroads.

—o—

General Electric Co., Schenectady, N. Y., is planning four 1 million pound electric locomotives for the Virginian railroad.

—o—

Ferro Corp., Baltimore, has resumed full production for porcelain enamel. Following its prewar facilities, it is now devoted exclusively to production of six-frit basic colors for the porcelain enameling industry and for ceramic and glass manufacturers.

—o—

American Magnesium Corp., Buffalo, will expand plant facilities by moving equipment from plants in Cleveland and Bridgeport, Conn.

—o—

Western Electric Co., New York, has developed a loudspeaker system capable of delivering 250 watts of power.

—o—

Ajax Induction Division, Ohio Crankshaft Co., Cleveland, has opened a sales engineering office at 35 E. Georgia St., Indianapolis.

—o—

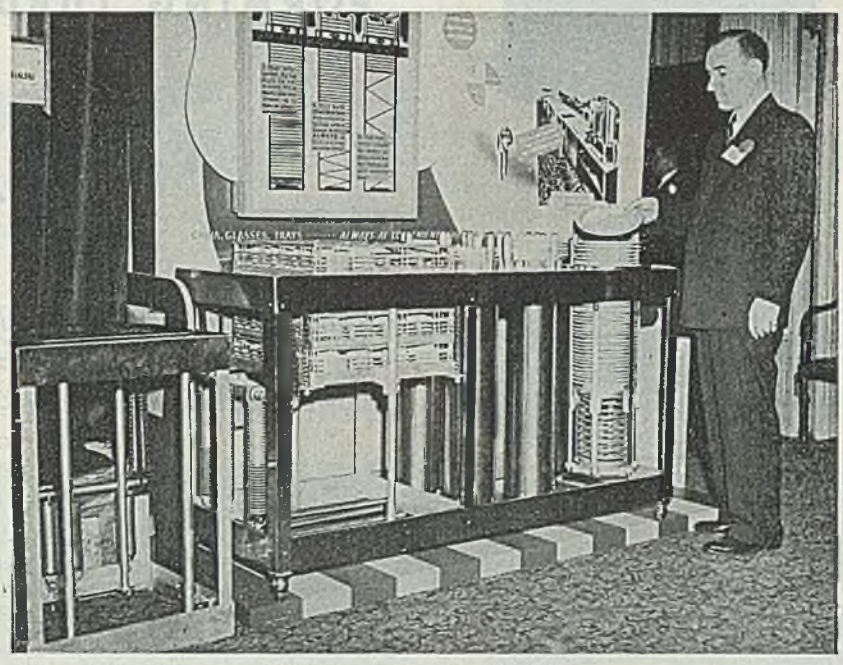
American Radiator & Standard Sanitary Corp., Litchfield, Ill., has resumed production of radiation equipment for civilian use.

—o—

Manning, Maxwell & Moore Inc., Bridgeport, Conn., is building a plant at Charlestown, Mass., for manufacture of steam check valves, inspirators and similar items.

—o—

Ampco Metal Inc., Milwaukee, announced appointment of N. A. Doolittle



DISH DISPENSER: One of the items attracting attention at a recent hotel exposition at Hotel Commodore, New York, was this automatic storage and dispensing unit for china, glasses and trays, designed to speed service and reduce breakage in hotel kitchens. Unit was designed by American Machine & Foundry Co., Brooklyn. NEA photo

of Tulsa, Okla., as Ampco sales representative in Oklahoma, southern Kansas and southwestern Missouri. W. W. Swan, New Orleans, has been assigned to a number of counties in Southeastern Texas in addition to his regular territory in Louisiana, Alabama and Mississippi.

—o—

W. S. Rockwell Co., Fairfield, Conn., has opened new general offices at 200 Eliot St., Fairfield.

—o—

Scully Machinery & Equipment Corp., Chicago, has moved its offices to 77 W. Washington Blvd.

—o—

Gyretech Corp., Chicago, newly-organized company specializing in precision metal spinning, has opened a plant at 2734 Janssen Ave.

Manpower, Materials Lack Slows New Construction

Manpower is the most threatening barrier to full-scale recovery in the construction industry, according to a study entitled, "Construction Revival," recently published by F. W. Dodge Corp. Other important factors, however, are material supply, price and wage adjustments and possibly transportation delays.

Included in the study is a statistical breakdown of 99,638 projects in design or preliminary stages, with an aggregate estimated cost of $15,746,202,000. Of this total, $4,303,080,000 is for privately owned work, and $11,443,122,000 for use in public works construction.

An annual average construction volume of $7,348,000,000 during the next ten years in the 37 states east of the Rocky mountains is estimated by Dodge. This compares with a volume of $6 628,000,000 in 1928, the peacetime peak year.

Warehouse Association Chapter Officers Elected

Following meetings of the Chicago, Detroit, and Valley chapters of the Steel Products Warehouse Association Inc., Clayton Grandy, president, has announced the election of the following officers to direct regional activities in the several areas in 1945-46:

Chicago Area: Thomas J. Reid, Century Steel Corp., chairman; S. E. Hokin, Hokin Steel & Tin Plate Co., vice-chairman; E. A. Hennessy, Lafayette Steel Corp., secretary; H. A. Greenberg, Western Sheet Steel Co., treasurer; and H. F. Alpim, Briggs & Turivas, trustee.

Detroit Area: L. J. Carolin, Stanton Steel Co., chairman; B. G. Schroeder, Schroeder Steel Sales Co., vice-chairman; S. H. Greenbaum, Bernard Epps & Co., secretary-treasurer; and Joseph Gendelman, National Sheet Steel Co., trustee.

Valley Area: J. E. Lavine, Union Steel Supply Co., Warren, O., chairman; J. H. Frankle, Metal Products Co., Niles, O., vice-chairman; R. R. Cook, Hyne Steel Products Co., Youngstown, secretary-treasurer; and H. B. Hoffman, the Wilkoff Co., Youngstown, trustee.

FORMING TUBULAR PRODUCTS A

FLAME

Rapid rotation of tube end under oxyacetylene flame, followed by closing with hard-faced forming tool or shoe, replaces slower cold-forming method and affords a superior finished chemical converter

FLAME-SPINNING offers many interesting possibilities for the rapid forming of steel. Oxyacetylene flame-spinning as a means of closing and otherwise forming tubes and tubular products is being widely used in place of some slower cold-forming methods. It also eliminates certain deep-drawing operations.

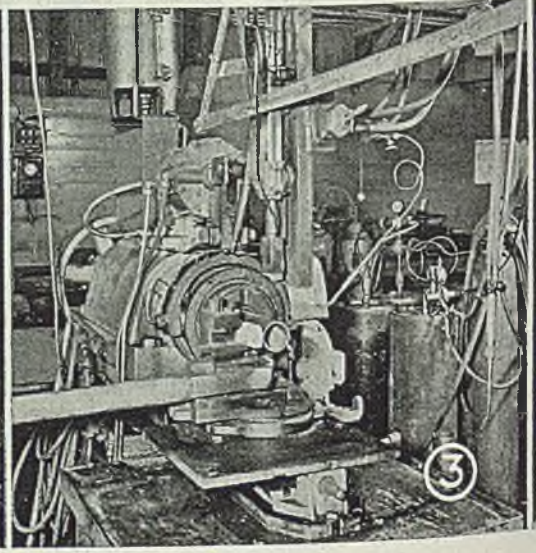
Fundamentally, the process consists of heating by an oxyacetylene flame that portion of the work to be formed. During this heating the work is rotated rapidly. As the correct temperature is reached, a forming tool is forced against the work, shaping it to the desired form. The oxyacetylene flames continue this heating during part or all of the forming operation, thus speeding the work and eliminating any necessity for removing the work piece for reheating. When the shaping is completed, the spinning is stopped and the piece is removed from the machine, ready for testing or further fabrication.

Overall view of the oxyacetylene flame-spinning machine used for end closure of 3-in. tubing at Murray Tube Works, Union, N. J., is shown in Fig. 3. The tubes, used in chemical converters, are of 12-gage, low-carbon steel. A tube in position for spinning is protruding from the end of the machine. To the left the tube is the forming tool, which operated manually, using the long directly beneath.

Fig. 2 is a close-up of the form tool or shoe. Hard-faced with Ha Stellite, it already has formed 5000 p and still is in good condition.

Operation shown in Fig. 6 consist sentially of heating with oxyacety flames the portion of the tube to formed, then shaping this portion. F ing temperature is reached in a very seconds using an Oxweld W-23 b pipe, made by Linde Air Products New York. This blowpipe is fitted a 30-flame rhomboid heating head though only nine orifices are used this job. A workman stands at ready to raise the flame head when tube end has been sufficiently heate permit forming. The forming-tool at lower left is operated by a se workman. Heating flame is shut of tomatically as heating head is raise permit clearance for forming shoe. then starts to close the heated en rotating tube as the bar at left is m

After the end of the tube is c completely, a secondary heating is plied to the tip as shown in Fig. 4.



OSING TUBE ENDS BY . . .

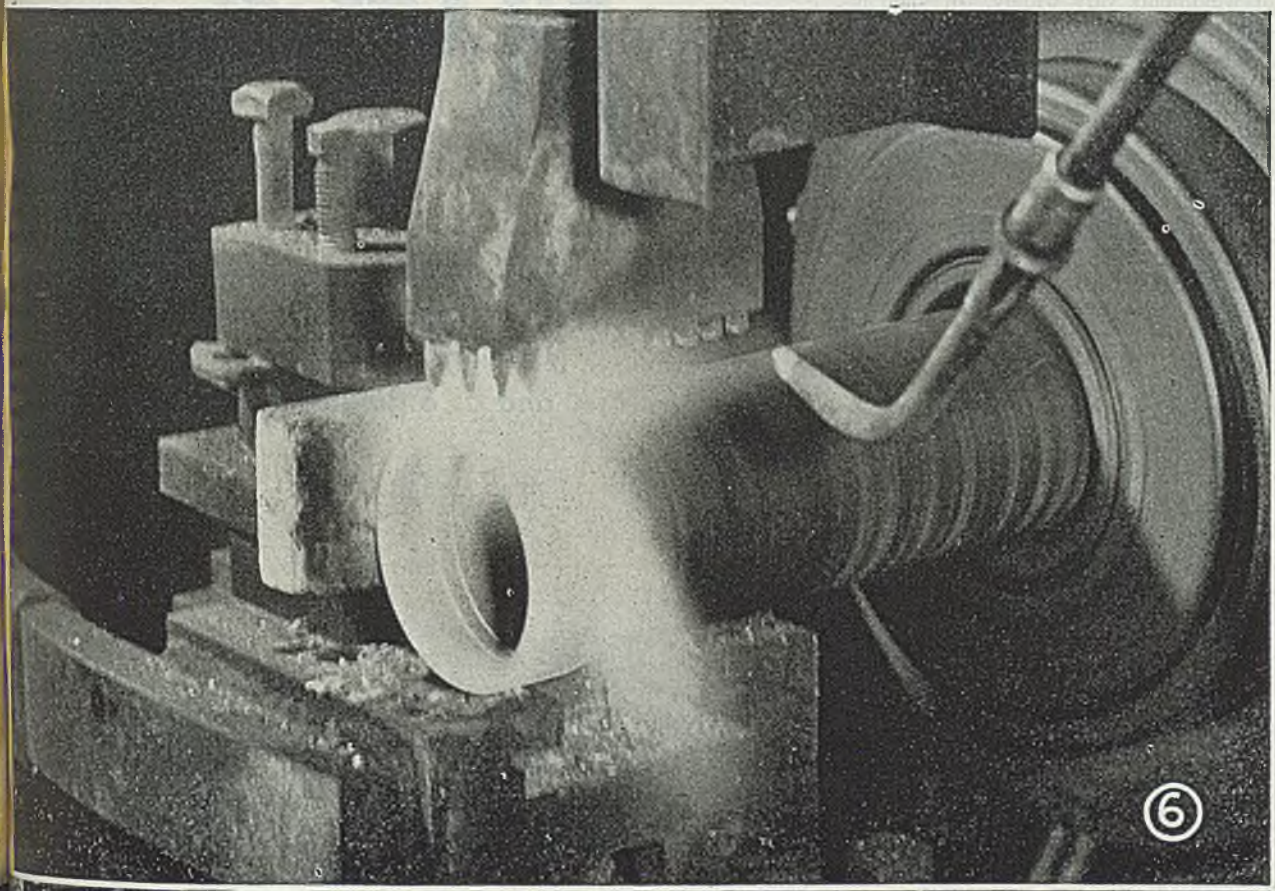
SPINNING

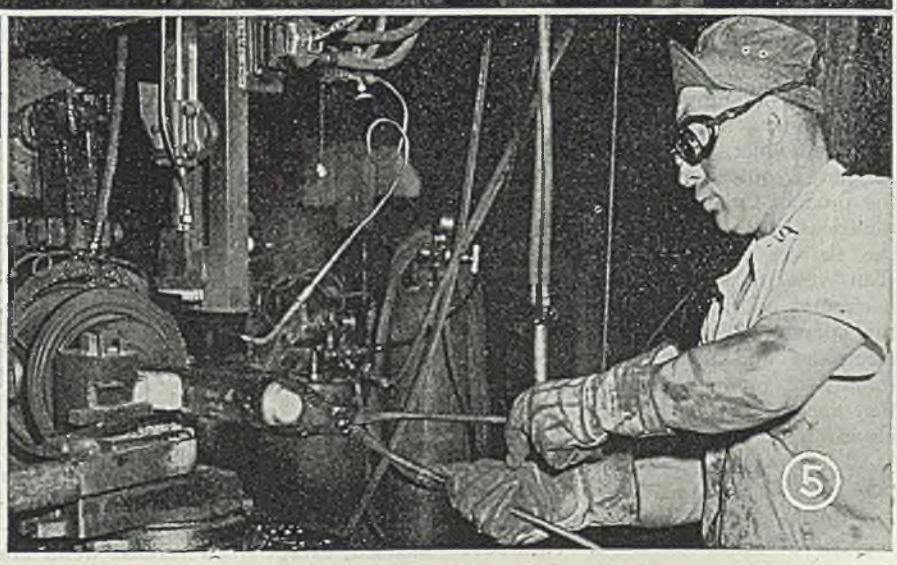
s to thicken and strengthen the wall at this point. Operator is us- an Oxweld W-17 blowpipe. The ing tool is again run over the end he tube following this secondary heating, thus finishing and completing the forming operation.

The forming shoe now is swung back to its neutral position, spinning is stopped, the chuck is opened, and work is removed (Fig. 5). All except the center portion of the closed tube end has cooled to below-red heat. Total time from beginning to end of complete operation averages between 30 and 40 sec per tube, a great reduction in time over the previous cold-forming method.

After forming, all tubes are tested in a hydraulic testing machine where they are subjected to a pressure of 1000 psi. This is well above the working pressure of the tubes. After testing, tubes are placed in racks preparatory to cutting to correct length.

Test specimens from flame-turned end of tube are shown in Fig. 1. The wall at end of closed tube is actually thicker than side walls as a result of the secondary heating. Etched specimens (not shown) have revealed a very satisfactory crystalline structure in the worked area, according to Murray engineers.





Welding Mild Stee

This article is intended to serve as a ref- erence outline covering more important welding conditions and requirements and as a guide for users of electrodes

By H. O. WESTENDARP JR.
Electric Welding Division
General Electric Co.
Schenectady, N. Y.

WELDING conditions vary widely in different shops. In some cases, the work is designed so that it can be welded in the flat position, or positioning equipment is available for this purpose. In others, it is necessary to do a large amount of welding in the vertical and overhead positions. Also, in some cases the welding equipment available is alternating-current, and in others direct-current. Furthermore, the requirements of weldments vary widely. In some instances a high quality deposit is of prime importance, while in others the emphasis is on high-production speed. To describe how to select the best electrode for each of the innumerable combinations of conditions and requirements would be impractical.

The following outline covers the more important welding conditions and requirements and the general procedure recommended for selecting the best electrode for the job.

Welding Conditions

1. Position in which welding must be done.
2. Power supply to arc.
3. Fit-up of joints.
4. Plate thickness.
5. Skill of operator.
6. Rating of welding equipment.

Welding Requirements

1. Quality
   a) Ductility
   b) Penetration
   c) Profile
2. Speed
3. Appearance
   a) Spatter
   b) Undercut

To clarify the significance of each of these conditions and requirements, each requirement is dealt with in great detail.

1. Position of Welding. The position in which welding must be done is dependent upon two major factors—Design of the product, and availability of positioning equipment. Where possible, the product should be designed or positioned so that welding can be done in the flat or horizontal position, rather than vertical or overhead. Flat and horizontal position welding is easier on the operator, permits the use of larger electrodes and results in greater uniformity of product and higher production speeds. Table I shows the AWS classification of electrodes available for "flat", "horizontal and flat", and "all-position" welding.

2. Power Supply to Arc. Table II lists the AWS classifications of electrodes suitable for operation on a-c, and on d-c straight and reverse polarity.

3. Fitup of Joint. When fitup of joint is poor, Class E6012 electrodes are recommended because of their ability to deposit weld metal that will readily bridge the gap in joints. When fitup is good, any other AWS class may be used satisfactorily. For high-quality welding, precautions should be taken to insure good fit-up.

4. Plate Thickness. Very thin plates (3/32-in. or less) favor use of class E6013 electrodes. All AWS classifications of electrodes may be used satisfactorily on heavier plates.

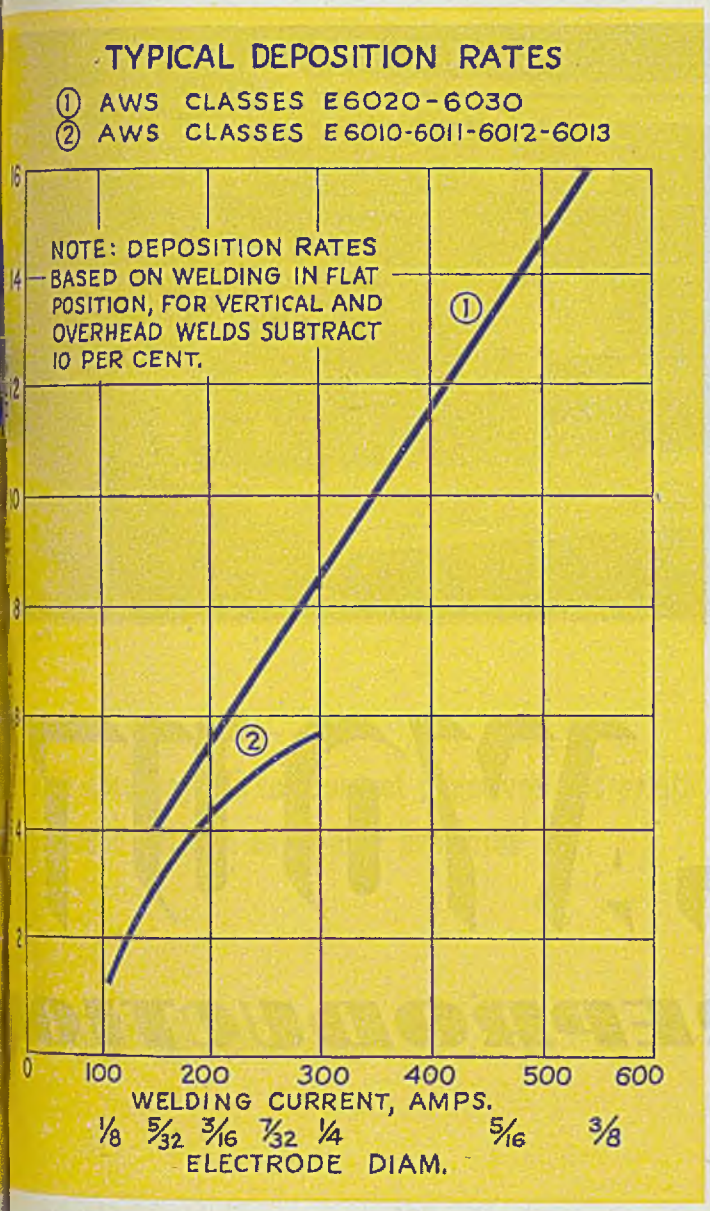
5. Skill of Operator. Highly-skilled operators can use all classifications of electrodes successfully. In those cases where the operator has had relatively little training, classes E6012- 6013- 6020- 6030- will be the easiest to use in the horizontal and flat positions. For the vertical and overhead positions of welding, classes E6010 and 6011 are recommended, except when vertical welds are made from the top down, in which Classes E6012 or 6013 are recomme

6. Rating of Welding Equip Table III shows the rating of we equipment and corresponding *max* diameter of electrodes recomm with each rating:

7. Diameter of Electrode. Tabl indicates the maximum diameter trode that will operate satisfactori various ratings of welding equipme indicated. Good welding practice for the selection of the largest d ter electrode that can be used, sistent with such limiting factors a sition of welding, plate thickness, of operator, and quality and appea of deposit. These conditions u limit size of electrode rather than c ity of welding equipment. Fig. 1 s effect of diameter on deposition rat indicates range of AWS classes.

Welding Requirements

1. Quality. All classes of elect will deposit metal having as hig higher yield point and tensile str



Effect of diameter on deposition rate; range of AWS classifications

dency of the various types to undercut.

Procedure

In order to select the best class of electrode to meet the requirements of a given job, each of the above welding conditions and requirements should be checked. *As each succeeding condition and requirement is checked, the choice will narrow down accordingly.* For example, a check of Condition No. 1 on a product that must be welded in the vertical position will indicate four classes of electrodes available. However, if Requirement No. 1 is for high quality, and Condition No. 2 is ac transformer equipment, then the choice is narrowed down to one electrode, Class E6011. Or, if Condition No. 1 is for vertical welding from top down, and Condition No. 4 is on 16-gage stock, the obvious choice is a Class E6013 electrode.

Many products are of such design as to require some welding in the vertical position and some in the horizontal or flat position. In such cases there are

(*Please turn to Page* 123)

TABLE I

All Positions	Horizontal and Flat	Flat Only
E-6010	E-6020	E-6030
E-6011		
E-6012		
E-6013		

TABLE II

A-C	D-C Str. Pol.	D-C Rev. Pol.
E-6011	E-6012	E-6010
E-6012	E-6013	E-6011
E-6013	E-6020	E-6030
E-6020	E-6030	
E-6030		

TABLE III

Rating of Welding Equip. Amps.	Maximum Diam. Electrode
100	1/8
200	5/32
300	1/4
400	5/16
500	3/8
600	3/8

…an the parent metal. Where high …uality welds are required, it is impor…nt that deposit metal should be high …ductility, have adequate penetration, …d that fillet welds should be relative…flat in profile. Since mild steel plate …s a ductility of 25 per cent in 2 in., …posited weld metal should approach …is as nearly as possible. Adequate …enetration is required to avoid the …nger of notch effect. Fillet or butt …lds are weakened seriously if depos…d metal does not thoroughly penetrate …e root of the joint. It is also impor…nt that profile of fillet welds should …e relatively flat to avoid stress concen…ation at the toe of fillets, which tends …o weaken joints. Undercutting should …lso be eliminated or kept at a minimum …or highest quality.

2. Welding Speed. The advantages …f high welding speed are obvious, and …all for the selection of electrodes hav…ng the highest possible deposition rates …onsistent with required quality of de…posited weld metal and other limiting …actors such as strength, appearance, etc.

3. Appearance of Welding. Appearance is usually judged by spatter undercut, and profile of deposit.

Table IV has been prepared as a guide to the selection of electrodes to meet the above requirements. It indicates the relation of the AWS classes of electrodes as to ductility, penetration, profile, deposition rate, spatter loss, and ten-

TABLE IV—AWS SPECIFICATIONS
RELATIONSHIP OF USABILITY—PERFORMANCE—QUALITY—CHARACTERISTICS

	Increasing Values					
Ten. st.	6030	6020	6010	6011	6013	6012
Ductility	6012	6013	6010	6011	6020	6030
Penetration	6013	6012	6011	6010	6020 &	6030
Absence of Undercutting	6010 &	6011	6020 &	6030	6012	6013
Absence of Spatter	6010	6011	6012	6013	6020 &	6030
Deposition Efficiency	6020 &	6030	6011	6010	6012 &	6013
Deposition Rate	6010	6011	6013	6012	6020 &	6030
Soundness	6012	6013	6010	6011	6020 &	6030
Arc Force	6013	6012	6011	6010	6020 &	6030
Ease of Handling	6010	6011	6020 &	6030	6012	6013
Ease of Restriking	6020 &	6030	6011	6010	6012	6013
Current Capacity	6010 &	6011	6013	6012	6020 &	6030
°Flux to Steel Ratio	6010	6011	6012	6013	6020 &	6030

°Flux to Steel (Ratio) = $\frac{\text{Weight of Coating}}{\text{Weight of Steel}}$ and is usually in proportion to coating thickness.

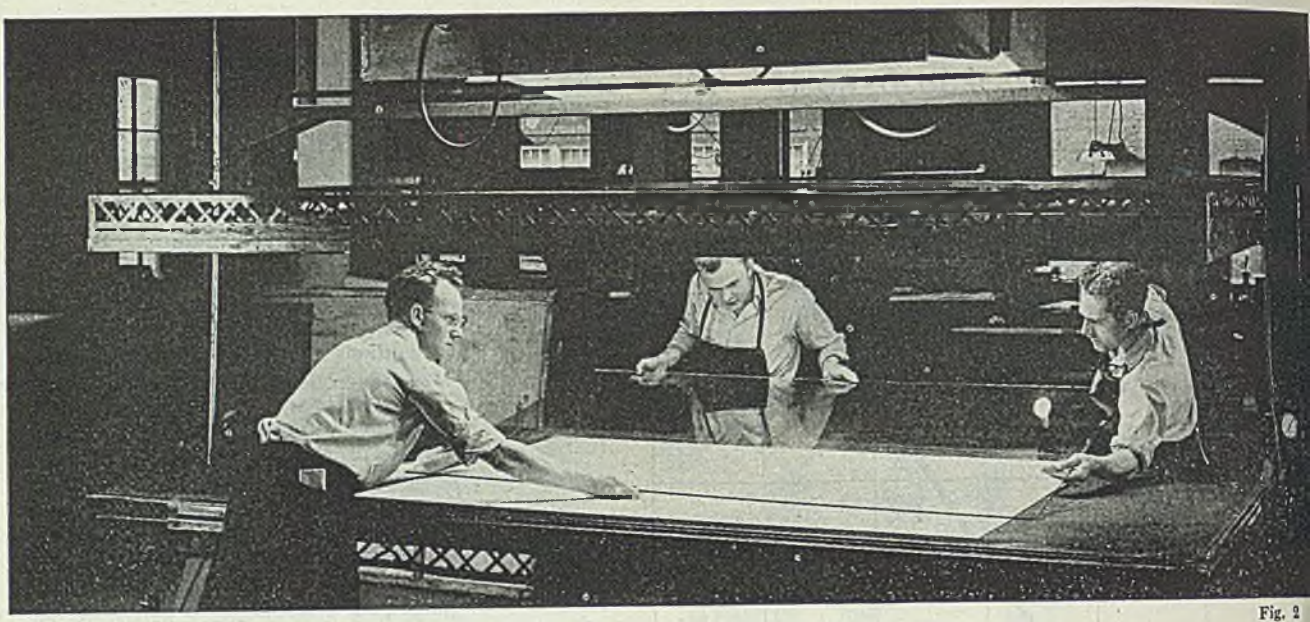


Fig. 2

Fig. 1

LAYOUT REPRODUCTIO

ACCURATE reproduction of engineering layouts—patterns, aircraft lofts, templates, full-size autobody detail and similar work—has been an essential phase of pre-production practice. Where original layouts are scribed on metal sheets instead of using the less accurate method of drawing paper-tracing-blueprint, a conventional method of reproduction has been by means of the camera, producing a negative of reduced size which in turn can be projected to full size and reproductions run off. However, in this system accuracy of detail suffers and particularly in the aircraft and pattern industries, greater precision is necessary.

A new system for production of direct contact reflex negatives and prints, requiring no camera or projection equipment, has come into fairly wide acceptance in the aircraft industry and pattern shops, especially in the Middle West, and gives promise of important advantages in other fields in the future. Developed by Bartheld Zeunen and now being used by Capitol Engineering Reproduction Co., Detroit, it can be explained best by following through the steps necessary in the reproduction of a typical pattern shop layout.

The original layout should be well scribed on a black background, using specially coated aluminum or steel sheets. Purple or blue backgrounds can be handled, but black is preferable. Conventional practice in this field has been to use blued sheets, but it has been found that actually black is more restful on the eyes of the layout man.

After cleaning with soap and water or oxalic acid, and drying, the layout is prepared by rubbing powdered magnesia into the scribed lines to obtain maximum contrast. If the layout is old and contrast is poor, it can be rerolled with ink and dried. The layout then is placed face up on a rubber blanket in a vacuum printing frame, as shown in Fig. 2.

A proper size (¼-in.) glass plate negative is selected, cleaned and rinsed, and placed in a whirler as shown in Fig. 3, with dichromate reflex negative solution poured over the surface. The plate whirled for a few minutes to get form distribution of the solution over glass. After it dries, the glass plate removed to the printing frame placed over the original layout, emul side down. Areas of the original covered by the glass negative blocked out with ¼-in. plate glass to vent them from buckling when the section of the printing frame is cran down over the negative and orig This top section is a steel frame wi clear glass plate, which fits tightly the lower section permitting air to pumped out of the space between the sections in order to bring the nega and original into the closest possible tact. When the two sections are loc together, the vacuum pump is tur on until a pressure dial reads 15 Six 1500-w lamps above the frame illuminated to expose the negative about 5 min.

An automatic timer controls the posure, after which lights are ex guished, the vacuum is broken and frame cranked up to permit remova the exposed negative. Exposed side the negative is rolled with ink and

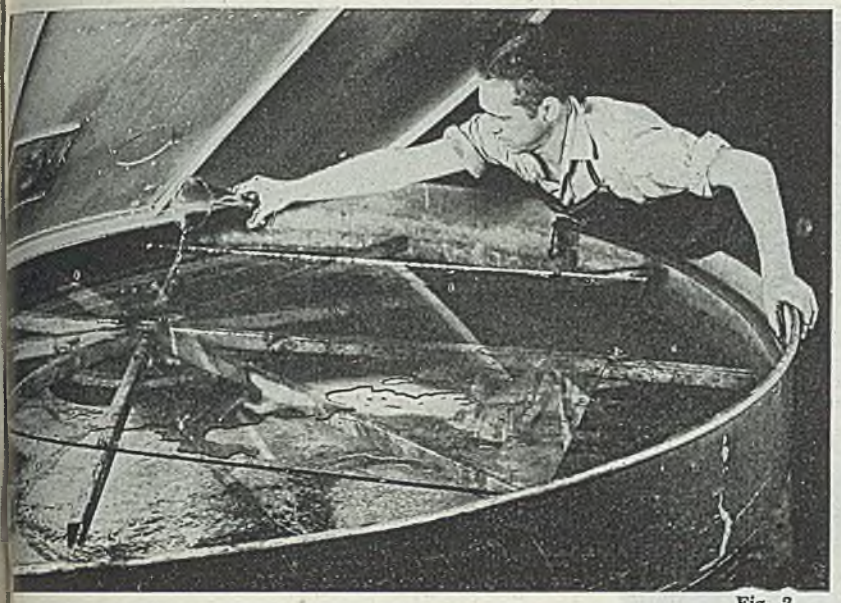


Fig. 3

By A. H. ALLEN
Detroit Editor, STEEL

Fig. 4

High accuracy, direct contact negatives and prints produced without camera or projector

SYSTEM

Fig. 5

Fig. 1—Water sprays wash ink from exposed portions of negative in developing sink, bringing out details of layout

Fig. 2—Treated glass negative is placed in vacuum printing frame with exposure lights above and original layout on metal sheet below the negative plate. Upper section of frame is lowered and locked to lower half, after which vacuum is applied to space between them

Fig. 3—Pouring light-sensitive dichromate solution on glass negative positioned in whirling machine. Rotation of unit uniformly distributes solution over surface

Fig. 4—Opaque solution is used to touch out spots on glass negative and to blank out changes desired in layout before printing

Fig. 5—Greater contrast is obtained in layout details by etching finished print in iron chloride solution

carried to a developing sink where a sprinkler pipe sprays the glass with fine streams of water and the layout is "developed" with the assistance of small brushes and air spray guns or a light rubbing with cotton. Fig. 1 shows this step.

Because of the difference in the amount of light reflected from light lines and dark backgrounds of the original, the light-sensitive dichromate chemical on the negative is "exposed" to a greater degree in those portions in contact with the scribed lines on the original. Thus when the negative is inked and developed, ink adheres to the background, but washes off the highly exposed or "line" portions, giving an exact copy of the original on the glass.

After drying, the negative is coated with powdered lamp black to increase contrast, excess amounts being wiped off. It is then taken to a retouching table where spots can be painted out with the use of "opaque", along with any detail which is not desired on the succeeding print or positive. This touch-up work is done by an operator with a brush as shown in Fig. 4. After coating with a transparent protector solution, negative is ready for printing or storage pending printing.

The printing process is somewhat similar to negative making. Proper size aluminum or steel sheet is cleaned and polished, all burrs removed from the edges, and a so-called "cold top" or light-sensitive solution poured over the surface in the whirler. After it is whirled and dried, it is transferred to the printing frame and the negative placed over it, emulsion side down. Exposure is similar to that in making the negative, and the exposed metal sheet is transferred to a cold-top developing bath. After a suitable developing interval the sheet is moved to the developing sink where the

Fig. 6

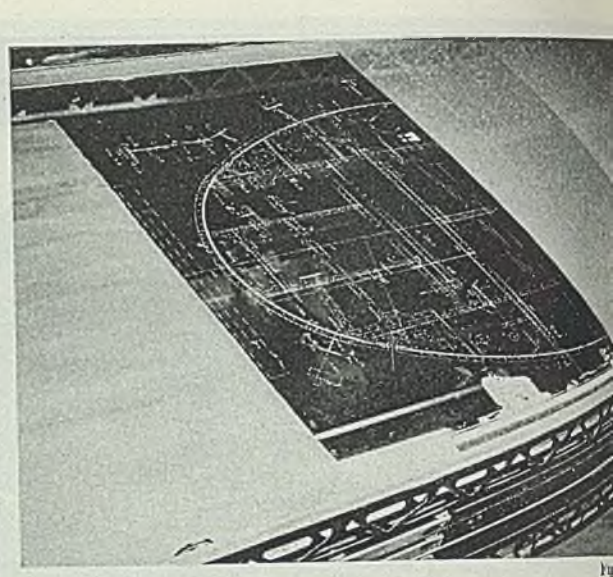


Fig. 6—Light rubbing of inked loft sheet as it is sprayed with water removes ink from unexposed portions while ink adheres to detail of layout

Fig. 7—Glass negative, emulsion side down, here is supported over prepared loft sheet in vacuum printing frame

details of the layout are brought out by immersion or spray, plus a light rubbing with cotton. The cold top does not adhere to the exposed portions of the sheet which can be etched to any desired depth by iron chloride solution (Fig. 5), thus providing the layout in the color of the metal sheet, with background black.

Many variations of the printing process are possible. For example, in direct contact loft printing, the loft sheets first are sprayed with three coats of white loft paint, and the exposure side coated with dichromate solution. The prepared sheet is removed to the printing frame and the negative spotted in the proper position over it, as in Fig. 7. After exposure, the sheet is sprayed with a special developing ink and transferred to the developing sink where the layout is brought out with water spray and hand rubbing as explained before. As indicated in Fig. 6, this developing process is about the reverse of the one for pattern layouts, in that the exposed portions of the loft sheets retain the developing ink, while the background reverts to the original white coating.

A third variation is direct contact template printing. The template sheet is cleaned thoroughly and then sprayed with dichromate solution, transferred to the printing frame and exposed with the negative over it. The exposed sheet is sprayed with developing ink as in the case of the loft layout, and hand developed with water. Printed side then is sprayed with blue or black acid resistant dye. The surface is lightly scrubbed with gasoline which dissolves out the ink lines of the layout, the dye not adhering to the inked portions. This gives a layout template with a background the color of the dye and the layout lines "printed" in the bare metal of the sheet. These lines may be further brought out by etching with iron chloride, as was done with the pattern layouts.

Another interesting variation of the process is the production of "flop" negatives for double prints, where one-half of the layout is the exact reverse of the other. In this case it is necessary to make an original of only one-half. From this original, a negative is prepared in the usual way, and careful register marks made on it. From this negative, a reverse glass negative is made by the contact-exposure method. This reverse negative must be treated specially to make it the same as the original negative. After exposure, inking and developing, it is sprayed with brown reverse negative dye and the layout detail developed gasoline.

In printing these flop negatives, o one is printed at a time, the sensiti template sheet being blocked out w paper over the half not being expo in the vacuum frame. This is necess because the negatives otherwise wo overlap, since the register marks m be carefully lined up with the aid a magnifying glass. After one-half is posed, the register marks are develo out and the sheet is returned to vacuum frame to receive the reverse of the negative which can be spotted curately through the register marks.

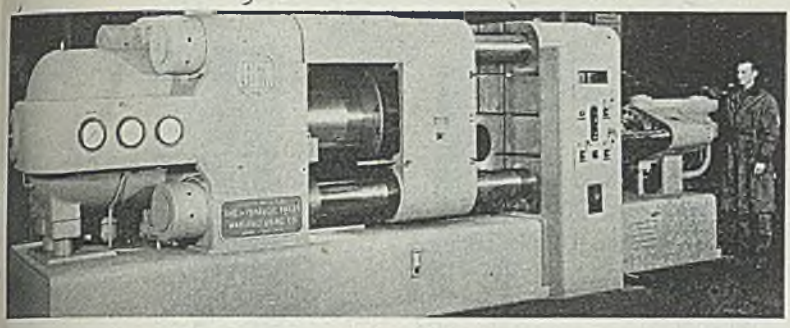
After the second or reverse nega is exposed, the entire sheet is deve and treated in the same manner as a normal loft or template print.

While this description may so complicated, the actual process is q simple, and requires no great amoun equipment beyond the vacuum prin frame, spray booths, the whirling chine and several shallow tanks for lutions and developing work. The f ful reproduction of minutest details layouts has to be seen to be appreci but an inspection of scores of layout the form of pattern shop sheets, lofts templates by this writer shows repro tions exact in every detail, including gradations in strengths of various

An important advantage of the pro is that as many "prints" as are des can be produced from the glass n tives. Thus if a contractor requ multiple sets of layouts to supply var subcontractors, they can be produ readily, and each one will be exactly the original layout. There can be quibbling with subcontractors over mensional limits since they are all f fully reproduced in metal and can gaged off accurately. Important savings likewise accrue.

Photochemical Reactions

Photochemical reactions (reactions requiring light to cause chemical changes) are classified by J. Q. Umberger, Columbia University, as follows: Electron-transfer type—purple dye thionine loses color in presence of iron ions and light, regains it in absence of light; electron-sharing—fluorescence of fluorescein diminishes in presence of light and iodide ions, is unaltered if iodide is absent; photon-sharing type—explain the fluorescent quenching action by molecules which have an absorption of same frequency as the emission of fluorescent molecules.



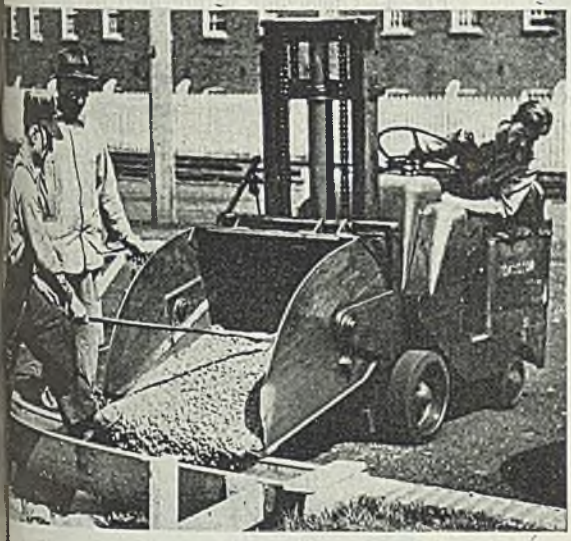
Die Casting Giant

Injection capacity increased nearly seven times in new machine

Construction of one of the world's largest high pressure die casting machines, designed to cast 14.88 lb of aluminum alloy per "shot" at an injection pressure of 25,000 psi, has been completed by the Hydraulic Press Mfg. Co., Mount Gilead, O. Hitherto, the largest standard existing high pressure machine had a 2.4 lb injection capacity.

This machine has a 56 x 31 in. mold mounting space, and an 18 in. injection stroke, both of which are actuated by hydraulic means. Power is supplied to the machine by two radial pumps directly connected through flexible couplings to a 100 hp double-end-shaft motor. A hydraulic ejector is a part of the movable mold clamp platen.

A majority of high pressure aluminum die castings are produced with injection pressures ranging from 10,000 to 12,000 psi. If such pressures prove satisfactory for extremely large parts, it is quite possible that aluminum coatings weighing 30 lb or more can be produced with this new machine. Advantages gained with high pressure die casting are the ability to produce interchangeable parts of good quality at a high hourly rate, and to shape them with a precision which reduces finishing operations.

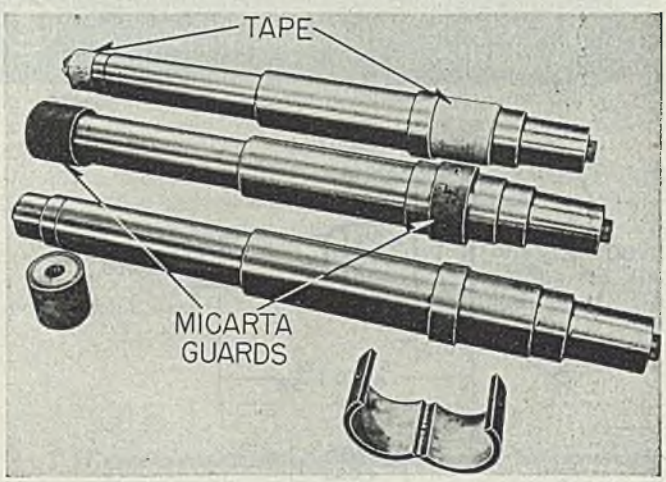


Modified Lift Truck

A ONE-MAN MAINTENANCE CREW

...vel and economical use for a lift truck has been devised ...eph Howard, chief engineer for Boott Mills, Lowell, ... He has equipped a Towmotor lift truck with a scoop ...ment and uses the unit as a one-man maintenance ... Such jobs as moving coal to the boilers, moving and ...ing barrels of oil and even carrying wet concrete from ... to forms keep the lift truck busy 24 hours a day. ... to the installation of the Towmotor, three men on each ...ree shifts had to handle this work; now a crew of three ... handles all the work during a complete 24 hour work

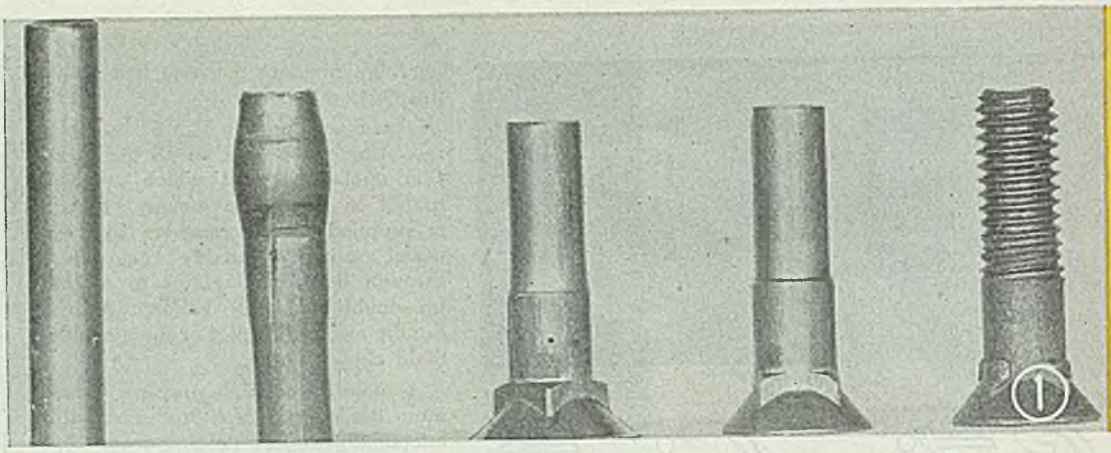
... receiving and shipping operations, 50 gal drums of oil ... carried to storage on the scoop. In hauling coal to the ..., the scoop carries a 600 lb load on each trip. Between ... to 600 tons of coal are handled each month in this ...



Micarta Journal Guards

PROTECT FINISHED SHAFTS

After the finish-grind operation on shaft journals, considerable handling of the shaft is necessary before final assembly. If unprotected, journal surfaces become scarred and scratched. Micarta journal guards, developed by Westinghouse Electric Corp., Pittsburgh, to replace the old tape method (see journal at top) are either hinged or threaded, depending on their application. Hinged guard is used on the pinion end of the shaft, and threaded guard on the commutator end as shown in illustration. Hinged guard is secured to the shaft by wire wrapped around the pins on the hinged sections. Threaded guard consists of a section of micarta tubing into which a threaded washer is inserted. Guards are applied to journals after the finish grinding operation and are left on throughout subsequent operations. They are returned to the original dispatching section by electric truck after a sufficient number has accumulated. Guards are identified for separation and reuse, are inexpensive and durable, and are applied to the shaft in a few seconds.



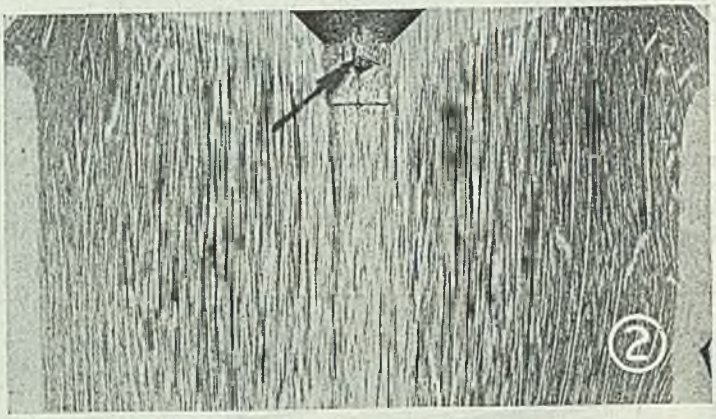


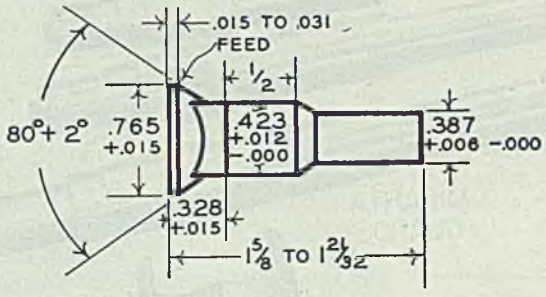
Fig. 1—Steps in manufacture of plow bolt

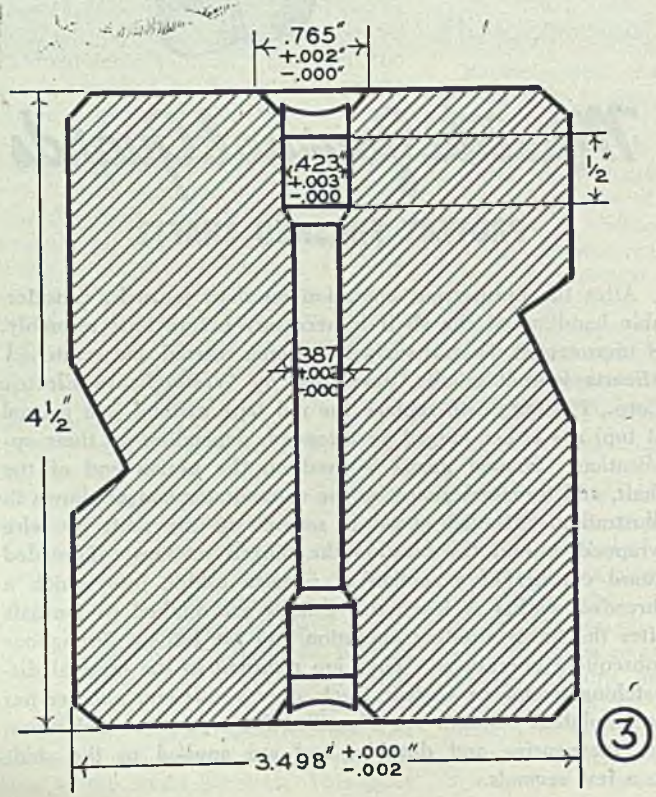
Fig. 2—Typical die failure indicated by arrow

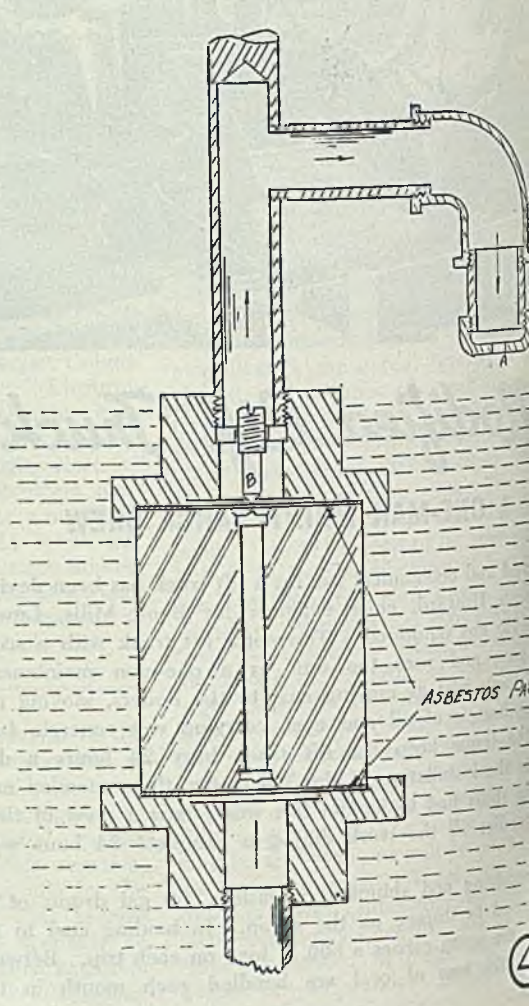
Fig. 3—Diagram of cold heading die

Fig. 4—Quenching fixture used for dies

Fig. 5—Faulty die, arrows indicate fissures in hardened zone







Factors Affecting Die Life

By A. S. JAMESON
Works Metallurgist
International Harvester Co.
Chicago

Many factors other than the nature of the die steel itself must be carefully studied to get the most out of dies

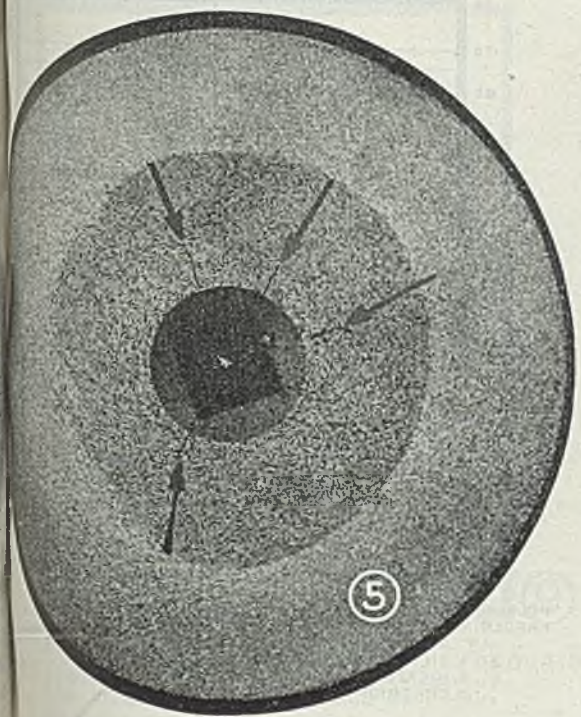
SEVERAL factors other than the characteristics of the die steel influence die life. These are: The characteristics of the material being cold headed, the design of the operation of the heading machine, the blank design and the quality of workmanship which goes into the making of the dies. If these factors can be controlled, die steel can be studied and related to the characteristics of the steel.

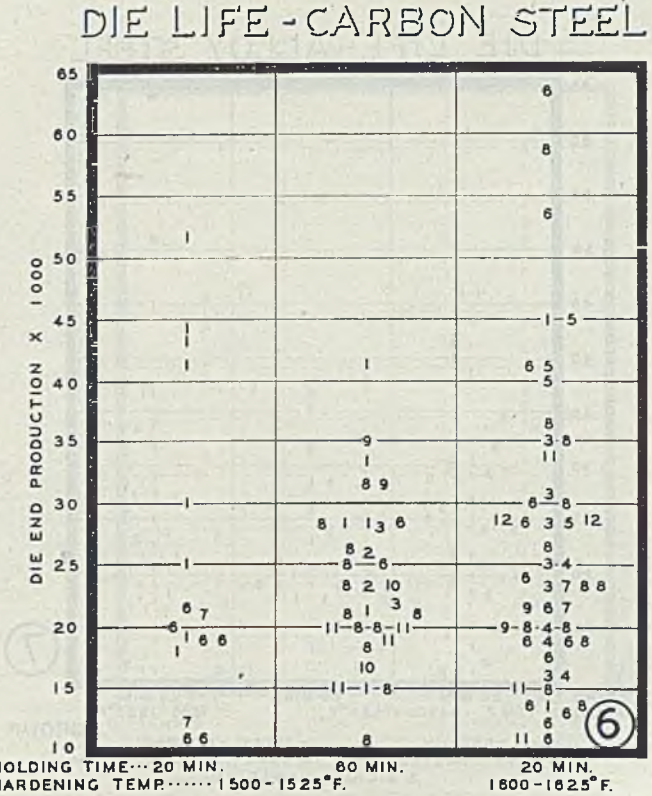
About 15 years ago a project was started for the purpose of determining whether carbon or low alloy steel was best suited to the practice of cold heading machine bolts. This particular bolt was selected as being the most desirable "guinea pig" for study, primarily, because the failure of the die occurred almost by a fatigue failure at the corner of the square.

In the case of many dies, the failure occurs by the wearing of the die so that it no longer produces a part of the proper dimensions. In these instances, die life resolves itself to a problem of wear and does not enable us to obtain complete failure of the die steel. Perhaps, the main factors governing die wear would be the hardness of the die and the hardness of the material being headed.

Ordinarily, hardness tests of the die and the material being headed are not sufficient to exercise any but the most superficial control of die wear, for they do not give a true picture of the immediate surface of both the die and the headed material which are in frictional contact. In the case of this particular plow bolt die, even if the failure resulted from fatigue and not from wear, the condition of the headed material entered into the picture in two ways. The harder the wire, the higher is the tensile strength and, therefore, the greater the force required to fill out the corners of the bolt. The poorer the wire finish, that is, with respect to the permanence of the bond between the wire finish and the metal beneath, the more likely it is to pack the corners of the die impression and thus limit the space into which the metal is forced. The amount of stock accumulated by the machine operator and forced into the die impression is usually calculated for the full volume of the impression and controlled by the length of the cut off.

If the volume of the die impression is changed by the packing of the impression either by oil or debris from the surface of the wire, something must give way and it is usually the die. The hardness and surface finish of the die





would also be factors. However, the die hardness was controlled by heat treatment. This leaves the surface finish of the die for consideration and this would be especially important in the corners of the square impression. Great care was exercised to prevent destruction of the surface of the die in heat treatment and the radius at the base of the square impression was machined accurately before heat treatment and polished after heat treatment.

Steps in the manufacture of this bolt are shown in Fig. 1. Typical die failure is shown in Figs. 2 and 5. This type of failure is noted by the machine operator as "corners down". Occasionally failure occurs by chipping in the slope of the head but the "corners down" type of failure would be reported in 98 per cent of the cases.

Starting with the assumption that the other factors which influence die life are controlled within reasonable limits, dies were made up from various carbon and alloy steels, heat treated and placed in production. Fig. 6 is a graphical representation of the number of pieces produced per die end from dies made from carbon steel; approximately 2,500,000 bolts were produced or 100 die ends used during this test. The chemical composition of the carbon steels corresponding to the numbers shown in Fig. 8 are given in Table I.

It has been mentioned in a previous article (STEEL, Oct. 29, p. 98), that chemical composition within certain limits is only a simple factor in the make-up of the character of a cold heading die steel. The hardness penetration and grain size are more important factors in affecting the mechanical strength of a cold heading die. It was pointed out, however, that where the die is of a large section the variation in the hardness penetration characteristic is not so critical a factor.

Figs. 7, 8, 9, and 10 are graphical representations of the number of pieces produced per die end for four groups of alloy steel. Each group contains the results of 100 die ends from which 2,200,000 to 2,900,000 bolts were produced. These alloy steels were grouped at random for comparison with carbon steel shown in Fig. 6. The chemical composition of these alloy steels is given in Table II.

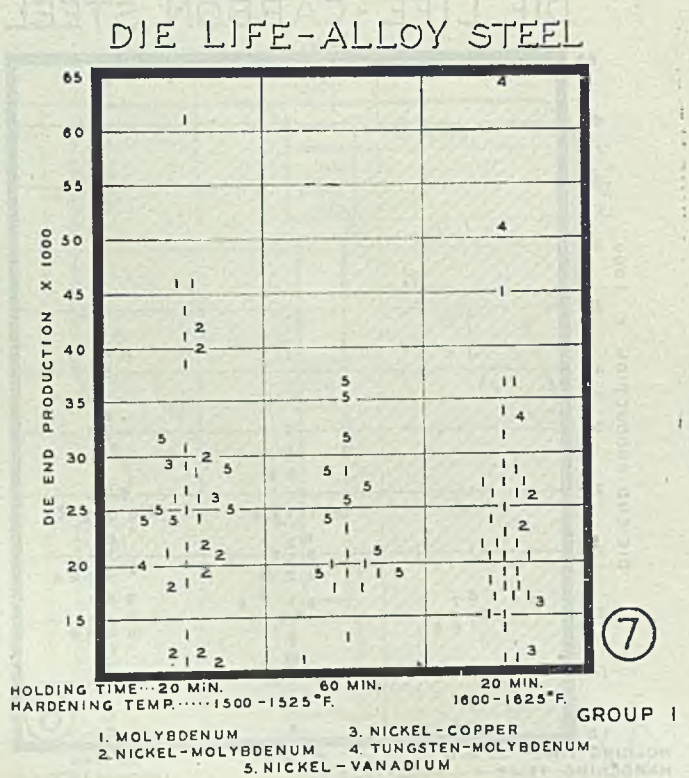
It will be noted from the graphical representations that three separate heat treatments were used. A temperature range of from 1500 to 1525° F, 1600 to 1625° F and with two holding times at the 1500-1525° F range; one of a 20 min duration and the other

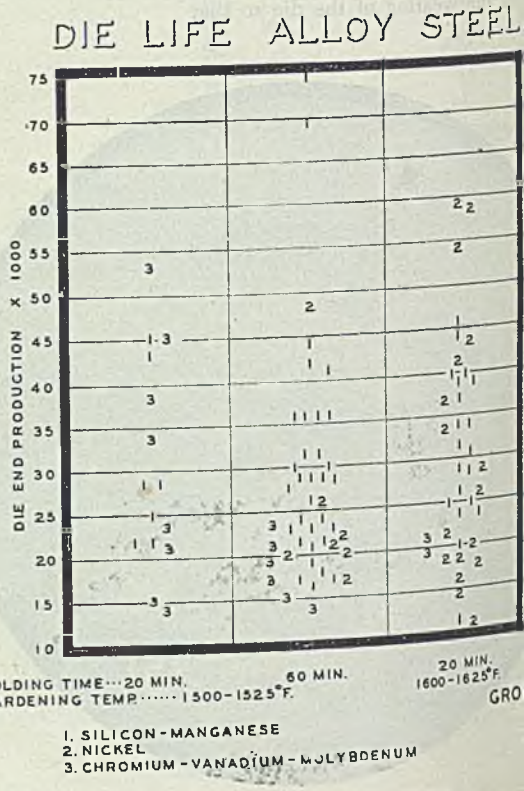
TABLE I.—CHEMICAL COMPOSITION OF CARBON STEELS

Identification	Element Per Cent			
	C	Mn	Si	Cr (residual)
1	0.91	0.22	0.21	0.01
2	0.92	0.28	0.24	0.01
3	1.00	0.24	0.28	0.01
4	0.92	0.32	0.23	0.03
5	1.03	0.24	0.29	0.02
6	1.21	0.34	0.22	0.03
7	0.95	0.46	0.13	0.05
8	0.90	0.35	0.28	0.08
9	0.93	0.24	0.23	0.00
10	1.00	0.23	0.16	0.00
11	1.07	0.40	0.20	0.03
12	1.08	0.28	0.13	0.01

TABLE II—CHEMICAL COMPOSITION OF ALLOY STEELS

Identification Group	No.	Type	Element Per Cent C	Mn	Si	Ni	Cr	Al	Mo
1	1.	Molybdenum	0.80	0.30	0.20	..	...	...	0.20
	2.	Nickel-Molybdenum	0.95	0.30	0.25	1.00	.	.	0.20
	3.	Nickel-Copper	0.95	0.30	0.25	1.25	...	.	...
	4.	Tungsten-Molybdenum	0.90	0.25	0.20	.	...	...	0.20
	5.	Nickel-Vanadium	0.90	0.35	0.40	0.70	...	.	...
2	1.	Silicon-Manganese	0.90	0.35	0.40	....	....	..	....
	2.	Nickel	0.90	0.30	0.25	1.00	....	..	....
	3.	Chromium-Vanadium-Molybdenum	0.90	0.25	0.20	....	0.25	....	0.30
3	1.	Chromium	0.90	0.30	0.30	..	0.20	..	...
	2.	Chromium-Vanadium	0.95	0.30	0.25	....	0.20	..	....
	3.	Vanadium	0.95	0.30	0.30	....	...	.	...
	4.	Vanadium	0.95	0.35	0.25	....	...	.	...
4	1.	Copper	1.00	0.30	0.25	....	...	.	...
		Copper	....	....	....	....	....	....	....
	2.	Graphitic-Silicon	1.50	0.30	0.90	....	...	...	...
	3.	Graphitic-Aluminum	1.50	0.30	0.20	....	..	0.20	..





60 min duration. The variation of 25° F in the ranges is due to the fact that the hardening temperature was actually based on the number of degrees above the critical range as indicated by the "temp" on the temperature control chart. A typical hardening procedure is as follows: Placed in furnace, held at 1300° F, and equalized for 1 hr, brought up to 1525° F, above Ac critical in 2 hr; held for 20 min and fixture quenched in 10 per cent brine (65-75°F); tempered for 1 hr at 500°F.

Hardness range of the dies after heat treatment was from 58-61 rockwell C. This has been found to be the best operating hardness for this application. The die is illustrated in Fig. 3 and the quenching fixture in Fig. 4. A glance at Figs. 6, 7, 8, 9 and 10 will show that of the heat treatments used, no particular one can be said to be generally preferred from a production standpoint. The heat treatment of the dies can therefore be ignored for the purpose of comparing the die life of carbon and alloy steels.

Table III gives a comparison of the life of the carbon steel and alloy steel dies. It will be observed from Table III that the die life of the alloy steels taken as a whole is approximately the same as that obtained from the carbon steel. The one group, Group 2, of the alloy steel dies has a better life record than the carbon steel. More than 50 per cent of this group contains what is virtually a chromium steel. We have designated it as an alloy steel, silicon-manganese, because both manganese and silicon are definitely

TABLE III—DIE LIFE OF CARBON & ALLOY STEELS

Production Ranges and Per Cent of Dies Within the Indicated Ranges

Type of Steel	10-20,000 (Incl.)	20-30,000 (Incl.)	30-40,000 (Incl.)	40-50,000 (Incl.)	50-60,000 (Incl.)	60-70,000 (Incl.)	70-80,000 (Incl.)
Carbon	39	38	10	9	3	1	..
Alloy							
Group 1	34	45	12	6	1	2	..
2	24	39	20	11	4	1	1
3	57	24	12	6	1	..	..
4	36	31	17	9	6	1	..
All	38	35	15	8	3	1	..

TABLE IV—COMPARISON OF THREE ALLOY STEELS

Production Ranges and Per Cent of Dies Within the Indicated Ranges

Type of Steel	10-20,000 (Incl.)	20-30,000 (Incl.)	30-40,000 (Incl.)	40-50,000 (Incl.)	50-60,000 (Incl.)	60-70,000 (Incl.)	70-80,000 (Incl.)
Chromium-Vanadium	54	26	15	4	2	0	0
Silicon-Manganese	12	47	27	12	0	2	2
Molybdenum	38	44	9	8	0	2	0

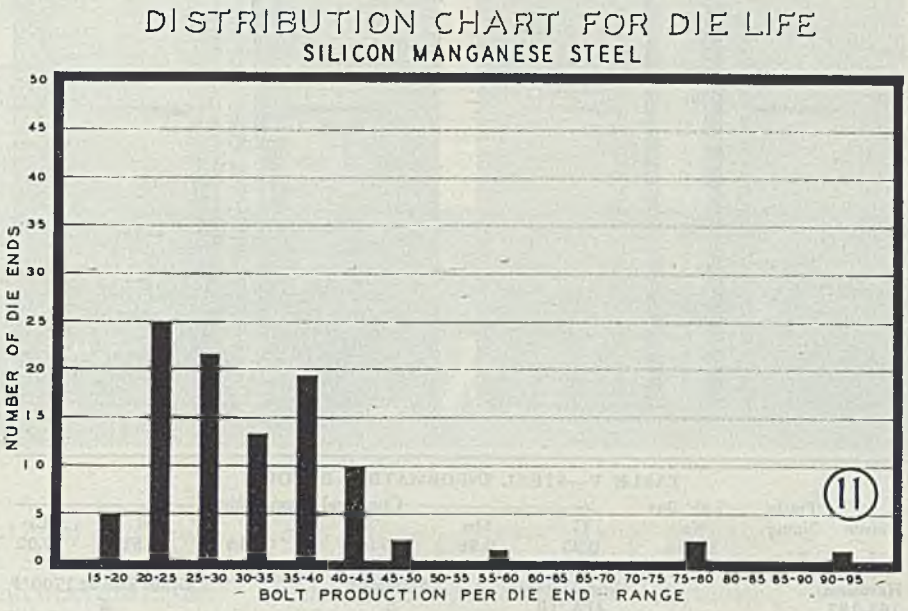
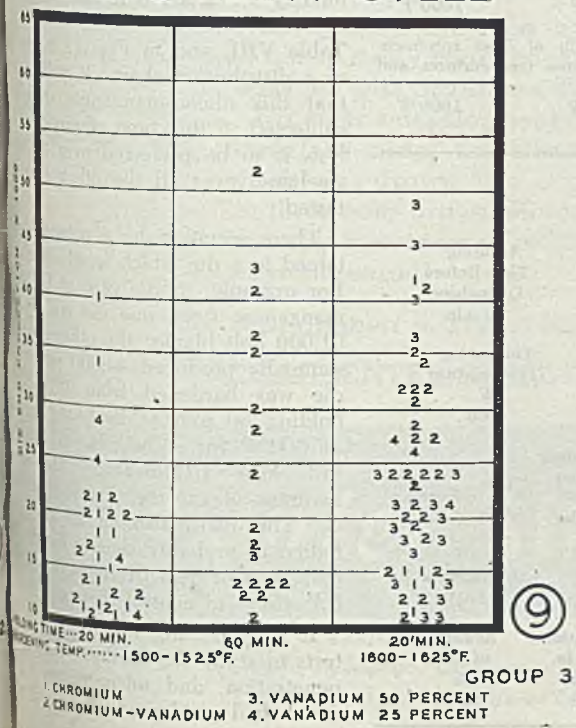
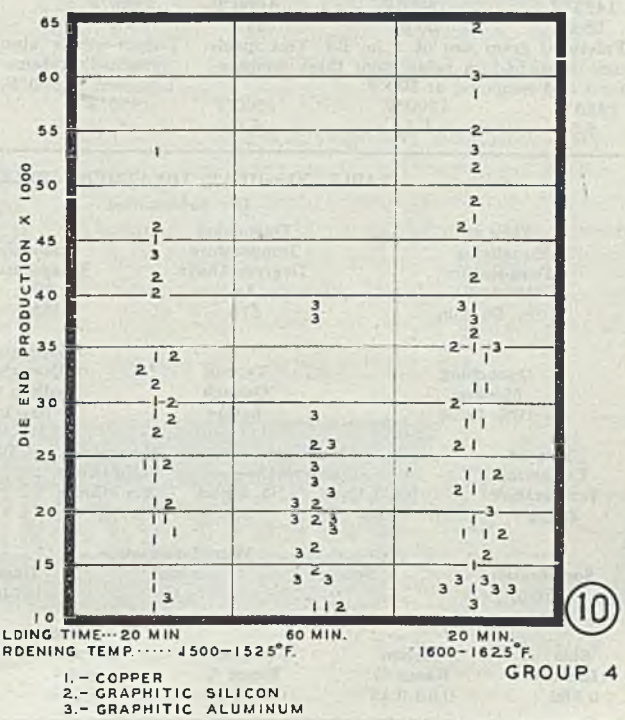


Fig. 11—*Production distribution chart for* 100 *die ends*





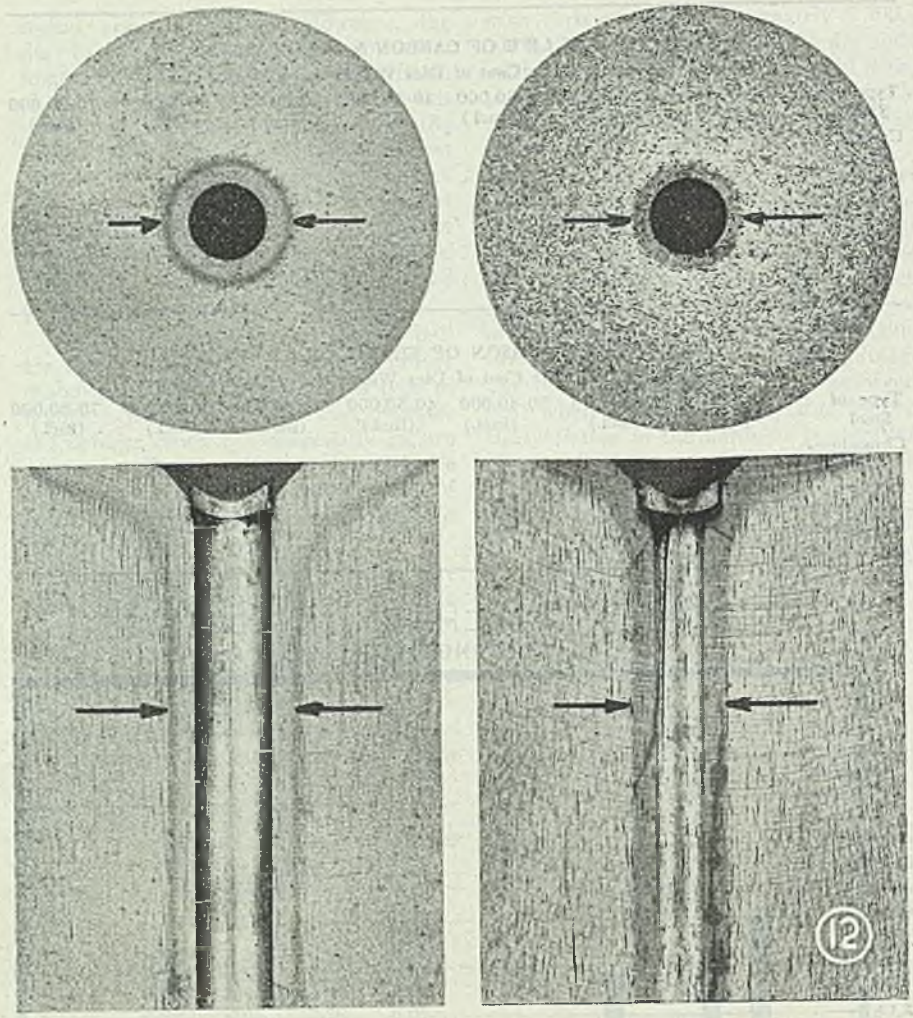


Fig. 12—Cross and longitudinal sections through dies showing hardened case—within arrows—brought out by etching in 1:1 hydrochloric acid

TABLE V—STEEL INFORMATION RECORD

Source	Trade Name	Lab. Bar No.	Chemical Composition C	Mn	S	P	Si	Cr
..	..	S-198	0.95	0.36	0.022	0.018	0.51	0.02

Brinell Hardness 163-187

Inclusion Count Non-Metallic 41A, 1B

Microstructure Standard 3

Austenitic Grain Size at 1700°F 4

Surface hardness rockwell C of 1 in. Rd. Test specimen after brine quenching and tempering at 500°F for three quenching temperatures.

1425°F	1500°F	1600°F
58.2	58.0	58.0

Hardness penetration to 50 rockwell C in 1 in. Rd. Test specimen, quenched in brine from three temperatures and tempered at 500°F in 1/16-in

1425°F	1500°F	1600°F
4.0	5.5	..

Fractured grain size of 1 in. Rd. Test specimen quenched in brine from three temperatures and tempered at 500°F.

1425°F	1500°F	1600°F
6.5	5.5	5.0

Impact-energy absorbed ft-lb of Test specimen quenched in brine from three temperatures and tempered at 500°F.

1425°F	1500°F	1600°F
4	3	2

TABLE VI—HEAT TREATMENT RECORD

Die Information

Time at Equalizing Temperature (1300° F)	Quenching Temperature Degrees Above Ac	Quenching Temperature °F	Holding Time Before Quenching
1 hr 50 min	175	1550	20 min

Quenching Medium	Type of Quench	Temperature of Quenching Medium °F	Tempering Temperature °F
10% brine	fixture	70-71	500

Time at Tempering Temperature	Hardness —Rockwell C— No. 1 End	No. 2 End	Atmosphere Fluid Drops Per Minute	Water Pressure Quenching Fixture	Furnace
4 hrs	58	58	76	20-25 lbs	No. 1

Wire Information

Specification	Source	Finish	Heat No.	Lab. Analysis No.
C-1040	.....	C	174013	6019

Size (Inches)	Carbon Range %	Manganese Range %	Tensile Strength psi	Elongation % in 2 in. Range	Reduction of Area %
0.382	0.38-0.42	0.79-0.80	98,000	14-16	54-57

increased over the standard carbon ste analysis range. A comparison betwe each alloy analyses has not been a tempted, for such comparisons are n considered possible where less than die ends are involved. Comparison m be made, however, between three an lyses types where this numerical cond tion is met. A comparison is made Table IV. This comparison shows th the steel designated as silicon-mangane is to be preferred over the chromiu vanadium and molybdenum analyses.

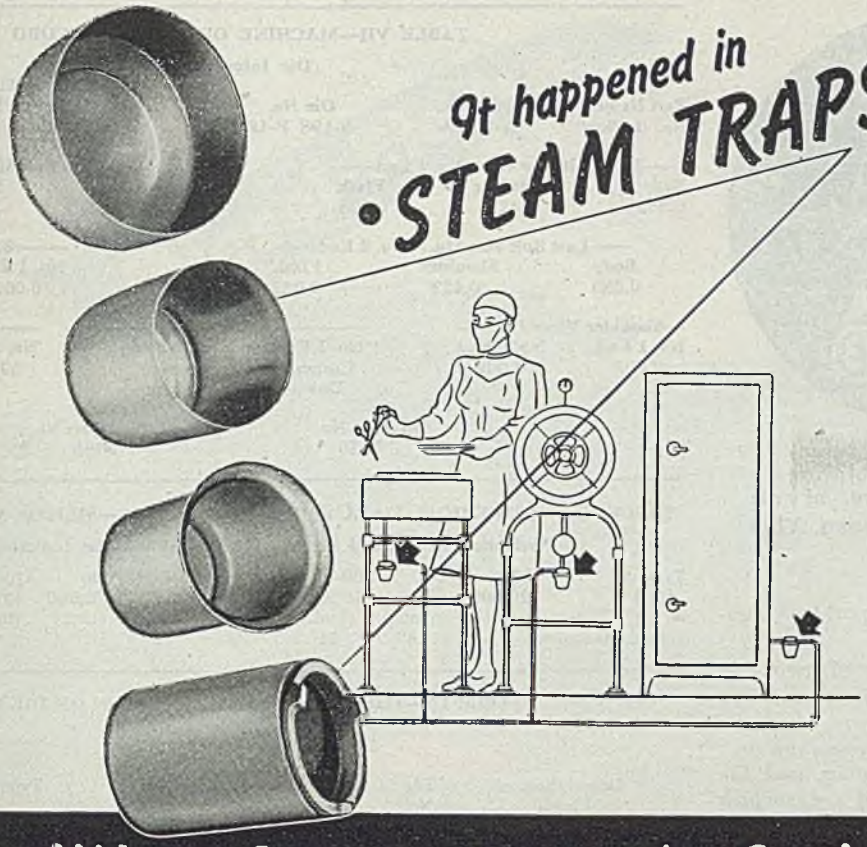
The reason for requiring a fairly la number of dies for the purpose of dra ing definite conclusions is that in tests of this kind, that is, service te variation in life is very great. It is p sumed that the cause for the large v ation is due to factors other than n uniformity of the dies themselves, eit with respect to material quality of characteristics, or to the heat treatm of the dies. These factors have b previously mentioned—among them machine operation and characteristics the headed material. In order to c trol these as well as the heat treatm of the dies, a detailed record should compiled during the process of test An example of such a record is given Tables V, VI and VII.

Silicon-Manganese Preferred

In order to be sure that the sili manganese steel was the preferred lysis for this application, a numbe dies were run so as to complete 100 ends for this type of steel. This i represented the production of app imately 3,242,900 bolt blanks. The obtained from these tests are show Table VIII, and in Fig. 11 in the of a distribution chart. It will be n that this silicon-manganese steel, subjected to this type of numerical lysis is to be preferred over the ca steel and over all the other alloy tested.

There seems to be a potentiality tained in a die which is seldom rea For example, in the case of the sil manganese steel, one die end prod 91,000 bolt blanks; the other end o same die produced 44,000 pieces. die was hardened from 1510° F holding 60 min at heat, and temp at 500°F for 4 hr (one of the s ard heat treatments). The su hardness of the die was 58-60 roc C. The non-realization of this p tiality is probably due to factors than steel or heat treatment despite ful efforts to control these other fa

It is interesting when making di tests to study the hardness, the har penetration, and microstructure of which had good production records



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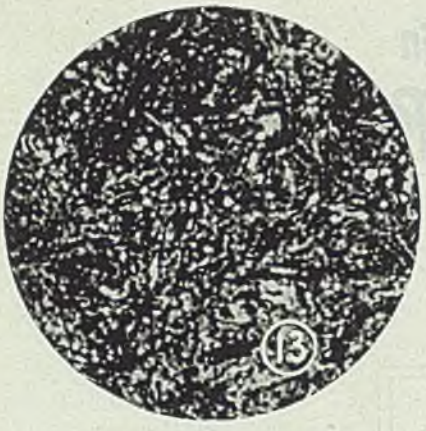

Fig. 13—Microstructure of die with good production record. X100

the object of duplicating these characteristics.

Fig. 12 shows sections of two dies which had good production records. The two sections at the left are of a die which produced 67,000 pieces on one end and 46,000 on the other, and the sections on the right are of a die which produced 59,000 pieces on one end and 58,000 pieces on the other. Both dies received the same heat treatment, being hardened from 1610°F after holding for 20 min at heat and tempered at 500° F for 4 hr, another one of the standard heat treatments. They show some variation in hardness penetration or case depth from one die to the other indicating that hardness penetration within certain limits was not too significant a factor. The microstructure of the die on the right in the hardened working area is shown in Fig. 13.

Wire Finish and Die Life

An opinion has been expressed that the cause for the non-realization of the maximum potentiality of a die is due to factors not related to the quality of the steel in the die or its characteristics. A short digression on the effect of the surface finish of heading wire follows.

One important factor affecting die life is the surface finish on the wire. Following will illustrate. A tabulation of tests run on mechanically cleaned wire vs acid cleaned wire with different finishes is shown in Table IX. The wire itself was manufactured by the same source and was of precisely similar composition and received the same thermal treatment prior to cleaning and cold drawing. The dies were made from the same bar of silicon-manganese steel and heat treated in the same manner. Values given in Table IX are the results of actual tests. However, they are given as an illustration of what wire finish can do to effect die life and should not be construed as an answer to the question of mechanically cleaned wire vs acid cleaned wire.

On the basis of the findings of this investigation a steel composition, quality, and character control was set up as shown in Table X (macrostructure—deep etch—and microstructure in accordance with photographic standards; fractured grain size and hardenability—1 in. round specimen hardened according to standard practice). These are briefly the main steel and die heat treatment controls set up for this silicon-manganese steel adopted for this particular heading operation. One interesting thing brought out by this test is that the addition of alloys such as chromium, vanadium, molybdenum, etc., do not, except as they effect the hardenability, enhance the performance of cold heading dies in any

In conclusion, the information tained in this article can, no doul applied to other cold heading di least the method used to arrive findings can be universally used improvement of die life. In all where a study of die life is contem because of the number of variabl volved, a large number of dies mu run. In this test 6 tons of tool were used representing about 800 These dies consumed 2500 tons of representing about 40,000,000 bol

TABLE VII—MACHINE OPERATION RECORD

Die Information

Part Name	Part No.	Die No.	First Bolt Size (In.) No. 1 End—Body	Shoulder	Fla
No. 3 Plow	A-200-A	S-198 P-12	0.387	0.427	0.0

Last Bolt Size (In.) No. 1 End—Body	Shoulder	Flash	First Bolt Size (In.) No. 2 End—Body	Shoulder	Fla
0.389	0.429	0.028	0.388	0.427	0.0

Last Bolt Size (In.) No. 2 End—Body	Shoulder	Flash	Body Wear (In.)—No. 1 End	No. 2 End
0.389	0.429	0.022	0.002	0.001

Shoulder Wear (In.)—No. 1 End	No. 2 End	Failure—No. 1 End	No. 2 End	Production Pcs.—No. 1 End	No. 2 E
0.002	0.002	Corners Down	Corners Down	39,000	41,00

Machine No.	Operators No.
P-5350	2586

TABLE VIII—NUMERICAL DATA FROM 100 DIE ENDS—SILICON-MANGANESE STE

Production Ranges and Per Cent of Dies Within the Indicated Ranges

Type of Steel	10-20,000 (Incl.)	20-30,000 (Incl.)	30-40,000 (Incl.)	40-50,000 (Incl.)	50-60,000 (Incl.)	60-70,000 (Incl.)	70-80,000 (Incl.)	80-90,000 (Incl.)	90-10 (In
Silicon-Manganese	5	47	34	10	1	..	2	..	

TABLE IX—THE EFFECT OF WIRE FINISH ON DIE LIFE

Production (Blank)

Description of Finish	Die No.	End 1	End 2	Die	Type of Die Failure
Mechanically cleaned, lime coated, and drawn through oil (wet drawn).	1	8,000	.....	.....	Corners down.
	2	8,300	8,600	16,900	Corners down, chipped and cr
Mechanically cleaned, lime coated and drawn through stearate (dry drawn).	3	16,100	15,000	31,100	Corners down, chipped and cr (No. 1) End repolished at blanks.)
Mechanically cleaned and drawn through stearate (dry drawn).	4	700	100	800	Scored— (No. 1) end repolished at blanks).
Acid cleaned, lime coated and drawn through stearate (dry drawn).	5	36,000	38,400	74,400	Corners down.
	6	29,000	31,000	60,000	Corners down.
	7	31,000	21,500	52,500	Corners down.
	8	33,000	39,000	72,000	Corners down.
	9	26,000	23,000	49,000	Corners down.

TABLE X—QUALITY CONTROL

Chemical Composition

Range	Carbon	Manganese	Silicon	Sulphur	Phosp
Minimum	0.90	0.30	0.40	....	..
Maximum	1.00	0.45	0.50	0.025	0.0

Quenching Temperature °F	Tempering Temperature °F	Fractured Grain Size of Case (No coarser than)	Hardness Penetration 1/16-in. to 50 rockwell C Min	Max
1425	500	7	2.5	4.0
1500	500	6	3.5	5.0

Standard heat treatment practice:

Preheat	Hardening Temperature	Holding Time	Quenching Medium	Tempering Temperature
1300°F	1550°F	30 Min	Brine (63-75°F)	500°F

Surface hardness of die in working area rockwell C 58-61

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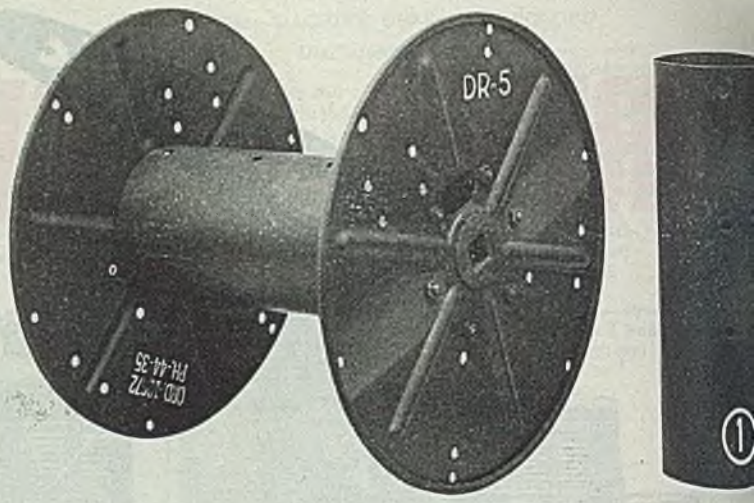
WIRE REELS



. . . . redesigned for fabrication from alloy steel provide both strength and lightness

ONE of the many wartime jobs well done was the production of alloy steel wire reels for the Army Signal Corps. These reels had to be light for easy handling and strong enough to withstand rough treatment. Further, rigidly flat flanges were required in order that the wire could unreel easily without binding.

Until 1939 it had been common practice to make wire reels for the Signal Corps from soft steel. About this time engineers of Parish Pressed Steel Co., Reading, Pa., suggested the use of alloy steel for the purpose of giving longer life to these reels. Shortly thereafter, alloy steel that could be heat treated to an elastic limit of 120,000 to 135,000 psi and an ultimate tensile strength of 135,000 to 150,000 psi was specified.

Four sizes of reels were produced with capacity ranging from 1000 to 5000 ft of wire. Fig. 1 shows the DR-5 reel made with a head diameter of 19¼ in., the inside diameter of the drum being 6⅛ in., the length 17 in., and the hub diameter 3 in. Rated capacity for this reel was 1 mile of field wire. Through the use of alloy steel, danger of damage in rough handling was reduced to a minimum, and the reels could be used repeatedly.

Because of the hardness of the alloy steel used, presses of approximately 250 tons capacity were required to form the heads. Usual practice was to blank, pierce and curl the edges in presses. In some plants the edges were curled in specially designed rolling machines. Heads for the DR-5 were made from 13 gage stock.

Production of wire reels at Noblitt-Sparks Industries Inc., Columbus, Ind., was as follows: Scrap alloy steel from the head blanking operation was used to form hubs for the heads of the reels and their fabrication was achieved by a series of rolls and arc welded on the inside of the seam. The outside of the seam was buffed to eliminate burrs which might damage the wire's insulation. Spacer tubes of each reel were made of 19 gage cold rolled coil stock formed into welded tubes on a Yoder resistance tube welder. These tubing pieces were cut to length, then squared at the ends in a press. The drums were of the same gage as the head, but were fabricated of mild steel.

After fabrication the parts were heat treated. Each reel head was placed in a conveyor-type gas-fired heat treating furnace and heated to 1630° F. They were removed, clamped in a quenching fixture and quenched under water. Following this operation the heads, clamped together in groups of thirty, passed through furnaces at a temperature of 850° to 900° F for approximately 30 to 35 min.

Ten Per Cent Are Tested

A conveyor then carried them through an acid pickling tank and a rinse. Ten per cent of the heads were tested for hardness on a rockwell hardness tester to assure meeting Signal Corps specifications.

Heads and other components of the reel next were placed on another conveyor where they were carried through a series of cleaning, washing, and bonderizing tanks; then to a drier and finally into a paint dip tank.

Component parts of the reel passed through a large conveyor drying oven where the semi-gloss olive drab paint was baked on at a temperature of 275° to 300° F. Parts were conveyed to an assembly line where the reels were assembled by means of special jigs, rolled along a track for inspection, stamping and application of an orange stripe to each head. Sectional view of the completed reel is shown in Fig. 2.

Inspection of these reels was on a quality control basis. Signal Corps inspectors were stationed at the end of the assembly line, while roaming inspection was carried on at various production points. Company inspectors were stationed at all control points including the final assembly operation station.

Under this production procedure, more than 14,000 reels per day were produced in the plant of Noblitt-Sparks.

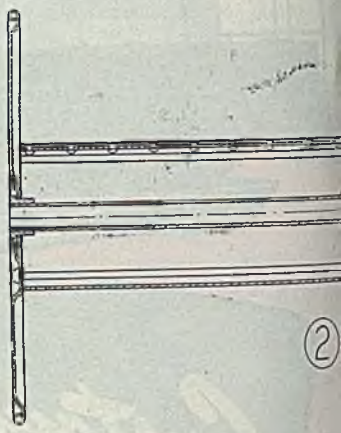


Fig. 1—The DR-5, wire reel presently formed of alloy steel. Heads were of 13 gage stock and the spacer tubes of 19 gage cold rolled coil stock formed into welded tubes on a resistance welder

Fig. 2—Sectional view of completed reel showing method of assembling parts

—o—

Special rolled shapes available from Lukenweld Inc., division of Lukens Steel Co. at Coatesville, Pa., are illustrated in a bulletin recently published. Bulletin pictures facilities of Lukenweld's roughing mill, together with examples of special rolled steel sections which were produced on it; also a number of Lukenweld special rolled shapes. Bulletin will be sent without cost on request to Lukens Steel Company, Lukens Building, Coatesville, Pa.

VAPOR DEGREASING

Equipment and methods keep pace with improvement in solvents. Efficiency of electric and gas-heated degreasers gives maximum production in minimum space, complete penetration of close-fitting parts without disassembly, and reduced handling

By
J. C. JOYCE
Joyce and Associates
Los Angeles

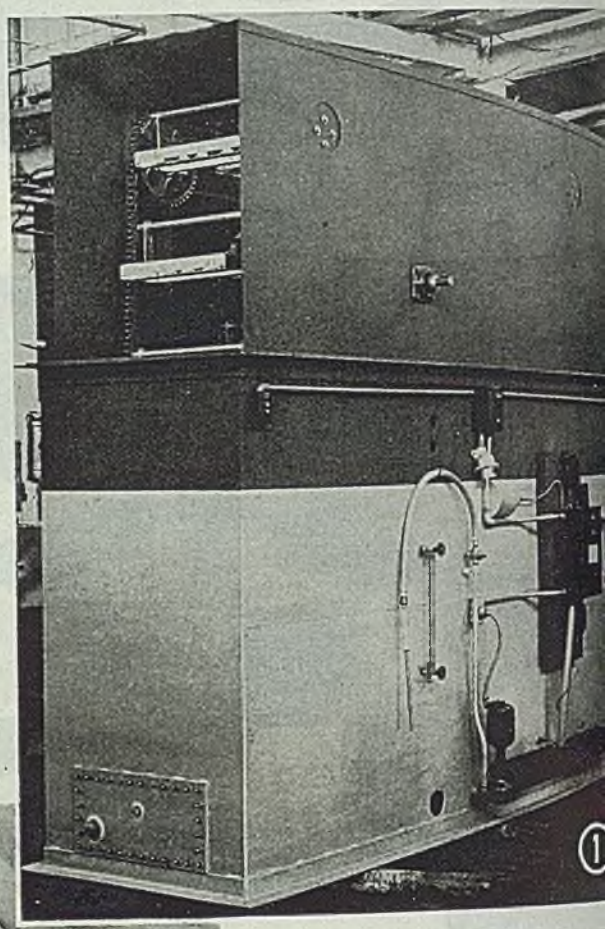


Fig. 1—All purpose conveyor electric vapor degreaser of medium size. Note elevator arrangement for handling work trays flushing hose and pump mounted on side carrying electrical controls and leads to heating element

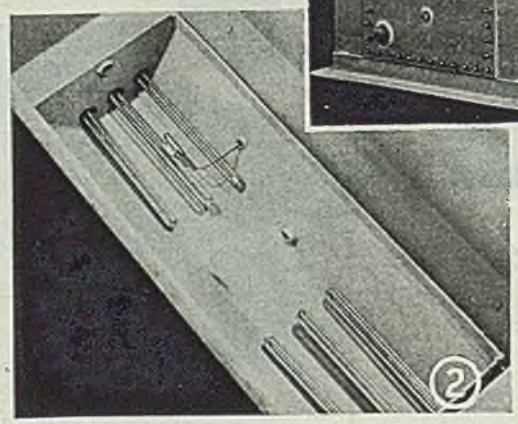


Fig. 2—View of heating elements and thermostat bulb in position at bottom of solvent tank. Photos for Figs. 1, 2 and 3, courtesy of Phillips Mfg. Co., Chicago

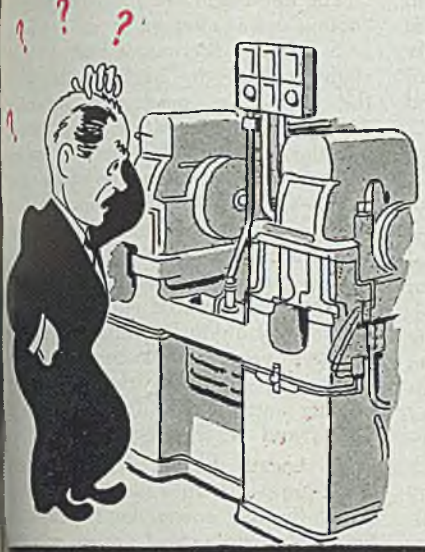
MASS production of intricate and precision-made products from new alloys and new metals has required higher efficiency in cutting oils and coolants. These in turn, have had to be removed from the metals to prevent corrosion. New methods were developed in recent years to effect this cleaning. As solvents improved, it became necessary to increase efficiency of vapor degreasing equipment. Much progress has been made in this direction.

When oily or greasy metal is introduced into the hot, solvent vapors, surfaces of metal heat rapidly to temperature at which greases become fluid. Vapors, condensing on the cooler surfaces of the metals, are highly miscible and have a flushing effect which completely removes all traces of the grease. When the metal surfaces have attained the same temperature as the vapors, condensation ceases and the degreasing operation is completed.

Vapor degreasing has many advantages. A few of the more outstanding features are as follows:

1. Floor space required for degreasing operations is minimized by compact equipment.
2. A minimum of equipment is required.
3. Materials handling, with consequent damage to parts, is substantially reduced.
4. Labor is conserved by reduction in handling of parts, elimination of many hand operations, faster operation, and lower maintenance.
5. Faster production may be obtained. Time element is reduced to minutes instead of hours.
6. Nested or close-fitting parts are thoroughly penetrated by vapors, and thus can be degreased without disassembly.
7. Better inspection of finished parts, especially those machined, or having close tolerances.
8. Vapor degreasers have low operating costs.
9. Vapor degreasing of parts prior to the removal of scale or oxide from the parts effects a substantial reduction in the quantity of chemicals required for the pickling process. Pickling, plating, or rustproofing baths are not affected by solvent degreased parts, as no solvent remains on parts after vapor degreasing.

Functions of Degreasers: Any vapor degreasing machine is primarily a chamber in which the solvents are boiled until a heavy vapor is formed inside the c ber. The machine must control temperature and level for efficient, nomical and safe operation. The ma should be designed so that positive trols regulate the temperature and of the vapor. Regulation of tempe at a given point will control the n vapor level—the top level to whic vapor rises in the machine when o ing at maximum heat input, with solvent, and with no work in the chine. It should have adequate he capacity to quickly restore the level after work is inserted in the chine. By maintaining the normal level, whether work is in the machi not, the efficiency and economy o machine is at a maximum. Tempe of solvent and solvent vapors mu



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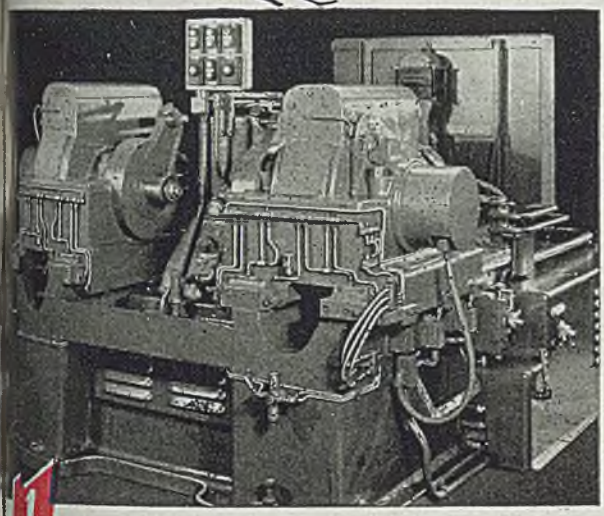

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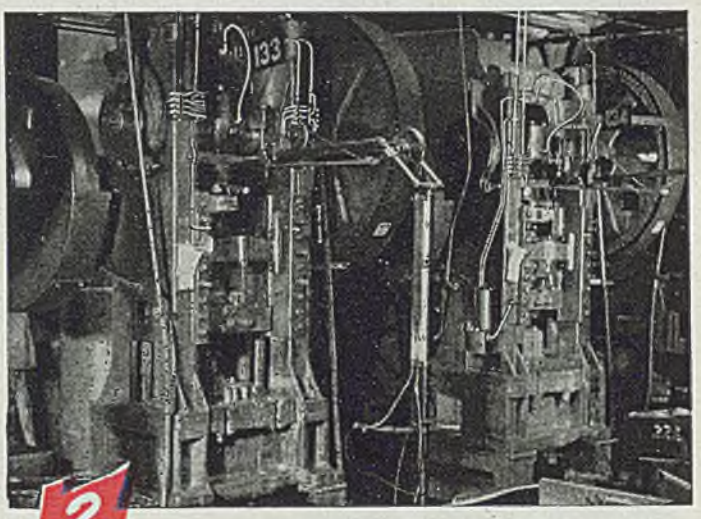

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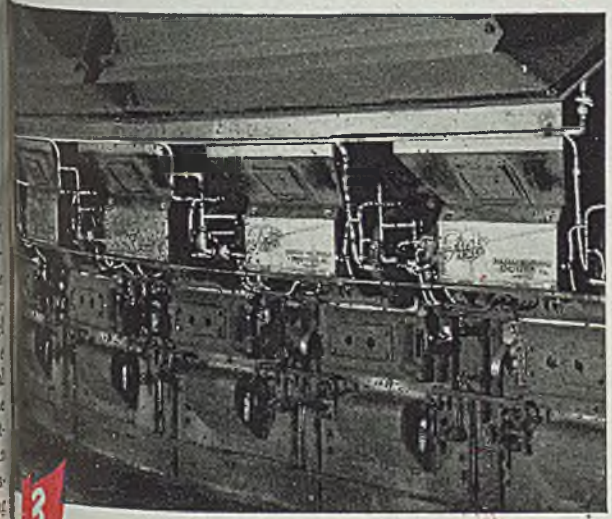

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regulated so that, at all times, there exists a safe "freeboard"—the vertical distance from the vapor level to the lowest point at which vapors can escape from the machine. When the vapors are at normal vapor level, the freeboard is at a minimum, but, when new work is inserted in the machine and the vapor level is lowered by the condensation on work, freeboard is increased in depth.

Construction and Design: The general construction of all vapor degreasing machines consists of a well galvanized metal tank, with internal or external heating devices, and with suitable controls for regulating the temperatures of the liquid solvents and vapors. Variations include compartmented tanks where dip, rinse, spray and drying operations are in sequence; conveyorized types; tumbler equipped chambers and other designs especially developed to suit particular requirements. Multiple units generally are designed and engineered for specific installations. The standard commercial, all purpose degreaser is by far the most widely used. See Fig. 1.

Exhaustive studies have been made on the advisability of requiring all vapor degreasers to have the vapor chamber vented. However, authorities do not seem to agree on the necessity for or the procedure of venting. Experience indicates that venting is secondary to installation and operating technique. It has been found that a poorly installed or operated degreaser, even though vented, will still show air contamination, whereas unvented machines, properly installed and operated, show practically no air contamination. It is recommended that venting be employed only where the particular installation is such that operation will not permit use of proper techniques, or where the degreaser lacks suitable controls for proper regulating of the vapor levels and temperatures.

Type of solvent used is important. Heavy solvent vapors, such as those generated by perchlorethylene, are fairly consistent in remaining within the vapor chamber, even when installation and operating techniques are not ideal.

Electrical Degreasers: The newest type of vapor degreasing machine is that which is completely heated and operated by electricity. The development of this type machine has eliminated many difficulties in vapor degreasing. As the electrical unit does not have water jackets or cooling coils, it is easily moved to the site of the work. This is advantageous in production operations where materials handling is a factor. Elimination of plumbing and sewage connections for water, steam or gas, and dispensing with venting flues from combustion chambers make it desirable in many installations. A unit of this type is shown in Fig. 1.

Electric heating elements of the kind shown in Fig. 2 are inserted in the liquid solvent chamber at points where their heat is evenly distributed throughout the solvent. Ample clearance is allowed between units and the bottom of the chamber. See Fig. 5. The number of heating coils varies with the size of the machine, but should be adequate to maintain a solvent temperature of about 265° F. A safety thermal control unit is attached to one of the coils, or the oil content of the solvent becomes excessive, thus increasing the boiling point of the solvent above a safe point, this thermal control unit actuates a switch, cutting off the heating coils. Heavy perforated plates or racks cover the coils to protect them from damage resulting from work being accidentally dropped into the machine.

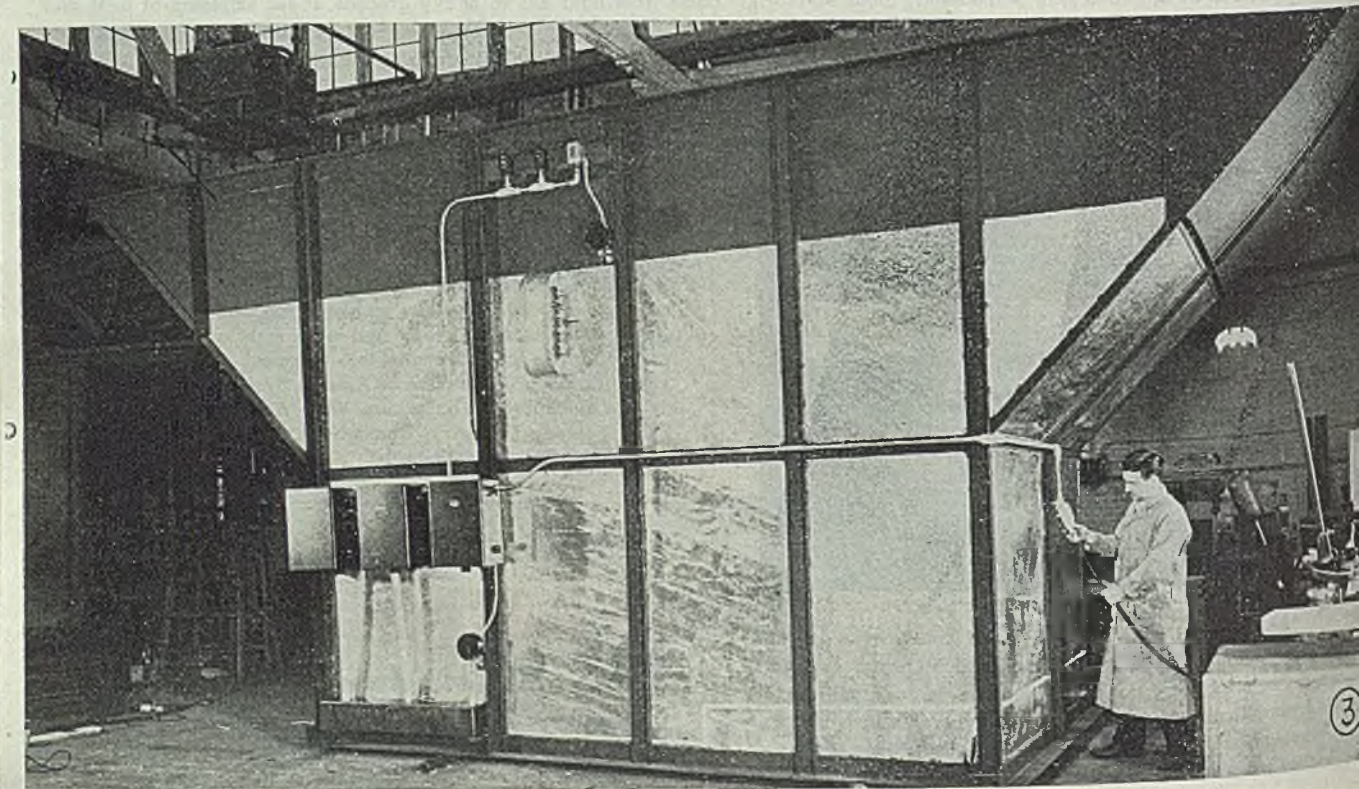
The elimination of the water jacket or cooling coil is effected by the installation of a sensitive thermostat bulb at a point slightly below the freeboard line. When the hot vapors reach this temperature control, the upper safety thermostat cuts off the heating elements, the solvent stops boiling, condensation of the vapor declines, the vapor level drops and allows the thermostat to cool to the minimum temperature at which the control is set. It then cuts in the heating elements and the cycle is repeated automatically. The dual sets of automatic safety thermostatic controls used on electrically operated degreasers eliminate the necessity for cooling and condensing units, vents exhausts and other safety devices.

Electrically heated degreasers usually are equipped with a motor and pump to which flushing or spraying systems can be attached for flushing excess grease or foreign matter from the work. See Fig. and diagram, Fig. 5. Solvent generally recommended for electrical degreasers is perchlorethylene (tetrachlorethylene)

Gas-Heated Degreasers: As these degreasers were among the first to be developed and have been in use for many years, there are probably more installations of this type than any other. The gas heated degreaser must, of necessity be a permanent installation due to the fact it requires plumbing for gas, water and sewage and must be equipped with flue from combustion chamber to exterior of the building. Safety codes usually require that the flue be constructed of acid-proof material and designed to prevent water influx and back draft. The also should be insulated to a height of least 1 ft above top of machine.

These units consist of a solvent tank mounted over a combustion chamber which are installed gas jets for heating

Fig. 3 — Large electrical degreasing unit for volume production



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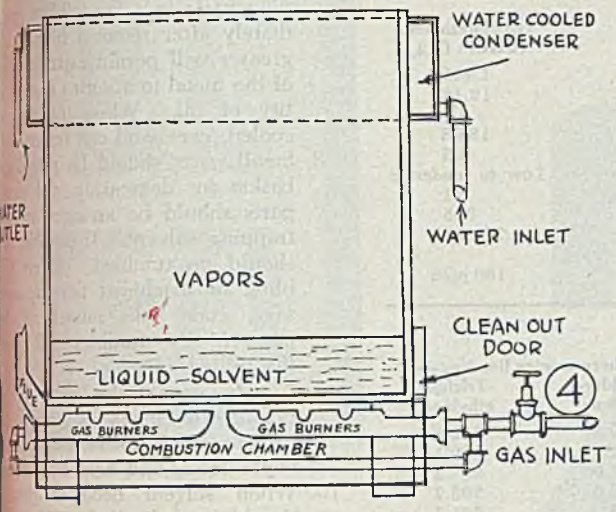


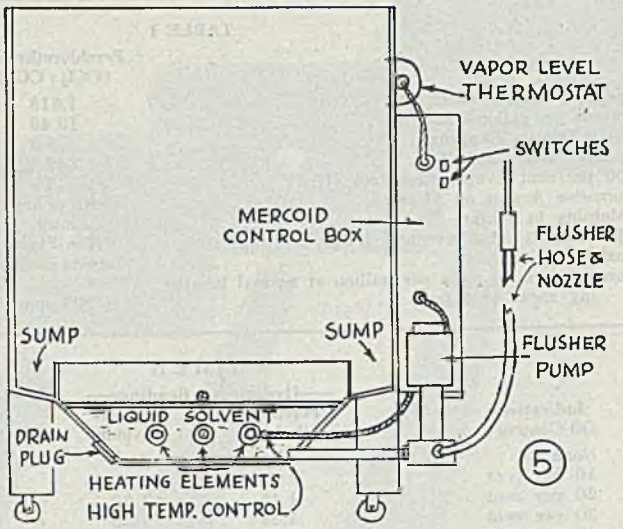


Fig. 4 — Sketch showing position of combustion chamber and gas burners in relation to solvent tank and other features of gas-heated degreaser

Fig. 5 — Arrangement of heating elements, controls and fluid system for simple electrically heated degreaser

poses. As very few gas-fired degreasers are equipped with automatic low temperature controls, they depend on a condensing surface, cooled by water jackets or coils to control the vapor level. A unit of this type is diagrammed in Fig. 4. These cooling devices generally are located around the upper part of the tank, and water is constantly circulated through them while the machine is in operation.

Some models of gas-fired degreasers have special motor and pump installations for flushing or spraying excess grease or foreign matter from the work. The solvent generally used in gas-fired degreasers has been trichlorethylene; however, the newer and more stable perchlorethylene is rapidly replacing it.

Steam-Heated Degreasers: The steam-heated degreaser is practically identical with the gas-fired degreaser except that no combustion flue is required. Heat is provided by steam coils instead of gas jets. These coils may be located in a combustion chamber beneath the solvent tank or immersed in liquid. Immersion installation usually is used for maintaining higher solvent temperatures.

Steam-heated degreasers usually are equipped with safety pressure relief valves, permanently set to operate at the pressure for which the machine is designed—not to exceed 25 lb gage pressure for trichlorethylene or 50 lb gage pressure for perchlorethylene. The steam-heated degreaser, like the gas-fired degreaser, must be considered a permanent installation.

Installation: Proper consideration as to the location and installation of degreasing machines will assure a maximum efficiency and economy and a minimum health hazard. Suggested rules for location and installation follow:

1. Locate installation in a room having a cubic volume not less than 200 times the overall cubic volume of the degreaser. Escaping vapors then will be better dissipated.
2. Do not install degreasers in the vicinity of forced draft equipment or near doors or windows where brisk air currents will pass over the top of the tank. This will create a suction which will draw vapors from the tank and disperse them in the room. This increases operating costs through solvent loss and increased heat input, as well as creating a health hazard.
3. Allow for a minimum of about eight air changes per hour in room in which degreaser is installed.
4. Never install a vapor degreaser within 50 ft of an open flame, welding operation, or other source of heat in excess of 500 °F unless shielding precautions are taken. Smoking should be forbidden in the vicinity of the tank. All chlorinated hydrocarbon solvents decompose at high temperatures to form injurious gases.
5. Do not install vapor degreasers in a pit or closely walled area where solvent vapors may accumulate. Vapors, being much heavier than air, will collect in the pit and may be a source of trouble. If it is necessary to make a pit installation, the bottom of the pit should have an exhaust system capable of changing the air 12 times per minute. Partitions or screens around a degreaser should be only partial, if used at all; otherwise a pocket of dead air might be produced.

Vapor Solvents: Many organic solvents are in use. As mentioned before, perchlorethylene and trichlorethylene, have attained wide acceptance in the metals industry. Other solvents are limited in application or are susceptible to oxidation, hydrolysis, or pyrolysis in their action on metals. General qualifications of a vapor solvent should be: (1) Noninflammable (not to exceed 10 in Underwriter's Laboratories Standards); (2) low toxicity rating; (3) stable to light, heat, moisture; (4) high vapor density; and (5) high boiling point.

In Table 1, the vapor density indicates that perchlorethylene vapors will be much heavier and thus be more readily confined to the vapor chamber. The weight of the vapors will tend to keep them below the normal breathing level of the operator, resulting in less danger of toxicity. The specific gravity indicates that the flushing effects on the work in the degreaser will be more effective in a shorter period of time. Two passes through perchlorethylene vapors equal three passes through trichlorethylene vapors. The vapor loss with perchlorethylene also should be much lower.

Higher boiling point of perchlorethylene indicates a more thorough degreasing job. This is due to an increase in the range and types of greases it will remove. It also means more complete penetration of intricate or close nested parts. The additional Btu input to attain this additional boiling point, however, is relatively small. The evaporation rate of perchlorethylene (less than one-third that of trichlorethylene) indicates greater economy and much lower vapor loss.

Corrosive action on metals in either case is almost nil, but the affinity of trichlorethylene to water gives cause for corrosive action on metals if there is any moisture present. As the boiling point of trichlorethylene is lower than that of water, any moisture accumulations from condensing areas, leaking water jackets, or dampness in the atmosphere will tend to form hydrochloric acid with resultant hydrolysis of the metals.

As perchlorethylene has a boiling point much higher than water, any moisture present is driven off in the form of steam before the solvent reaches a vapor stage. Consequently, there is no opportunity for the formation of hydrochloric acid with resultant hydrolysis.

As the liquid solvents become contaminated with oil or grease, their boiling point increases until the vapors become excessively hot. This is avoided in machines which automatically redistill

TABLE I

	Perchlorethylene ($CCl_2 : CCl_2$)	Trichlorethylene ($CHCl : CCl_2$)
Specific Gravity—25C	1.618	1.461
Pounds per gallon—25C	13.46	12.16
Vapor Density (Approx.)	5.3	4.5
Boiling Point (Fahr.)	249.8	188.8
100 per cent Evaporation Rate (Hrs.)	15	4.5
Corrosive Action on Metals	Nil to low	Low to moderate
Solubility in Water—25C	insol.	0.1
Flammability (Underwriters R't'g)	Non-Flam.	3–5
Toxicity	Low to medium	Medium
Concentration in parts per million at normal breathing zone. (5½ feet)	105 ppm	160 ppm

TABLE II

Indicated Oil Content	—Hydrometer Reading— Perchlorethylene	Trichlorethylene	—Thermometer Reading— Perchlorethylene	Trichlorethylene
None	1.61	1.46	249.8	188.8
10 per cent	1.52	1.40	251.0	190.1
20 per cent	1.45	1.36	255.0	293.4
30 per cent	1.38	1.29	260.0	193.2
40 per cent	1.31	1.22	264.0	201.7
Time to Redistill Solvent				
50 per cent	1.25	1.15	270.0	207.1
60 per cent	1.18	1.12	278.0	214.0

solvent, but on other types of degreasers, a check should be made periodically by thermometer or hydrometer to test the contamination of the liquid solvent. Table II gives indexes for determining degree of contamination.

Applications: Some of the more common applications of vapor degreasing techniques in general use are: Removal of hard petroleum greases; removal of protective oil films; removal of cutting oils and coolants; removal of waxes, tallow, and animal-fat compounds; flushing off of filings and chips from machining; and other preparation of surfaces for anodizing, painting, spraying, or application of protective coatings.

Other lesser known uses, while successful in many instances, have not yet been accepted as general practice. A few of these are: Removal of hard carbon from piston heads; loosening of paint, varnish, and lacquer; removal of tars and road oils; removal of drawing tallow; and flushing off foreign substances. Electrical maintenance departments have been adopting vapor degreasing to remove greases, oil and dirt from stators, rotors, armatures and commutators.

Ordnance plants report that vapor degreasing is suitable for the removal of powders, waddings, lint, silk, etc. from riflings and arms mechanisms. They also employ this principle for thorough cleaning of the cavities of various types of projectiles. All oil, greases, acids, grit, or other foreign matter in the cavity of the projectile must be completely removed before the explosive can be poured into the shell.

Most of these applications usually are accomplished in standard commercial type vapor degreasers employing standard solvents.

It has been found that vapor degreasing removes the hard oil base on piston heads, leaving only the powdery carbon which often can be wiped off with a rough towel. Much experimental work has been done on this problem in the aircraft and automotive fields.

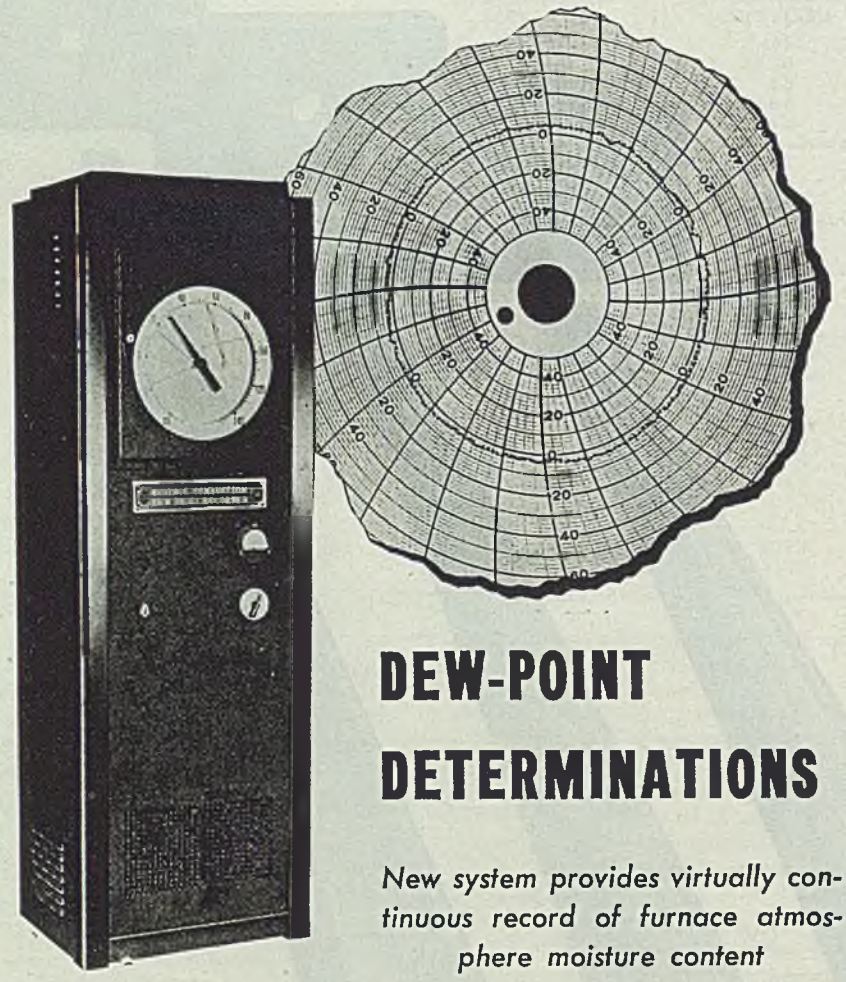
Portable vapor generators also have been developed for the purpose of cleaning differential housings on automotive equipment. The same principle can be applied to degreasing marine boilers and condensers at shipside or in place, thus materially reducing the unpleasant and protracted process of boiling out with alkaline solvents.

Operation: Assuming standard solvents and commercial degreasers are used, the success of vapor degreasing lies with the operating technique. Efficiency, economy, and safety lie with operator. Consequently, following rules apply to use of any vapor degreaser:

1. Vapors should reach normal vapor level before any work is inserted into the degreaser.
2. Work should be inserted slowly into the vapors to avoid agitation. Displacement by work causes an overflow of vapors. Insert work at the rate of about 12 feet per minute for greatest speed in the degreasing cycle.
3. Heavier vapor fog clings to metal, indicating condensation. When this fog is no longer apparent, work is ready to be removed.
4. Remove work slowly and at same rate of speed as in inserting. When work has been drawn out past the normal vapor level, suspend it momentarily to permit final drainage of the condensed vapors. If there are crevices, turn work at angles which will permit complete drainage from crevices. If the work has been completely degreased, it will come out perfectly dry.
5. As work has been heated to high temperature, long hooks, or trays with long handles, should be used in handling.
6. Operator never should breathe close to the vapor zone.
7. If the work comprises machined parts which will require protective oil coatings after degreasing, dip ping parts in a fine oil bath imme diately after removal from the de greaser will permit expanded pore of the metal to absorb a small quan tity of oil. When the part h cooled, excess oil can be wiped o
8. Small parts should be placed in basket for degreasing, and cupp parts should be arranged to avo trapping solvent. If possible, th should be tumbled. Where tu bling of machined parts is nec sary, cork balls mixed with t parts in the tumbler will prot the milled edges.
9. Covers should be kept on greasers as much as possible, pecially when not in use, to red vapor losses and heat consumpti
10. When solvent becomes dirty, should be redistilled. This usu can be done within the machine self. In normal operation, the por condensation compartment a flow-back tube permitting the condensed vapors to flow back the liquid solvent compartm By plugging this tube, liquid s ents are converted to vapors wh are recondensed in the vapor c partment in the form of pure s ent. When all liquid solvent been distilled in this manner, bottom of the liquid solvent c partment is cleaned, and then flow-back tube is opened and clean redistilled solvent drains into the solvent compartment is ready for use. Redistilled sol usually is considered more effe than new solvent, as it has had ous impurities removed in the distillation process.
11. During operation and distillatio the solvent, the inhibiters adde the manufacturer become lost, it is necessary to retreat the r tilled solvent. One-half ounc sodium carbonate per gallon solvent is recommended as a tralizing agent to offset acids.

Toxicity: All chlorinated hydrocar may have toxic effects. Principal d ences arise out of the use of the ents, operating conditions, and phy properties of the solvents not relate toxicity. Given equal concentratio the air, there is little to choose fro to relative toxicity of the various ents, although most of the scientist gaged in this research have indic perchlorethylene to be less toxic trichlorethylene or carbon tetrachlo Odor of chlorinated hydrocarbons concentrations as low as 30 parts million, are readily detectable. commonly used interferometer will readings which are accurate within or minus 20 parts per million. Wi apparatus also is exceedingly accu

Research indicates that concentra of as high as 500 parts per million not injurious to humans over protra exposures, but for safety, concentra of 200 parts per million have been cepted by most states as the maximu lowable for prolonged exposure.



DEW-POINT DETERMINATIONS

New system provides virtually continuous record of furnace atmosphere moisture content

FURNACES utilizing prepared atmospheres in the metal processing industries require close control of moisture content in gaseous mixtures to prevent scaling, decarburization, etc. Such control is afforded with a dew-point recorder which applies the principle of the dew-point cup and is thereby independent of the nature or composition of the gases making up the atmosphere.

Principal units of the recorder are a dew-point cup with mirrored surface which can be refrigerated at varying temperatures, a thermocouple which is connected to a recording potentiometer, and the refrigerating unit with its associated circulating system. The recorder, made by Surface Combustion Corp., Toledo, O., can provide a virtually continuous record of humidity within a temperature range of from minus 70° to plus 60° F.

In operation a stream of filtered furnace gas is directed against the mirrored surface of the dew-point cup, while refrigerant is circulated within the cup. As the temperature of the refrigerant drops, a film forms on the mirror when the dew-point temperature of the gas is reached. Upon formation of the film, a light beam which has been directed upon the mirror is intercepted and reflected on a photo-electric cell. The cell alters the flow of current which shuts off the stream of refrigerant around the mirror, at the same time making an instantaneous point record of the temperature on the recorder chart. This operation is continuously repeated at 3 min intervals so that the series of instantaneous recording forms a virtually continuous line for a 24 hr period.

Frequent adjustments of the various constituent gases in the atmosphere can thus be made to compensate for differences in humidity. Or, if humidity control of the atmosphere is used, permanent information regarding its dew-point is provided. Sensitivity of the recorder can be adjusted by controls mounted through the front panel.

The presence of such "impurities" as hydrogen sulphide and sulphur dioxide in the furnace gases do not alter the recorder's accuracy. An analysis of the furnace gas, previously the customary method of checking for the desired humidity and often the only method used, is unnecessary.

Any conversion table can be used when it is desired to determine the per cent relative humidity from the recorded dew point.

Explosive Rivets Adapted T Mass Production

Explosive rivets especially adapted meet the needs of peacetime mass p duction, said to be the latest developm in explosive-type "blind" fasteners u extensively by the aircraft industry, announced by E. I. du Pont de Nem & Co., Wilmington, Del. They fastened in place by firing a small plosive charge within the shank of rivet. Retaining basic features of vious types, improved design eli ates necessity for close tolerance dri and provides rivets which will acc modate a wide range of metal th nesses. These features are in d contrast to those of the explosive r supplied to wartime aircraft manu turers where precision tolerances a wide variety of lengths were requ

After explosive rivets are in place person applies the tip of an electri heated iron to the rivet heads. fires the explosive charge within app mately 2 sec. Shank of the rivet pands to fill the hole completely a barrel-shaped head is formed on "blind" end to lock the rivet sec in place. Strength of these rive only slightly less than that of con tional solid rivets.

Rivets now are provided in 1/8, 5 and 3/16-in. diameters, and wil produced in additional sizes. They made of various materials inclu several aluminum alloys, brass, co mild steel and Monel metal.

Ceramic Material Has Hi Resistance to Shock

A thermal expansion coefficient i same range as that of Invar, and resistance to extreme thermal shoc among the properties of a ceramic terial recently developed in the res laboratories of General Ceramic Steatite Corp., Keasbey, N. J. Know Material M-244, the new ceramic been heated to a temperature of 14 and then immediately plunged in ice water bath. It survived the c without cracking, and retained its or dimensions at both temperature ext within the same limits characteris the nickel-steel alloy long employ the manufacture of precision instru and standard measures.

Potential uses advanced for the ceramic are applications in high perature furnaces, insulation for precision instruments in which d sional changes must be absolutely mized, and other electrical and el nic purposes demanding a low th expansion coefficient in high q ceramic parts.

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Recommends 3-Part Separation for Pittsburgh Seam Coking Coals

PRACTICE of mining the low-ash and low-sulphur areas of seam and benches in the seam has brought cokemakers face to face with the fact that too much of today's unmined tonnage of coking coal is what may be called skim milk, particularly as to the sulphur analysis. This point was brought out by John Griffen, McNally Pittsburgh Mfg. Corp., Pittsburgh, at the joint meeting of the Blast Furnace and Coke Association of the Chicago District and the Eastern States Blast Furnace and Coke Oven Association, Hotel Carter, Cleveland, Nov. 9. Mr. Griffen's remarks follow:

A study of the reserves of Pittsburgh seam coal as of Jan. 1, 1937, made by Eavenson, Alford & Auchmuty, indicates that only about 1 billion tons or 15 per cent of the total reserves on that date would produce hand-loaded run-of-mine coal analyzing 1.25 per cent sulphur or less, and that two-thirds of this coal was in Washington and Green counties of Pennsylvania.

Reserves Are Not Large

They likewise estimated that when the sulphur limit is raised to 1.5 per cent and coal is included in properties having washing plants that produce washed coal not exceeding 1.50 per cent sulphur, the reserves of these coals were 1,656,480,000 tons or 25.5 per cent of the total reserves.

High production during the past 9 years has undoubtedly seriously depleted these reserves and attention now is being focused on the higher sulphur reserves in Washington and Greene counties, which must largely supply the future requirement for seam coking coals in the Pittsburgh district.

Mechanized loading has greatly impaired the quality of raw coal as well as washed coal. Not only is the bottom coal which is high in ash and sulphur loaded by the machines, but also a considerable amount of the top coal as well as draw slate which were left with hand-loading. All these additional materials are high in ash and sulphur, and, except for the draw slate, cannot be completely removed by washing and thus impair the quality of the coal put through the washing process.

The drive for tonnage and low costs and the difficulty of holding up top coal and draw slate are causing mining men to develop cutting, shooting and loading techniques which deliver all the seam including draw slate into the mine car. With such mining and loading systems the run-of-mine coal as delivered to a cleaning plant may carry 30 to 35 per cent of refuse and the 4-in. to 0 portion to be washed may carry 25 per cent of refuse.

In comparison a washing plant designed 10 to 20 years ago for hand-loaded coal was called on to remove only 2 to about 6 per cent of refuse.

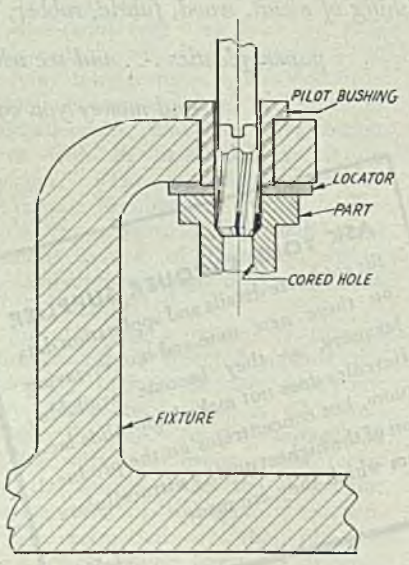
In connection with the Pittsburgh seam the belief is held that a 3-part separation offers a useful tool in reducing the ash and sulphur in the main product—coking coal. The intermediate gravity coal from 1.60 to 1.40 or even 1.35 specific gravity contains considerable sulphur and its removal as a steam coal analyzing 10 to 15 per cent ash and from 2 to 3.5 per cent sulphur is beneficial. However, this practice has not been popular because the steel companies have considered that their regular supply of steam coal was cheaper. Further, a fairly large amount of st coal must be made—say 15 to 25 cent of the total product—before appreciable reduction in the sulphur alysis of coking coal is obtained. the production of 25 per cent steam the sulphur analysis of the coking may be reduced perhaps 10 per ce its value.

So far coal cleaning equipment not been in general use in this cou which could make a precise separ lower than about 1.40 specific gra Such equipment has been develope Europe and additional types now being developed in the United S They may finally show that the se tion of a steam coal as low as 1.3 even 1.33 specific gravity will economic, particularly because a si cant reduction has been made in sulphur analysis of the coking coal. ever, opinion is expressed that all of new processes will require higher i ment costs and show appreciably h operating costs. For these reasons, believed that the coal washing pla the future will utilize conventional e ment for removing the refuse and its product will be re-treated at a lowe cific gravity and in equipment o newer type, to produce steam coa coking coal.

Recommends Adequate Facilitie

Mr. Griffen concurred with Mr. sell concerning the importance of viding adequate equipment for sam and analysis, and equipment and p methods for plant control. These be designed with the plant as extra head is invariably required for p sampling. Automatic sampling equip should be provided for the main pro

Much of the data supporting the remarks can be found in a paper lished in the 1944 Transactions o AIME by Davis and Griffen—"The burgh Coal Seam in Penna.—Its serves, Qualities and Beneficiation



Carbide-Tipped CORE DRILLS

SPECIALLY DESIGNED carbide-tipped core drills, intended for use in drilling hard scaly cast irons such as rough cast exhaust manifolds, have been introduced by Tungsten Carbide Tool Co., Detroit. Diagrammed is a core drill in use drilling exhaust manifold.

When core drilling hard scaly cast irons with standard types of carbide-tipped core drills, drills have a tendency to chip and break down fairly rapidly. The new TCT core drills are the result of a study of the effect of various carbide grades, tool shapes shank materials, tool angles and num ber of flutes, on life expectancy o tools under such conditions.

It is reported that the new drill give in one application a life of some 10,000 holes 1 5/8-in. diameter, 5/8 in. deep, between grinds—equivalent to continuous production for 7 days, two-hr shifts per day. In breakdow tests, as many as 50,000 pieces per grind are obtained, although this prac tice is not recommended by the com pany.

STE

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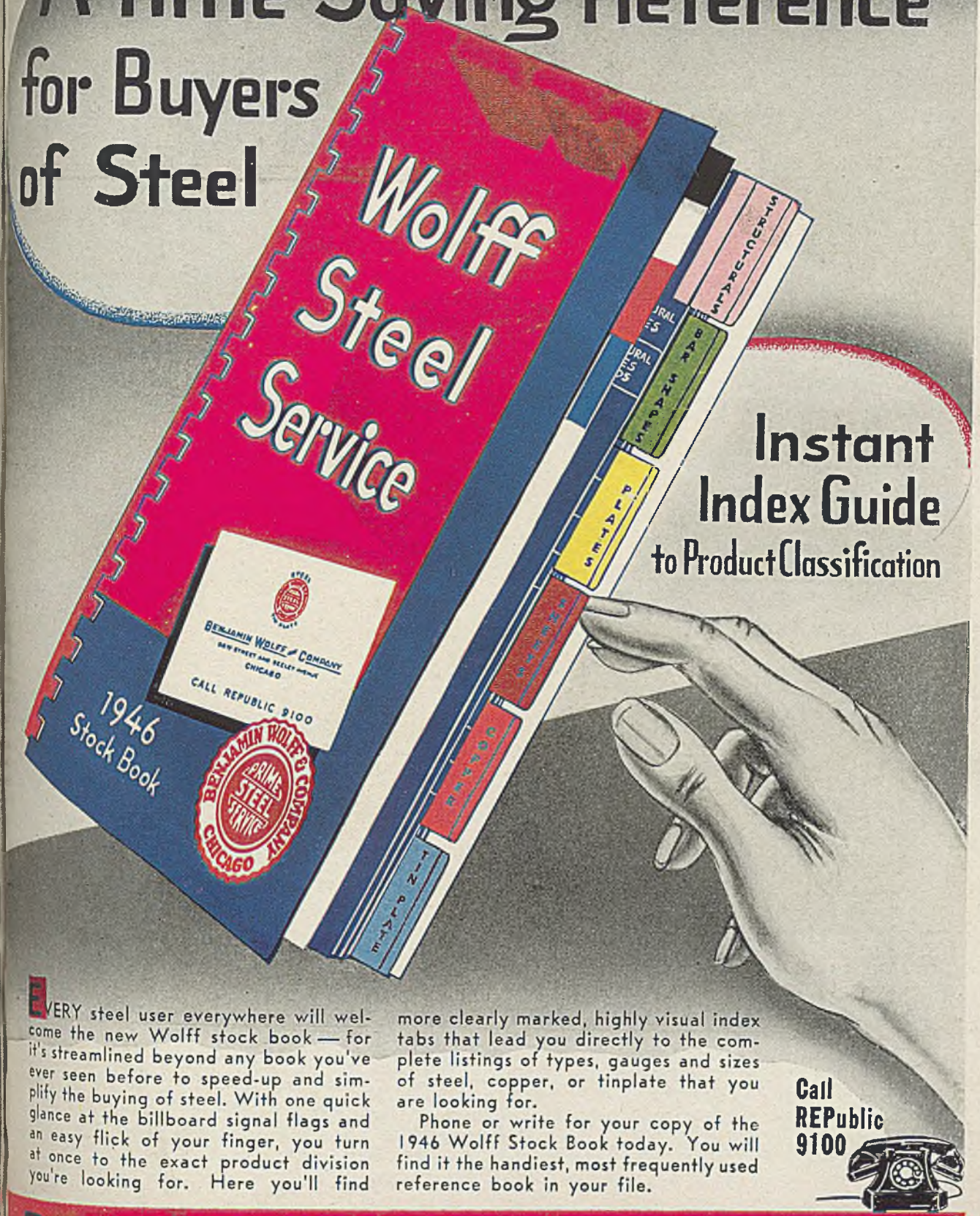

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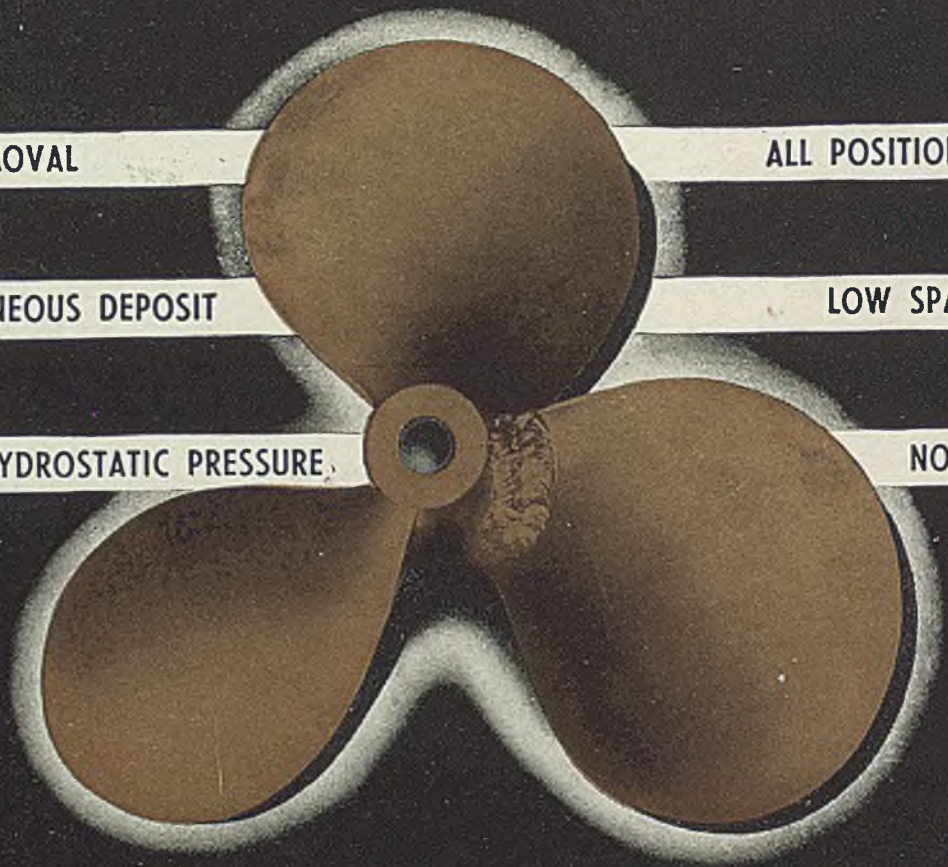

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Obtain full information from your local Alloy Rods Co. distributor, or write York, Penna. for bulletin CAC-1145.

Alloy Rods Co.

YORK, P

elding Mild Steel

(Concluded from page 95)

preferred electrodes, one for the al work and one for the horizontal lat work. If the majority of weld- is in the vertical position, it may be ible to do the whole job with the position" electrode selected for ver- work, rather than stock two elec- s. However, if most of the work lat and only a small amount is in the al position, the purchase of two s of electrodes is required, for the s reason that vertical work can- done satisfactorily with an elec- designed for welding in the flat

Specifications

ifications are issued by a number gulatory bodies, such as American of Shipping, U. S. Navy, Ord- Department, Air Corps, etc. These ations do not specify the posi- in which welding must be done, or supply, etc., and therefore they indicate the class of electrode hould be used. They do limit , however, as work coming under risdiction of such specifications be done with electrodes that are the approved list of the regulatory involved.

ulated Wire Resists h Temperature, Moisture

eltabeston appliance lead wire for here both heat and moisture are blem is announced by General c Co.'s Appliance & Merchandise rtment, Bridgeport, Conn. Wire nsulated with a moisture-resisting lose acetate wrap next to the con- r, a layer of felted asbestos and a ered glass braid over-all cover- It is designed for use with nces and equipment such as steri- , where medium high temperatures moisture are to be found. Its maxi- operating temperature is 125°C. th finish is available in white, red, blue, brown or black. It will, ver be shipped in white unless rwise specified. Color of over-all braid is permanent, as individual threads are dyed, not the over-all g of lacquer.

d Tachometers Have Special Ranges

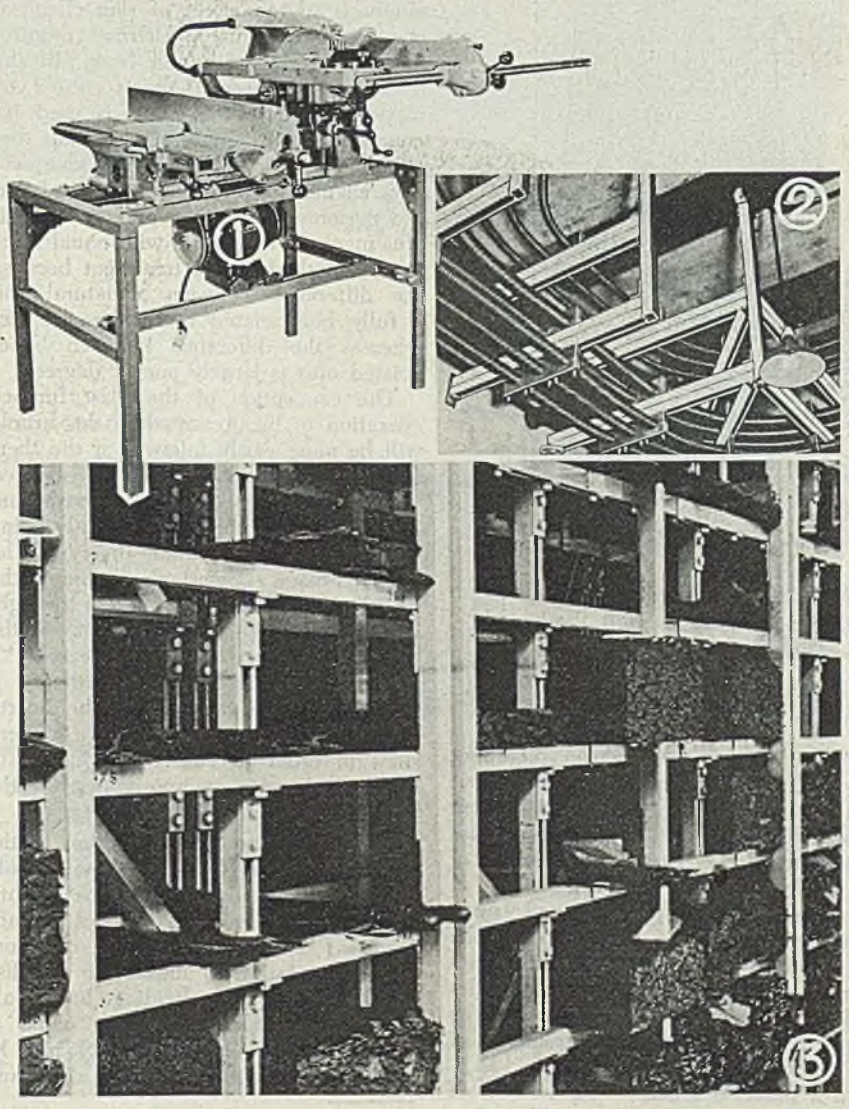
ed Tachometers, type U, imported Switzerland, with five ranges, are ed in bulletin No. 750 by Her- H. Sticht Co. Inc., 27 Park Place, York. Tachometers have wide- e and unusual readability as over- range is divided into five special s with readability as close as 1 per division. Instruments are having a 3 in. dial and fit into palm of the hand. They are of the magnetic, centrifugal type, direct ing and well damped reduce oscil-

ON-THE-JOB Construction

FABRICATION of any type metal frame, stock rack, support or hanger for industrial, electrical, commercial or public building use can be quickly and easily completed on the job by a new assembly method. Construction unit, made by Unistrut Products Co., Chicago, consists of a slotted hollow-square steel or other metal section and standard spring-held nut attachments. It does not require drilling of holes, riveting or welding and can be cut to any desired length with a hack saw.

The nut attachment can be slid along in the hollow square to any point or points where it is desired to attach it to another member, a supporting structure, or to the floor, ceiling or wall. The nut has serrated teeth which bite into the inturned edges of the hollow square section and hold the attachment firmly in position when it is tightened with an ordinary wrench. However, the nut can be loosened easily, the attachment moved to a new location and again tightly fastened.

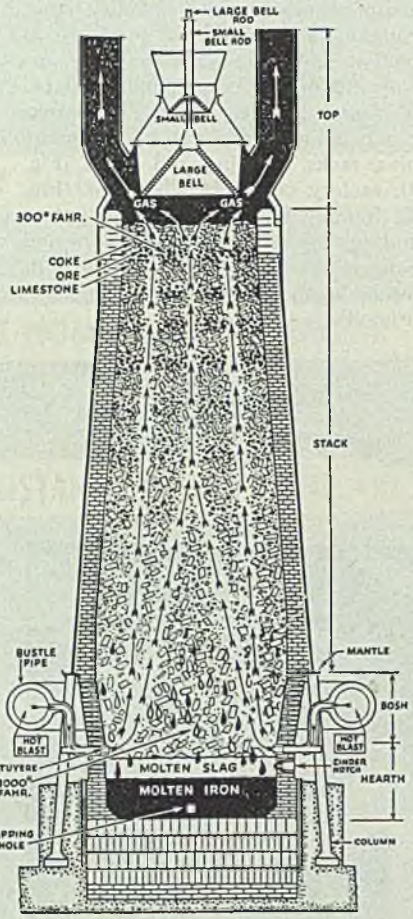
Because of its hollow square design, this structure is suited for use as a compression or tension member, strut, column, or beam. It is furnished in sections of several sizes or gages, usually 16 or 20 ft long, but available in shorter lengths. Among numerous products and applications are storage bins, racks, shelving and boxes (Fig. 3); factory tables, benches, etc. (Fig. 1); framing for many kinds of indoor and outdoor structures; supports and hangers for all types of electrical or mechanical equipment or systems (Fig. 2).



Principles of IRON ORE BENEFICIATION and Their Effects on Blast Furnace Operation

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

In this the first installment of a four-part treatise the author describes the various processes of beneficiation including sintering, nodulizing, briquetting and pelletizing and presents the characteristics of the respective products. Work accomplished by blast furnace shaft in preparing raw materials for smelting in bosh and hearth is explained in detail



Modern blast furnace showing location of stack or shaft, bosh and hearth (U. S. Steel News)

WIDE diversity of opinion regarding the preferred method of ore treatment and product characteristics which are most desirable for blast furnace use apparently has confused the thought of the industry rather than clarified it. Frequently opinions are based upon some local condition rather than upon the principles involved and sometimes there is confusion between the principles and limitations of beneficiation and the principles and thermal requirements of the blast furnace operation.

In a previous article[1] an analysis of the thermal principles of the blast furnace operation as applied to the use of sinter was presented. This present article will attempt to amplify the subject of those principles with particular emphasis to the effect of slag chemical composition upon the thermal requirements of the hearth and bosh. In the discussion of thermal effects caused by material beneficiation sinter is used for comparison with natural materials because it is representative of complete beneficiation. However, it is believed that the reasoning presented and the principles involved will apply with equal force to any method of ore treatment because the difference between a natural and a fully beneficiated ore is one of fact whereas the difference between beneficiated ores is largely one of degree.

The conception of the blast furnace operation to be presented in this article will be more easily followed if the thermal work of the operation is visualized in the three divisions of shaft, bosh, and hearth work. Johnson[2] in advancing the two thermal equation theory of the blast furnace operation combines the hearth and bosh as a unit but in the light of the knowledge of the reactions of the two regions uncovered by research[3-4-5] since the publication of his theory it seems advisable to separate the hearth and bosh into their respective dimensions in order to clarify the effects of material chemical composition upon the thermal requirements of the regions.

In this treatise the conception of the three furnace regions of the shaft, bosh, and hearth are based upon the quantitative measurements of the blast furnace reactions taken by the Bureau of Mines scientists referred to above. To establish these regions two dividing lines only need be considered, (1) the plane at which slag starts to form, which may be considered the bottom of the shaft and the top the bosh, and (2), the plane at which coke combustion begins, which may be considered the bottom of the bosh and the top of the hearth.

The research found this first plane to be about 5 ft above the mantle and the second about 2 ft above the tuyeres. With reasonable variations these approximate locations can be accepted for any blast furnace operation.

In the first[6] of a series of articles prepared by the author, dealing with the subject of the production of sinter and its use in the blast furnace burden, which have appeared in STEEL, it was said:

"Sinter is the best known and the most economical method of large scale beneficiation for natural ores but sintering alone is not always the complete answer to beneficiation. A fully beneficiated ore might be said to be one which was concentrated, sintered, and sized.

"Myriads of technical papers may be written upon the subject of the production and use of sinter for the blast furnace burden but the opinion is offered that in the last analysis the factors of greatest practical value to the blast furnace operation are, the freedom from volatiles, the ability to absorb, conduct, and hold heat, and a small uniformly graduated particle size which makes the efficient recovery of heat possible."

Throughout the series of articles frequent reference has been made to the advantage of "concentration and blending" before sintering.

These previous comments are referred to because it is believed they are pertinent to the purpose of the present article, which is an attempt to clarify thought, and to show the consistency of the reasoning which has been presented throughout the series of articles.

In reality the blast furnace operation is a combination of two operations, (1), the preparation of the raw material for smelting, which takes place in the shaft

[1]All references are presented at the end of Installment No. 4.

This 50-ton capacity Lectromelt is one of the largest top charge furnaces in operation in the western hemisphere.

For melting and refining acid and basic steels, alloy steels, gray and white irons, etc.

Rated capacities 100 tons down to 250 pounds in the top charge type, laboratory sizes down to 25 pounds.

Top charge and door charge types

SPECIAL TYPES

For smelting ores and concentrates of iron, copper, nickel, manganese, cobalt, antimony, magnesium, zinc, etc.

For production of ferro-alloys, carbides, phosphorous, refractories, etc.

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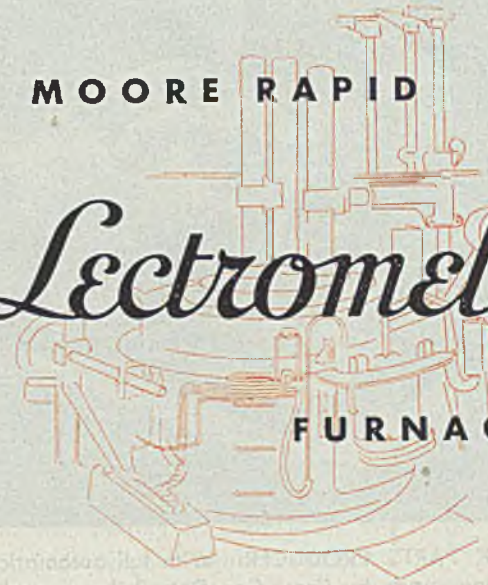
MOORE RAPID

Lectromelt

FURNACES



PITTSBURGH LECTROMELT FURNACE Corp.

PITTSBURGH 30, PENNA.

of the furnace, and (2), the smelting of the prepared materials, which takes place in the hearth and bosh of the furnace. The operation is first of all a thermal problem and each material charged into the furnace has certain thermal requirements. The term "beneficiated material" denotes a change in the character of the material beneficiated and the degree of change in character will determine the degree of change in thermal requirements in the furnace. This principle must be accepted before the subject of iron ore beneficiation can be clearly understood.

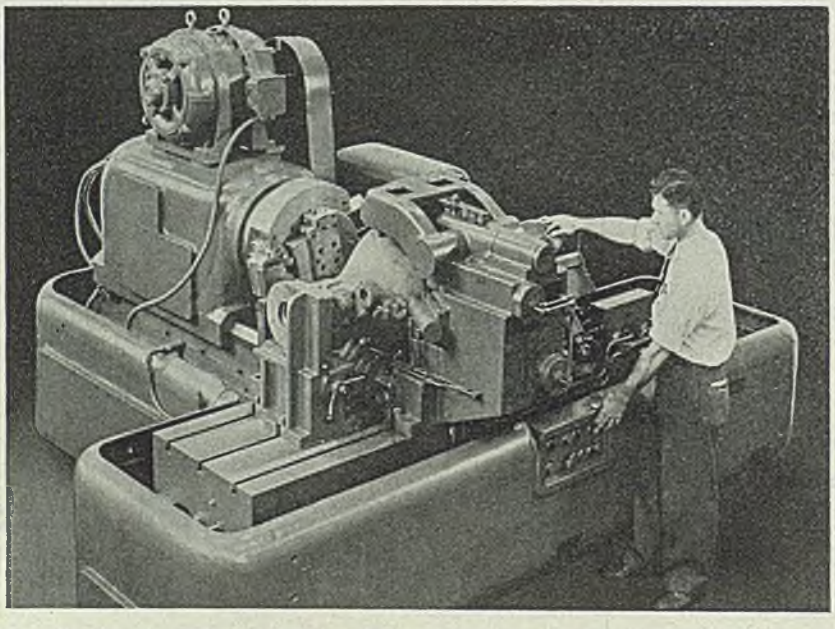
To present a clear picture of the effects of using beneficiated materials in the blast furnace burden it is therefore necessary to analyze the subject in three steps, (1), the beneficiation processes and the characteristics of the respective products, (2), the effect of the respective product characteristics upon the thermal work of the furnace shaft, and (3), the effect of those characteristics upon the thermal work of the furnace hearth and bosh.

To produce pig iron it is necessary to separate the iron from the volatile, and the gangue nonvolatile elements of the materials which carry all three. Whether all of that separation takes place in the blast furnace or a part of it before the materials enter the furnace is immaterial to the final product. Commercially it is entirely a question of the most economical means of effecting the separation. With naturally rich ores and low-cost fuel it may be reasoned that the furnace is the most economical place to effect the separation and it has been just that combination which has governed the development of American blast furnace practice with regard to this phase of the furnace operation. But that favorable combination appears to be approaching an end, at least for the great majority of American furnace operations, because of the probable exhaustion of the naturally rich Lake ores in a relatively few years and the tendency for furnace fuel costs to increase.

Most blast furnace plants are pleased to recover even a part of the slag disposal cost from the sale of slag by processing it for commercial uses and the furnace operation which does not have that credit is handicapped. It does not require much imagination to visualize what would happen to pig iron production costs if the slag volume was increased and iron production reduced because of the necessity of using leaner ores and if the fuel cost for smelting was increased because of the necessity of melting more slag per ton of iron.

Heat Is Consumed

All nonvolatile gangue material entering the furnace must be melted to effect its removal from the furnace and will consume heat in the process. Any excess gangue over the amount needed to form the slag necessary to desulphurize the iron (a slag chemical composition which requires a high temperature to effect its removal, or one which fails to conserve and concentrate heat in the lower bosh of the furnace) will consume heat which otherwise would be available for smelting iron and therefore the productive capacity of the furnace will be affected.



TRUCK PARTS PRODUCER: With full automatic cycle, this Cross special machine, made by Cross Co., Detroit, bores and faces bowl flanges and inner lugs on front and rear automotive truck and tractor axle housings. Work is located in fixture with power-operated gaging mechanism for automatically dividing stock prior to power clamping, thus eliminating the old practice of manual location, surface plate layout and subsequent gaging to layout lines

Economically it is then a question for decision between the cost of the fuel needed to melt the excess or objectionable gangue material and the acceptance of the decreased productive capacity of the furnace, compared to the cost of removing the excess gangue from the materials by mechanical means before charging them into the furnace to get a decreased fuel rate and increased production from the furnace. The principles of material beneficiation to be studied as a basis for such a decision include:

(1) Removal of volatile elements only from the iron bearing materials *can* increase the capacity of the furnace shaft for preparing material for the hearth and bosh. Consequently the work of the hearth and bosh will be increased but the ratio of work between the iron and the nonvolatile gangue will not be changed from that of the original material. So that any benefit to production capacity and the fuel rate will be limited to the capacity of the hearth and bosh to accept the proportionate increase in iron and gangue work.

(2) Removal of volatile elements only from the iron bearing materials *will* not increase the capacity of the furnace shaft for preparing material for the hearth and bosh unless the particle size of the beneficiated materials is suitable for an efficient transfer of heat from gas to stock in the shaft of the furnace and unless recognition is given the changed conditions in the shaft of the furnace with regard to the principle governing the efficient transfer of heat from gas to stock.

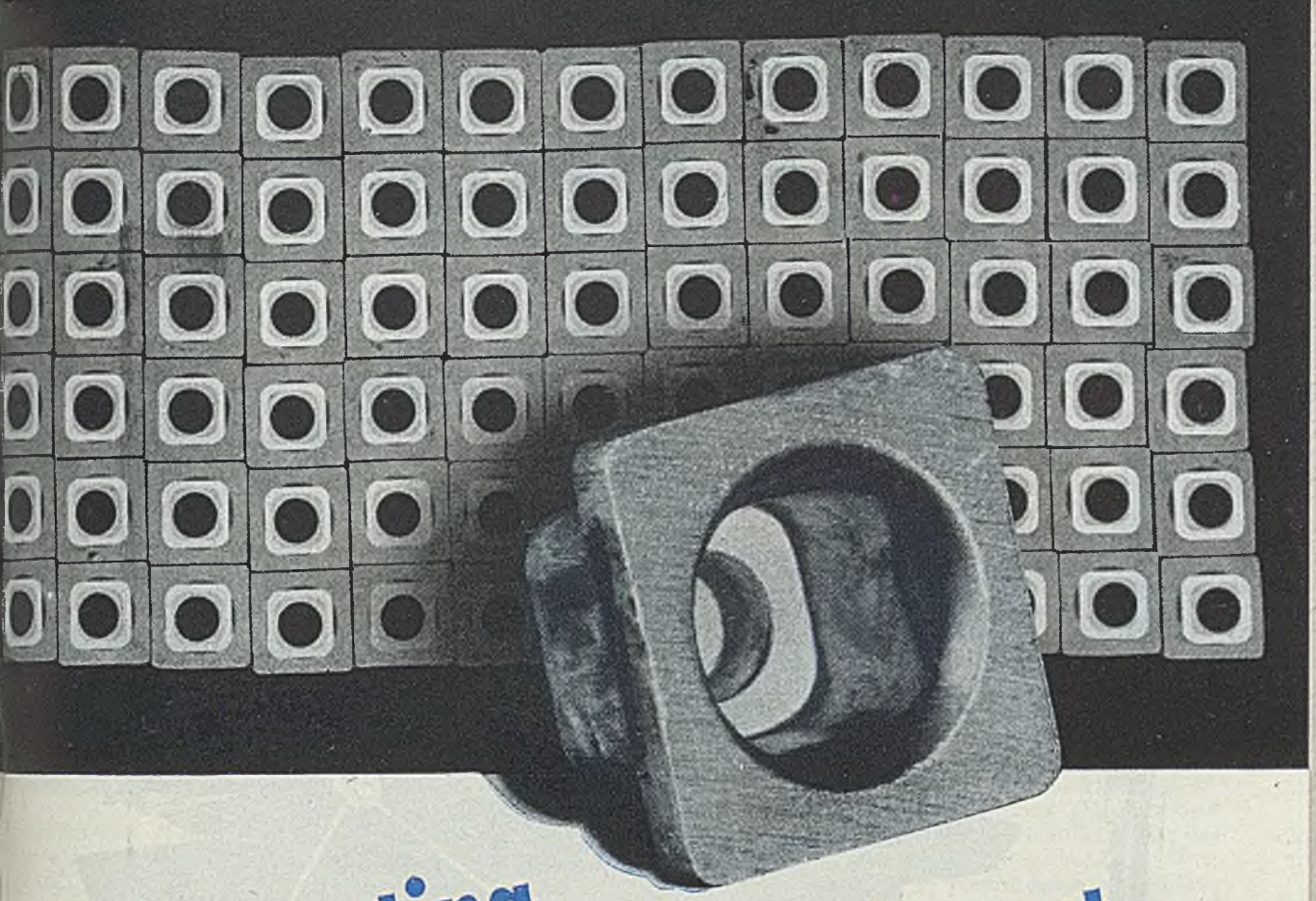
(3) Reduction in percentage of nonvolatile gangue elements only *can* increase the capacity of the hearth and bosh for smelting iron but the possible benefit *cannot* be fully realized unless the volatile matter content and particle size of the beneficiated material is favorable to efficient preparation of the material in the shaft of the furnace.

(4) Removal of all volatile matter and a reduction in the percentage of the nonvolatile gangue from the natural materials, a suitable particle size for the beneficiated material, and recognition of the thermal principles governing the transfer of heat in the shaft of the furnace, will increase both the capacity of the furnace shaft for preparing material and of the hearth and bosh for smelting iron; consequently, both productive capacity and the fuel rate will be greatly improved.

The beneficiation processes: Four beneficiation processes include sintering, nodulizing, briquetting, and pelletizing. The first three are applied to natural or concentrated materials and the fourth to extremely finely ground concentrates[7].

Sinter: In any comparison of processing methods the first consideration must always be the character of the material being processed. Sintering of a natural ore cannot possibly produce a sinter of the same characteristics as would be produced from the same ore if it was concentrated before sintering; therefore, the term "sinter" alone is not sufficiently descriptive. Natural ore sinter, concen-

(*Please turn to Page 144*)



This casting had a checkered past

With rejections 40% RADIOGRAPHY helps cut them to less than 5% ... saves unnecessary machining

The checkerboard pattern you see is a radiograph of a group of aluminum motor shaft housings, revealing their hidden flaws. But you'll want to read the full story . . .

TROUBLESOME FROM THE VERY START, the order called for cast aluminum housings with a three-piece metal insert. Troublesome? Any foundryman knows the headaches of locating inserts to a "T" . . . of getting a sound bond between insert and casting metal . . .

Satisfactory motor performance demanded precision . . . so a seemingly correct casting technic was developed. Castings were delivered to the customer. Radiographic inspection turned thumbs down on 40%. Many inserts were out of place, and incomplete bond was common.

Radiography had forestalled the wasteful machining of many faulty parts—and from the customer's viewpoint, the savings were important and obvious. *But radiography went a great step further . . .*

To reduce rejections, the foundry tried new casting technics . . . each step was radiographed, studied, and changed. Thus, with the help of X-ray, a satisfactory procedure was finally achieved, and deliveries of the improved castings began. Continuing radiographic inspection showed that rejections were now *less than 5%!*

* * *

This case history repeats common experience. For radiography is *more* than an inspector of internal structures . . . it's a design tool, too. X-rays show designers how to reduce weight safely. They help engineers specify sound processing technics. They guide the fabricators to better fabricating methods.

Now is the right time to explore *full* use of radiography in your plant. See your local X-ray equipment dealer.

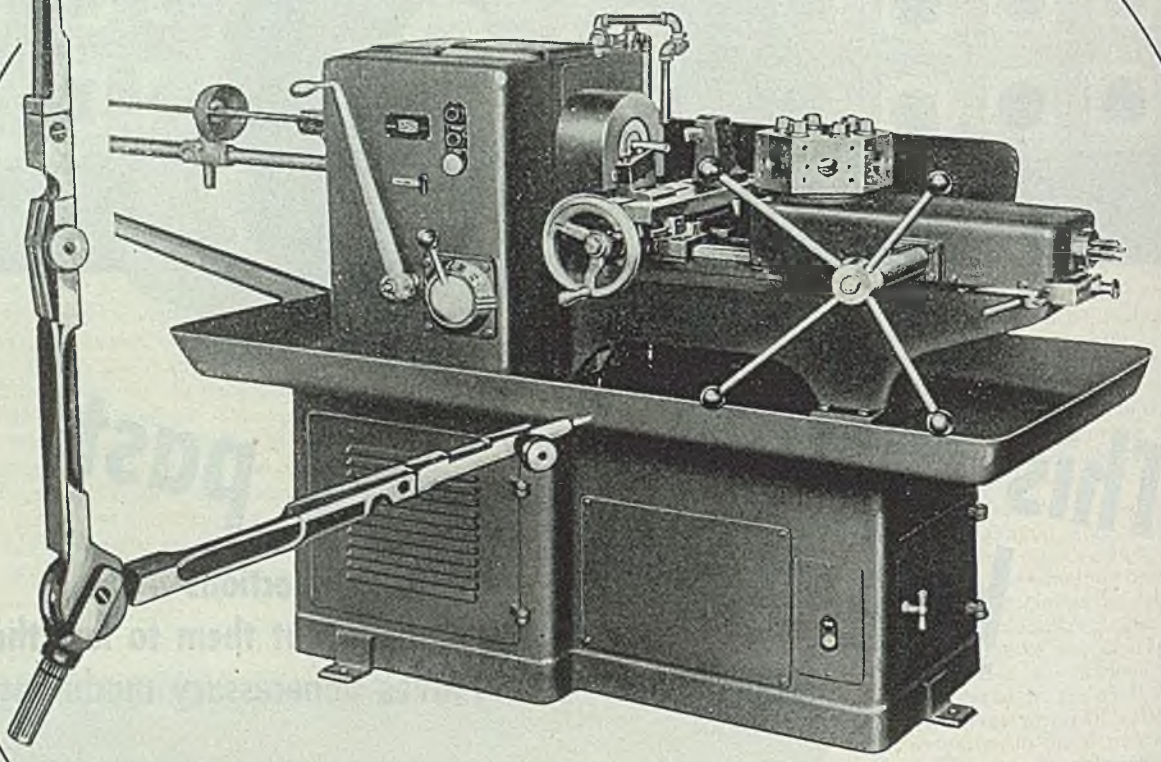
EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

RADIOGRAPHY

ANALYZES . . . INSTRUCTS . . . CORRECTS . . . IMPROVES

Kodak

WIDER CIRCLE OF APPLICATIONS



Widely used in vital war production plants as a *SIMPLIFIED* lathe on numerous bar and chucking operations, the Oster No. 601 "RAPIDUCTION" is now developed to include a still wider circle of applications. Among these recent developments are the following:

1. New 4-speed motor permits four speed changes without change of sheaves. (2-speed motor optional.)
2. Motor is mounted on oil-resistant rubber to insure smooth, quiet operation.
3. Individual ⅛ H. P. motor now operates coolant pump to provide uniform flow of lubricant, independent of spindle speeds.
4. New electrical controls have speed selector switch located conveniently for the operator.
5. Increased rigidity of the machine is insured with longer base of heavier construction.

More than ever, the Oster No. 601 "RAPIDUCTION" lathe offers you "custom-built value" at an economical price. Optional WORM drive or DIRECT drive, as required. Six position turret is automatically indexed. Automatic chuck capacity 1½" round bar.

OSTER "Rapiduction" LATHES

THE OSTER MANUFACTURING COMPANY • 2037 EAST 61ST STREET, CLEVELAND 3, OHIO, U. S. A.

ocksmith's Forge

smiths' forge originally designed for ship and shipyard uses is now ilable to the general trade. The unit elf-contained—having a fuel (oil) ge tank, pump, motor, blower, er, combustion chamber, etc. com-

within the unit. It plugs into any 50 or 440 v circuit and is ready to and use.

the heat is concentrated at the work opening, and bar stock, an- pieces, etc. are heated to forging very quickly, and can easily be on the end, center, or as the desires. Use of light fuel oil elim- smoke and soot. The unit is of- by Mahr Mfg. Co., division of ed Iron Works Inc., Dept. A., apolis 11.

ol Holder

new development of Boyar-Schultz 2110 Walnut Street, Chicago 12, small size floating tool holder. design with light weight tool head fast, accurate alignment for mum accuracy in reaming, counter- and drilling. It compensates for gnment between turret and work, ating bell-mouthed holes.

m Handling Unit

strom barrel-lift raises loaded off the floor with ease, transports rum, and is arranged for tilting pense contents. Drums may be with little effort when thorough prior to pouring is desired. placed in the barrel lift are main- in a balanced position and little is required for rotating or tilting. k-up is simple, with a safety-locked arrangement encircling the drum. locking safety stops, conveniently provide finger tip safety control. mechanical linkage of the lifter is ble to give several degrees of ge permitting the handling of drums up to 1000 lb gross weight. Saddle tilt locks hold open-head drums in a vertical position during transport, which effectively prevents tipping and spilling of contents. Drums may also be locked in tilted position. Use of this barrel lift enables drums to be handled by one operator. Unit is heavy duty, all steel welded construction. Shipping weight is 113 lb. Particularly useful when corrosive or inflammable materials

must be handled without spilling or slopping, the Barrel-Lift is a product of the Falstrom Co., Falstrom Court, Passaic, N. J.

V-Belt 9-Inch Lathe

Latest addition to line of South Bend Lathe Works, South Bend 22, Ind., is a V-belt drive 9-in. precision-bench lathe. Made especially for those who prefer advantages of the V-belt drive, this bench lathe features 4-step, V-belt cone pulleys which, with the back gears, provide either 8 or 16 spindle speeds, ranging from 46 to 1176 rpm. It is made with either quick-change gear or plain change gear equipment for a wide range of thread cutting and power longitudinal feeds. Two of the models incorporate power cross-feeds.

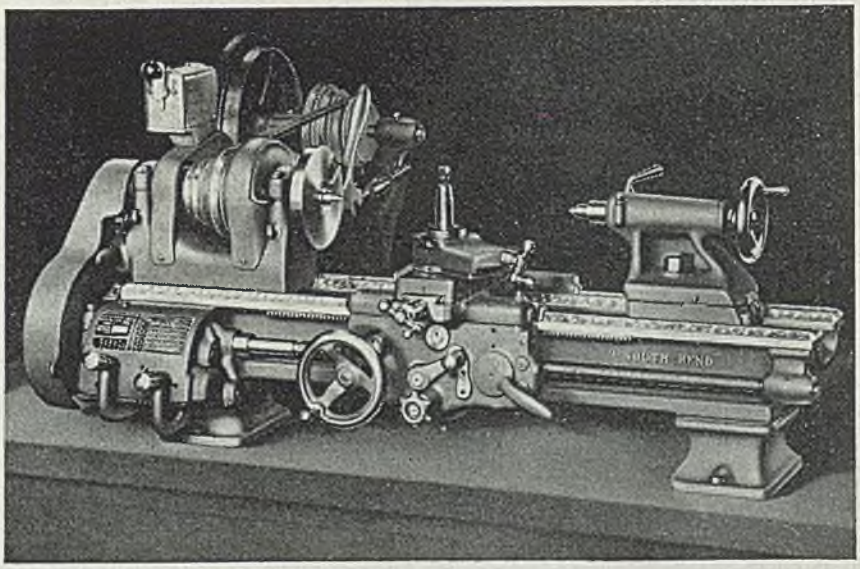
All models have a 9¼ in. swing over the bed and saddle wings, and ¾-in. headstock spindle hole with maximum collet capacity of ½-in. Choice of bed lengths give maximum distances between centers up to 34 in. The usual line of practical attachments is available for special classes of work.

The lathe is ideal for precision toolroom or production work, and for general use in machine, laboratory, and repair shops for machining metals, plastics, compositions, and other machinable materials.

Cold Cabinet

Precision Scientific Co., 1750 North Springfield avenue, Chicago 47, announces a new Vari-Temp cold cabinet. It is available in two sizes, 1 cu ft capacity and 8 cu ft capacity. It operates with dry ice and was designed and developed to satisfy cold test conditions encountered and required by present day testing techniques from minus 90° F to plus 220° F. Vertical front opening door provides access to the chamber which is sufficiently large to hold the various pieces of apparatus used in making the Youngs modulus test of natural and synthetic elastomers at normal and subnormal temperatures, according to ASTM D-797. The apparatus and specimens under test are visible at all times as a seven pane sealed window unit prevents condensation and frosting and a fluorescent light, shielded to prevent both direct and indirect glare, is provided.

Incorporation of a heating unit in this cold chamber allows a full temperature testing range of from minus 90° F to plus 220° F. Constant temperature in specimen cabinet is insured by an air stirrer which holds temperature constant

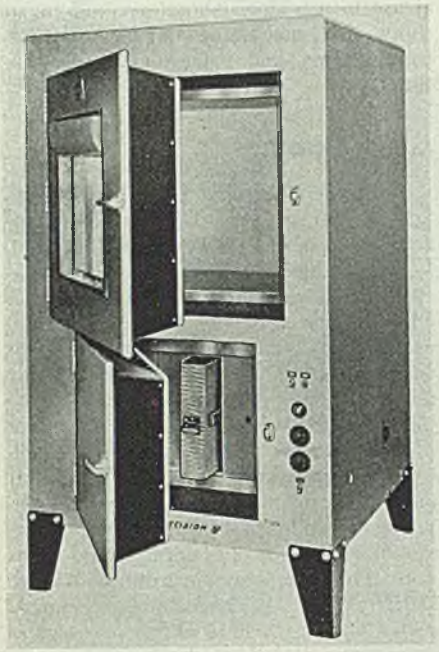


All claims are those of the manufacturer of the equipment being described.

to plus or minus 1° F. This fan is automatically turned off when door is opened to prevent rapid temperature change. A blower circulates air to and from chamber.

Metal plates 4 in. wide, height of chamber are centered on each side, in rear and on top, to provide facilities for mounting test apparatus from any of these positions. Holes can be drilled and tapped at these points to fasten apparatus securely to cabinet. Insulating tubes prevent dissipation of cold from inner chamber.

Heavy gage tinned copper has been used in all parts liable to corrosion due



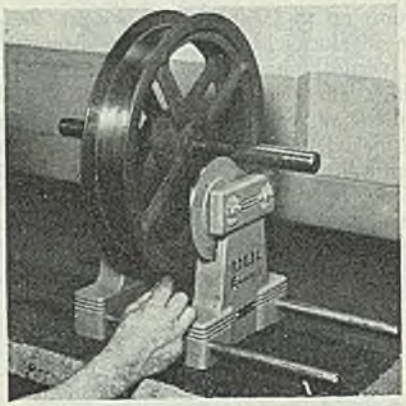
to condensation. To facilitate cleaning and provide for disposal of condensation on inside of chamber, drains are provided for both dry ice chamber and test chamber. All temperatures are controlled thermostatically, one thermostat being provided for low temperatures and one for high temperatures.

Balancing Ways

Ideal Commutator Dresser Co., 1921 Park avenue, Sycamore, Ill., announces a new line of super sensitive balancing ways that are said to revolutionize static balancing operations. Through use of scale type bearings in the small 10 in. size, sensitivity to 0.007 oz inches is made possible. Special sensitive bearings used in the 20 and 42 in. size permit accuracy in balancing to 0.009.

Work is carried on free turning disks, mounted on precision bearings. Disks are ground on outside diameters, mounted on ground spindles and balanced with extreme care. Standards supporting the revolving disks are movable on shafts to take different lengths of armatures within capacity of the machine. Maximum strength and rigiidity are obtained through use of solid-end castings.

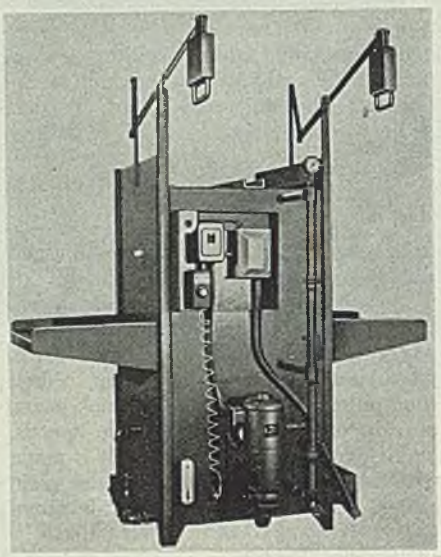
Ideal balancing ways simplify static balancing, straightening and truing operations of parts such as fans, pulleys, flywheels, crankshafts, grinding wheels,



armatures, etc. Four sizes are available, 10, 20, 42 and 60 in. swing; 400, 1000 and 5000 lb capacity respectively.

Single Stage Washer

A new Optimus single stage washer which permits rinsing and washing in one unit is announced by Optimus Equipment Co., 177 Church street, Matawan, N. J. The unit is portable which permits



it to be spotted wherever work is and eliminates the necessity of bringing the work to the machine. It occupies a floor area of 12 sq ft. The washer has moving jets and vertical sliding doors that control splash and spray. It can be equipped with any type heating device and thermostatic control.

General Purpose Positioner

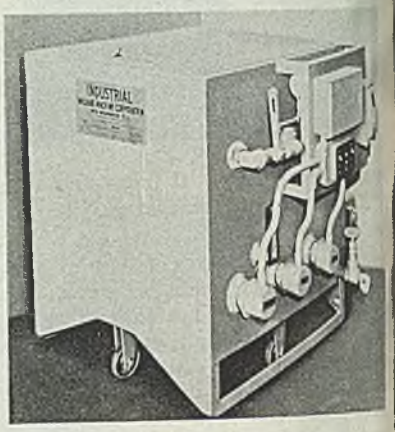
A general purpose positioner is offered by U. D. A. Co., 3201 Vista, St. Louis 4, to aid either the small shop mechanic or tool room worker of large plant in positioning and holding metal parts and tools for filing, fitting and/or welding operations.

As the column supporting work table is threaded to fit threads (Whitworth form—2 pitch) on inner walls of a clamp bolted to pedestal top, adjustment of elevation to proper height for individual using positioner is easily accomplished by releasing clamp and revolving table by hand. Rate of travel is ½-in. per revolution. Column is cast semi-steel. Maximum height, table to floor, is 38 in.; minimum is 27 in. Table top is 12 x 12 in., while two tool trays attached to opposite sides of table slightly below working surface each measure 4 x 12 in. Base is made of welded steel angles.

Industrial Washing Machine

Known as model C. B. II., a new portable industrial washing machine is offered by Industrial Washing Machine Corp., New Brunswick, N. J. Unit consists of a tank and housing; mounted on housing are electric immersion heaters, a pump and motor, valves, switches all wired, gages, etc.

Parts to be cleaned are placed in a



square mesh basket 16 x 16 in.; cover is lowered, and spray valve turned. Force of spray causes basket to rotate so that all the material is completely cleaned. If desired, basket can be removed and machine is thus converted into a dip tank which can be used for wax or oil dipping of parts. Unit can be used for cleaning stamping, ball bearings, castings, bakery pans, etc.

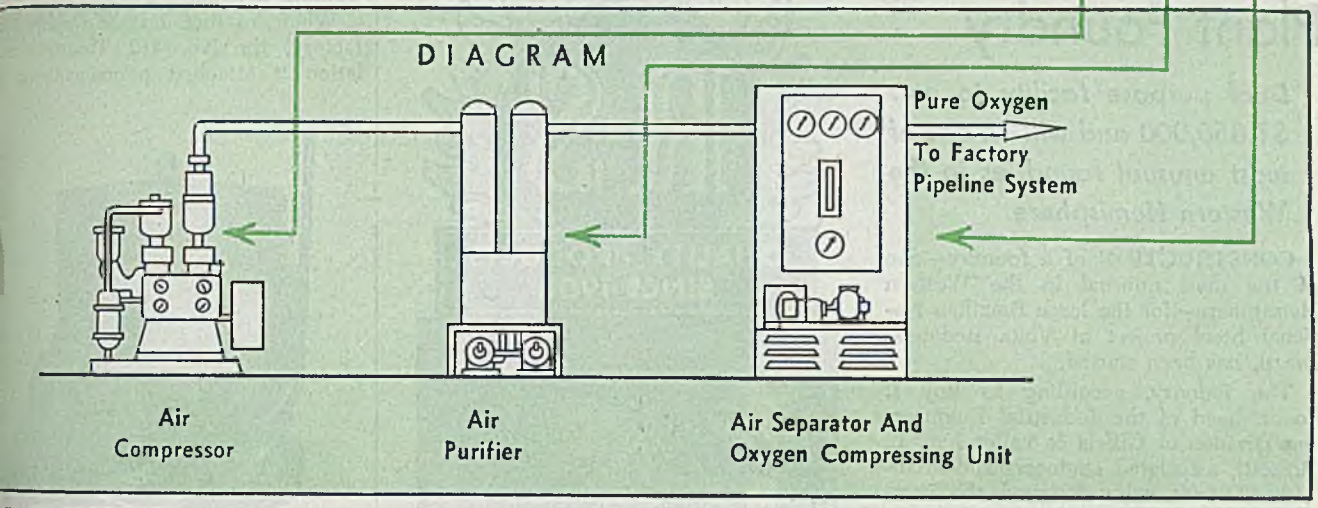
Light Welding Attachment

A 3-step Thinweld attachment that gives wider range to standard arc welding machines and makes it possible to weld from 10 amp up through the maximum rating of the welding machine without any dead spots in the complete welding range is a product of Hobart Brothers Co., Troy, O. It is intended for arc welding machines being used in widely diversified fabricating plants and job shops where work may vary from extremely heavy to the lightest gages practical for welding.

The No. 413 attachment is furnished with a 3 ft cable which is connected to the ground terminal of welding machine and ground lead is connected in turn to wing nut on the attachment. By plugging the jack into the three alternative positions of the Thinweld (low, medium, high) it is possible to get three additional ranges of amperage. Intermediate

Cutting Your OXYGEN Costs

Is Just as Simple as A B C

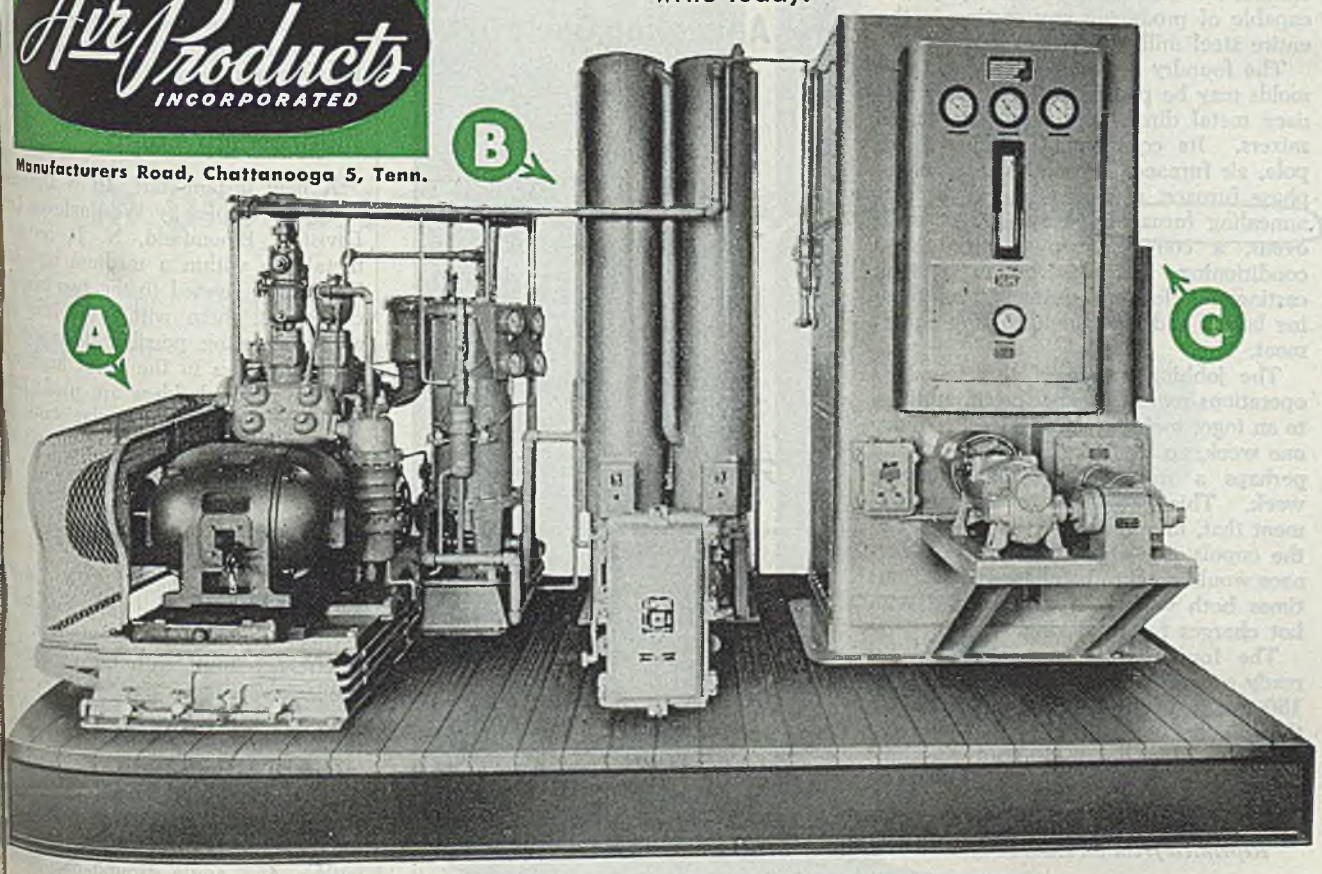


The AIR PRODUCTS process for making oxygen is simple: Air is compressed to the proper pressure and then is cleaned and purified by the air purifier. The air then goes to the air separator for the separation of the pure oxygen. The bone-dry oxygen gas produced at 99.6% purity is compressed to any required pressure by the AIR PRODUCTS patented oxygen compressing system which is an integral part of the air separator.

You can save 50% or more by making your oxygen in your own plant with an AIR PRODUCTS generator. Efficient and easy to operate, the AIR PRODUCTS generator requires only 100 square feet of floor space and 7 feet of headroom for installation. Eliminate unnecessary oxygen costs — expensive handling of heavy, cumbersome cylinders — by using the modern, more economical method of supplying your plant with oxygen. For specific details, write today.

Air Products INCORPORATED

Manufacturers Road, Chattanooga 5, Tenn.



Work Starts on Brazilian Steel Plant Foundry

Dual purpose facility to cost $1,850,000 and will be one of most unusual foundries in the Western Hemisphere

CONSTRUCTION of a foundry—one of the most unusual in the Western Hemisphere—for the large Brazilian National Steel project at Volta Redonda, Brazil, has been started.

The foundry, according to Roy I. Jones, head of the Industrial Engineering Division of Giffels & Vallet Inc., L. Rossetti, associated engineers and architects, Detroit, who designed the complete foundry project, will produce ingot molds and stools, iron grain and chilled rolls, steel rolls, miscellaneous iron, steel and nonferrous castings. The foundry which will cost approximately $1,850,000 will pioneer in many ways the reduction of hand labor and the improving of working conditions in the Brazilian foundry industry.

The foundry is a dual purpose facility. Half of the space is devoted to highly mechanized production systems for the regular supply of ingot molds and stools. The remaining half of the foundry is primarily for production of castings to keep the mill equipment in constant operation, and has facilities and equipment capable of producing any casting in the entire steel mill.

The foundry is designed so that ingot molds may be poured with hot blast furnace metal direct from the open-hearth mixers. Its equipment includes a cupola, air furnace, electric furnace, monophase furnace, nonferrous metal furnace, annealing furnaces, pit type ingot mold ovens, a completely mechanized sand conditioning and distribution system, casting and cleaning equipment, roll turning lathes, and ingot mold milling equipment.

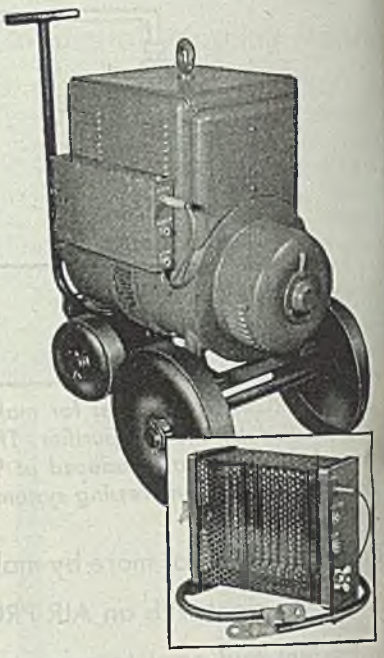
The jobbing nature of this foundry's operations requires that it be, in addition to an ingot mold foundry, a steel foundry one week, an iron foundry the next, and perhaps a roll foundry the following week. This gave rise to the requirement that, in addition to the charging of the cupola, the arc furnace and air furnace would need to be charged at various times both with cold charges and with hot charges for duplexing.

The foundry has been designed for ready expansion to provide an additional 150 per cent capacity. Construction of the foundry is expected to be completed in about nine months, about the time when the main portion of the steel mill will be completed.

Reprinted from STEEL Magazine

points between low, medium and high can be obtained by use of the field rheostat. Current values obtainable in each of these sub-ranges are low, 10-20 amp; medium 15-30 amp; high, 25 and up to the minimum capacity of standard welding machines.

When installed on arc welders at the factory, the No. 412 Thinweld installation is attached permanently on the



back of the welding machine and is connected to the first and second range of the 10-range switch. Thus, in the first range, the 3-step Thinweld permits additional lower amperage for light gage welding and the other ranges from 2 to 10 give the operator the wide range of higher amperage for welding of the heavy gages.

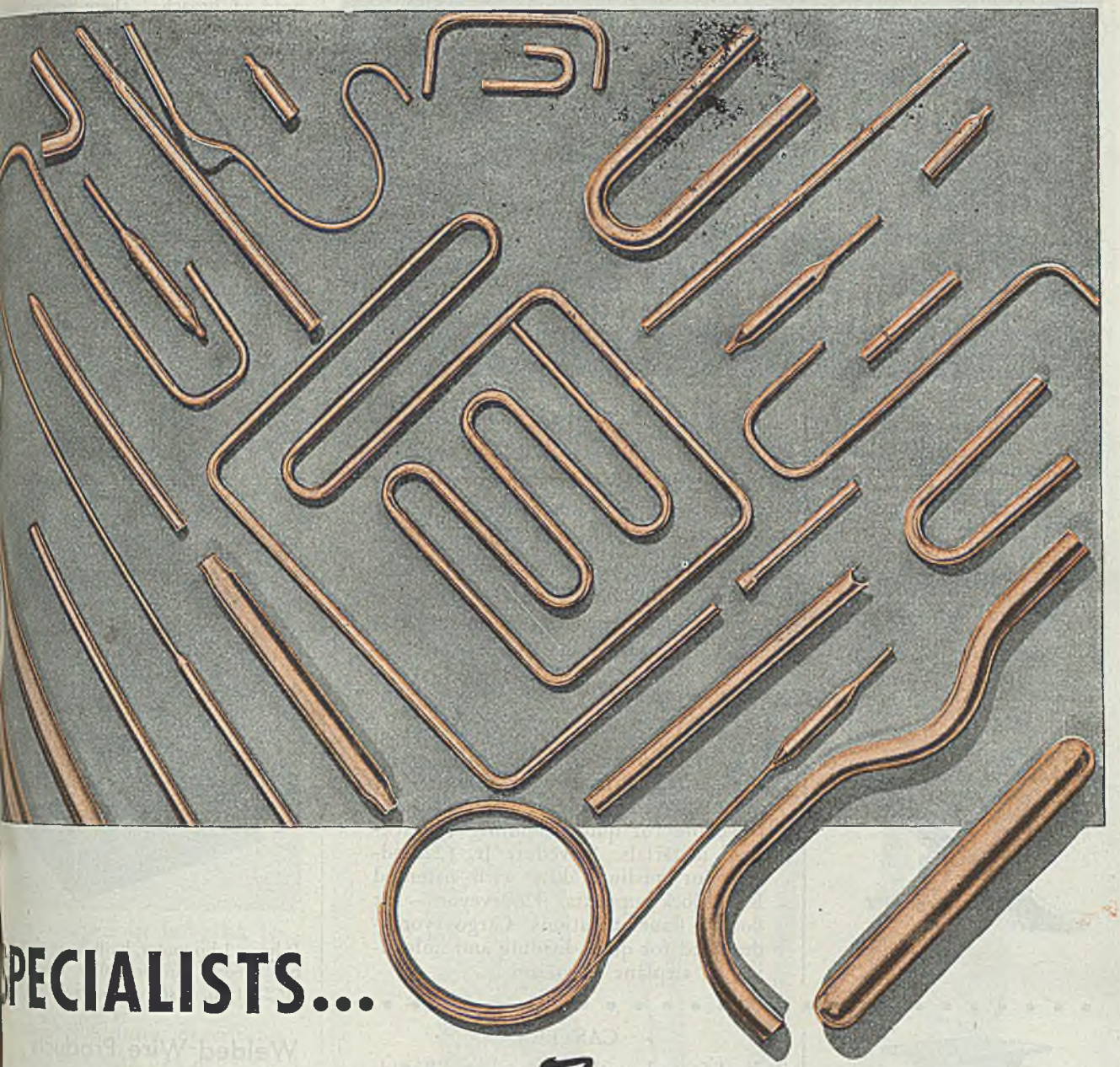
Fluorescent Lamp

A new instant-start, 40 w fluorescent lamp, developed by Westinghouse Lamp Division, Bloomfield, N. J., features a metal tab within a medium bipin base. The tab is riveted to the two base pins, connecting them within the lamp itself and preventing possible damage to the lamp cathodes in the event improper or defective lampholders are used. Lamps will not operate on regular starter type equipment and can be used only with instant-start ballasts.

Broaching Machine

Zagar Tool Inc., 23880 Lakeland boulevard, Cleveland 17, announces a vertical type broaching machine. The machine is built with three guide bars, similar to a three post die shoe. Consequently, the broach will positively be pushed straight without any deflection in machine column.

In operation the broach is pushed with a cone-shaped cup which is located in top adaptor plate and which mates up with a 45° angle ground onto pushing



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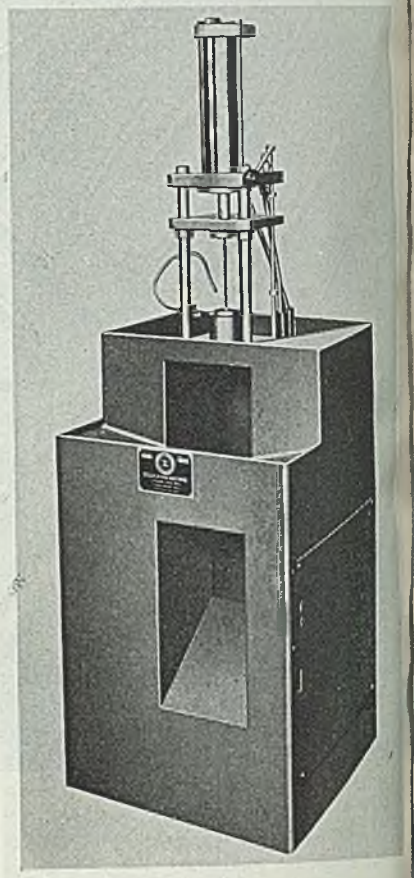
In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

head of broach. There are no broach holders or attachments to fasten the broach. It is pushed through work and then carried back up to its original position to repeat cycle.

Overall dimensions of the unit are: Height, 72 in.; depth, 25 in.; width, 25 in.



It has a 1 hp motor, built-in coolant tank, two speeds, Cuno oil filter, 1 ton pressure at 25 fpm, fast return stroke.

Welded Wire Products

Welds of multisection wire products made of tungsten, copper clad steel, copper, nickel and copper and nickel alloys

are produced in sections ranging from 0.0005 to 0.1280-in. diameter by Sylvania Electric Products Inc., Warren, Pa. These welds are suitable for leads, pins and mounts used in incandescent and fluorescent lamps, electron tubes; evacuated and gas-filled switches and many

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ge cost is low. The uses un-mited.

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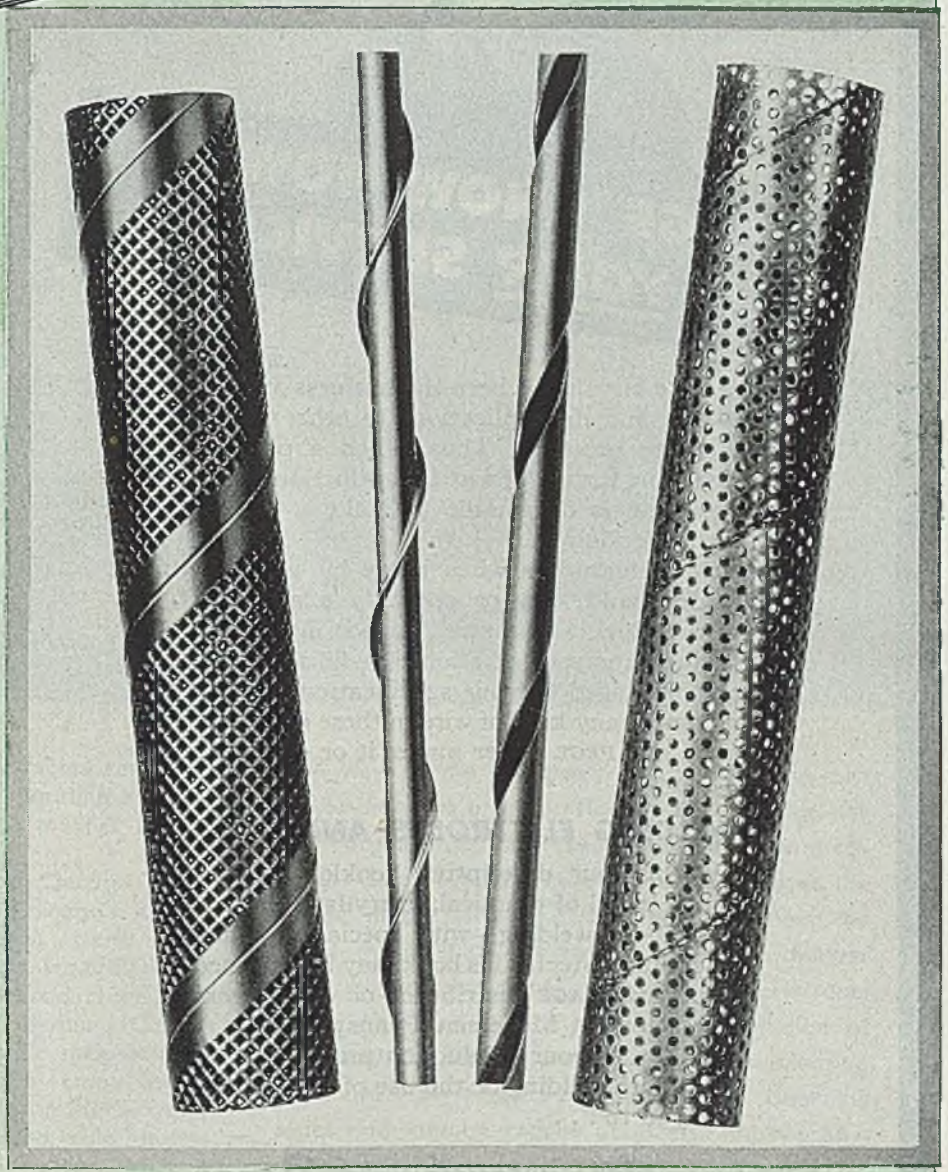
Write for literature describing galoy's complete line of old drawn Stainless, Car-on and Alloy tubing.



AGALOY TUBING COMPANY

MILL: SPRINGFIELD, OHIO

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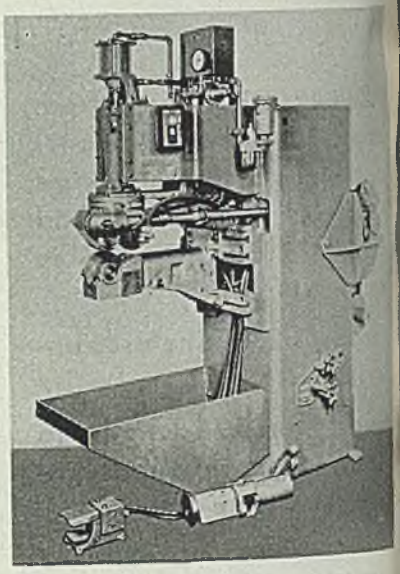
CHICAGO OFFICE: 221 NORTH LA SALLE STREET, CHICAGO 1, ILLINOIS

special, hermetically sealed electrical devices. Tungsten, nickel and copper clad wire products with or without welds to as many as four other metals may be supplied surfaced for direct bonding with glass. All sections are electrically welded. Contact pins for radio tubes, plug-in coils and similar products are also fabricated from solid nickel or tungten rod with ground or rolled tips and cut to exact lengths for lead mounts and glass seals.

Seam Welder

Thomson-Gibb Electric Welding Co., Lynn, Mass., introduces a new seam welder, known as model 6, for work ranging from 30 to 18 gage clean, mild steel in two thicknesses. Production speeds range up to 20 fpm. It may be used for circular or for longitudinal welds or as a universal machine with swiveling upper head and interchangeable lower arm for conversion from



circular to longitudinal seaming. It is available in various throat depths and transformer capacities to suit the work.

Welding wheels may be gear or knurl driven and the drive may be applied to either upper, lower or both wheels. Separate water cooling circuits are provided for the transformer, upper welding shaft, head, lead bracket, lower welding arm and bracket. Electronic current timing control permits a wide range of work and assures uniform production.

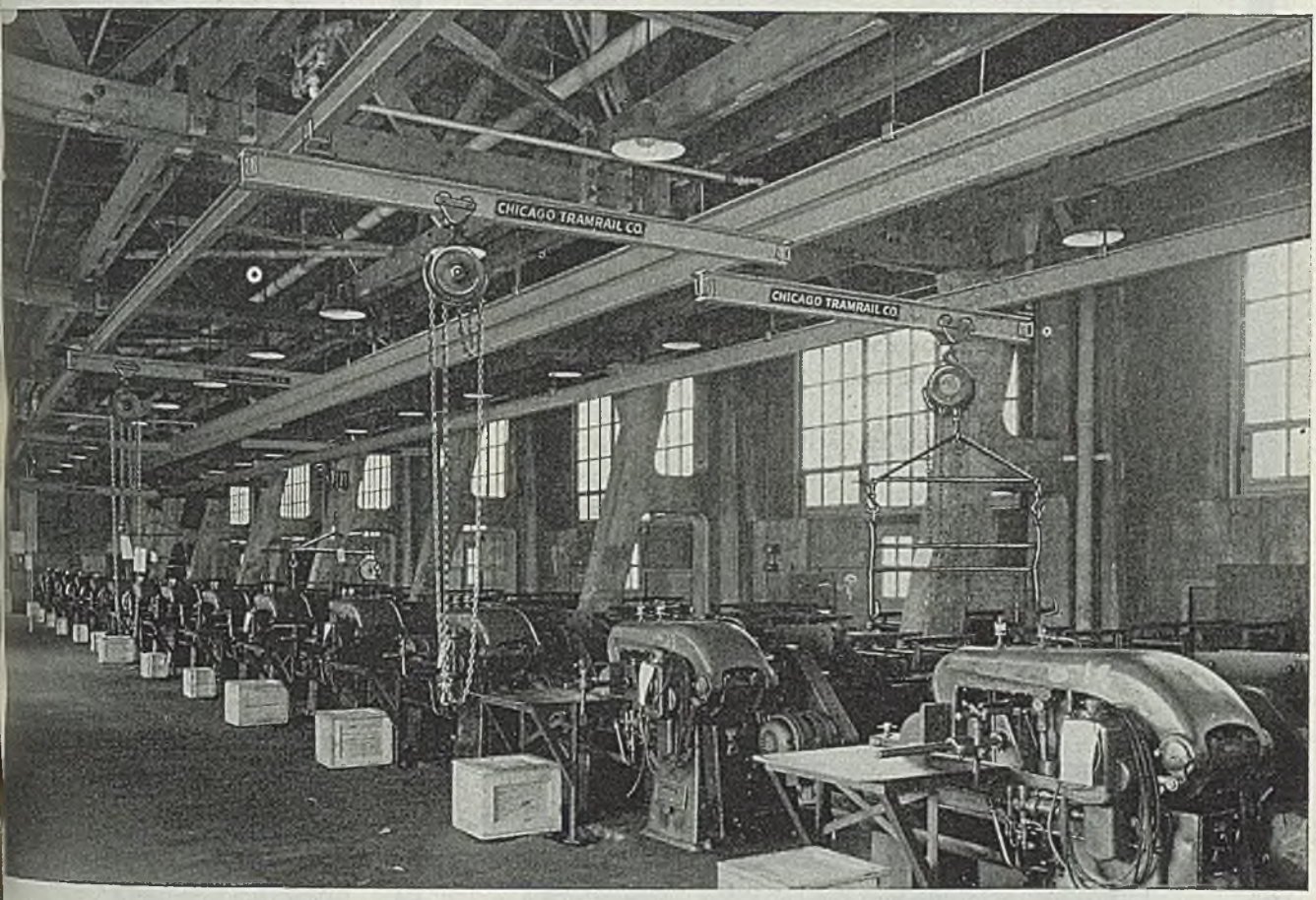
Contactors

Convertible contacts, easily changed from normally open to normally closed without additional parts, are one of the features of the new size 00 contactors announced by Industrial Controller Division of Square D Co., 4041 North Richards street, Milwaukee 12.

Conversion from normally open to normally closed is performed by removing a movable contact assembly, inverting it and putting it back in place. All terminals have provision for two wiring clips.

On the right track ....

CUTTING STEEL



You are "On the right track" for some very substantial savings along with utmost operating efficiency, when you handle steel in this manner during the cutting operation.

Above view shows installation of Chicago Tramrail Overhead Cranes at one of Chicago's largest aircraft engine manufacturing plants. Here, working toward top efficiency, Chicago Tramrail Company engineers installed two overhead crane runways with 9 Chicago Tramrail Underhung Cranes spanning a battery of 18 automatic reciprocating hydraulic feed hack saws. Outside crane brings steel through wall hatchway where an inside crane picks it up, sets it up at automatic feed table for cutting, picks it up again and stacks it on the skid.

In view of the amazingly low steel cutting cost as compared to other previously used methods, the result of this installation has been no less than gratifying. Bear in mind—one overhead crane does the job of many because it operates throughout the room; the hoist shifts from one runway to another at various transfer points, or travels from one room to another. Let us prove that an installation of Overhead Cranes can save on labor by releasing your crews for other work. More—you clear the aisles and thereby reduce accidents. Above all—you *speed plant operations for increased profits!*

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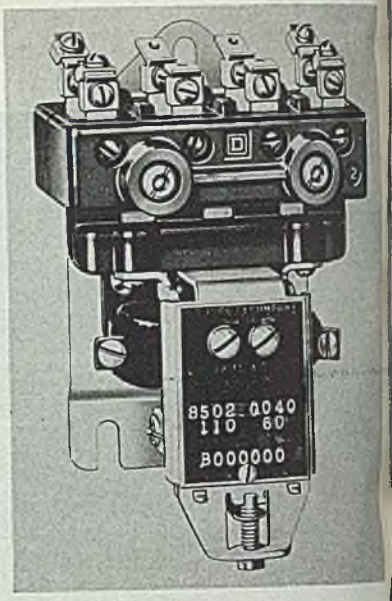
CHICAGO tramrail

A new type contact bar and guide is also incorporated in this device. Double break silver contacts can be readily replaced if and when prolonged, frequent operation makes replacement necessary.

Type Q contactors are suitable for mounting on steel panels and are avail-



able with two to six poles in any combination of normally open and normally closed contacts. Ratings are 600 v a maximum; 10 amp open, 9 amp closed

Fire Extinguisher

Trigger control on carbon dioxide fire extinguishers is featured on the larger portable models now offered by Walter Kidde & Co. Inc., 140 Cedar street, New

York 6. Operated entirely with one hand this model is controlled by an upward pull of the index finger. It can be latched open when desired by a slight forward motion and as easily disengaged to avoid wasting gas.

One-piece handle closure protects valve itself and is light in weight. Other improved features of the extinguisher in

Preformed wire rope

SAVES MONEY 3 WAYS

Are you looking for new ways to cut your production costs? Then follow the lead of successful operators, in every industry, who use Preformed wire rope. Their records prove that it saves money. First, because it lasts longer. This results from Preformed's ability to resist bending fatigue. Second, it saves money because it withstands heavy shock loads and thus helps avoid costly shut-downs. Third, Preformed spools better on the drum, and helps to maintain a profitable speed of operation. You can gain these and many other advantages by specifying Preformed the next time you order wire rope.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

clude the permanent bushing and removable siphon tube, which allows inspection, periodic hydrostatic testing and, when necessary, replacement of any part without devalving. Locking pin fits into a blind hole so that there is no possibility of its getting bent or jamming and the seal wire is placed where it is least likely to be broken and easily observed.

Dip Tank

Phillips Mfg. Co., 3431 Touhy avenue, Chicago 45, offers a new and improved melting tank of ethyl cellulose dip compounds that maintains critical melt with a temperature variation of less than 5° F. This unit has a capacity of 15 gal of melted ethyl cellulose or similar compounds. Melting tank is encased in an oil bath by which heat is

transmitted throughout the melt uniformly by convection. There are no moving parts to break down. Thermostatic controls keep melt at exactly the temperature desired. A separate, screened off section is provided for adding additional unmelted ethyl cellulose so that it does not enter melt until it is of the right consistency. The tank is all steel, arc welded, insulated throughout and controls are completely enclosed and protected.

Casting Machine

Centri-Meco centrifugal casting machine is announced by Centrifugal Machine & Engineering Co., 707 Jackson court, Kalamazoo 7, Mich.

The centrifugal casting machine features the Miracle-Hub, and has been designed to be heat-free in the bearing area during continuous use with permanent molds attached directly to the heavy table mounting plate. This new type hub is said to be so constructed that temperature in the bearing area never exceeds 125° F.

Heavy table has four strut-vanes which

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It's as simple as this: Build into your machine or product, as an integral part, a Veeder-Root Counting Device that registers strokes, turns, pieces, trips or any other units of performance ... mechanically or electrically. Then your customers can *see* when your guarantee period is reached ... for the Facts-in-Figures are right there in front of them in plain, bold black and white. So there's no room for argument, no needless loss of goodwill or future business through lack of positive proof. In fact, there are cases in which inexpensive Veeder-Root Devices have saved hundreds, even thousands, of dollars.

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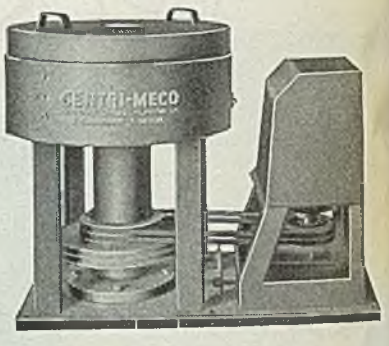
act as a fan to carry away excess heat radiated above the top bearing. Joining of the strut-vanes to hub is made by rigid welded construction to provide great strength at this vital point. This type of construction permits four relatively small points of contact to make their junction with hub and thus a smaller area of conductivity of heat is the result. Strut-vane type of construction also adds greater strength against any possible table distortion.

Machine is mounted on heavy plates for anchoring to floor. Hub is turned of 6¾ in. mechanical tubing of ¾-in. wall. The table mounting-plate is 18 in. diameter and the heavy-plate base is 20 x 42 in. Two antifriction bearings are employed in the hub construction. Double V-belts are used to drive table. Motor mounting is made of 2 x 2½ in. angle;



it is adjustable into standard belt lengths permitting minimum to maximum obtainable machine speeds. Motor is adjustable up and down for alignment of sheaves. Two-speed casting machines, and variable-speeds are obtainable. Equipped with certain mechanical drives, infinitely variable speeds are provided from 198 to 1290 rpm with a 2 hp motor, or with 3 hp, an increased range of variable speeds from 301 to 1959 rpm. Electronic drives may be installed on custom-built machines where greater ranges of higher or lower speeds than these are needed.

Protective-hood and spill-pan are made of 10 gage sheet metal in a 25 in. diam on Centri-Meco Junior model. They telescope from 8 to 15 in. so that metal can be poured near mold height. Net weight of this all-steel fabricated machine is 725 lb.

Counting Scale

A scale to count parts by direct reading has been announced by J. H. Keeney & Co. Inc., 6610 South Ashland avenue, Chicago. This scale represents a radical change from ratio and other counting methods used in the past. If there is a bin full of parts to be counted, instead of counting them one at a time, or using slow measuring methods, operator simply places parts in counting scale and has the answer in a second by reading result on its dial. This device has been an aid in solving inventory problems resulting from contract terminations.

B&W DIRECT-FIRING PULVERIZED-COAL CIRCULATING SYSTEM

SERVICE-CHECKED on all these points

✔ SIMPLE INSTALLATION
Only one pulverizer with a single circulating line for pulverized coal required by the system.

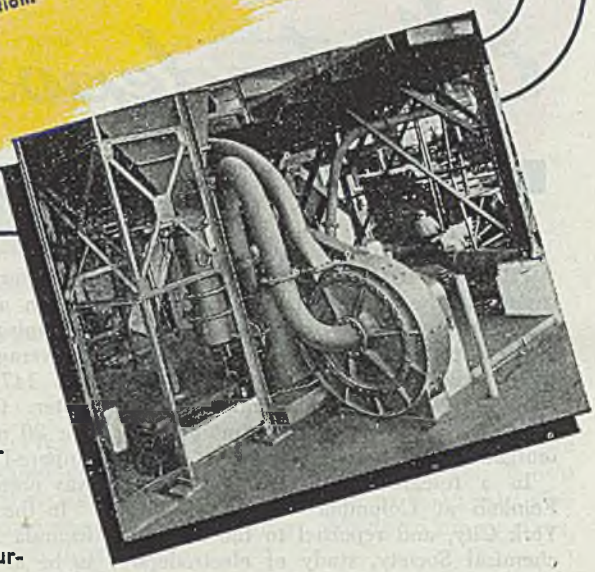
✔ SAVES FLOOR SPACE
Space at furnaces clear for product handling — pulverizer at a distance — circulating loop overhead.

✔ FLEXIBLE MULTI-FURNACE OPERATION
As many take-offs to burners as needed. Burners may be turned on and off as desired.

✔ INCREASED FURNACE OUTPUT
Existing installations show shorter heating cycles with lower fuel consumption per ton of castings.

✔ SUSTAINED FURNACE CAPACITY
Pulverizer maintains its rated capacity in coal to the fineness required by the installation.

✔ UNIFORM FURNACE TEMPERATURE
Temperatures easily controlled, by methods similar to those used with gas and oil firing.



FOR SIMPLIFIED FIRING OF METALLURGICAL FURNACES, investigate the B&W Direct-Firing Pulverized-Coal Circulating System. Its economy and efficiency have been proved on billet heating, reheating, forge, malleable-iron annealing, zinc fuming and other types of metallurgical furnaces.

This method of firing is equally applicable to other metallurgical furnaces, including ingot, bloom and billet heating furnaces; normalizing furnaces; copper, lead, and zinc melting furnaces; multiples of small units such as small forge furnaces and process heating furnaces in chemical industries.

The same B&W pulverizers, used in this system are also providing economical *direct-firing* of individual furnaces. For further details, write for Bulletin 3-333.

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PM-108

Iron Ore Beneficiation

(*Continued from Page* 126)

trate sinter, or sinter blend, are more descriptive. The percentage and chemical composition of the gangue of an ore has an all-important effect upon the character of the sinter produced from it. To sinter is to fuse and in that fusion all volatile matter is eliminated and all nonvolatile matter is increased in percentage in direct proportion to the percentage of volatile matter eliminated. The percentage of the gangue nonvolatile matter in the sinter is a major factor governing the particle size of the sinter and the particle size is a major factor in the effect of any volatile free material upon the thermal work of the blast furnace shaft. The percentage of nonvolatile gangue in sinter, as in any material, is a major factor in its effect upon the thermal work of the furnace hearth and bosh because it must be melted and fluxed to effect its removal from the furnace. Partial sintering, or incomplete fusion, produces a product of weaker structural strength than complete fusion and with it the average particle size of the product will be smaller than from the complete fusion but also with it there will remain some of the physical characteristics of the unsintered material. In short, partial sintering can remove volatile matter without completely fusing the residue into a clinker.

In a fully sintered material the natural friability of the product will definitely be determined by the percentage and the chemical composition of the iron silicates formed during the sintering operation. With complete fusion a hard clinker is inevitable but a sinter can be physically hard and still be sufficiently friable to give a small average particle size providing the gangue constituents of the sinter mix are low enough in percentage and of a composition which will provide desirable bases for the silicates[6]. The physical property of hardness in individual sinter particles is not objectionable in itself and may even be said to be desirable because it prevents packing of the stock in the furnace shaft.

The fact that hardness is frequently accompanied by large particle size should not confuse the effect of that property with that of structural strength. In sinter excessive structural strength is objectionable because it decreases natural friability and prevents the sinter from adopting the preferred particle size with natural handling but the same thing cannot necessarily be said about hardness.

These differences between partial and complete sintering are plainly in evidence in the variable sinter products produced from natural Lake ores, flue dust and ore, and the highly concentrated magnetite ores of the Eastern District. Their respective advantages and disadvantages to the furnace operation will be discussed in more detail later in this article.

Nodules: Nodulizing effects the same

Electrodeposited Plastics PROTECT METALS

PROTECTION of metals against corrosion may be accomplished in the future with the use of electrodeposited plastics in the form of films. It so happens that those resins that show poor solubility characteristics and poor lacquer-forming properties are the most resistant to both inorganic and organic chemicals.

In a research conducted by Morris Feinleib at Columbia University, New York City, and reported to the Electrochemical Society, study of electrodeposition was limited to the vinyl group. The report, entitled "Electrodeposition of Vinyl Plastics", discusses conditions and variables and presents optimum conditions for vinyl chloride and vinylite.

In the experiments, a constant 235 v dc source was used to supply potential to the electrodes which were spaced 1 cm apart. Nickel anodes, although not entirely free from anodic attack, were found to be satisfactory; copper was used for the cathode. Specially built saran (vinylidene chloride) electrode holders were used to maintain the electrodes the desired distance apart.

The preparation of a good vinylite deposition bath was found to consist of the following steps: Five grams vinylite molding powder (about 85 per cent vinyl chloride) were dissolved in 60 cc of butyl acetate. To this, 1.2 cc of tributyl citrate were added then, in several steps, a mixture of 27 cc absolute ethanol and 9 cc butyl acetate. The suspension was shaken after each addition and finally, electrolyzed at room temperature.

Average current density (for 30 min) was 147 micro-amp per square centimeter. Current yield was found to be (for 30 min) 0.071 g vinylite per milliampere-hour. Very little anode oxidation was noted.

In the case of vinyl chloride, the best formula for a good deposit was found to be as follows: One gram of koroseal (trade name for vinyl chloride), 40 cc dioxame, 10 cc butyl acetate, 0.5 cc tributyl citrate, and 13 cc absolute (99 per cent) ethanol.

Three Advantages

The current yield for this suspension was 2.15 g of vinyl chloride per milliampere-hour (in 35 min). This indicated that less current is used up in secondary anodic reactions than in the case of the vinylite suspensions. The nickel anodes were very slightly darkened.

In obtaining, by electrophoresis, removable plastic films which would be suitable for direct use, it was found that the advantages of nonaqueous suspensions were as follows: Little or no secondary electrode products and reactions (such as oxidation); low power consumption; and good electric properties of the film.

The method, however, was not without disadvantages. The concentration of solids in the suspension was low, so that the problem of frequent regeneration of suspension presented itself. On an industrial scale there would be a solvent loss to be considered, and in some cases a solvent recovery problem. Finally, the absence of secondary electrode products means that a very high resistance film is soon built up on the metal surface, with a high voltage gradient in the suspension resulting in little or no further deposition.

It was also learned that the greater the asymmetry, the easier it was to deposit the plastic (vinylite, saran). All of the vinyl plastics investigated migrated to the anode. The substituents in the hydrocarbon skeleton of all of these resins are so-called "negative groups" such as chloride, acetate, etc.

Finally, it was learned that the solvent must be less volatile than the precipitant in order to obtain good, uniform, nonporous deposits. Both solvent and precipitant had to be reasonably volatile so that the film was ready for use shortly after electroprecipitation. And, the liquid phase had to contain an ester such as butyl acetate (in the case of the vinyls) for stabilization and maximum electro-orientation. Purity of the reagents did not seem to be too critical; a small moisture content improved current yields.

Important Questions to users of metal cleaning abrasive ?

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HOW LONG does it hold to that most effective size

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chemical changes in ores as sintering in that all volatile matter is eliminated and the gangue nonvolatile constituents are fused into silicates. It may therefore be said that chemically there is no choice between the two processes. Physically the sinter is a friable cellular product of considerable variation in particle size and shape while nodules are balls of less variation in particle size. Density is claimed as an advantage for nodules but for the blast furnace operation where the necessity of maximum gas-solid contact is paramount, density does not appear to be as important as a large ratio of surface to mass and in that respect the advantage will always be with a cellular sinter particle equal in diameter with a nodule particle.

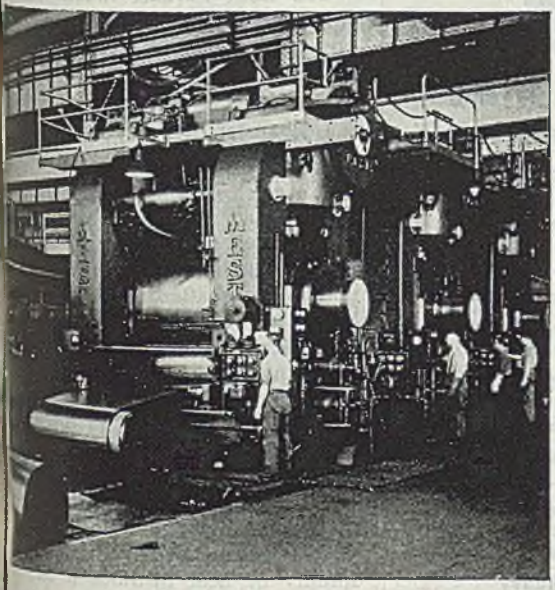
It is claimed that particle size of the nodule product can be more uniformly controlled than sinter because the product is not subject to the same effects from the iron silicates formed as is the sinter. However, the disadvantage of a percentage of nonvolatile gangue constituents in either product beyond an economically desirable percentage for the blast furnace hearth and bosh operation destroys any practical value for the claim because with a satisfactory percentage of gangue in the mix the sinter will be sufficiently friable to adopt from ordinary handling a satisfactory particle size.

Briquettes: Aside from surface moisture removal the effects upon ore from briquetting are entirely physical, simply the binding together of small particle sizes into larger ones. The effects are obtained by mixing the ore with some binding material, applying pressure, and drying or firing the briquette until hard. Chemically or physically the briquette does not approach either sintering or noduling in the degree of beneficiation obtained because in neither respect can the changes effected be said to equal those of the other two. All chemically bound volatile matter of the natural materials remains in the briquetted material and any particle size which is practical to produce is still large compared to the practical particle size of sinter or nodules and this is particularly true of sinter.

Pellets: The new pelletizing process has been fully and clearly described by Firth[7] and need not be repeated other than to call attention to the absence of fusion in the process and consequently the absence of silicates in the product. The purpose of the process is avowedly that of agglomerating finely ground concentrates which because of their mass resistance to the passage of air are more difficult to sinter than coarser materials. As in the nodulizing process the claim is made that the particle size of the pellet can be controlled at will but the minus ¼-in. particles are screened out because of structural weakness. The recommended size for the pellets is ½ to 1¼ in.

The principle involved in all of these methods of ore treatment is the prepara-

...-Three stand, 79 inch cold reduction mill on which Youngs-...n Enameling Sheets are cold reduced to required thicknesses.



THIS one-piece range top is an outstandingly successful job of deep drawing--as everyone who has seen it agrees.

With full credit to the skilled craftsmen who do the drawing and to the ingenious method they employ, the excellence of this product begins in the perfection of the sheet with which they start--a Youngstown Enameling Sheet.

Youngstown Enameling Sheets do the job, because their ductility and strength are exactly what a fabricator needs. They form into the desired contour, without buckling or straining. The fabricated part enamels without sagging or warping and the uniform surface takes and holds the enamel without imperfections, to result in a smooth, lustrous porcelain finish which helps so much the sale of the final product.

Youngstown Enameling Sheets will help you to put that wanted eye-appeal into your newly styled products, too. We are ready to work with you now. Your inquiry will receive our prompt attention.

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QUALITY V YOUNGSTOWN SERVICE

tion of the material before charging it into the furnace to lessen or to facilitate the work in the furnace necessary to smelt it. Emphasis is placed on the term "to smelt it" because it is believed there is too much confusion of thought with regard to "smelting" and "reducing" and this confusion is a contributing cause to the diversity of opinion regarding the best method of ore preparation.

Clearly the changes in material characteristics which can be effected by the four methods outlined, and the benefits which may be expected from them in the blast furnace operation are themselves diverse.

Sinter and nodules have the common property of being free from volatile matter while the briquette and pellet are only partially free from it.

Sinter can have a wide range in particle size and bulk density, depending largely upon the chemical composition of the sintering mix, but the others will be comparatively uniform in size.

Changes in volatile matter content and in particle size of materials have a direct effect upon the thermal work of the blast furnace shaft and an indirect effect upon the thermal work of the hearth and bosh the extent of which is dependent upon the effectiveness of the work performed in the shaft.

The nonvolatile elements of all blast furnace materials have little if any effect upon the thermal work of the furnace shaft but do have an all important effect upon the work of the hearth and bosh.

The Blast Furnace Shaft: The work of the blast furnace shaft consists of preparing the raw materials for smelting in the hearth and bosh. The principles involved appear to be:

1. Transfer of heat from gas to stock.
2. Elimination of all volatile matter from the burden materials.
3. Indirect reduction of iron oxide by the carbon monoxide (CO) and methane (CH_4) of the gas.
4. Raising of the temperature of the nonvolatile matter of the burden materials to their fusing temperatures.

The plane at which fusion begins determines the bottom of the shaft and the top of the bosh. The maximum rate at which the materials in the shaft can be prepared for the bosh is dependent upon the amount of volatile matter to be eliminated, the cubical dimensions of the shaft, the volume of blast which prevents excessive dust production, the uniformity of heat distribution throughout the stock column, the range in particle size of materials, and the capacity of the hearth and bosh to accept the prepared material.

Each of these conditions has a critical point most favorable to the principle of transmission of heat from the ascending gas column to the descending stock column. That principle has not changed since the first blast furnace stack was built but the conditions under which principle has been applied have changed many times. Thermal efficiency in the

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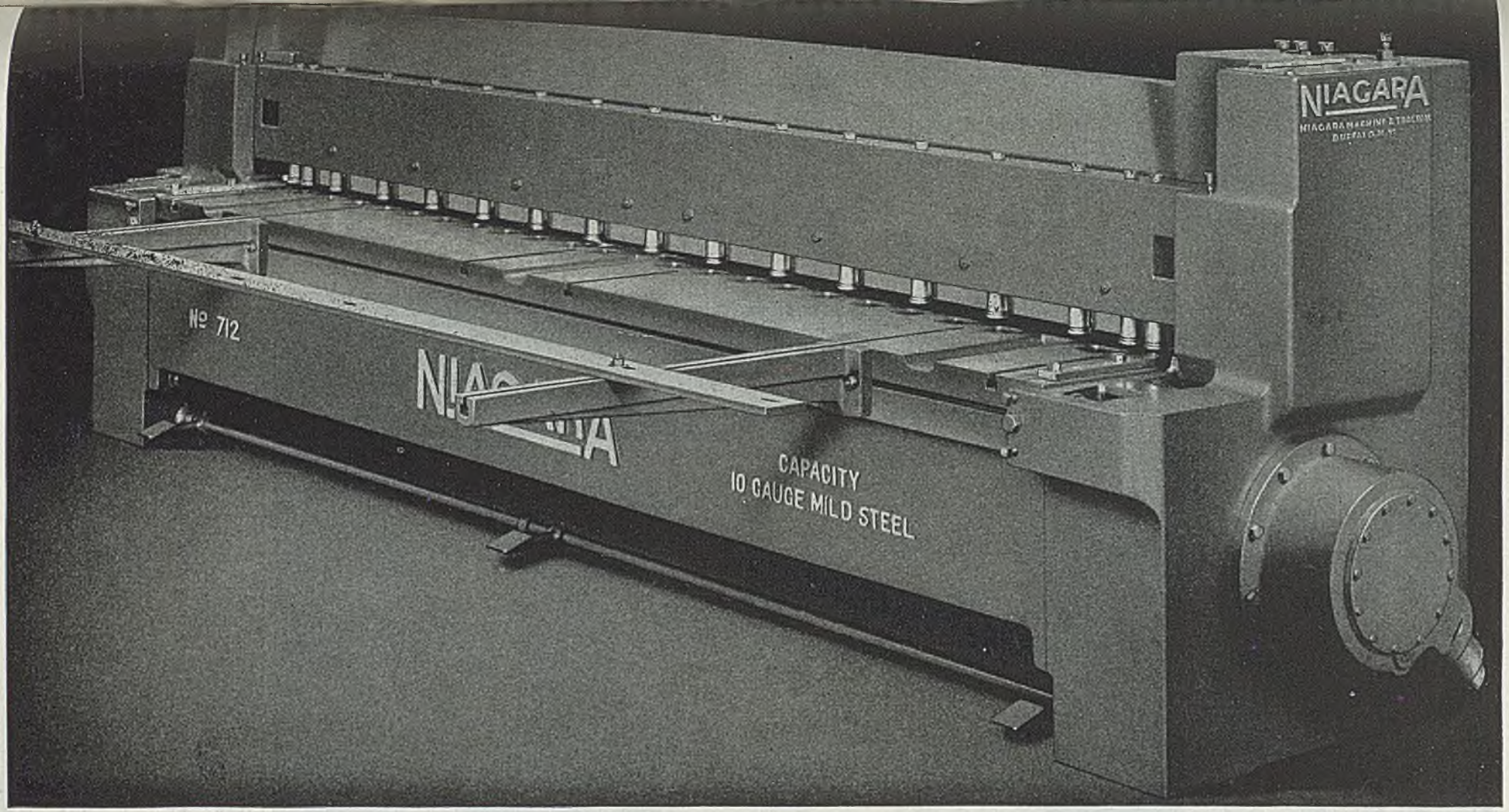
preparation of stock for smelting is determined by the degree of efficiency attained in this transmission of heat from gas to stock and not by the ability to generate heat. That overall operating economy under certain conditions can favor the sacrifice of some heat to effect other economies has been well proved by American soft ore practice but in a study of principles it must be recognized that a sacrifice of heat has been made in that practice. It must also be recognized that the operating conditions which have favored the sacrifice, have been due to the characteristics of the iron-bearing materials upon the thermal work of the furnace shaft and that a change in material character may not only be unfavorable to the soft ore practice but may positively forbid it.

Opinion is offered that the character of the iron-bearing materials is the governing factor in determining the blowing rate which is practical for the successful and efficient application of the principle of heat transmission from gas to stock in the shaft of the furnace.

Early American furnaces using lump ores relatively free from volatile matter employed a slow blowing rate. Modern American furnace practice developed during the past 75 years using largely the soft volatile bearing ores from the Lake region has favored a fast blowing rate. Because the increased use of the fast blowing rate has been complementary with the increase in the size of the furnaces it is probably the more general belief that the blowing rate is determined by the furnace lines. However, in the light of the experience of the few Eastern district furnaces, which have used 100 per cent of fully beneficiated materials and the experience of some Middle West furnaces using various fractional percentages of such material, the belief is only a half truth.

Naturally there is a relation between the volume of blast and the size of the furnace but it is not a fixed ratio and the blast volume for a given furnace must vary as the character of the burden materials vary. During the past 75 years of development in American furnace practice and design the character of Lake ores has remainded relatively constant which has permitted the development of other factors of operation for exploiting that constant to the best economic advantage. However, with the approaching exhaustion of the naturally rich ore and the necessity of adopting some means of beneficiation for the leaner remaining ores the character of the natural ore will be changed and with that change it becomes necessary to adjust the blowing rate to the changed conditions in the furnace shaft if efficient transfer of heat from gas to stock is to be had.

This phase of the subject was presented in a previous article[1] and need not be repeated other than to re-emphasize the importance and necessity of maintaining the proper balance between the low temperature work of the furnace shaft and the high temperature work of



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the hearth and bosh. The critical condition of this balance might be said to be the temperature at which the stock begins to fuse. When fusion has started it must be maintained, otherwise scaffolds will form on the walls of the furnace. Intermittent fusion at a given plane is favorable to the formation of scaffolds and once started they are difficult to remove. Without proven data to support it but conceived from experience, observation, and reason, it is believed that the combination of surface and absorbed moisture, combined volatile matter, and particle size of materials, in relation to the amount of heat present, are the material properties which determine the stability and uniformity of temperature at the plane which separates the shaft from the bosh and that the method required to efficiently utilize those properties in the preparation of stock for smelting in the bosh will vary with the ratio of those properties in the materials.

Surface and absorbed moisture are the first volatile elements to be evolved from the stock at the top of the shaft. The combined volatile matter follows and the absorption of heat for fusion purposes cannot take place until all of the combined volatile matter has been eliminated.

With a natural soft ore burden the moisture content of the fines is greater than that of the coarser particles and this natural moisture is generally supplemented by additional moisture added as water on the stock. Because of the much greater ratio of surface to mass in fines of a bulk equal to a given lump the fines will absorb a much greater percentage of the added water than the lump. Consequently the elimination of the combined volatile matter of the fines will be retarded to a degree which permits the final elimination of the combined volatile matter and the absorption of heat for fusion purposes in both fines and lump to proceed at a comparable rate in a zone intermediate between the zone of water elimination and the zone of fusion at the plane where the bosh begins. The two particle sizes will approach the plane dividing the shaft from the bosh at a temperature sufficiently uniform to prevent intermittent fusing and freezing of stock which must occur with irregular preparation of stock and cause scaffolds to form on the walls of the furnace.

With the conditions outlined the blowing rate and delivery of heat to the shaft is limited only by the ability to add enough water to maintain the heat/combined volatile matter ratio consistent with a volume of blast which will prevent a prohibitive production of flue dust as the gas passes from the furnace. The passage of gas through the stock is a mechanical operation and actual furnace practice indicates that the critical mechanical condition of gas disposal will be reached before the critical thermal condition of heat concentration will be reached which will cause irregular preparation of stock and intermittent fusion

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at the plane separating the shaft from the bosh.

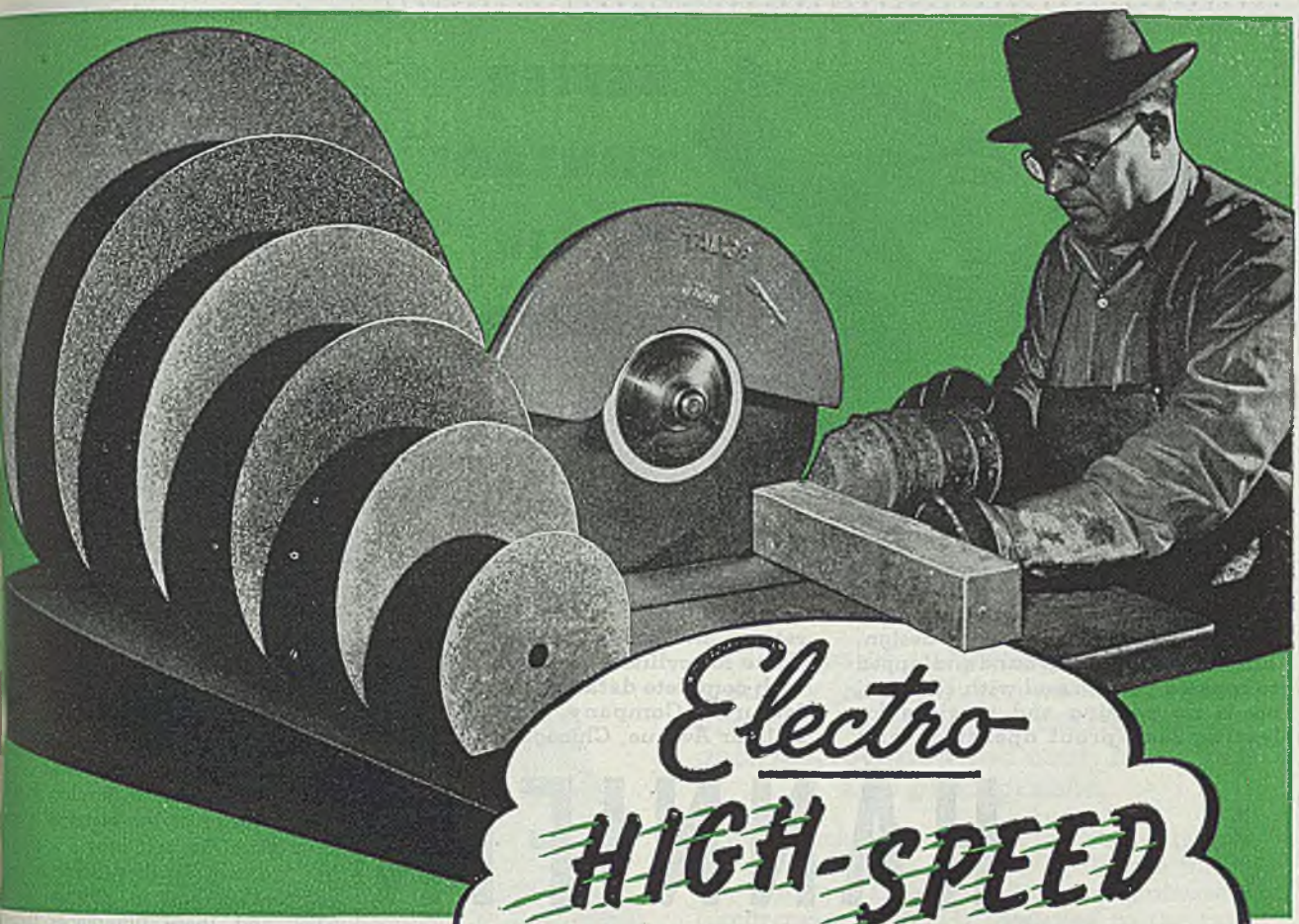
In a burden of fully beneficiated materials the combined volatile matter is entirely eliminated from the materials before they are charged into the furnace; consequently the intermediate zone of combined volatile matter removal in the furnace is also eliminated. Surface and absorbed moisture are reduced to a minimum because such materials cannot absorb moisture. Absorption of heat for fusion and reduction purposes is the only preparation needed in the shaft by fully beneficiated materials and because of absence of combined volatile matter all heat absorbed by materials is retained.

Because of the difference in characteristics and thermal requirements between the natural soft ore and the fully beneficiated material the critical transition from preparation to fusion calls for a different method of control for the respective materials. In the soft ore operation an excess of heat at the top of the shaft can be controlled with water because there is an intermediate zone of combined volatile matter removal which serves as a stabilizer but in the fully beneficiated material operation water alone will not suffice because there is not a stabilizing zone present. Particle size of materials in relation to the amount of heat delivered to the shaft then becomes of paramount importance and with particle size of materials reduced to a practical workable size the blowing rate must be reduced to control the amount of heat delivered to the shaft. Actual furnace practice indicates that the critical thermal condition of heat concentration, which will cause scaffolds to form on the walls of the furnace, will be reached before the critical mechanical condition of gas will be reached.

Between these two extremes in burden material conditions caused by different material characteristics and thermal requirements in the shaft of the furnace there can be a wide range of conditions depending upon the percentage of the different classes of materials in the furnace burden.

Volatile bearing ore with small particle size predominating permits a hard blowing rate because of the reasons outlined. Emphasis is placed upon the word "permit" to prevent the possible thought that with a soft ore burden hard blowing is required. Hard blowing is an expedient favorable to productive capacity when soft volatile bearing ores are used but it is not an operating necessity. The truth of the statement is proved by the known practice of slow and intermittent blowing sometimes practiced with soft ore burdens.

Volatile free materials will not permit a hard blowing rate because of the reasons outlined. To a degree this condition can be offset by an increase in ratio of burden to fuel but the limiting factor then becomes the capacity of the hearth and bosh to smelt the additional burden. However, actual furnace practice indicates the limiting factor to that capacity



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is the degree to which heat can be conserved in the furnace and concentrated in the lower bosh.

Respective conditions of heat transfer in the furnace shaft are well exemplified in the many soft ore furnace operations of the Middle West district and the few fully beneficiated ore operations of the Eastern district. The principle of heat transmission from gas to stock is the same in both instances only the conditions of transfer are different.

It is believed that the conflict between these two conditions of heat transfer in the blast furnace shaft is another contributing cause to the diversity of opinion among blast furnace operators regarding the preferred percentage of sinter for the furnace burden. Also it is believed that the same difference of opinion would occur if various percentages of nodules, briquettes, or pellets, were substituted for the soft ore instead of the sinter because in each case the character of the substitute is different from that of the soft ore it would replace. The change in material affects the conditions for heat transfer in the furnace shaft and the percentage of the substitute which causes the critical condition of heat concentration in the shaft to develop varies with the character of the material it replaces. As a class the soft ores are comparable but individually they differ in chemical composition and in physical characteristics and these differences themselves have an effect upon the conditions of heat transfer in the furnace shaft.

For those operations, which have received a benefit from some fractional percentage of sinter but none beyond that percentage, it seems reasonable to say that the benefits obtained were more mechanical than they were chemical. The introduction of a percentage of coarse material into a mass of finer material will increase the permeability of the whole to a better distribution of gas and consequently a better distribution of heat. Gas distribution is entirely mechanical. When such operations reach the critical mechanical condition of maximum gas-solid contact they have received their maximum possible benefit from such means and in a study of principles it must be recognized that the benefits were obtained by mechanical means.

Particle size is the principal material property involved in this application. The same benefit could be obtained from the use of any coarse volatile free material of equal iron content which would open the mass to equal gas distribution. Until the condition of maximum gas-solid contact is reached the influence of the volatile bearing materials govern the application of the principle of heat transfer in the furnace shaft but beyond that condition the influence of the nonvolatile bearing materials begins to be felt and unless the necessary adjustments in heat delivery are made not only will the benefit cease but operating difficulties of hanging and scaffolding will occur.

That the percentage of coarser material needed to obtain the optimum con-

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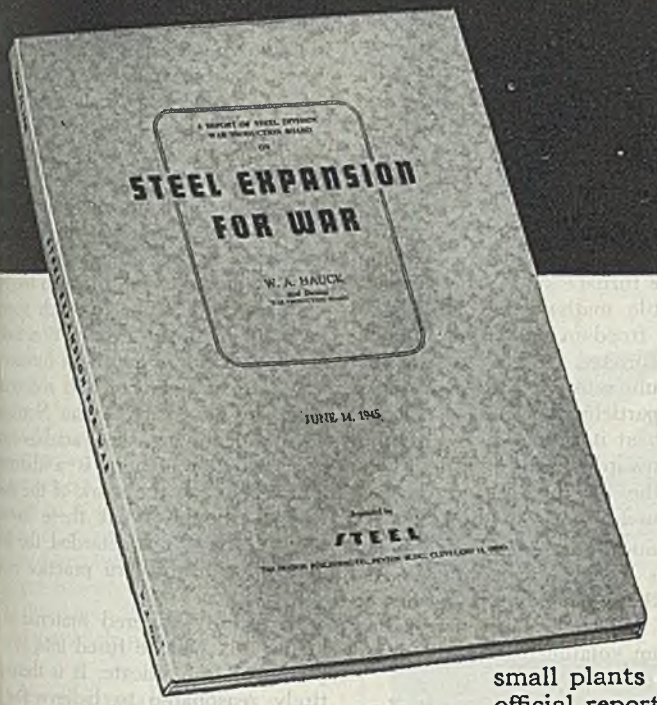

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dition of gas distribution varies with different ore mixes is proven by the diversity of opinion regarding what the percentage should be. That the operating difficulties encountered beyond the variously stated preferred percentages are not due to any sintered property but to the conditions created in the furnace shaft by the method of its use, is proven by the successful use of various percentages of sinter, up to a preferred 100 per cent, by some Eastern district furnace operations for the past decade and more.

If the principle of heat transmission from gas to stock is used as a basis for reasoning rather than an assumed blowing rate based upon furnace lines the selection of a method of beneficiation resolves itself into a choice of material characteristics which best serve the principle. Volatile matter and particle size are the two material properties which have the greatest effect upon transmission of heat in the furnace shaft. The elimination of volatile matter takes heat from the furnace, freedom from it conserves heat in the furnace. Large particle size has a minimum ratio of surface to mass while small particle size has a maximum ratio. Since heat must be absorbed from the surface inward the maximum surface exposed to the gas provides the maximum opportunity for heat absorption.

If the products of the four beneficiation methods being compared are examined for these desirable properties it will be seen that sinter and nodules are both free from volatile matter but differ in particle size.

Briquettes and pellets are partially free from volatile matter and differ in particle size.

Sinter and nodules being equal in their freedom from volatile matter the choice for effects upon the shaft work of the furnace must be made on particle size. It has been shown how particle size of the sinter can vary with the chemical composition of the mix but a sinter having a gangue content desirable for a blast furnace burden will be friable enough to adopt a particle size range from ordinary handling in which the smaller sizes will predominate. Based upon long experience the opinion is offered that a range[6] between 1 in. maximum and 100 mesh minimum is a preferred size range.

It is accepted that the particle size of nodules can be controlled regardless of the chemical composition of the mix and the preferred particle size will be balls free from fines or they would not be good nodules. In this comparison the advantage is definitely with the sinter. While small particle size in a beneficiated volatile free material is always the most desirable it becomes vital as the percentage of the beneficiated material assumes major proportions in the furnace burden.

The same reasoning with regard to particle size applies with equal force to the briquettes and the pellets. The pellet being produced from a high-iron concentrate would be a distinct advantage to the work of the furnace hearth and bosh but it is believed the recommended particle size would be a disadvantage to the work of the furnace shaft if used in any appreciable percentage of the burden. Without the recommended size the structural strength is described as weak[7].

Reduction of Iron: The work of Joseph[8] and Philbrook[9] on reducibility of different iron-bearing materials has created a great deal of interest in that phase of the subject of beneficiated materials. Their work, past Bureau of Mines[3-4-5] research and present generally known operating practices, prove that any slight difference in reduction rate between iron bearing materials is of little if any practical importance to actual operation. In the various laboratory tests the differences in time for reduction between materials are measured in minutes but in actual practice all blast furnace materials are in the furnace for hours during their passage through the furnace.

Bureau of Mines research shows 80.5 per cent of the iron reduction took place in the shaft of a Southern furnace[3] but only 24.4 per cent of that reduction took place in the shaft of the Northern furnace[5], showing the variable nature of the reduction. There is a difference of hours between the work of the shaft and that of the bosh but these known differences have not retarded the development of the northern practice or caused any concern.

In a fully sintered material all silica in the mix will be fused into some compound of iron silicate. It is therefore entirely reasonable to believe that whatever percentage of the iron of the mix which has been converted from the oxide to the silicate will not reduce as rapidly as the iron of the remaining oxides because the oxides are readily reduced by the carbon monoxide (CO) of the furnace gas. The silicate, however, has to be remelted. The temperature necessary to remelt is not available until the silicate arrives at the furnace bosh consequently the time for reduction must be longer than for the oxide.

(*Continued next week*)

New Business Guide for Executive by Lasser

Business Executive's Guide, by J. K. Lasser; fabrikoid, 252 pages, 5 x 8 inches, published by McGraw-Hill Book Co., New York, for $3.

This is a check list on problems of organization, finance, taxes and management by the author of books on income tax, settlement of terminated war contracts, accounting methods, corporation tax and related subjects.

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THE BUSINESS TREND

Inflation Accompanies Lag in Reconversion

NEW evidences that the lag in progress of reconversion is being accompanied by inflation are appearing almost weekly. While the inflation is not in the run-away stage it nevertheless means that the dollar buys less of many commodities than it once did. Projected far enough, inflation of commodity prices could prevent the huge pent-up demand for goods from being satisfied, and it is on this tremendous backlog of demand that the nation is counting so heavily to bring about peacetime prosperity.

Among inflationary signs is a rise in the Dun & Bradstreet daily wholesale commodity price index which on Nov. 10 rose to its highest point since 1932 when the index was inaugurated. That index closed on Nov. 13 at 1 per cent above the previous week's close and at 5.7 per cent over a year ago.

Also continuing an upward trend is the Dun & Bradstreet wholesale food price index which in the week ended Nov. 13 rose 1 per cent over the previous week and reached its highest mark since 1920.

Other gages which are rising are the Bureau of Labor Statistics wholesale price indexes of all commodities and industrial raw materials. Both of those indexes have been on the upgrade since Sept. 8.

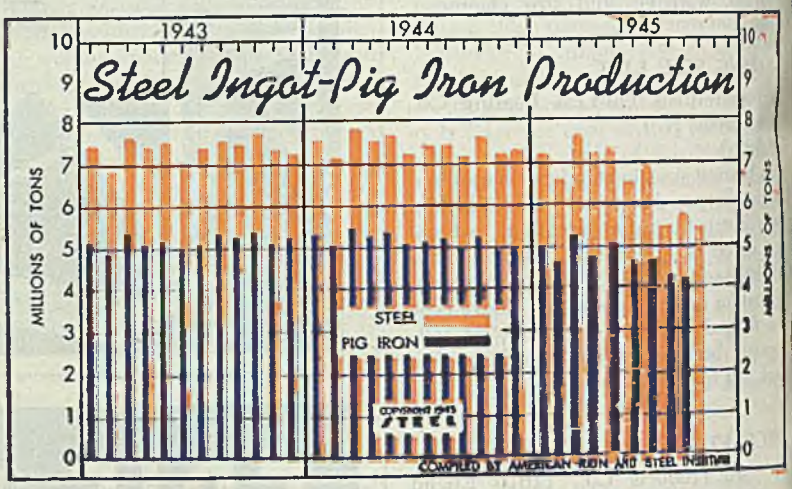
While reconversion has lagged there is visible evidence that there has been some progress. New automobiles are in dealers' showrooms, some new household appliances are reaching dealers, utility companies have started to renew and expand facilities, and construction of houses has begun.

CONSTRUCTION—An indication of the activity in the construction field is a Dun & Bradstreet report that volume of building permits rose sharply in October to the highest level since May, 1930. Permits in October aggregated $161,851,437, a 33.2 per cent increase over the previous month and 53.4 per cent higher than October of last year.

STEEL—Additional encouragement is seen in current industrial activity. Steel ingot production is showing a strong upward tendency, and bituminous coal output is holding at a high level. In the week ended Nov. 10 the preliminary estimate of bituminous coal production was 12,450,000 tons, only 20,000 tons below the year's high mark of the previous week.

AUTOS—The upward trend in automobile assembly continues, although the gain in the week ended Nov. 17 was only 215 units over the previous week's production of 32,225.

FREIGHT TRAFFIC—The October downtrend in industrial activity is reflected in a 1.3 per cent decline in ton-miles of revenue freight over Class 1 railroads that month, compared with September.



Iron, Steel Production
(Net tons—000 omitted)

	Steel Ingots			Pig Iron	
	1945	1944	1943	1945	1944
January	7,206	7,593	7,424	4,945	5,276
February	6,655	7,194	6,824	4,563	5,083
March	7,708	7,826	7,673	5,228	5,434
April	7,292	7,594	7,375	4,786	5,243
May	7,452	7,703	7,550	5,016	5,343
June	6,842	7,234	7,041	4,605	5,057
July	6,987	7,498	7,416	4,734	5,151
August	5,736	7,499	7,592	4,249	5,310
September	5,983	7,235	7,519	4,227	4,955
October	5,620	7,621	7,819	....	5,200
November	....	7,279	7,374	....	4,904
December	....	7,366	7,266	....	4,999
Total	....	89,642	88,873	....	61,894

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	80.5	76	65	96.5
Electric Power Distributed (million kilowatt hours)	3,945†	3,948	3,915	4,450
Bituminous Coal Production (daily av.—1000 tons)	2,075	2,078	1,022	1,803
Petroleum Production (daily av.—1000 bbls.)	4,400†	4,451	4,237	4,739
Construction Volume (ENR—Unit $1,000,000)	$76.3	$45.8	$73.1	$29.4
Automobile and Truck Output (Ward's—number units)	32,446	32,225	13,750	20,930

*Dates on request. †Preliminary.

TRADE				
Freight Carloadings (unit—1000 cars)	835†	838	773	864
Business Failures (Dun & Bradstreet, number)	15†	17	15	13
Money in Circulation (in millions of dollars)‡	$28,178	$28,137	$27,952	$24,717
Department Store Sales (change from like wk. a yr. ago)‡	+13%	+10%	+11%	+9%

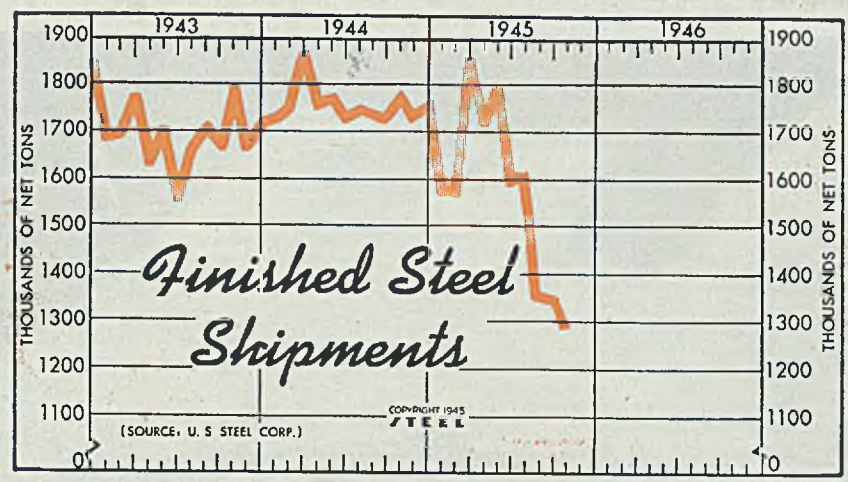
†Preliminary. ‡Federal Reserve Board.

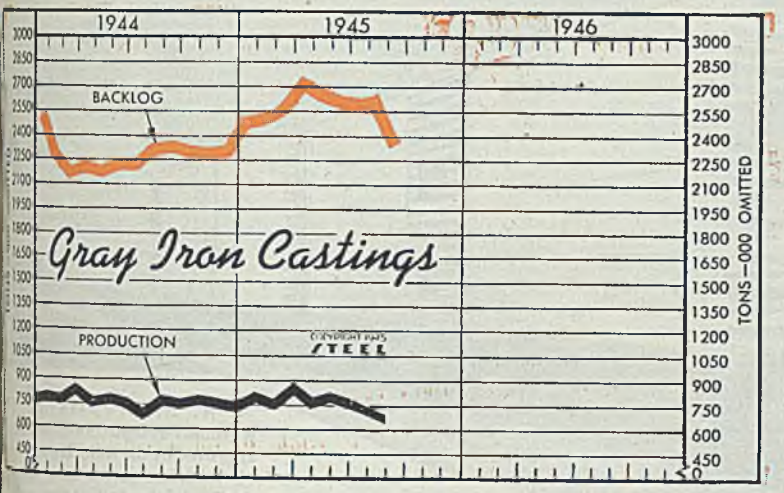
U. S. Steel Corp.'s Finished Steel Shipments

(Net Tons)

	1945	1944	1943	1942
Jan.	1,569,115	1,730,787	1,685,993	1,738,893
Feb.	1,562,489	1,755,772	1,691,592	1,616,587
Mar.	1,869,642	1,874,795	1,772,397	1,780,938
Apr.	1,722,845	1,756,797	1,630,828	1,758,891
May	1,797,987	1,776,934	1,706,543	1,834,127
June	1,602,882	1,737,769	1,552,663	1,774,068
July	1,608,994	1,751,525	1,660,762	1,765,749
Aug.	1,332,180	1,743,485	1,704,289	1,788,650
Sept.	1,321,576	1,733,602	1,664,577	1,703,570
Oct.	1,290,358	1,774,969	1,794,968	1,787,501
Nov.	.....	1,743,753	1,660,594	1,665,515
Dec.	.....	1,767,600	1,719,624	1,849,635
Total	.....	21,150,788	20,244,830	21,064,157
Adjustment	.....	°98,609	°97,214	°449,020
Total	.....	21,052,179	20,147,616	20,615,137

°Decrease.





Gray Iron Castings

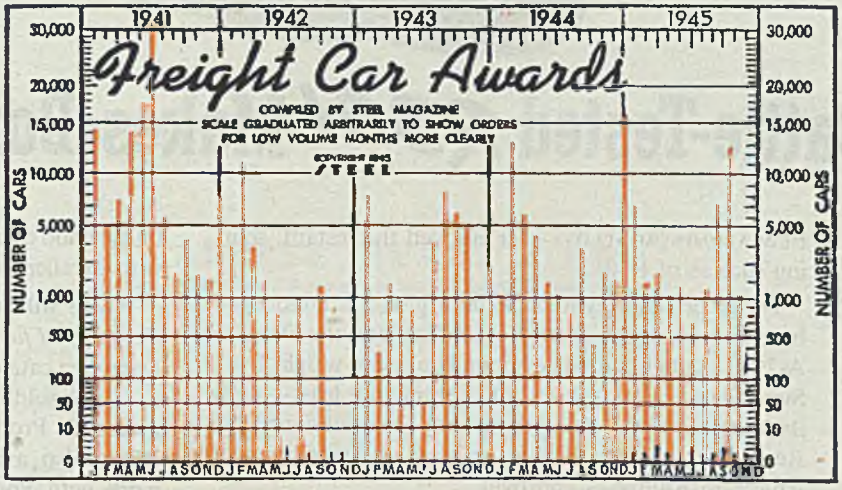
(U. S. Bureau of Census)

Tons—000 omitted

	Production		Backlog	
	1945	1944	1945	1944
Jan.	807	794	2,497	2,259
Feb.	753	773	2,562	2,145
March	851	841	2,714	2,184
April	769	766	2,641	2,159
May	806	789	2,603	2,205
June	773	766	2,596	2,213
July	693	698	2,565	2,314
Aug.	675	778	2,375	2,335
Sept.	...	769	....	2,304
Oct.	...	788	....	2,297
Nov.	...	770	....	2,300
Dec.	...	744	....	2,475
Mo. Ave. ..	...	773	....	2,266

Freight Car Awards

	1945	1944	1943	1942
.....	7,200	1,020	8,365	4,253
.....	1,750	13,240	350	11,725
March	2,500	6,510	1,935	4,080
.....	1,120	4,519	1,000	2,125
.....	1,526	1,952	870	822
.....	670	1,150	50	0
.....	3,500	795	4,190	1,025
.....	7,240	3,900	8,747	0
.....	12,840	400	6,820	1,863
.....	1,320	2,425	5,258	0
.....	.....	1,065	870	0
.....	.....	16,245	2,919	135
.....	...	53,221	41,374	26,028



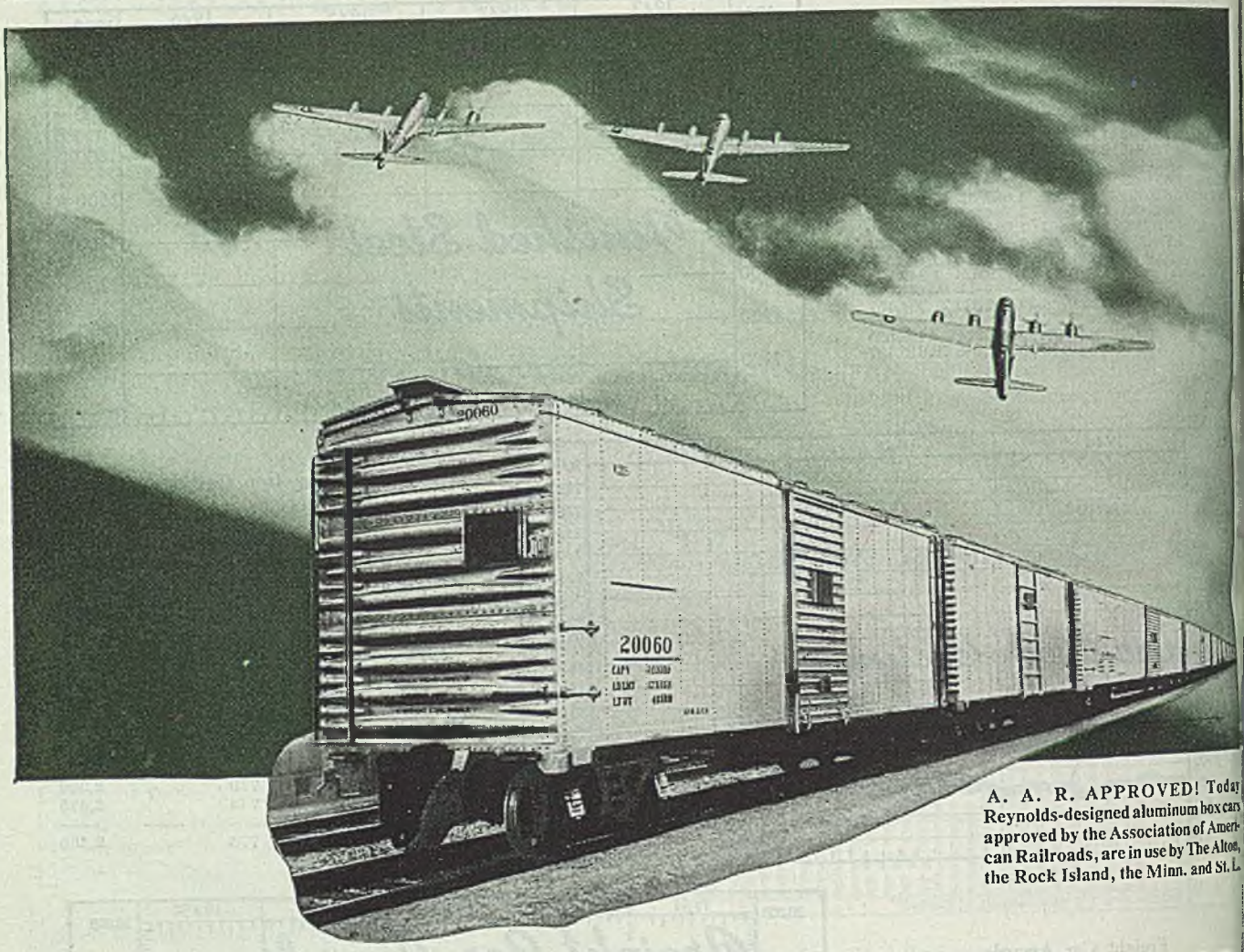
ANCE	Latest Period°	Prior Week	Month Ago	Year Ago
ank Clearings (Dun & Bradstreet—millions)	$10,008	$10,326	$10,072	$9,380
ederal Gross Debt (billions)	$263.2	$262.8	$262.1	$212.5
ond Volume, NYSE (millions)	$33.0	$32.4	$39.3	$44.5
tocks Sales, NYSE (thousands)	9,538	8,949	9,168	4,752
oans and Investments (billions)†	$61.0	$60.9	$60.9	$53.6
nited States Gov't. Obligations Held (millions)†	$45,263	$45,142	$45,108	$39,467

°Member banks, Federal Reserve System.

ICES				
STEEL's composite finished steel price average	$58.27	$58.27	$58.27	$56.73
All Commodities†	106.1	105.9	105.3	104.1
Industrial Raw Materials†	118.6	118.2	116.6	114.3
Manufactured Products†	102.2	101.9	101.9	101.1

†Bureau of Labor Statistics Index, 1926=100.

How UP-TO-DATE are you on ALUMINUM?



A. A. R. APPROVED! Today Reynolds-designed aluminum box cars approved by the Association of American Railroads, are in use by The Alton, the Rock Island, the Minn. and St. L.

Battle-Tested R301 Makes Box Cars TOUGHER

FEW ALUMINUM ALLOYS ever enjoyed the instant, soaring success of R301.

Developed by Reynolds metallurgists . . . announced barely a year ago . . . today, it armor plates the Douglas A-26 . . . cuts hundreds of pounds of dead weight from Superforts . . . and—last, but certainly not least—lends its tough, rugged strength to box cars designed by Reynolds, and first to win the coveted Association of American Railroads approval.

What is R301? Today's airplane armor plate, R301, is tomorrow's great sheet and plate alloy. Combines a typical tensile strength of 60,000 p.s.i.; superior workability; good corrosion-resistance in all tempers, together with excellent spot-welding properties.

Where will it be used? R301 will be used *wherever there's need for light, tough, corrosion-defying sheet and plate.* See catalog in Sweet's or write for Catalog 100-A . . . "Reynolds Aluminum. Its Important Role in Tomorrow's Products." Special Bulletin 50-A, featuring R301, also available. Reynolds engineers will gladly work with your engineers. Offices in principal cities. Phone nearest . . . or write Reynolds Metals Company, Aluminum Div. 2520 South Third Street, Louisville 1, Kentucky. **Consider Aluminum . . . Consult Reynolds.**

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STEEL

HELPFUL LITERATURE

1. Molding Presses

Watson-Stillman Co.—4-page illustrated bulletin No. 642A discusses molding presses for handling complicated plastic parts by transfer method and plastic products requiring split molds. Specifications and principal dimensions are given.

2. Blast Cleaning

American Foundry Equipment Co.—Four illustrated catalogs Nos. 154, 164, 174 and 184 present information on Nos. 1, 1-A, 2, and 3 Wheelabrator Multi-Tables respectively. These rotary table type machines employ abrasive which is fed to center of wheel from overhead storage hopper.

3. Hard Facing Alloys

Wall Colmonoy Corp. — 8-page illustrated catalog No. 76 discusses Colmonoy hard facings. Characteristics, specifications and uses are presented. Both ferrous and nickel base alloys are covered. Applications are outlined.

4. Wire Rope Sling Service

American Chain & Cable Co.—4-page illustrated folder presents features of wire rope sling service embodying efficient designs for specific purposes, guarantee of specified strength and means to determine remaining life. Types of slings furnished are shown.

5. Dolomite Distributor

Blaw-Knox Co.—10-page illustrated booklet No. 2047 presents information on features of improved dolomite throwing machine. Increased flexibility, larger hoppers, increased range of rates, optional self-contained power unit, improved throwing mechanism are among advantages.

6. Tool Steel Tubing

Bennett Steel Co.—8-page illustrated catalog "Bore Tool Steel Tubing" shows variety of applications of tubing, and includes information on heat treating, ordering data and current list of available sizes.

7. Temperature Exchanger

Ward-White Co.—2-page illustrated leaflet No. 12 describes temperature exchanger combining temperature control for air or gas with general heating and purification applications. Cutaway drawing and specifications are included.

8. Air Motors

Bellows Co.—8-page illustrated circular "Bellows Air Motors" contains information on features, stroke lengths available, and shows dimensional drawings of air motors for handling pulling, pushing or lifting operations.

9. Crushers

American Pulverizer Co.—4-page illustrated bulletin tells features of American Rolling Ring and Hammermill crushers, grinders and shredders for handling metal turnings, coal, stone and variety of friable, semiabrasive and fibrous materials. Size, horsepower, speed, weight and required floor space of units are covered.

10. Aluminum Bronze Weldrods

Ampco Metal, Inc.—20-page illustrated bulletin No. W-2 discusses methods of welding with Ampco-Trode coated aluminum bronze rod. It contains weldability chart for copper base alloys that shows range of metals that can be welded successfully with this electrode.

11. Centrifugal Pumps

Worthington Pump & Machinery Corp.—4-page illustrated bulletin No. W-321-B16 presents data on vertical coolant and circulating turbine centrifugal pumps for general circulating services and handling of coolants containing particles of abrasives and fine chips.

12. Cutting Torches

Victor Equipment Co.—34-page illustrated bulletin No. 52 describes hand and machine cutting torches, attachments and tips. Cross-section views show design and construction features. Cutting units are available for use with acetylene, hydrogen, liquefied petroleum gases or natural gas.

13. Chromium Plating

Van der Horst Corp. of America—8-page illustrated booklet entitled "Porus-Krome—Good for the Life of your Engines" describes advantages, application and characteristics of Porus-Krome chromium plating which is applied to internal combustion engine cylinder bores and other bearing surfaces.

14. Idler Backstands

Behr-Manning Div., Norton Co.—8-page illustrated booklet discusses factors in belt grinding and finishing with idler backstands. These units are especially suited to handling small castings, forgings, stampings, edged tools and hardware. Bench models as well as floor models are shown.

15. Balancing Machines

Bear Mfg. Co.—20-page illustrated booklet describes dynamic balancing machines for precision balancing of rotating parts. Complete specifications are given for bench and floor models and general information on correct ordering procedure is included.

16. Forgings

Wyman-Gordon Products Corp.—64-page illustrated booklet entitled "Forgings" deals with company's facilities for producing forgings for aircraft and automotive industries. Development of company from its founding in 1883 to present time is traced by means of photographs.

17. Cranes & Shovels

Bay City Shovels, Inc.—32-page illustrated catalog L presents complete specifications on company's line of convertible crawler and pneumatic tire-mounted shovels, cranes, draglines and hoes, trailers and dragline buckets.

18. Hydraulic Actuation

John S. Barnes Corp.—Illustrated bulletins No. 013-G and No. 012-G deal with pointers on installation and maintenance of hydraulic actuating units, type 139 self-contained hydraulic unit for light duty applications and automatic reciprocating cylinder.

19. Tension Lock Control

Arens Controls, Inc.—1-page leaflet presents information on lightweight compact tension lock control which can be used in combination with rods, cables, and flexible or rigid push-pull remote controls.

20. Heating & Melting

Ajax Electrothermic Corp.—16-page illustrated pamphlet "Ajax-Northrup Heating and Melting" shows typical installations of induction heating for spinning, hardening, brazing, forging, and steel and brass melting.

21. Hot Rolled Steel

Bushwick Iron & Steel Co.—56-page illustrated pocket sized manual gives specifications and prices of steel bars, structurals, strip, sheets, plates and wire. Plant facilities, decimal equivalents and wire gages are listed.

22. Stainless Steel Electrodes

Alloy Rods Co.—20-page illustrated bulletin No. SS145-5MR covers complete line of stainless steel arc welding electrodes. Chemical and physical properties, applications, sizes and identification of each electrode are fully described.

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23. Spring Stripping Units

Wales-Strippit Corp.—8-page illustrated catalog S, second edition, presents features and uses of Wales Strippits which are self-contained spring units for stripping metal from conventional dies. Specifications, typical set-ups and advantages of use are outlined.

24. Cutting Tools

Wendt-Sonis Co.—48-page illustrated catalog No. 445 is buyers guide for boring tools, centers, counterbores, spot facers, cut-off tools, drills, end mills, fly cutters, lathe bits, milling cutters, reamers, roller turning tools and special tools. Specifications and prices are given.

25. Brazing

Westinghouse Electric Corp.—12-page illustrated booklet No. B-3201 outlines methods of brazing with Phos-Copper. Gas, incandescent carbon, electric furnace and dip brazing methods can be used. Available in rod form, alloy is used for butt, scarf, shear and lap joints. Diagrams show proper design.

26. Gear Inspection Equipment

Vinco Corp.—12-page illustrated bulletin No. 91 presents Vinco gear rolling inspection fixtures and master gears. Method of use and features of seven types are described. Features of master gears used for checking purposes are also covered.

27. Flexible Tubing

Aeroquip Corp.—6-page illustrated bulletin No. 104 describes flexible tubing and fittings for medium pressure hose assemblies. Complete specifications are given and cross-section illustrations show construction. Physical characteristics and applications are also listed.

28. Aircraft Tools

Aero Tool Co.—6-page illustrated folder entitled "Special Purpose Tools for Aircraft" describes company's research, design, production, testing and distribution facilities for producing special aircraft tools and maintenance kits.

29. Electronics

Allis-Chalmers Mfg. Co.—20-page illustrated booklet No. E6358 entitled "Introduction to Electronics" was prepared to provide understanding of principles of electronics and part played by electronics in future industrial developments. Electron tubes, both vacuum and gaseous, are fully described.

30. Optical Safety

Allen Optical Co.—4-page illustrated folder discusses Sani-Spray cleaner which cleans and fogproofs glasses and goggles. Cleaner can be obtained in quarts or gallons. Goggle station for applying cleaner is also described.

31. Portable Vacuum Cleaners

Allen Billmyre Co.—10-page illustrated bulletin gives details on power, capacity, performance, dimensions, weights and uses of Exidust portable vacuum cleaners. Cross-section illustrations show construction and operation of cleaners. Cleaning tools and accessories are briefly described.

32. Vibration Fatigue Testing

All American Tool & Mfg. Co.—4-page illustrated bulletin No. 1007 explains advantages of vibration fatigue testing and shows typical installations in electronic and industrial laboratories. Model 100 VA is described fully and eight other types are covered briefly.

33. Pumps

Viking Pump Co.—Three illustrated bulletins Nos. 2500, 2900 and 3000 and catalog No. 42 G contain complete data on line of positive displacement, selfpriming rotary pumps with capacities ranging from ½ to 1050 gallons per minute.

34. Insulation

Baldwin-Hill Co.—24-page illustrated pamphlet "Industrial Insulations" describes Mono-Block block insulation, blanket insulation, pipe covering, low pressure coverings, insulating cement, felt insulation, Koldboard low temperature insulation, fill insulation, diatomaceous earth products, asbestos and other materials.

35. Hard Chrome Plating

Acme Plating Co.—20-page illustrated booklet entitled "Hard Chrome Plating—A Practical Guide to the Industrial Application of Chromium Plating" discusses development, physical characteristics, typical and special applications of hard chrome plate. Company's plants, laboratories and engineering service are also discussed briefly.

36. Drainage Equipment

Armco Drainage & Metal Products, Inc.—60-page illustrated catalog No. 13 entitled "Armco Products for Engineering Construction" lists 21 drainage and related products for use in airports, building construction, flood control, power and irrigation, highways, streets and railways, sewage treatment and water supply, mines and industrial construction.

37. Oxygen

Air Reduction Sales Co.—24-page illustrated booklet entitled "Oxygen—Indispensable Servant of Industry" explains the use of 99.5 per cent pure oxygen gas in flame cutting, cleaning, hardening and other operations. Oxygen is available in containers of from 122 to 40,000 cubic feet.

38. Heat Treating Furnaces

Ajax Electric Co.—8-page illustrated bulletin No. 113 describes Ajax Isothermal quench equipment and processes. List of parts treated includes bearings, gears, springs tubing crankshafts, lock nuts, and parts for aircraft engines, business machines, automobiles, sewing machines and machine tools.

39. Grinding Wheel Accessories

American Emery Wheel Works—8-page illustrated folder entitled "American Grinding Wheel Accessories for Portable Tools" covers abrasive accessories for welding, blacksmith, pipe and structural work as well as for building and contracting industry. Guide to grain and grain selection is also given.

40. Tool Steels

Allegheny Ludlum Steel Corp.—170-page illustrated manual entitled "The Tool Steels of Allegheny Ludlum" presents data on applications, composition and working of high speed, hot work, shock resisting, cold work, carbon and low alloy tool steels. Reference tables covering weights, measurements, areas, circumferences and metric, hardness and temperature conversion are given.

41. Brass Mill Products

Bridgeport Brass Co.—128-page illustrated technical handbook, prepared primarily for design engineers, metallurgists and purchasing agents in metalworking industries, deals with high strength, corrosion resisting, copper-base engineering alloys as well as standard brass alloys. Tables showing comparison of wire gages, decimal equivalents, temperature conversions and weights of strip, circles, rod wire and tubing are included.

42. Flexible Shaft Machines

Wyzenbeck & Staff, Inc.—30-page illustrated catalog No. 44 contains specifications and prices on flexible shaft machines and accessories for toolrooms, machine, pattern and welding shops, foundries, sheet metal work and automotive and aircraft plants.

43. Brass, Bronze & Iron Alloys

Baldwin Locomotive Works, Cramp Brass & Iron Foundries Div.—44-page illustrated bulletin No. 194 lists composition, applications and physical properties of brass, bronze and iron alloys which are used in manufacture of castings, babbitt, ingots, forgings and rods.

44. Valves

Vickers, Inc.—8-page illustrated bulletin No. 40-13 presents details on line of Multiple-Unit hydraulic valves made up of standardized and interchangeable units. They are suitable for installation on road building equipment, excavating machinery, industrial trucks, dump truck hoists, clutch and brake operating cylinders on metalworking and other industrial machi-

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Strike Threats Have Little Effect on Steel Demand

Consumers seek order acceptance more than delivery promise . . . Production rate regains coal strike loss . . . Scrap and pig iron still tight

IT IS uncertain to what extent steel product demand will be affected in event widespread work stoppages in the automotive and steel industries transpire. Some suspension of shipments to the automotive industry have been received but relatively few order cancellations are expected unless work stoppages are prolonged.

In the case of some automotive consumers, who have faced the strike threat for weeks, it is understood preparations have been made to accept and store all the steel mills can supply during the interruption, to assure sufficient for full production of vehicles after the strike ends. In the case of the threat to steel production consumers seek to obtain as good deliveries as possible now, before a strike occurs, if, indeed, it actually comes about.

This pressure continues in spite of the fact that mills generally are refusing tonnage in many cases and a number of producers are out of the market because of overloaded books and inability to promise delivery. There has been some change in the nature of consumer demand, most effort now apparently being to have orders accepted, giving position on mill books, with somewhat less effort to obtain early delivery. This indicates possession of steel for current consumption under conditions of labor shortage and desire to assure continuous supply when the pinch is relieved.

Under the quota system now applied by most producers on many products delivery possibilities on current orders mean little, as steel is distributed pro rata to all regular customers in proportion to normal buying in the past. However, backlogs on practically all steel products now extend well into next year and in some cases practically cover probable production for the entire year. The latter condition applies particularly to flat-rolled steel, with wire products, and bars only slightly less involved and structural shapes gaining in demand.

Demand for steel plates continues to surprise the trade, being directly contrary to expectations of a few months ago. With capacity reduced by return of continuous strip mills to production of sheets and strip, demand is crowding producers and delivery dates are being pushed back steadily into next year. Miscellaneous users contribute heavily and tank and boilermakers' needs are heavy as reconversion proceeds. Some shipbuilding also is coming out to require plates and shapes.

Steel ingot production continues its steady rise, the estimated national rate last week advancing 2 points to 82½ per cent of capacity, practically regaining all ground lost by the soft coal strike. Youngstown rose 5 points to 80 per cent, Chicago 4½ points to 91, Cleveland 4 points to 87, Pittsburgh 1½ points to 78½ and New England 2 points to 83. Cincinnati dropped 2 points to 65 per cent, the only decline. Rates were unchanged in the remaining districts, as follows: Eastern Pennsylvania 78, St. Louis 68, Birmingham 95, Wheeling 90, Buffalo 86 and Detroit 87.

As a result of considerable interruption to blast furnace operation during the coal strike Lake Superior iron ore smelted in October reached only 4,491,246 gross tons. In September consumption was 5,837,017 tons and in October, 1944, it was 7,319,948 tons.

With melters eager for larger supply of scrap, dealers have difficulty obtaining sufficient to meet demand and material is moved from fairly remote locations to centers of consumption, at cost of springboard payments. Steelmakers also continue to buy premium grades for open-hearth use.

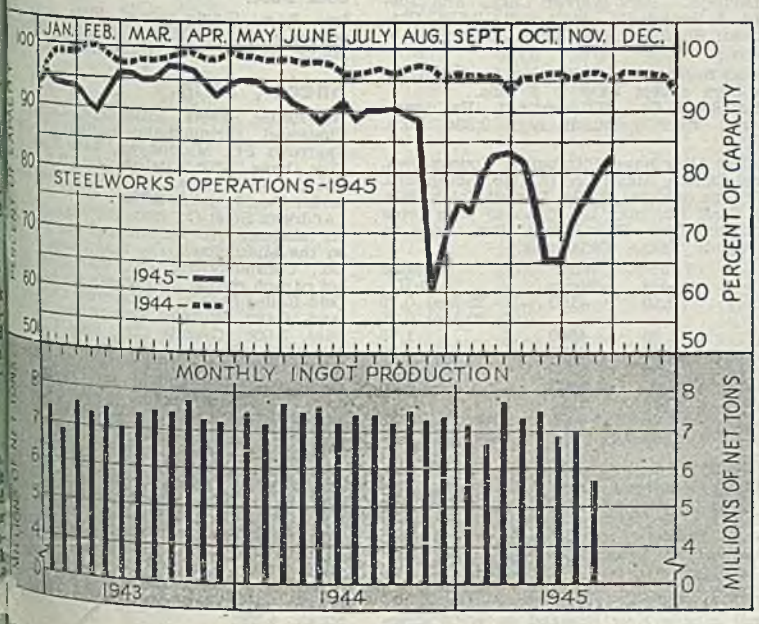
Average composite prices of steel and iron products are unchanged, all being at ceiling prices. Finished steel composite is $58.27, semifinished steel $37.80, steelmaking pig iron $24.80 and steelmaking scrap $19.17.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Nov. 24	Change	Same Week 1944	Same Week 1943
Pittsburgh	78.5	+1.5	92	101
Chicago	91	+4.5	92.5	101.5
Eastern Pa.	78	None	95.5	95
Youngstown	80	+ 5	88	93
Wheeling	90	None	91	99
Cleveland	87	+ 4	93	85.5
Buffalo	86	None	90.5	86
Birmingham	95	None	90	100
New England	83	+ 2	90	97
Cincinnati	65	— 2	87	91
St. Louis	68	None	75	98
Detroit	87	None	88	88
Estimated national rate	82.5	+ 2	95	99

*Based on steelmaking capacities as of these dates.



COMPOSITE MARKET AVERAGES

	Nov. 24	Nov. 17	Nov. 10	One Month Ago Oct., 1945	Three Months Ago Aug., 1945	One Year Ago Nov., 1944	Five Years Ago Nov., 1940
Finished Steel	$58.27	$58.27	$58.27	$58.27	$58.27	$56.73	$56.73
Semifinished Steel	37.80	37.80	37.80	37.80	37.80	36.00	36.00
Steelmaking Pig Iron	24.80	24.80	24.80	24.25	24.05	23.05	22.05
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	16.40	20.80

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; other, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for last Month, Three Months and One Year Ago

Finished Material	Nov. 24, 1945	Oct., 1945	Aug., 1945	Nov., 1944
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.15c
Steel bars, Philadelphia	2.57	2.57	2.57	2.47
Steel bars, Chicago	2.25	2.25	2.25	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.25	2.25	2.25	2.10
Plates, Philadelphia	2.30	2.30	2.30	2.15
Plates, Chicago	2.25	2.25	2.25	2.10
Sheets, hot-rolled, Pittsburgh	2.20	2.20	2.20	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.70	3.70	3.70	3.50
Sheets, hot-rolled, Gary	2.20	2.20	2.20	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.70	3.70	3.70	3.50
Bright bess., basic wire, Pittsburgh	2.75	2.75	2.75	2.60
Tin plate, per base box, Pittsburgh	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.90	2.90	2.90	2.55

Semifinished Material				
Sheet bars, Pittsburgh, Chicago	$36.00	$36.00	$36.00	$34.00
Slabs, Pittsburgh, Chicago	36.00	36.00	36.00	34.00
Rerolling billets, Pittsburgh	36.00	36.00	36.00	34.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.15	2.15	2.15	2.00

Pig Iron	Nov. 24, 1945	Oct., 1945	Aug., 1945	Nov., 1944
Bessemer, del. Pittsburgh	$26.94	$26.35	$26.19	$25.19
Basic, Valley	25.25	24.65	24.50	23.50
Basic, eastern del. Philadelphia	27.09	26.53	26.34	25.34
No. 2 fdry., del. Pitts., N.&S. Sides	26.44	25.85	25.69	24.69
No. 2 foundry, Chicago	25.75	25.15	25.00	24.00
Southern No. 2, Birmingham	22.13	21.57	21.38	20.38
Southern No. 2 del. Cincinnati	26.05	25.50	25.30	24.30
No. 2 fdry., del. Philadelphia	27.59	27.03	26.84	25.84
Malleable, Valley	25.75	25.15	25.00	24.00
Malleable, Chicago	25.75	25.15	25.00	24.00
Lake Sup., charcoal del. Chicago	37.34	37.34	37.34	37.34
Gray forge, del. Pittsburgh	25.94	25.35	25.19	24.19
Ferromanganese, del. Pittsburgh	140.00	140.26	140.33	140.33

Scrap				
Heavy melting steel, No. 1 Pittsburgh	$20.00	$20.00	$20.00	$17.15
Heavy melt, steel, No. 2, E. Pa.	18.75	18.75	18.45	15.50
Heavy melting steel, Chicago	18.75	18.75	18.75	17.50
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke				
Connellsville, furnace, ovens	$7.50	$7.50	$7.50	$7.00
Connellsville, foundry ovens	8.25	8.25	8.25	7.75
Chicago, by-product fdry., del.	13.35	13.75	13.75	13.35

STEEL, IRON RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941, Feb. 4, 1942 and May 21, 1945. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. Seconds and off-grade products are also covered. Exceptions applying to individual companies are noted in the table. Finished steel quoted in cents per pound.

Semifinished Steel

Gross ton basis except wire rods, skelp.

Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, $31.00. (Empire Sheet & Tin Plate Co., Mansfield, O. may quote carbon steel ingots at $33 gross ton, f.o.b. mill Kaiser Co. Inc., $43, f.o.b. Pacific ports.)

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $45.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $36; Detroit, del. $38; Duluth (bll) $38; Pac. Ports, (bll) $48. (Andrews Steel Co., carbon slabs $41; Continental Steel Corp., billets $34, Kokomo, to Acme Steel Co.; Northwestern Steel & Wire Co., $41, Sterling, Ill; Laclede Steel Co., $34 Alton or Madison, Ill.; Wheeling Steel Corp. $36 base, billets for lend-lease, $34, Portsmouth, O., on slabs on WPB directives, Granite City Steel Co. $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., Kaiser Co. Inc., $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $42. Detroit, del. $44; Duluth, billets, $44; forg. bll. f.o.b. Pac. ports, $54. (Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 f.o.b. Toronto, O. Geneva Steel Co., Kaiser Co. Inc., $64.64. Pacific ports.)

Open Hearth Shell Steel: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Youngstown, Birmingham, base 1000 tons one size and section; 3-12 in., $52; 12-18 in., excl., $54.00; 18-in. and over $56. Add $2.00 del. Detroit; $3.00 del. Eastern Mich. (Kaiser Co. Inc., $76.64, f.o.b. Los Angeles.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54, del. Detroit $56, Eastern Mich. $57.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $36. (Wheeling Steel Corp. $37 on lend-lease sheet bars, $38 Portsmouth, O., on WPB directives; Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, Pa., 1.90c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, 5—⅜ in. inclusive, per 100 lbs., $2.15 Do., over ⅜—47/64-in., incl., $2.30; Galveston, base, 2.25c and 2.40c, respectively. Worcester add $0.10; Pacific ports $0.50 (Pittsburgh Steel Co., $0.20 higher.)

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base 20 tons one size, 2.25c; Duluth, base 2.35c; Detroit, del. 2.35c; Eastern Mich. 2.40c; New York del. 2.59c; Phila. del. 2.57c; Gulf Ports, dock 2.62c; Pac. ports, dock 2.90c, (Calumet Steel Division. Borg-Warner Corp., and Joslyn Mfg. & Supply Co., may quote 2.55c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons. (Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c; Detroit del., 2.80c. (Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.10	4100 (.15-.25 Mo)	0.70
		(.20-.30 Mo)	0.75
2300	1.70	4300	1.70
2500	2.55	4600	1.20
3000	0.50	4800	2.15
3100	0.85	5100	0.35
3200	1.35	5130 or 5152	0.45
3400	3.20	6120 or 6152	0.95
4000	0.45-0.55	6145 or 6150	1.20

*Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.75c; Detroit 2.80c; Toledo 2.90c. (Keystone Drawn Steel Co. may sell outside its usual market area on Proc. Div., Treasury Dept. contracts at 2.65c, Spring City, Pa., plus freight on hot-rolled bars from Pittsburgh to Spring City. New England Drawn Steel Co. may sell outside New England on WPB directives at 2.65c, Mansfield, Mass., plus freight on hot-rolled bars from Buffalo to Mansfield.)

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.45c; Eastern Mich. 3.50c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.25c; Eastern Mich. and Toledo 2.30c; Gulf ports, dock 2.50c; Pacific ports, dock 2.55c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo base 2.15c; Detroit, del. 2.25c; Eastern Mich. and Toledo 2.30c; Gulf ports, dock 2.50c.

Iron Bars: Single refined, Pitts. 4.40c; double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, single ref., 5.00, double ref., 6.25c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.20c; Granite City, base 2.30c; Detroit del. 2.30c; Eastern Mich. 2.35c; Phila. del. 2.37c; New York del. 2.44c; Pacific ports 2.75c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.35c hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown base, 3.05c; Granite City, base 3.15c; Detroit del. 3.15c; Eastern Mich. 3.20c; Pacific ports 3.70-3.39c; Phila. del. 3.37c; New York del. 3.39c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.70c; Granite City, base 3.80c; New York del. 3.84c; Phila. del. 3.78c; Pacific ports 4.25c. (Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 28 gage, per square 3.3

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage not corrugated, copper alloy 3.60c; Granite City 3.70c; Pacific ports 4.25c; copper iron, 3.90c; pure iron 3.85c; 18 coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.25c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 2.85c; Granite City, base 2.95c; Detroit, del. 2.95c; eastern, Mich. 3.00c; Pacific ports 3.50c; 20-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.45c; Detroit del. 3.55c; eastern Mich. 3.60c; Pacific ports 4.10c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.30c	4.05c	3.30c
Armature	3.65c	4.40c	3.75c
Electrical	4.15c	4.90c	4.25c
Motor	5.05c	5.80c	5.15c
Dynamo	5.75c	6.50c	5.85c
Transformer			
72	6.25c	7.00c	....
65	7.25c	8.00c	.....
58	7.75c	8.50c	.....
52	8.55c	9.30c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.20c; Eastern Mich. 2.25c; Pacific ports 2.75c

Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.90c; Eastern Mich. 2.95c; Worcester base 3.00c.

Commodity C. R. Strip: Pittsburgh, Cleveland Youngstown, base 3 tons and over, 2.95c; Chicago 3.05c; Detroit del. 3.05c; Eastern Mich. 3.10c; Worcester base 3.25c.

Cold Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, $5.00; Granite City $5.10.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb. base box, 0.25 lb. tin, $4.35; 0.50 lb. tin, $4.60; 0.75 lb. tin $4.65; Granite City, $4.45, $4.60, $4.75, respectively

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed, 4.05c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 28 unassorted 3.80c; Pacific ports 4.55c.

Manufacturing Ternes: (Special Coated) Pittsburgh, Chicago, Gary, 100-base box $4.30; Granite City $4.40.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb. $12.00; 15-lb. $14.00; 20-lb. $15.60; 25-lb. $16; 30-lb. $17.25; 40-lb. $19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.25c; New York, del. 2.44c; Phila., del. 2.30c; St. Louis, 2.49c; Boston, del. 2.57-82c; Pacific ports, 2.80c; Gulf ports, 2.60c.

Granite City Steel Co. may quote carbon plates 2.35c f.o.b. mill; 2.65c f.o.b. D.P.C. mill; Kaiser Co. Inc., 3.20c, f.o.b. Los Angeles. **Central Iron & Steel Co.** 2.50c f.o.b. basing points; Geneva Steel Co., Provo, Utah, 3.20c, (Utah, Pac. ports.)

Floor Plates: Pittsburgh, Chicago, 3.50c; Pacific ports, 4.15c; Gulf ports, 3.85c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c; Gulf ports 3.95c; Pacific ports 4.15c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del. 2.27c; Phila., del. 2.215c; Pacific ports, 2.75c; Gulf ports, 2.45c.

Phoenix Iron Co., Phoenixville, Pa., may have the equivalent of 2.45c, Bethlehem, Pa., on the general range and 2.55c on beams and channels from 4 to 10 inches.)

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham to manufacturers in carloads.

Bright basic, bessemer wire ..... •2.75c

Spring wire ..... •†3.35c

Wire Products to the Trade:

Standard and cement-coated wire nails, box staples, 100-lb. keg, Pittsburgh, Chicago, Birmingham, Cleveland, $3.90; Pac. ports, $3.40; galvanized, $3.55 and $3.05, resp.

Galvanized Merchant quality wire, 100-lb. Pittsburgh, Chicago, Cleveland, Birmingham ..... ††$3.20

Galvanized Merchant quality wire, 100-lb. Pittsburgh, Chicago, Cleveland, Birmingham ..... ††$3.55

Woven fence, 15½ gage and heavier, per base column 67

Barbed wire, 80-rod spool, Pittsburgh, Chicago, Cleveland, Birmingham, column 72; twisted cross wire, column 72.

•Pittsburgh Steel Co., 0.20c higher; add 10 cents for Worcester, 1 cent for Duluth; add 20-cent for bright, annealed or galvanized and 30-cent for other finishes for Pacific ports. Same bases as for bright basic except Birmingham.

††Add 10 cents for Worcester; 50 cents for galvanized, bright basic and 70 cents for all other finishes for Pacific ports.

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 Weld

Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
⅛	56	33	¼	24	3½
¼ & ⅜	59	40½	⅜	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
2	61	49½	1¼	23	3½
2¼-3	64	54½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½-3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	12

Boiler Tubes: Net base prices per 100 feet f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

		—Seamless—		—Lap Weld—	
O.D Sizes	B.W.G	Hot Rolled	Cold Drawn	Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	.....

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, $43.00. Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $45.00.

•Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $31-$33.

Supplies: Track bolts, 4.75c; heat treated, 5.00c. Tie plates $46 net ton, base, Standard spikes, 3.25c.

•Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb.; Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.

Tung	Chr.	Van.	Moly.	Base, per lb.
18.00	4	1	....	67.00c
1.5	4	1	8.5	54.00c
.....	4	2	8	54.00c
6.40	4.15	1.90	5	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.

CHROMIUM NICKEL STEEL

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	....	.....
•316	40.00	44.00	48.00	40.00	48.00
†321	29.00	34.00	41.00	29.25	38.00
‡347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIGHT CHROMIUM STEEL					
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡430F	19.50	22.50	29.50	18.75	24.50
440A	24.00	28.50	33.50	23.75	36.50
442	22.50	25.50	32.50	24.00	32.00
443	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
STAINLESS CLAD STEEL (20%)					
304	.....	‡‡18.00	19.00	.....	.....

•With 2-3% moly. ‡With titanium. †With columbium. **Plus machining agent. ††High carbon. ‡‡Free machining. ‡‡Includes annealing and pickling.

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago Birmingham

Structural 3.75c

⅞- inch and under ..... 65-5 off

Wrought, Washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l. ..... $2.75-3.00 off

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅝ and ⅞ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	55 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 with nuts separate 71-10 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Nuts

	U.S.S.	S.A.E.
Semifinished hex	62	64
⅞-inch and less	59	60
1-1-inch	57	58
1⅛-1½-inch	56	--
1⅝ and larger		

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	71 off
Headless, ¼-in., larger	68 off
No. 10, smaller	70 off

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.

Extra mean additions or deductions from base prices in effect April 16, 1941.

Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.

Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price.

Seconds, maximum prices: flat-rolled rejects 75% of prime prices, wasters 75%, waste-wasters 65% except plates, which take waster prices; tin plate $2.80 per 100 lbs.; terne plate $2.25; semifinished 85% of primes; other grades limited to new material ceilings.

Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	•7.50
Connellsville, foundry	8.00- 8.50
New River, foundry	9.00- 9.25
Wise county, foundry	7.75- 8.25
Wise county, furnace	7.25- 7.75

By-Product Foundry

Kearney, N. J., ovens	12.65
Chicago, outside delivered	13.00
Chicago, delivered	13.75
Terre Haute, delivered	12.80
Milwaukee, ovens	13.75
New England, delivered	14.65
St. Louis, delivered	†13.75
Birmingham, delivered	10.90
Indianapolis, delivered	13.50
Cincinnati, delivered	12.25
Cleveland, delivered	13.20
Buffalo, delivered	15.40
Detroit, delivered	15.75
Philadelphia, delivered	13.25

•Operators of hand-drawn ovens using trucked coal may charge $8.00; effective May 26, 1945. †14.25 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do., less than car lots	13.25c
Do., tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls., to jobbers	3.50c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$20.20

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras.

	Hot rolled bars	Structural shapes	Plates	Floor plates	Hot rolled sheets (10 gage base)	Hot rolled bands (12 gage and heavier)	Hot rolled hoops (14 gage and lighter)	Galvanized flat sheets (24 gage base)	Cold-rolled sheets (17 gage base)	Cold finished bars	Cold-rolled strip	NE hot bars 8600 series	NE hot bars 9400 series
Boston	4.044[1]	3.912[1]	3.912[1]	5.727[1]	3.774[1]	4.106[1]	5.106[1]	5.224[14]	4.744[14]	4.244[13]	4.715	6.012[23]	6.012[23]
New York	3.853[1]	3.758[1]	3.768[1]	5.574[1]	3.590[1]	3.974[1]	3.974[1]	5.010[12]	4.613[14]	4.203[21]	4.774	.....	.....
Jersey City	3.853[1]	3.747[1]	3.768[1]	5.574[1]	3.590[1]	3.974[1]	3.974[1]	5.010[12]	4.613[14]	4.203[21]	4.774	.....	.....
Philadelphia	3.822[1]	3.666[1]	3.605[1]	5.272[1]	3.518[1]	3.922[1]	4.272[1]	5.018[15]	4.872[25]	4.172[21]	4.772	5.816[25]	5.860[25]
Baltimore	3.802[1]	3.759[1]	3.594[1]	5.252[1]	3.394[1]	3.902[1]	4.252[1]	4.894[1]	4.852[25]	4.152[21]	.....	.....	.....
Washington	3.941[2]	3.930[1]	3.796[1]	5.341[1]	3.596[1]	4.041[1]	4.391[1]	5.196[17]	4.841[30]	4.141[21]	.....	.....	.....
Norfolk, Va.	4.065[1]	4.002[1]	3.971[2]	5.465[1]	3.771[1]	4.165[1]	4.515[1]	5.371[17]	4.965[24]	4.265[21]	.....	.....	.....
Bethlehem, Pa.*	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del*	.....	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.35[1]	3.40[1]	3.63[1]	5.26[1]	3.35[1]	3.819[1]	3.819[1]	4.75[15]	4.40[10]	3.85[21]	4.669	5.60[23]	5.75[23]
Buffalo (country)	3.25[1]	3.30[1]	3.30[1]	4.90[1]	3.25[1]	3.81[1]	3.50[1]	4.65[15]	4.30[10]	3.75[21]	4.35	5.60[23]	5.75[23]
Pittsburgh (city)	3.35[1]	3.40[1]	3.40[1]	5.00[1]	3.35[1]	3.60[1]	3.60[1]	4.75[15]	4.40[24]	3.85[21]	.....	.....	.....
Pittsburgh (country)	3.25[1]	3.30[1]	3.30[1]	4.90[1]	3.25[1]	3.50[1]	3.50[1]	4.65[15]	4.30[24]	3.75[21]	.....	.....	.....
Cleveland (city)	3.35[1]	3.588[1]	3.40[1]	5.188[1]	3.35[2]	3.60[1]	3.60[1]	4.877[15]	4.40[24]	3.85[21]	4.45[21]	5.60[23]	5.85[23]
Cleveland (country)	3.25[1]	.....	3.30[1]	.....	3.25[1]	3.50[1]	3.50[1]	.....	4.30[24]	3.75[21]	4.35[21]	.....	.....
Detroit	3.450[1]	3.661[1]	3.609[1]	5.281[1]	3.450[1]	3.700[1]	3.700[1]	5.000[12]	4.500[24]	3.900[21]	4.659	5.93[23]	5.93[23]
Omaha (city, delivered)	4.115[1]	4.165[1]	4.165[1]	5.765[1]	3.865[1]	4.215[1]	4.215[1]	5.608[19]	5.443[24]	4.543[13]	.....	.....	.....
Omaha (country, base)	4.015[1]	4.065[1]	4.065[1]	5.665[1]	3.765[1]	4.115[1]	4.115[1]	5.508[19]	.....	.....	.....	.....	.....
Cincinnati	3.611[1]	3.691[1]	3.661[1]	5.291[1]	3.425[1]	3.675[1]	3.675[1]	4.825[12]	4.475[24]	4.111[21]	4.711	6.10	6.20
Youngstown, O.*	.....	.....	.....	.....	.....	.....	.....	4.40[12]	.....	.....	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.25[1]	3.50[1]	3.50[1]	4.65[16]	.....	.....	.....	.....	.....
Chicago (city)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.25[1]	3.60[1]	3.60[1]	5.231[15]	4.20[24]	3.85[21]	4.65	5.75[23]	5.85[23]
Milwaukee	3.637[1]	3.687[1]	3.687[1]	5.287[1]	3.387[1]	3.737[1]	3.737[1]	5.272[15]	4.337[24]	3.987[21]	4.787	5.987[23]	6.087[23]
Indianapolis	3.58[1]	3.63[1]	3.63[1]	5.23[1]	3.518[1]	3.768[1]	3.768[1]	4.918[15]	4.568[24]	4.08[21]	4.78	6.08[23]	6.18[23]
St. Paul	3.76[2]	3.81[2]	3.81[2]	5.41[2]	3.51[2]	3.86[2]	3.86[2]	5.257[15]	4.46[24]	4.461[21]	5.102	6.09[23]	6.19[23]
St. Louis	3.647[1]	3.697[1]	3.697[1]	5.297[1]	3.397[1]	3.747[1]	3.747[15]	5.172[15]	4.347[24]	4.131[21]	4.931	6.131[23]	6.281[23]
Memphis, Tenn.	4.015[5]	4.065[5]	4.065[5]	5.78[5]	3.965[5]	4.215[5]	4.215[5]	5.265[15]	4.78[24]	4.43[21]	.....	.....	.....
Birmingham	3.50[1]	3.55[1]	3.55[1]	5.903[1]	3.45[1]	3.70[1]	3.70[1]	4.75[15]	4.852[24]	4.64	5.215	.....	.....
New Orleans (city)	4.10[4]	3.90[4]	3.90[4]	5.85[4]	4.058[4]	4.20[4]	4.20[4]	5.25[26]	5.079[19]	4.70[21]	5.429	.....	.....
Houston, Tex.	3.75[3]	4.25[3]	4.25[3]	5.50[3]	3.763[3]	4.313[6]	4.313[3]	5.313[26]	4.10[19]	3.75[22]	.....	.....	.....
Los Angeles	4.40[4]	4.65[4]	4.95[4]	7.20[4]	5.00[4]	4.95[4]	6.75[4]	6 00[13]	7.20[6]	5.683[22]	5.613	5.85[23]	5.95[23]
San Francisco	4.15[7]	4.35[7]	4.65[7]	6.35[7]	4.55[7]	4.50[7]	5.75[7]	6.35[15]	7.30[15]	5.433[21]	7.333	8.304[23]	8.404[23]
Portland, Oreg.	4.45[27]	4.45[27]	4.75[27]	6.50[27]	4.65[27]	4.75[27]	6.30[27]	5.75[15]	6.60[15]	5.633[15]	.....	.....	8.00[28]
Tacoma	4.35[6]	4.45[6]	4.75[6]	6.50[6]	4.65[6]	4.25[6]	5.45[6]	5.95[15]	7.60[15]	5.883[21]	.....	.....	8.00[28]
Seattle	4.35[6]	4.45[6]	4.75[6]	6.50[6]	4.65[6]	4.25[6]	5.45[6]	5.95[15]	7.05[15]	5.883[21]	.....	.....	.....

*Basing point cities with quotations representing mill prices, plus warehouse spread.
NOTE—All prices fixed by Office of Price Administration in Amendments Nos. 10 to 33 to Revised Price Schedule No. 49. Deliveries outside above cities computed in accordance with regulations.

BASE QUANTITIES

[1]400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]— 300 to 4999 pounds.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% f.e.b. Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

(Equivalent OPA schedules):

Gross ton f.o.b. 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	$41.00
48% 3:1	43.50
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	43.50
Domestic (seller's nearest rail)	
48% 3:1	52.80
less $7 freight allowance	

Manganese Ore

Sales prices of Metals Reserve Co., cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85.0c; Fontana, Calif., Provo, Utah, and Pueblo, Colo. 91.0c; prices include duty on imported ore and are subject to premiums, penalties and other provisions of amended M.P.R. No. 2[illegible] effective as of May 15. Price basing points which are also points of discharge of imported manganese ore is f.o.b. cars, shipside, dock most favorable to the buyer.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.7[illegible]

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Basic open-hearth Electric furnace

Designation	Chemical Composition Limits, Per Cent — Carbon	Mn.	Si.	Cr.	Ni.	Mo.	Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per G
NE 8612	.10-.15	.70-.90	.20-.35	.40-.60	.40-.70	.15-.25	$0.65	$13.00	$1.15	$23.[illegible]
NE 8720	.18-.23	.70-.90	.20-.35	.40-.60	.40-.70	.20-.30	.70	14.00	1.20	$4.[illegible]
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.25	$5.[illegible]
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.30	$6.[illegible]
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.80	16.00	1.15	$3.[illegible]
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.65	13.00	1.80	$4.[illegible]
NE 9830	.28-.33	.70-.90	.20-.35	.70-.90	.85-1.15	.20-.30	1.30	26.00	1.55	$1.[illegible]
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	1.55	$1.[illegible]
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00		

Extras are in addition to a base price of 2.70c, per pound on finished products and $54 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

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 11 effective June 10, 1941, amended Feb. 14, and Oct. 22, 1945. Exceptions indicated in footnotes. Base prices bold face, delivered light face. Federal tax on freight charges, effective Dec. 1, 1942, not included.

	Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$26.75	$26.25	$27.75	$27.25
Newark, N. J., del.	28.28	27.78	29.28	28.78
Brooklyn, N. Y., del.	29.25	.....	.....	29.75
Birdsboro, Pa., base	26.75	26.25	27.75	27.25
Birmingham, base	22.13	20.75	26.75	.....
Baltimore, del.	27.36	.....	.....	.....
Boston, del.	26.89	.....	.....	.....
Chicago, del.	25.97	.....	.....	.....
Cincinnati, del.	25.81	24.48	.....	.....
Cleveland, del.	25.87	24.99	.....	.....
Newark, N. J.	27.90	.....	.....	.....
Philadelphia, del.	27.21	26.71	.....	.....
St. Louis, del.	25.87	24.99	.....	.....
Buffalo, base	25.75	24.75	26.75	26.25
Easton, del.	27.25	26.75	28.25	27.75
Rochester, del.	27.28	.....	28.28	27.78
Syracuse, del.	27.83	.....	28.83	28.33
Niagara, base	25.75	25.25	26.25	25.75
Milwaukee, del.	26.85	26.35	27.35	26.85
Muskegon, Mich., del.	28.94	.....	.....	28.94
Portland, base	25.75	25.25	26.25	25.75
Akron, Canton, O., del.	27.14	26.64	27.64	27.14
Everett, base	25.75	25.25	26.25	25.75
Saginaw, Mich., del.	28.06	27.56	28.56	28.06
Duluth, base	26.25	25.75	26.75	26.25
St. Paul, del.	28.38	27.88	28.88	28.38
E. Pa., base	25.75	25.25	26.75	26.25
Everett, Mass., base	26.75	26.25	27.75	27.25
Easton, del.	27.25	26.75	28.25	27.75
Granite City, Ill., base	25.75	25.25	26.25	25.75
St. Louis, del.	26.25	25.75	.....	26.25
Canton, O., base	25.75	25.25	.....	25.75
Cincinnati, del.	26.19	26.36	.....	26.86
Rhode Island, Pa., base	25.75	25.25	26.25	25.75
Pittsburgh, del.				
No. & So. sides	26.44	25.94	26.94	26.44
Provo, Utah, base	23.75	23.25	.....	.....
Brownsville, Pa., base	25.75	25.25	26.25	25.75
Struthers Point, base	26.75	26.25	.....	.....
Steelton, del.	27.74	.....	.....	.....
Sweden, Pa., base	.....	26.25	.....	27.25
Swedeland, Pa., base	26.75	26.25	27.75	27.25
Philadelphia, del.	27.59	27.09	.....	28.09
Toledo, O., base	25.75	25.25	26.25	25.75
Youngstown, O., base	25.75	25.25	26.25	25.75
Mansfield, O., del.	27.69	27.19	28.19	27.69

Base grade, silicon 1.75-2.25%; add 50 cents for each additional 0.25% Si, or portion thereof; deduct 50 cents for silicon below 1.75% on foundry iron. †For McKees Rocks, Pa., add .55 to Neville Island base; Connellsville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa, Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Aspinwall, Brackenbridge 1.24.

Note: Add 50 cents per ton for each 0.50% manganese or portion thereof over 1.00%.

Nickel differentials: Under 0.50%, no extra; 0.50% to 0.74% incl., $2 per ton; for each additional 0.25% nickel, $1 per ton.

High Silicon, Silvery

6.00-6.50 per cent (base)	$31.25		
6.51-7.00	$32.25	9.01- 9.50	37.25
7.01-7.50	33.25	9.51-10.00	38.25
7.51-8.00	34.25	10.01-10.50	39.25
8.01-8.50	35.25	10.51-11.00	40.25
8.51-9.00	36.25	11.01-11.50	41.25

F.o.b. Jackson county, O., per gross ton, Buffalo base $1.25 higher, whichever is most favorable to buyer. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Electric Furnace Ferrosilicon: Sil. 14.01 to 14.50%, $45.50; each additional .50% silicon up to and including 18% add $1; low impurities not exceeding 0.05 Phos., 0.40 Sulphur, 1.0% Carbon, add $1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Northern

Lake Superior Furn. $34.00
Chicago, del. 37.34

Southern

Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn. $33.00 (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $25.25
Valley base 25.25

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $31.25 base; $32.49, del. Philadelphia. Intermediate phos., Central Furnace, Cleveland, $28.25.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differential: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorus Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorus content of 0.70% and over.

Ceiling Prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Ceiling Prices: Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic, Bessemer and Malleable. Mystic Iron Works, Everett, Mass., may exceed basing point prices by $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $68.50

First Quality

Pa., Ill., Md., Mo., Ky.	54.40
Alabama, Georgia	54.40
New Jersey	58.35
Ohio	47.70

Second Quality

Pa., Ill., Md., Mo., Ky.	49.35
Alabama, Georgia	40.80
New Jersey	52.00
Ohio	38.15

Malleable Bung Brick

All bases 68.45

Silica Brick

Pennsylvania	54.40
Joliet, E. Chicago	62.45
Birmingham, Ala.	54.40

Ladle Brick
(Pa., O., W. Va., Mo.)

Dry Press	32.90
Wire Cut	30.30

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk 22.90
net ton, bags 26.60

Basic Brick

net ton, f.o.b. 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, f.o.b. Ill., Ky., net tons, carloads, CaF_2 content, 70% or more, $33; 65 but less than 70%, $32; 60 but less than 65% $31; less than 60%, $30. After Aug. 29 base price any grade $30.00 war chemicals.

Ferroalloy Prices

Ferromanganese (standard) 78-82% Mn, gross ton, duty paid, $135 f.o.b. cars Baltimore, Philadelphia or New York, whichever is most favorable to buyer; Rockdale or Rockwood, Tenn., where Tennessee Products Corp. is producer; Birmingham, Ala., where Sloss-Sheffield Steel & Iron Co. is producer; $140 f.o.b. cars, Pittsburgh, where Carnegie-Illinois Steel Corp. is producer; add $6 for export, $10 for ton, $13.50 for long ton; $1.70 for each 1%, or fraction contained manganese over 82% and under 78%.

Ferromanganese (Low and Medium Carbon); per lb. contained manganese: eastern zone, low carbon, bulk, c.l., 23c; 2000 lb. to c.l., 24c; medium, 14.50c and 15.20c; bulk, low carbon, bulk, c.l., 2000 lb to c.l., 24.40c; medium 14.80c and 16.20c; western zone, low carbon, bulk, c.l., 24.50c, 2000 lb. to c.l., 25.40c; medium, 15.20c and 17.20c; f.o.b. shipping point, freight allowed.

Spiegeleisen: 19-21% carlots per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Electrolytic Manganese: 99.9% plus, carlots, per lb. 37.6 cents.

Chromium Metal: 97% min. chromium, 2% max. .50% carbon, eastern zone, per lb. contained chromium in carlots, c.l., 79.50c, 2000 lb. to c.l., central 81c and 82.50c; western 82.25c and 84.75c; f.o.b. shipping point, freight allowed.

Ferrocolumbium: 50-60%, per lb. of contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: High carbon, eastern zone, bulk, c.l., 13c, 2000 lb. to c.l. 13.90c; central, add .40c and .65c; western, add 1c and 1.85c—high nitrogen, high carbon ferrochrome; Add 5c to all high carbon ferrochrome prices; all zones; low carbon eastern, bulk, c.l. max. 0.06% carbon, 23c, 0.10% 22.50c, 0.15% 22c, 0.20% 21.50c, 0.50% 21c, 1.00% 20.50c, 2.00% 19.50c; 2000 lb. to c.l., 0.06% 24c, 0.10% 23.50c, 0.15% 23c, 0.20% 22.50c, 0.50% 22c, 1.00% 21.50c, 2.00% 20.50c; central, add .4c for bulk, c.l. and .65 for 2000 lb. to c.l.; western, add 1c for bulk, c.l. and 1.85c for 2000 lb. c.l.; carload packed differential .45c; f.o.b. shipping point, freight allowed. Prices per lb. contained Cr high nitrogen, low carbon ferrochrome: Add 2c to low carbon ferrochrome prices; all zones. For higher nitrogen carbon add 2c for each .25% of nitrogen over 0.75%.

Special Foundry ferrochrome: (Chrom. 62-66%, car. approx. 5-7%) Contract, carload, bulk 13.50c, packed 13.95c, ton lots 14.40c, less, 14.90c, eastern, freight allowed, per pound contained chromium; 13.90c, 14.35c, 15.05c and 15.55c central; 14.50c, 14.95c, 16.25c and 16.75c, western; spot up .25c.

S.M. Ferrochrome, high carbon: (Chrom: 60-65%, sil. 4-6%, mang. 4-6% and carbon 4-6%.) Contract, carlot, bulk, 14.00c, packed 14.45c, ton lots 14.90c, less 15.40c, eastern, freight allowed; 14.40c, 14.85c, 15.55c and 16.05c, central; 15.00c, 15.45c, 16.75c and 17.25c, western; spot up .25c; per pound contained chromium.

S.M. Ferrochrome, low carbon: (Chrom. 62-66%, sil. 4-6%, mang. 4-6% and carbon 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up .25c.

SMZ Alloy: (Silicon 60-65%, Mang. 5-7%, zir. 5-7% and iron 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 .25c.

Silcaz Alloy: (Sil. 35-40%, cal. 9-11%, alum. 6-8%, zir. 3-5%, tit. 9-11% and boron 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 .25c.

Silvaz Alloy: (Sil. 35-40%, van. 9-11%, alum. 5-7%, zir. 5-7%, tit. 9-11% and boron 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 ¼c.

CMSZ Alloy 4: (Chr. 45-49%, mang. 4-6%, sil. 18-21%, zir. 1.25-1.75%, and car. 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 .25c.

CMSZ Alloy 5: (Chr. 50-56%, mang. 4-6%, sil. 13.50-16.00%, zir. .75-1.25%, car. 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 and 12.50c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up .25c.

Ferro-Boron: (Bor. 17.50% min., sil. 1.50% max., alum. 0.50% max. and car. 0.50% max.) per lb. of alloy contract ton lots, $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Manganese-Boron: (Mang. 75% approx., boron 15-20%, iron 5% max. sil. 1.50% max. and carbon 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: (Bor. 15-18%, alum. 1% max., sil. 1.50% max., car. 0.50% max., iron 3% max., nickel, balance), per lb. of alloy. Contract, 5 tons or more, $1.90, 1 ton to 5 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.

Chromium-Copper: (Chrom. 8-11%, cu. 88-90%, iron 1% max. sil. 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.

Vanadium Oxide: (Fused: Vanadium oxide 85-88%, sodium oxide approx. 10% and calcium oxide, approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx.

2.5%) Contract, any quantity, $1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, $1.105, less carlots, $1.108, central; $1.118 and $1.133, western; spot add 5c to contracts in all cases.

Calcium metal; cast: Contract ton lots or more $1.80, less, $2.30, eastern zone, freight allowed, per pound of metal; $1.809 and $2.309 central, $1.849 and $2.349, western; spot up 5c.

Calcium-Manganese-Silicon: (Cal. 16-20% mang. 14-18% and sil. 58-59%), 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; 18.65c, 19.10c and 19.60c western; spot up .25c.

Calcium-Silicon: (Cal. 30-35%, sil. 60-65% and iron 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 .25c.

Briquets, Ferromanganese: (Weight approx. 3 lbs. and containing exactly 2 lbs. mang.) per lb. of briquets. Contract, carlots, bulk .0605c, packed .063c, tons .0655c, less .068c eastern freight allowed; .063c, .0655c, .0755c and .078c, central; .066c, .0685c, .0855c, and .088c, western; spot up .25c.

Briquets: Ferrochrome, containing exactly 2 lb. cr., eastern zone, bulk, c.l., 8.25c per lb. of briquets, 2000 lb. to c.l., 8.75c; central, add .3c for c.l. and .5c for 2000 lb. to c.l.; western add .70c for c.l., and .2c for 2000 lb. to c.l.; silicomanganese, eastern, containing exactly 2 lb. manganese and approx. ½ lb. silicon, bulk, c.l., 5.80c, 2000 lbs. to c.l., 6.30c; central, add .25c for c.l. and 1c for 2000 lb. to c.l.; western, add .5c for c.l., and 2c for 2000 lb. to c.l.; **ferrosilicon,** eastern, approx. 5 lb., containing exactly 2 lb. silicon, or weighing approx. 2½ lb. and containing exactly 1 lb. of silicon, bulk, c.l., 3.35c, 2000 lb. to c.l., 3.80c; central, add 1.50c for c.l., and .40c for 2000 lb. to c.l.; western, add 3.0c for c.l. and .45c for 2000 to c.l.; f.o.b. shipping point, freight allowed.

Ferromolybdenum: 55-75% per lb. contained molybdenum f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Eastern zone, 90-95%, bulk, c.l., 11.05c, 2000 lb. to c.l., 12.30c; 80-90%, bulk c.l., 8.90c, 2000 lb. to c.l., 9.95c; 75%, bulk, c.l., 8.05c, 2000 lb. to c.l., 9.05c; 50%, bulk c.l., 6.65c and 2000 lb. to c.l., 7.85c; central 90-95%, bulk, c.l., 11.20c, 2000 lb. to c.l., 12.80c; 80-90%, bulk, c.l., 9.05c, 2000 to c.l., 10.45c; 75%, bulk, c.l., 8.20c, 2000 lb. to c.l., 9.65c; 50% bulk, c.l., 7.10c, 2000 lb. to c.l., 9.70c; western, 90-95%, bulk, c.l., 11.65c, 2000 lb. to c.l., 15.60c; 80-90%, bulk, c.l., 9.55c, 2000 lb. to c.l., 13.50c; 75%, bulk, c.l., 8.75c, 2000 to c.l., 13.10c; 50%, bulk, c.l., 7.25c, 2000 to c.l., 8.75c; f.o.b. shipping point, freight allowed. Prices per lb. contained silicon.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all f.o.b. Bridgeville, Pa., usual freight allowance.

Silicon Metal: Min. 97% silicon and max. 1% iron, 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% silicon and max. 2% iron, 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 f.o.b. shipping point, freight allowed. Price per lb. contained silicon.

Manganese Metal: (96% min. manganese, max. 2% iron), 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.

Ferrotungsten: Spot, carlots, per lb. contained tungsten, $1.90; freight allowed as far west as St. Louis.

Tungsten Metal Powder. Spot, not less than 97 per cent, $2.50-$2.60; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb. contained titanium; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5 cents per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots $1.35; less-ton lots $1.40 eastern. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20% contract basis, per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi River and North of Baltimore and St. Louis, 6.8% carbon $142.50; 3-5% carbon $157.50.

Carbortam: Boron 0.90 to 1.15% net ton to carload, 8c lb. f.o.b. Suspension Bridge, N. Y., frt. allowed same as high-carbon ferrotitanium.

Bortam: Boron 1.5-1.9%, ton lots 45c lb., less ton lots 50c lb.

Ferrovanadium: 35-55%, contract basis, per lb. contained vanadium, f.o.b. producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Zirconium Alloys: 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 ¼c per ton higher.

Zirconium Alloy: 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 ¼ cent higher.

Alsifer: (Approx. 20% aluminum, 40% silicon, 40% iron) contract basis f.o.b. Niagara Falls, N. Y., per lb. 5.75c; ton lots 6.50c. Spot ½ cent higher.

Siminal: (Approx. 20% each Si., Mn., Al.) Contract, frt. all. not over St. Louis rate, per lb. alloy; carlots 8c; ton lots 8.75c; less ton lots 9.25c.

Borosil: 3 to 4% boron, 40 to 45% Si., $6.25 lb. cont. Bo., f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to page 15 of Sept. 4, 1944, issue of STEEL. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25

Cast Grades

(F.o.b. Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices.)

No. 1 Heavy Melt. Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstrip Motor Blocks	17.50
Stove Plate	19.00

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec Furnace Bundles	20.50

BOSTON:

(F.o.b. shipping points)

No. 1 Heavy Melt. Steel	$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.81
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

Boston Differential 99 cents higher, steel-making grades; Providence $1.09 higher.

PITTSBURGH:

(Delivered consumer's plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Hvy Melt.	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD, O.:

(Delivered consumer's plant)

Machine Shop Turnings	15.00

BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	$22.00
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	8.50- 9.00
Cast Iron Borings	8.50- 9.00
Iron Car Wheels	16.50-17.00

CHICAGO:

(Delivered consumer's plant)

No. 1 R.R. Hvy Melt.	$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dlr. Bundles	18.75
Baled Mach. Shop Turn	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

(Cast grades f.o.b. shipping point, railroad grades f.o.b. tracks)

BUFFALO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
Low Phos.	21.75

DETROIT:

(Dealers' buying prices.)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

ST. LOUIS

(Delivered consumer's plant)

Heavy Melting	17.50
No. 1 Locomotive Tires	20.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.5
Shoveling Turnings	12.5
Rerolling Rails	21.0
Steel Car Axles	21.50-22.0
Steel Rails, 3 ft.	21.5
Steel Angle Bars	21.0
Cast Iron Wheels	20.0
No. 1 Machinery Cast	20.0
Railroad Malleable	22.0
Breakable Cast	16.5
Stove Plate	18.0
Grate Bars	15.2
Brake Shoes	15.2
(Cast grades f.o.b. shipping point	
Stove Plate	

CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.5
No. 2 Heavy Melt. Steel	18.5
No. 1 Comp. Bundles	18.5
No. 2 Comp. Bundles	18.5
Machine Turnings	9.50-10.0
Shoveling Turnings	11.50-12.0
Cast Iron Borings	11.00-11.5
Mixed Borings, Turnings	10.50-11.0
No. 1 Cupola Cast	20.0
Breakable Cast	16.5
Low Phosphorus	21.00-21.5
Scrap Rails	20.50-21.0
Stove Plate	16.00-16.5

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.0
No. 2 Heavy Melt. Steel	13.0
No. 1, 2, Deal. Bundles	12.0
Machine Turnings	4.0
Mixed Borings, Turnings	4.0
No. 1 Cast	20.0

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$15.0
No. 2 Heavy Melt. Steel	14.0
No. 1 Busheling	14.0
No. 1, No. 2 Bundles	13.0
No. 3 Bundles	7.0
Machine Turnings	7.0
Billet, Forge Crops	15.0
Bar Crops, Plate	15.0
Cast Steel	15.0
Cut, Structural, Plate, 1", under	15.0
Alloy-free Turnings	14.0
Tin Can Bundles	14.0
No. 2 Steel Wheels	20.0
Iron, Steel Axles	15.0
No. 2 Cast Steel	15.0
Uncut Frogs, Switches	15.0
Scrap Rails	15.0
Locomotive Tires	15.0

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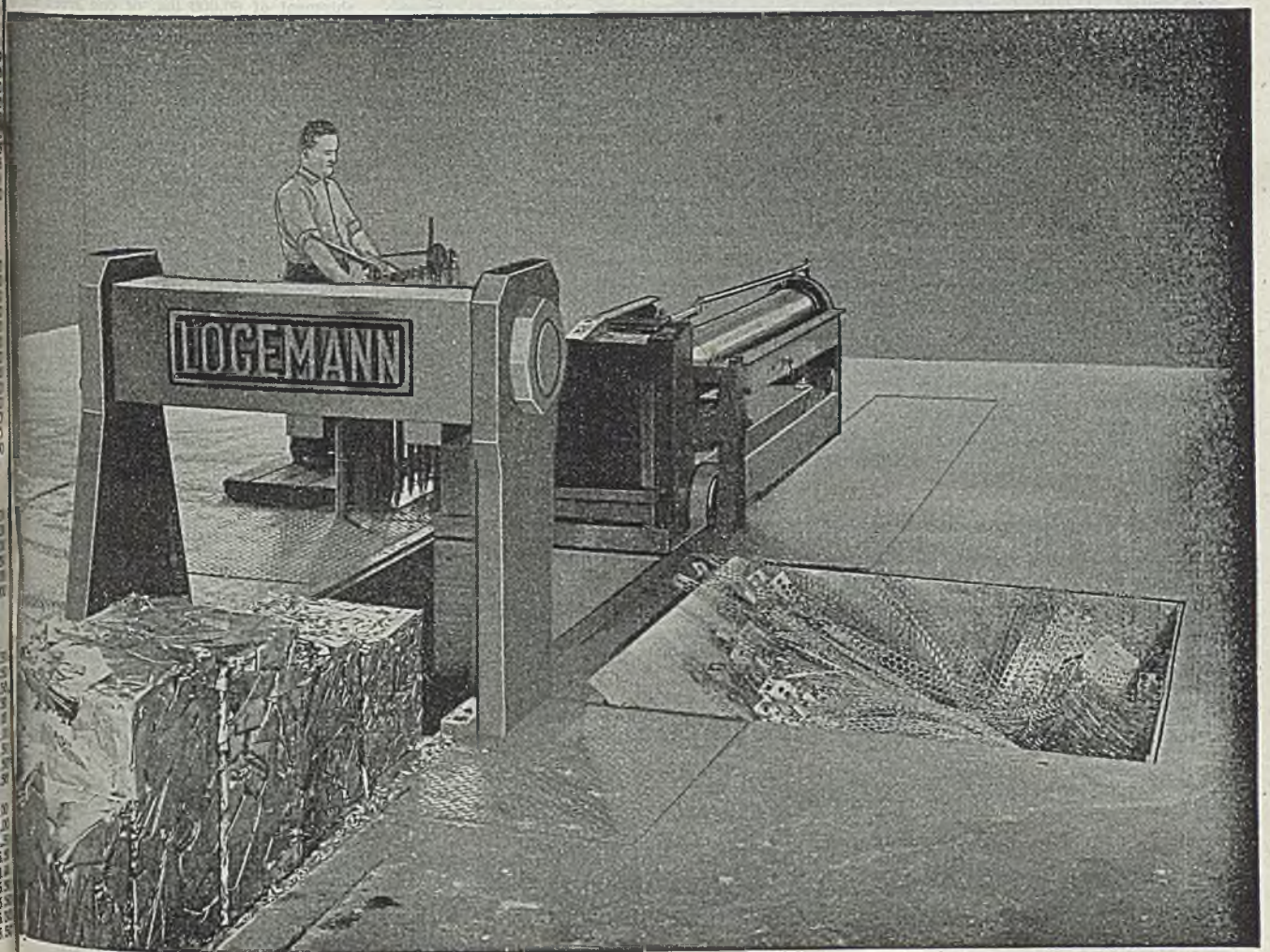


NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 12.00c, Del. Conn., less carlots 12.12½c, refinery; dealers may add ¼c for 5000 lbs. to carload; 1000-4999 lbs. 1c; 500-999 1¼c; 0-499 2c. Castings, 11.75c, refinery for 20,000 lbs., or more, 12.00c less than 20,000 lbs.

Brass Ingot: Carlot prices, including 25 cents per hundred freight allowance; add ¼c for less than 20 tons; 85-5-5-5 (No. 115) 13.00c; 88-10-2 (No. 215) 16.50c; 80-10-10 (No. 305) 15.75c; Navy G (No. 225) 16.75c; Navy M (No. 245) 14.75c; No. 1 yellow (No. 405) 10.00c; manganese bronze (No. 420) 12.75c.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis, for carlots. For 20,000 lbs. to carlots add 0.15c; 10,000-20,000 0.25c; 2000-10,000 0.40c; under 2000 0.50c.

Lead: Common 6.35c, chemical, 6.40c, corroding, 6.45c, E. St. Louis for carloads; 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 Lsland.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lbs. and over; add ½c 2000-9999 lbs.; 1c less through 2000 lbs.

Secondary Aluminum: All grades 12.50c per lb. except as follows: Low grade piston alloy (No. 122 type) 10.50c; No. 12 foundry alloy (No. 2 grade) 10.50c; chemical warfare service ingot (92½% plus) 10.00c; steel deoxidizers in notch bars, granulated or shot, Grade 1 (95-97½%) 11.00c, Grade 2 (92-95%) 9.50c to 9.75c, Grade 3 (90-92%) 8.50c to 8.75c, Grade 4 (85-90%) 7.50c to 8.00c; any other ingot containing over 1% iron, except PM 754 and hardness, 12.00c. Above prices for 30,000 lb. or more; add ¼c 10,000-30,000 lb.; ½c 1000-10,000 lbs.; 1c less than 1000 lbs. Prices include freight at carload rate up to 75 cents per hundred.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lbs.) 20.50c lb., add 1c for special shapes and sizes. Alloy ingots, incendiary bomb alloy, 23.40c; 50-50 magnesium-aluminum, 23.75c; ASTM B93-41T, Nos. 2, 3, 4, 12, 13, 14, 17, 23.00c; Nos. 4X, 11, 13X, 17X, 25.00c; ASTM B-107-41T, or B-90-41T, No. 8X, 23.00c; No. 18, 23.50c; No. 18X, 25.00c. Selected magnesium crystals, crowns, and muffs, including all packing screening, barrelling, handling, and other preparation charges, 23.50c. Price for 100 lbs. or more; for 25-100 lbs., add 10c; for less than 25 lbs., 20c. Incendiary bomb alloy, f.o.b. plant, any quantity; carload freight allowed all other alloys for 500 lbs. or more.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lbs., 1½c 1000-2239. 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05 per cent maximum arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American bulk carlots f.o.b. Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05%, max. and other impurities, 0.1%, max.) 15.00c. 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 ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, f.o.b. refinery 35.00c lb.; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c; Monel shot 28.00c.

Mercury: Open market, spot, New York, $93-$98 per 76-lb. flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be., $17 lb. contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" bbls. 34.00c f.o.b. Niagara Falls.

straight or flat forms 90.00c lb., del.; anodes, balls, discs and all other special or patented shapes 95.00c lb. del.

Cobalt: 97-99%, $1.50 lb. for 550 lb. (bbl.); $1.52 lb. for 100 lb. (case); $1.57 lb. under 100 lb.

Indium: 99.9%, $7.50 per troy ounce.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, N. Y. 70.625c per ounce.

Platinum: $35 per ounce.

Iridium: $165 per troy ounce.

Palladium: $24 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 12.00c, Conn., for copper. Freight prepaid on 100 lbs. or more.)

Sheet: Copper 20.87c; yellow brass 19.48c; commercial bronze, 90% 21.07c, 95% 21.28c; red brass 80% 20.15c, 85% 20.36c; phosphor bronze, Grades A and B 5% 36.25c; Everdur, Herculoy, Duronze or equiv. 26.00c; naval brass 24.50c; manganese bronze 28.00c; Muntz metal 22.75c; nickel silver 5% 26.50c.

Rods: Copper, hot-rolled 17.37c, cold-rolled 18.37c; yellow brass 15.01c; commercial bronze 90% 21.32c, 95% 21.53c; red brass 80% 20.48c, 85% 20.61c; phosphor bronze Grade A, B 5% 36.50c; Everdur, Herculoy, Duronze or equiv. 25.50c; Naval brass 19.12c; manganese bronze 22.50c; Muntz metal 18.87c; nickel silver 5% 26.50c.

Seamless Tubing: Copper 21.37c; yellow brass 22.23c; commercial bronze 90% 23.47c; red brass 80% 22.80c, 85% 23.01c.

Extruded Shapes: Copper 20.87c; architectural bronze 19.12c; manganese bronze 24.00c; Muntz metal 20.12c; Naval brass 20.37c.

Angles and Channels: Yellow brass 27.98c; commercial bronze 90% 29.57c, 95% 29.78c; red brass 80% 28.65c, 85% 28.86c.

Copper Wire: Soft, f.o.b. Eastern mills, carlots 15.37½c, less-carlots 15.87½c; weatherproof, f.o.b. Eastern mills, carlot 17.00c, less-carlots 17.50c; magnet, delivered, carlots 17.50c, 15,000 lbs. or more 17.75c, less carlots 18.25c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lbs. 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 9.50c; cut sheets 9.75c; pipe 8.15c, New York; 8.25c, Philadelphia, Baltimore, Rochester and Buffalo; 8.75c, Chicago, Cleveland, Worcester, Boston.

Zinc Products: Sheet f.o.b. mill, 13.15c; 36,000 lbs. and over deduct 7%; Ribbon and strip 12.25c, 3000-lb. lots deduct 1%, 6000 lbs. 2%, 9000 lbs. 3%, 18,000 lbs. 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lbs. 12.50c; 100-500 lbs. 13.00c; under 100 lbs. 14.00c. 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 lbs. to 1 ton 17.75c; under 400 lbs. 18.25c.

Copper Anodes: Base 2000-5000 lbs., del.; oval 17.62c; untrimmed 18.12c; electro-deposited 17.37c.

Copper Carbonate: 52-54% metallic cu, 250 lb. barrels 20.50c.

Copper Cyanide: 70-71% cu, 100-lb. kegs or

Sodium Cyanide: 96%, 200-lb. drums 15.00c; 10,000-lb. lots 13.00c f.o.b. 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 lbs. and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb. bbls. 39.00c f.o.b. Grasselli, N. J.; 100-lb. kegs 39.50c.

Sodium Stannate: 100 or 300-lb. drums 36.50c, del.; ton lots 33.50c.

Zinc Cyanide: 100-lb. kegs or bbls. 33.00c f.o.b. Niagara Falls.

Brass Mill Allowances: Prices for less than 15,000 lbs. f.o.b. shipping point. Add ¼c for 15,000-40,000 lbs.; 1c for 40,000 or more.

Scrap Metals

	Clean Heavy	Rod Ends	Clean Turnings
Copper	10.250	10.250	9.500
Tinned Copper	9.625	9.625	9.375
Yellow Brass	8.625	8.375	7.785
Commercial bronze 90%	9.375	9.125	8.625
Commercial bronze 95%	9.500	9.250	8.750
Red Brass, 85%	9.125	8.875	8.375
Red Brass, 80%	9.125	8.875	8.375
Muntz Metal	8.000	7.750	7.250
Nickel Sil, 5%	9.250	9.000	4.625
Phos. br., A, B, 5%	11.000	10.750	9.750
Herculoy, Everdur or equivalent	10.250	10.000	9.250
Naval brass	8.250	8.000	7.500
Mang. bronze	8.250	8.000	7.500

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are f.o.b. shipping point; add ¼c for shipment of 60,000 lbs. of one group and ½c for 20,000 lbs. of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, copper borings 9.75c; No. 2 copper wire and mixed heavy copper, copper tuyeres 8.75c.

(Group 2) soft red brass and borings, aluminum bronze 9.00c; copper-nickel and borings 9.25c; car boxes, cocks and faucets 7.75c; ball metal 15.50c; babbit-lined brass bushings 13.00c.

(Group 3) zincy bronze borings, Admiralty condenser tubes, brass pipe 7.50c; Muntz metal condenser tubes 7.00c; yellow brass 6.25c; manganese bronze (lead 0.00%-0.40%) 7.25c, (lead 0.41%-1.0%) 6.25c; manganese bronze borings (lead 0.00-0.40%) 6.50c, (lead 0.41-1.00%) 5.50c.

Aluminum Scrap: Price f.o.b. point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb., 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb. borings and turnings one cent less than segregated.

Lead Scrap: Prices f.o.b. point of shipment. For soft and hard lead, including cable lead, deduct 0.55c from basing point prices for refined metal.

Zinc Scrap: New clippings 7.25c, old zinc 5.25c f.o.b. point of shipment; add ½-cent for 10,000 lbs. or more. New die-cast scrap, radiator grilles 4.95c, add ½c 20,000 or more. Unsweated zinc dross; die cast slab 5.80c any quantity.

Nickel, Monel Scrap: Prices f.o.b. point of shipment; add ½c for 2000 lbs. or more of nickel or cupro-nickel shipped at one time and 20,000 lbs. or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 26.00c; 90-98% nickel, 26.00c per lb. nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb. contained nickel plus 8.00c per lb. contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheets, Strip . . .

Sheet & Strip Prices, Page 166

Inquiries and orders for steel sheets and strip continue to flood mills and many refuse to accept further business, with delivery promises difficult to obtain from any source. Production is covered well into next year and in some cases extends far past midyear. Quota systems and allocations are in force generally in the effort to spread the supply as well as possible.

Philadelphia — Many sheet mills are out of the market, accepting tonnage only on some specialties, but being booked up on major grades through first quarter, refusing to enter orders for delivery beyond. Where producers of hot-rolled, cold-rolled and galvanized still are endeavoring to keep books open, though restricting tonnage accepted, they are scheduled well into third quarter and on narrow hot strip certain rollers are booked solidly through 1946. Deliveries on polished stainless sheets are being extended and are likely to be put on a quota basis shortly, effective with beginning of third quarter. Should this be done, quotas probably will be set up on the basis of the number of sheets polished rather than on a tonnage basis, because each sheet, regardless of gage, requires the same amount of polishing. The determining factor is the cost of the polishing operation, therefore depending primarily on the number of sheets involved in a given order. Meanwhile unpolished stainless sheets are available for shipment principally in February, though some tonnage still can be had in January.

Sheet mills generally now are adopting the policy of refusing to guarantee deep-drawing quality sheets unless made of killed steel, which takes premiums, depending on gage. This applies particularly to hot and cold-rolled sheets and enameling stock.

Boston — Fabricators seeking narrow cold strip for delivery in second quarter find some mill schedules filled for that period with openings limited; tonnage offered beyond is held for clarification of production outlook. Pressure for strip is intense for nearby supply to meet immediate reconversion needs and for later shipment for inventory. Most converters, forced to dip into inventory of hot strip, now experience effect of tonnage lost by the coal strike with hot strip delivery schedules more extended or reduced. Carry-over tonnage is mounting with most producers. Light gage hot-rolled sheets, notably pickled, are extremely tight, also polished stainless and other specialties, including galvanized. Despite much shopping, fabricators are unable to place firm orders for even part of inquiry. While pressure for tonnage is general among metalworking industries, manufacturers of toys, usually users of seconds, are striving for substantial tonnage of new light gage material.

St. Louis — Sheet production increased about 10 per cent during the first half of November, due to a 5 per cent improvement in labor. A better class of workers is applying and general interest over a potential steel strike seems to be lessening. October output was a trifle larger than in September and at this rate will be near normal in December. One producer expects to add a seventh furnace by December. Sheet schedules are extended to fourth quarter next year and no orders are being accepted for cold-rolled. Heavy galvanized is under quotas, with some open tonnage in first quarter. Light galvanized capacity is filled to third quarter and electrical sheets through next year. Backlogs of light-gage sheet orders are increasing, although number of new orders is less because of deferred deliveries.

Cincinnati—The clamor for sheet tonnage continues, heavy pressure for deliveries being accompanied, in some cases, by a note of dissatisfaction with allotments under the mill quota plan. An immediate task, and a difficult one, is making first quarter schedules, these not to be definite excepting on a month-to-month basis. The unappeased demand in all products is enabling mills to hold rather closely to previously established percentages in output. The unscheduled backlogs are extensive.

Cleveland — Adoption of sales quota systems by most producers of flat-rolled steel products has provided a means of distributing prospective supplies in the most equitable manner but at the same time has created considerable discord. Customers generally are disgruntled over the sharp cut and are using every argument at their disposal to get an upward revision. They are stressing their long standing as valuable customers, the importance of their particular plant to the reconversion program, and in

some instances are threatening reprisals in future freer markets. At the same time, some district managers are pressing their home offices for an upward revision in their allotments. Producers plead that they are scraping bottom and are doing everything possible to make a fair distribution. This indicates clearly the jam which has developed in sheet and strip order books and which gives every indication of growing worse before it can be broken. The few positions which are still open on some mills for late first quarter delivery of hot-rolled, hot-rolled pickled and cold-rolled sheet are being filled rapidly. Strip is unavailable before second quarter for most specifications, and light strip books for 1946 have been closed by some makers.

New York — While consumers are becoming fairly reconciled to limitations now imposed by sheet producers on acceptances of orders, there is still heavy demand for sheets. This is particularly true of jobbers, who insist they could sell twice the sheet tonnage they have available, and even more, if they could get the material. Some jobbers now, where they find a susceptible mill, are ordering into third quarter.

Policies of various sheet mills are reflected in their delivery positions. While some mills are booked up for the first quarter and refuse to accept tonnage for delivery beyond, certain others are virtually booked up for the entire year of 1946. This is true not only in sheets but in hot narrow strip and one producer of cold strip, 12 inches and under, is quoting late November and December of next year.

It is possible for consumers of hot and cold-rolled sheets to obtain tonnage for early third quarter; galvanized sheet consumers can pick up some tonnage in late July and August.

One leading producer of stainless sheets is now setting up quotas on polished material beginning with third quarter. These quotas are being established on a sheet, rather than on a tonnage basis.

Pittsburgh — Overall requirements for light flat-rolled steel tonnage continue well in excess of current production and despite careful screening of new orders, mill bookings continue heavy. There is also no easing in pressure for early delivery. Trends in sheet and strip demand are without significance for all users are actively in the market, attempting to build inventories for anticipated steady increase in production of automobiles, stoves, refrigerators, radios, and numerous other items. Mills are not scheduling tonnage beyond second quarter. Particularly heavy demand is noted for enameling, electrical and stainless sheets. On polished stainless sheets deliveries are in May, while stainless bars are available in January and shapes and plates in February. Nonintegrated sheetmakers in the Mahoning Valley and surrounding areas are being hard pressed for semifinished steel. Sale of Carnegie-Illinois Steel Corp.'s Farrell works to Sharon Steel Corp. presents an additional problem to these interests, for although no definite decision has been reached it appears there is some doubt that Sharon Steel Corp. will continue to operate its semifinished steel plant at Lowellville, O., because the Farrell plant is expected to be sufficient for the company's needs.

Chicago — Demand for steel sheets continues, and consumers exert considerable pressure to get on order books. With order books filled through first half, sheetmakers generally are declining tonnage beyond that point. Unable to obtain delivery on prime sheets, some consumers are turning to secondary material, even grades below wasters, in order to maintain fabricating operations.

Steel Bars . . .

Bar Prices, Page 166

Bar buying continues sufficient to overbalance production and backlogs are pushing gradually further back. Some producers can do no better than third quarter on small sizes, though large and medium diameters are available in second quarter. Cold-drawn carbon bars are easier and may be obtained for February and March.

Philadelphia — Hot carbon bar schedules fall well into second quarter on large and medium sizes and in some cases well into third quarter on small sizes. One large producer, in fact, has nothing to offer on his 8-inch mill before November. Cold-drawn carbon bars, however, still can be had in February and March and hot alloy bars in January and February. Demand for cold-drawn bars has been lagging for several weeks, with new tonnage far from offsetting volume of war work canceled. However, there has been slight improvement recently and this, combined with restriction in hot bar tonnage furnished to cold draw-

ers is tightening schedules somewhat.

St. Louis — Pressure on merchant bars continues to increase with no relief in sight. Production is at about 80 per cent of normal, due to labor shortages and furnace repairs. The latter are to be completed by Jan. 1. Calls from manufacturers eager to get household consumer goods on the market by spring are showing greatest gain. No delivery promises are being made and schedules are filled to mid-year and beyond. Prospects are for considerably better production after first quarter. At least two major plant expansions are to be completed during the year. A large International Harvester Co. plant to be built in this area is expected to aid in keeping bar demand high.

Pittsburgh — Mills are scheduled into May on small carbon bars but large rounds and alloys are promised for early first quarter. Due to restricted production, resulting from limited supply of carbon bars, cold rollers now promise delivery from January through April, with small sizes most extended. Cold finishers report demand well diversified and pressure for early delivery is no great, except in case of some agricultural equipment makers who were able to accumulate some inventories in recent weeks while operations were curtailed by strikes. Automobile partsmakers, textile machinery and other equipment manufacturers are asking unusually large tonnages for early delivery. They seek to build up stocks in spite of strike threats. Mill production is back to pre-final strike level. Loss in tonnage, varying from three to five weeks on carbon steel bars, is expected to be made up by the yearend on most sizes. One large interest here is preparing to enter the cold-finished alloy bar field but no date has been set for deliveries.

Cleveland — Demand for bars continues to exceed production, especially in smaller sizes on which some mill books are closed. Some mills are still offering April and May delivery on larger sizes of carbon bars and first quarter on alloy bars. All mills are selective in booking and several will not book any business for delivery beyond first half. The situation in this district is expected to improve over the next few weeks since one mill that has been strike-bound resumed shipments last week and expects to step up operations steadily.

New York—Hot carbon bar deliveries fall largely in second quarter. Some producers have little to offer in any size month before the latter part of that period, and most are booked for that period entirely on the very small sizes. One interest, in fact, is quoting fourth quarter on products from his 8-inch mill.

The situation is cold-drawn and in alloy bars is quite different. Most cold-drawn bar sellers are quoting February and March. Hot alloy bars are freely available in January and February.

Chicago — Although alloy bars are in comfortable position and can be had for delivery this year, all carbon grades are exceedingly tight. Virtually all barmakers find it necessary to follow some allocation scheme to assure their customers receiving equitable quantities. Despite this, customers feel they are not getting a fair deal. New carbon bar orders in many cases command no better than June delivery and mills decline orders for second half of next year.

Steel Plates . . .

Plate Prices, Page 167

Plate demand continues to press mills in spite of the former expectation that this product would be in small demand when the shipbuilding program ceased. Miscellaneous users are in the market for important tonnages and mills as a result have backlogs well into and in some cases through first quarter. Light plates furnish an important part of current demand, for tanks and boilers.

Boston — Plate demand, except for shipbuilding, is gradually mounting. While at less accelerated rate than other major heavy hot-rolled products, buying is more conservative as regards estimated requirements over first quarter. Inventories with industrial consumers are lower and have reached a point where more are placing additional volume. Light plates lead in demand for small tanks and boiler shop work. Sheared plates are still available for February delivery, but first quarter schedules are tightening and in several instances will go under allocation Jan. 1 where this is not already in effect.

Philadelphia — Plate backlogs continue to expand and except for premium tonnage little sheared plate can be had before February and March. One mill is reported booked up for the entire first quarter. This expansion is developing despite the heavy shrinkage in ship work, although not to be overlooked in this situation is the fact that capacity has de-

clined sharply for the wartime peak, as a result of the extent to which strip mills have withdrawn from plate production. However, 50,000 to 60,000 tons of strip plate still are being produced each month, it is estimated. A Norfolk, Va., shipyard is low on four relatively small tankers, each requiring 3200 tons of shapes, plates and bars. Meanwhile backlogs in the local district yards are dwindling rapidly, although one yard is bolstering operations by an increasing volume of oil refinery fabrication. Much of the new ship work now coming out appears to be going principally to southern and West Coast yards.

St. Louis — Plates continue in unexpectedly heavy demand and schedules are filled far ahead. A recheck of backlogs eliminated the rare cases of duplications and an allocation system has put plate operations on a more orderly basis. A better labor supply has increased production slightly.

Cleveland—With sheet mills unable to roll the usual amount of light plates, due to pressure for the former commodity, consumers are attempting to place an increasing volume of business with plate mills. A large portion of this business is being turned down, however, to maintain a balance between light and heavy plates. Tank builders are especially active in the ⅜-inch market. Mills are booked well into second quarter on light plate and are rapidly filling first quarter books for heavy plate. Flanged and formed heads demand continues heavy, originating with producers of storage and pressure tanks and other vessels, as well as boiler makers.

New York — While shipyard requirements have declined sharply, there is a good diversified demand for plates. Most producers claim they are booking tonnage faster than they are producing it. This is reflected in the fact that some mills are booked up solidly into late February and March, with one producer actually quoting April. There is still strong pressure for light gage plates, ¼ and 3/16-inch, for oil storage tanks for domestic installation and for filling stations.

Birmingham — Plate production is estimated at about 60 per cent of capacity. Demand is little less than during the war period but more flexibility in production schedules gives opportunity for better balanced output.

Wire . . .

Wire Prices, Page 167

Chicago — Inquiries and sales of welded wire fabric are increasing and demand now far exceeds supply. In the merchant classification, requirements for steel posts exceed those of other products. Inquiries have started to come in for bale ties for use next year.

Cleveland — Although merchant wire product mills are being scheduled for only five or six months forward, sales offices have sufficient orders to maintain operations throughout 1946. Practically all leading mills are now, or will be by Jan. 1, on a quota basis. Shortage of merchant wire products is the most acute in the history of the industry and shows no sign of abating. Some contractors have informed producers directly that unless they obtain nails shortly they will have to dismiss their working forces. This situation is aggravated by the fact that some mills have reduced nail output and at least one large eastern mill is discontinuing production of that item. Demand for manufacturers' wire products still exceeds production but the situation is not as critical as in merchant products.

Birmingham — Demand for wire and wire products is unusually heavy and consistent. Jobbers have difficulty meeting needs of customers in view of limited supply from wire mills.

Rails, Cars . . .

Track Material Prices, Page 167

New York — Outstanding in the car market is the award by the Southern Railways of 1000 fifty-ton auto cars to Pullman-Standard Car Mfg. Co., Chicago, for construction in the company's Birmingham plant. One hundred covered hopper cars have been placed by the Nickel Plate with the Harlan & Hollingsworth Co., Wilmington, Del., according to reports. The Virginian has placed four 500-ton electric locomotives with the General Electric Co., Schenectady, N. Y., for delivery in 1946.

Schedules on track accessories are far extended, with one producer sold out for all next year on spikes and tieplates. The Pennsylvania railroad has closed on its first half requirements of track accessories, estimated at 30,000 to 35,000 tons. Its second half needs are expected to be 15,000 to 20,000 tons.

Tin Plate . . .

Tin Plate Prices, Page 167

Pittsburgh — Amendment to WPB order M-81 giving increase in permitted uses for tin cans to 190 products from 139 is not expected to alter tin plate production materially through the remainder of the year, for it is considered doubtful if output could be increased under present conditions, short labor supply and generally tight supply of steel. Another factor limiting output, particularly in the midwest, is shortage of box cars. The only production change for the time being would be in product mix, with shifts from bonderized and black plate to electrolytic and hot-dipped. Permission to use terne plate in paint can bodies instead of black plate is considered the most significant factor in the recent amendment to the order. Permission to use tin plate in beer cans, dog food cans and similar containers, does not appear probable in the near future, although reports persist that conditions of tin mines in the Dutch East Indies are better than earlier predicted. Tin mills are nearly fully booked for first quarter.

Chicago—Shipments of tin plate are being held up again by box car shortage, one district maker reporting that during the past three or four weeks the deficiency has ranged from 150 to 200 cars daily. This is because railroad car demand currently is contrary to seasonal pattern, due to heavy grain movement in the West. Fall loadings usually reach peak before Nov. 1. Canmakers normally follow practice of leaving tin plate ordered in storage in producer's plant for withdrawal as needed, but this year, possibly fearing a paralyzing steel strike are pressing for prompt delivery on tonnage as produced. This factor serves to make the car shortage more acute.

tructural Shapes . . .

Structural Shape Prices, Page 167

New York — After requesting bids eral times without receiving estimates e New York Housing Administration nally received bids on its Elliott Houses roject at Tenth avenue and 26th St., anhattan, which reflected an increase f 68 per cent in costs above 1941. hese estimates were far in excess of e budget and were rejected. Approxiately 1400 tons of reinforcing bars ill be required should the work eventlly go ahead. Such sharp increases costs, combined with scarcity in bars, keeping new business considerably reicted.

Chicago — Structural fabricators find emselves in an uncomfortable predicaent. Having recently completed war ntracts in which prime contractors rnished the steel, and now in a posi- to resume normal fabricating opions, they have little stock and little ance of getting on mill schedules for empt delivery. For this reason, fabricrs are unable to bid on even attrac- construction projects. During the few days, little new inquiry has deped and awards are light. More are being withdrawn because of the eneck in steel.

Philadelphia—A leading shape mill quotes April on standard and wide-ge sections, while two others are near- that position. Structural demand is egular in some districts but the overall situation is increasingly active and spite lack of draftsmen and estimators ge mills are receiving more tonnage an they can turn out on the basis of el being apportioned for that prod-

Birmingham — Shape demand is conently high, with production at about per cent of capacity. This is not fficient to meet needs. Bookings of bricators go well into next year.

g Iron . . .

Pig Iron Prices, Page 169

Pig iron demand is strong and foun- have more castings inquiries than y can entertain. With labor supply far ow needs iron melt is limited. While pments are keeping all users supplied stocks are accumulated at consumer producer plants. Melters usually stor- a supply for winter find this impossi- under present conditions and some pension is felt for that period.

Philadelphia — District iron foundries e being deluged with orders, with many ncerns trying to place subcontracts. This flected in continued strong demand pig iron, with producers keeping ace, but with little or no stocks accumu- ing for winter use at either producer consumer plants. One supplier of southern iron to this district has blown a furnace for relining.

Boston — Pig iron supply is suffi- nt for current needs; most furnaces e caught up with delivery schedules h current production, but have no rn in reserve. Unless interrupted by axes or transportation delays this sit- on is likely to continue. Any halt in livery schedules would soon reflect in ortages. Slight increase in melt by a foundries, is not the case with steel ks, the latter barely maintaining an per cent capacity schedule. Consumers have been unable to build inventories beyond 30 days to any extent, although some have been given permits to exceed this volume.

St. Louis — Pig iron remains tight, with inventories low. There has been no major change in six months. Iron producers report the manpower supply currently adequate. Pig iron is being allocated, allowing deliveries to be kept on schedule. Production capacity, however, still severely limits orders.

Cincinnati — Pig iron supply is tight, but continues to be adequate for the district melt, which tends upward. Most marked improvement in demand has come from manufacturers of heating and sanitary equipment. The labor situation, although easier, has not reached a level where foundries might meet the castings demand. Few foundries have been able to accumulate the allowed inventory.

Birmingham — Pig iron production closely approximates demand but with little margin. Regular customers of merchant producers are well cared for but irregular buyers meet difficulty filling requirements. Woodward Iron Co. and Tennessee Coal, Iron & Railroad Co. each has a furnace idle for repair.

Pittsburgh — Labor shortage and to less degree limited fuel supply continue to retard full blast furnace operation, only 42 stacks out of 54 blowing in this district. Foundry interests and steel producers have low stocks with little indication of improvement during the

remainder of the year. Production and demand are in close balance, even at the present level of steel production. Should the manpower situation improve, with larger foundry operation, and steelmaking move up to 85 or 90 per cent a critical pig iron shortage is considered likely. No foundries have been forced to curtail because of lack of iron, but the seriousness of the situation is shown by the number of interests not normally served by producers here who are shopping in this area for supply.

New York — Shipments and consumption of pig iron in this district continue in fair balance, with the daily melt on a slightly higher level than a month ago. Foundries report demand for iron castings the heaviest in recent years and assert they could step operations up considerably were it not for the continued lack of manpower. However, there is some improvement in this respect and foundries are hopeful that as cold weather approaches there will be a substantial betterment.

Some foundries anticipate this change before the end of the year. Pig iron producers, while unable at present to build up inventories either at their own plants or those of their consumers, nevertheless believe that the improvement in manpower at consuming plants will be sufficiently gradual to enable them to keep pace with requirements.

Chicago — With pig iron production now approaching the level when the coal strike forced suspension of blast furnaces, iron suppliers are getting more tonnage for distribution to foundries. The latter, down to dangerously low inventories, are pressing for deliveries as it is a foregone conclusion that iron will be critical for months. Strikes continue to beset midwestern foundries, thereby reducing their melts, but at the same time easing the pressure for iron. Three more blast furnaces in this district have resumed to make 35 of the available 41 active. This is one stack less than just before the coal strike. Those resuming were South Works No. 5 and Gary No. 9, Carnegie-Illinois Steel Corp., and South Chicago No. 1 of Wisconsin Steel Co.

Buffalo — With foundries able to get additional manpower, demand for pig iron is increasing. Sellers say they have requested foundries asking for large tonnages to whittle down their demands. In addition to improved labor supplies, foundries also have adequate stocks of coke for more active operations.

Scrap . . .

Scrap Prices, Page 170

Scrap continues short of needs and melters continue to pay springboards and also to buy premium grades for open-hearth use. While some improvement has been noted in labor supply it still is insufficient to handle unprepared scrap in yards. Contract termination is bringing out some tonnage but not as much as needed.

Philadelphia — Delays in reconversion have limited volume of manufactured scrap needed to fill gaps resulting from war cancellations, with heavy melting steel and borings and turnings consequently now falling short of demand. The situation in melting steel would be somewhat relieved if yards had sufficient help to handle unprepared material, but so far there has been little improvement in manpower. One eastern consumer has become so pressed that he is reported to be paying as much as $2 springboard and is taking scrap from the local district for the first time in a number of weeks. All other district consumers are buying actively. Purchases of cast grades are limited severely by amount of material available.

Boston — Improvement in supply of tightest grades, heavy melting and cast, is moderate in the appearance of more contract terminated material and prospects for an increase in automobile wrecking. Latter depends on yard labor and availability of new cars to permit junking of thousands of old units. This appears to be some time ahead. More contract surplus, including scrap, is coming out, however, with indications this trend will increase, although alloys will make up a relatively high ratio. For scrap, Petroleum Heat & Power Co., Stamford, Conn., liquidated 1032 tons of forgings. Long-cycle and dealer scrap offerings are light, including alloy-free turnings. Industrial production has changed in quality and grades since reconversion started, although there is substantial volume of three-way alloy. Only on alloy material are prices below ceilings.

Cleveland — Steelmakers continue to press for further scrap tonnage and take all material offered, paying substantial springboards to obtain shipments from remote areas. Buying of low phos grades for open-hearth use continues, in spite of the higher price. This causes shortage of material for electric furnace operators dependent on low phos for their material. Collectors find some relief in labor supply but still are hampered by lack of experienced workers. Cast scrap scarcity has not been relieved and foundries are unable to obtain their requirements. With steelmaking rate increasing as effects of the coal strike diminish the situation is becoming tighter.

St. Louis — Scrap is moving somewhat better, although still scarce. The labor shortage in yards and at rural collection points is unrelieved. Reserves are around 45 days but mills continue to take all they can get. Foundries are in fair condition, No 2 heavy melting is scarcest. Recent scrap offerings from contract terminations are helping the situation little because of their alloy content. All prices remain at ceilings.

Cincinnati — The iron and steel scrap market is strong, dealers and brokers being able to move all offerings promptly. Two counteracting factors, possibility of a steel strike and desire to avoid excessive stocks at inventory time, have so far failed to check demand. An occasional lot of high-priced railroad specialties has moved below ceiling but otherwise prices are firm.

Birmingham — Scrap continues tight especially on iron grades. Not much scrap is available in view of absorption of offerings by a steelmaker who lacks direct iron from a blast furnace down for repairs.

Pittsburgh — Scrap supply is nearly as tight as at any time during the war and is expected to become more critical this winter. One large consumer has raised his freight equalization 50 cents per ton to $1.50 on open-hearth grades but scrap sellers claim they can not obtain additional tonnage any faster

Carbon machine shop turnings still command up to $1 freight equalization and supply has not improved, with crushers scouring the district for tonnage. Short shoveling turnings are moving as soon as available. Low phos and cast scrap supply still is far short of demand. Breakable cast is moving on freight charges of about $3.50 per ton and cupola cast up to $5.50. War Department, third service command, Frederick, Md., opened bids last week on 10,000 gross tons of miscellaneous unprepared heavy scrap.

Buffalo — Yard receipts of industrial scrap are estimated to have decreased 50 per cent. Dealers report insufficient stock to cover any large commitment at this time. A fairly large quantity of unprepared scrap is scattered through this area, with labor lacking for its preparation. With navigation near its close water receipts include about 5500 tons by canal and 5000 tons from upper lake ports.

Chicago — Scrap consumption is back to near full capacity and, barring a steel strike, should remain steady. This situation is reflected in the strong demand for scrap which cannot be satisfied entirely from local sources. Consumers are not averse to acquiring heavy melting from remote points and paying freight board. Ceiling prices prevail on all scrap, including blast furnace grades, with the possible exception of railroad rails.

New York — Scrap demand is highly active, with both Pittsburgh and eastern Pennsylvania consumers in the market and with a dearth of good carbon steel scrap, to say nothing of continued scarcity in all cast grades.

Warehouse . . .

Warehouse Prices, Page 168

New York — Inquiry for steel from warehouse exceeds supply on numerous products, inventories of which are becoming more out of balance; light and galvanized sheets, strip and structurals are among products in heaviest demand. Large orders per size, normally going direct to mill, are offered warehouses unable to fill substantial part of total volume offered. Mill size orders are also supplemented by heavy export inquiry. Replacements of steel in heaviest demand are more extended and revised quotas in most cases indicate distributors will get 20-25 per cent less tonnage over the next few months than was expected.

Boston — Unable to place them with mills, buyers are seeking to place larger orders with warehouses, supplementing heavy demand by consumers normally filling most of their tonnage with distributors. In the case of most light flat-rolled carbon steel products, only part of the volume can be filled by warehouse. In general alloy stocks are ample and coming for this grade lags. Quotas for producers during next few months are frequently below expectations in more products and replacement on the whole is less encouraging.

Philadelphia — Warehouse movement, on a daily basis, is slightly heavier than last month, with sheets, shapes and bars in greatest demand.

Pittsburgh—Three to four weeks delay in warehouse deliveries was caused by the coal strike, particularly in light flat-rolled steel, wire, small bars and shapes. This has severely unbalanced stocks. Movement from warehouse matches that during the war, due to steady upturn in civilian goods production and the fact that many normal mill buyers seek to make up the deficiency through warehouses. There also is a tremendous backlog of maintenance and repair work. Because of limited mill deliveries and heavy demand on warehouses assortments are broken and deliveries suffer. In many instances buyers are forced to take substitutes.

Chicago — Operating with inventories depleted, warehouses continue to encounter heavy demand for light-gage sheets of all grades. Demand for secondary material also is heavy and some consumers seek grades below wasters. Light plates, light structurals, and bars, except alloy, are other products which warehouses are unable to supply in volume required. Because mills are sold out for months industry turns to distributors for more than normal quantities obtained from these sources.

Cincinnati — Except for a fair supply of cold-finished steel, warehouses are hard pressed for stocks to meet an insistent demand. Shipments from mills have declined, creating scarcity of sheets and strip, structurals and other items. Even plates are in more meager supply. The market is featured by an unusual amount of shopping, and inquiries from nearby buyers.

Iron Ore . . .

Iron Ore Prices, Page 168

Consumption of Lake Superior iron ore in October totaled 4,491,246 gross tons, compared with 5,837,017 tons in September, during which many blast furnaces were banked because of the coal strike. In October, 1944, consumption was 7,319,948 tons, according to the Lake Superior Iron Ore Association, Cleveland. Total consumption to Nov. 1 this year has been 63,865,117 tons, compared with 73,274,130 tons in the comparable period last year.

Stocks of ore at furnaces and on Lake Erie docks Nov. 1 totaled 45,090,166 tons, practically the same as the 45,342,562 tons on hand at the same date a year ago. Furnaces in blast Nov. 1 totaled 132 in the United States and Canada, compared with 148 a month earlier and 172 on Nov. 1, 1944.

Canada . . .

Toronto, Ont. — Demand for steel continues at a high level and consumers are rushing orders to cover first quarter requirements. Small users have been more persistent in demands recently and it is apparent that many interests that had delayed repairs through the war years are not wasting further time in getting these jobs under way. Warehouse operators are on a quota basis and while receiving regular monthly deliveries report the tonnage involved is not sufficient to meet all requirements.

While the strike at the Ford works, Windsor, Ont., has been under way for over two months, and has resulted in closing of other automotive plants, including the laying off of 2000 workers at the Oshawa plant of General Motors Corp., through shortage of motors, it has not materially affected demand for steel. With regard to steel it is pointed out that companies are accepting delivery with the idea of having supplies when work is resumed. Minor labor troubles have developed in some steel plants but these were quickly settled and have not resulted in serious curtailment in production. However, Canadian steel production continues well below the high average attained in war years, largely due to reduced output by Dominion Steel & Coal Corp. at Sydney, N. S.

To this time there has been no report that the Steel Co. of Canada Ltd., Hamilton, has commenced operations at its new sheet and strip mill although it is expected the plant will go into production within the next two or three weeks. Demand for sheets continues at a brisk pace and practically all capacity now is booked solid through first quarter and mills are not accepting orders beyond March. Galvanized sheets are scarce and consumers point out that they are unable to obtain enough for present needs and many jobs are being held up through shortage.

Heavy buying of bars continues and some Ontario barmakers report full coverage to the end of March, while others still take orders for delivery in first quarter. Demand for both carbon and alloy bars centers chiefly on smaller sizes.

Steel plate demand is steady but lacks special feature. The supply position is easy and producers offer delivery at the beginning of first quarter.

While there has been improvement in wire and wire products output, demand continues well in excess of supply and many users report difficulty in obtaining supplies. Distributors have only small stocks of nails and in a number of instances where lots up to one or two kegs are required these have been picked up by retailers in small towns throughout the country, while in the larger centers shelves are bare. Screws also are difficult to obtain and wire is in short supply in most areas.

Despite the fact that extensive building projects are slated to get under way and will involve thousands of tons of structural shapes and reinforcing bars, there has been some slowing in demand for immediate delivery. A number of large contracting firms are completing construction projects and will not start other jobs until spring. This curtailment in building operations, largely due to shortages in some materials, has resulted in better delivery of shapes to small jobs.

Merchant pig iron sales have been gaining recently, largely due to shortage of scrap and there have been indications of some tightening in pig iron supply. However, production schedules do not indicate shortages as only eight of the 14 furnaces in Canada are blowing. Most new business is for spot delivery, and awards for the week held about the same as in the previous period, with foundry iron accounting for around 5000 tons; malleable, 3500 and basic, 1500 tons. Producers continue to give good delivery on new orders.

In scrap iron and steel receipts are declining while demand increases. Dealers have difficulty meeting customer requirements and most report no stocks. The supply situation is becoming more serious each day with no indications of early improvement as far as domestic sources of supply are concerned. The shortage is equally severe in both steel-making scrap and iron grades.

Steel in Europe . . .

London — (*By Radio*) — Shipbuilding demand is increasing in Great Britain, giving larger outlet for steel plates. Active export business is expanding. Sheet deliveries are being further extended. The light castings trade, engaged on building products, needs more pig iron. Activity in the bar market is sustained.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1100 tons, buildings Nos. 18, 20, 21 and 22, Lansing, Mich., for Fisher Body Division, General Motors Corp., 400 tons to Fort Pitt Bridge Works, Pittsburgh, and 700 tons to C. J. Glasgow Co.; bids Oct. 16.

800 tons, expansion to proving grounds, Milford, Mich., for General Motors Corp., to Whitehead & Kales Co., Detroit; bids Oct. 23.

480 tons, plant addition for Young Spring Co. at Trenton, N. J., to Bethlehem Fabricators, Bethlehem, Pa.

450 tons, addition to nylon salt plant, Orange, Tex., for E. I. du Pont de Nemours & Co. Inc., to Consolidated Steel Co. of Texas, Orange, Tex.

150 tons, addition, Chicago, for Cuneo Press, to Wendnagel & Co., Chicago; bids Oct. 25.

STRUCTURAL STEEL PENDING

2000 tons, tumor hospital, Hines, Ill., for U. S.

Veterans Administration; bids Sept. 11 over estimate and rejected.

1517 tons, factory, Brawley, Calif., for Holly Sugar Corp.

1150 tons, bridges, Sallisaw, Okla., for state highway commission.

1100 tons, warehouse building, Detroit, for Central Steel & Wire Co.

1000 tons, several bridge jobs for New York State; bids Nov. 29.

900 tons, addition to naval ordnance laboratory at White Oak, Md.; bids Nov. 27.

775 tons, sheet piling, dock wall, Chicago, for Chicago Park District; Harry A. Thompson, Chicago, low on general contract; bids Nov. 13.

500 tons, kiln sheds, Chicago, for Chicago Fire Brick Co.

500 tons, face caissons for maintenance spillways, Grand Coulee dam, Grand Coulee, Wash., for U. S. Bureau of Reclamation.

300 tons, power plant, Mooringsport, La., for Sargent & Lundy.

75 tons, plant addition for Owens-Illinois Glass Co., at Bridgeton, N. J.

REINFORCING BARS . . .

REINFORCED BARS PENDING

tons, building, Chicago, for Cadillac Motors; bids Nov. 20.

tons, tumor hospital, Hines, Ill., for U. S. Veterans Administration; bids taken Sept. 11 above estimate and rejected.

tons, expansion, Saginaw, Mich., Chevrolet Gray Iron Foundry Division, General Motors Corp.

tons, bridge, Farley, Mo., for Chicago, Burlington & Quincy railroad.

tons, miscellaneous repairs, Chicago, for Chicago Department of Public Works; bids Nov. 30.

tons, welded mesh, paving, Ft. Knox, Ky., for U. S. Engineers, Louisville, Ky.; bids Nov. 23.

tons, expansion, Minneapolis, for General Mills Inc.

tons, cold storage plant, Mt. Vernon, Wash.; bids in.

ated, nine concrete silos for Permanente Cement Co., at Seattle; bids in.

PLATES . . .

PLATES PLACED

ated, tanks and other equipment plant at Willbridge, Oreg., for California Asphalt Co. plant, to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

ed, nine penstock coaster gates for Coulee; bids to Denver, Dec. 4.

PE . . .

CAST IRON PIPE PLACED

tons, for Yakima, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

CAST IRON PIPE PENDING

tons or more, 6 to 16-inch cast iron pipe, the Seattle water department stocks; bids Nov. 23.

tons or more, Oak Grove, Oreg.; Rushlight Supply Co., Portland, low, $43,542.

RAILS, CARS . . .

RAILROAD CARS PLACED

Rail Plate, 100 covered hoppers, reported placed with Harlan & Hollingsworth Co., Wilmington, Del.

Southern Railways, 1000 fifty-ton cars to Pullman-Standard Car Mfg. Co., Chicago.

LOCOMOTIVE PLACED

Virginian four 500-ton electric locomotives, to General Electric Co., Schenectady N. Y.

Suspensions of Shipments Follow Calling of Strike

(*Concluded from Page* 65)

over the past three decades demonstrates, the automotive industry is the foremost practitioner of the policy of high wages for its workmen and low prices for its customers.

"Due to artificial restrictions on production brought about in recent years by the auto union monopoly, there has been a reversal of this historic productivity trend. As government figures show, the output per worker has declined in the automotive industry in recent years and, as a result, cars cost more to produce and prices have been going up since 1935.

"We are anticipating, as a result of recent correspondence with Secretary of Commerce Henry A. Wallace, the early opportunity to submit abundant evidence of the declining productivity per worker in our industry. By making these facts generally available, we are hopeful that a correction of the dangerous downtrend can be made, so that the automotive industry and other industries will not lose their world-renowned production supremacy; so that the workers' real wages and our national standard of living can continue to increase.

"The American people, having come through a long and costly war, are anxious for domestic peace. Nothing, except more power for the union, is to be gained—much to be lost—through prolonged industrial strife. Even before the major strike threats in our industry have been met, strikes in supplier plants have held car production to less than half of what it should be. Even for this year, this represents the loss of more purchasing power than a 30 per cent wage increase for all auto workers would create in more than a year's time.

"Contrary to official and public expectations when the war ended, car plants have been speedily reconverted, and, except for supplier strikes, employment in our industry already exceeds normal peacetime levels."

Enamelers Club to Meet In Chicago, Dec. 8

"Automatic Spraying and Special Developments in the Field of Spray Equipment" will be the topic of the meeting of the Chicago district Enameler's Club to be held Dec. 8, in the LaSalle Hotel, Chicago. Three speakers will discuss spraying in the porcelain enamel field.

Urge Prompt Liquidation Of Surplus Machine Tools

(*Concluded from Page 67*)

ployment and in increasing the standard of living and in maintaining our national defense.

7. Let us in the machine tool industry with characteristic courage and vision rededicate ourselves to the manufacture of even finer machines and to the introduction of these machines where they will do so much in the upbuilding of our country's future and influence. Let us demonstrate again the self-reliance, the ingenuity and the fortitude which has typified the history of the machine tool industry. Let us set a new standard of commercial practice as well as of engineering. Let us through our example, our enthusiasm and our effort build machine tools of surpassing possibilities.

The speaker at the annual dinner on Monday evening was Col. Edwin Motch who recently returned to Cleveland after long service with the Ordnance Department in Washington and in France and Germany. He gave details of American manufacturing activities in France and he gave a particularly graphic picture of the pouring of the vast forces of the United States into Germany during the final days of the war. It was a masterpiece of planning and traffic handling.

Because of the fact that the operations of the association were interrupted by travel restrictions during the past year, the 1944-45 officers were re-elected to serve for 1945-46. They are: President, A. B. Einig, general manager, Motch & Merryweather Machinery Co., Cleveland; vice president, George Habicht Jr., Marshall & Huschart Machinery Co., Chicago; second vice president, D. N. Macconel, Machinery Sales Co., Los Angeles; secretary-treasurer, C. C. Brogan, W. E. Shipley Machinery Co., Philadelphia; executive secretary, Thomas A. Fernley Jr., Philadelphia.

Four new members of the executive committee were elected, however, these being: H. A. Perry, Perry Machinery Co., Dallas, Tex.; Omar S. Hunt, Marshall & Huschart Machinery Co. of Indiana, Indianapolis; A. R. Williams, A. R. Williams Machinery Co., Toronto; and Howard Mook, Van Dyke, Churchill Co., New York.

Uncertainty as to Strike Of Steelworkers Increases

(*Concluded from Page 64*)

the strike vote scheduled for Nov. 28 would lead to a violation by the union of the collective bargaining agreement between the company and the union. The contract specifically states that a strike on the part of the union is prohibited.

The company had agreed under protest to co-operate in the conduct of the election in keeping with the board's request, but pointed out that negotiations between the company and the union on the union's recent wage request have not broken down but are subject to reopening upon proper notice by either side.

"By petitioning for a strike vote, the union has served notice that it does not wish to settle this issue through the medium of true collective bargaining," the company's letter to the board said.

The letter also stated, "If a strike results from the vote which the board considers it is obligated to conduct, not only will it work an unnecessary hardship on our employees and their communities, but it will also make meaningless a collective bargaining contract which contains a no-strike pledge."

Virtually all of the steel producers have taken the position that a strike vote at this time would be a violation of their contracts with the union. Bethlehem Steel Co. referring to the no-strike clause in its contract advised the labor board that any filing of a strike vote notice or holding of a strike vote would be in violation of the contract.

Emphasizes Existence of Contract

J. M. Larkin, vice president of Bethlehem, in his letter to the board affirmed that it now has a contract with the union dated April 23, 1945 and effective until Oct. 15, 1946.

"We believe that it was not the intention of the Congress," says Mr. Larkin, "in passing the War Labor Disputes Act to sanction any strike which should be in violation of any agreement between an employer and a labor organization representing its employees, or to authorize the expenditure of public funds in the conducting of a strike ballot in such a case." The no-strike clause in the Bethlehem-United Steelworkers of America contract reads: "During the term of this agreement neither the union nor any employee shall, (a) engage in or in any way encourage or sanction any strike or other action which shall interrupt or interfere with work or production at any of the plants or works or (b) prevent or attempt to prevent the access of employees to any of the plants or works."

The United States Steel Corp. in its reply to the NLRB notification of the strike vote said that it would co-operate in making arrangements for the vote but that it was extending this co-operation in spite of its conviction that the strike vote is contrary to the labor agreement now in effect between the subsidiary companies of the corporation and the United Steelworkers of America.

Republic Steel Corp., Cleveland, has taken the same position as other producers with respect to the legality of the vote. As reported in STEEL (p. 91, Nov. 12) Republic asked that the union's petition be dismissed on the ground its contract with the union expressly prohibits any strike during the life of the pact. The contract was signed April 11, 1945 and continues in effect until Oct. 15, 1946.

CONSTRUCTION AND ENTERPRISE

OHIO

BEREA, O.—John E. Halas, operator of Service Grinding Co. will build a plant on First Ave., to cost about $6500.

CLEVELAND—Nottingham Steel Co., S. M. Friedman, president-treasurer, NBC Bldg., Cleveland, steel warehouse and fabricating firm, with plants at Detroit and Chicago, has bought the Cleveland yards of American Shipbuilding Co. at auction.

CLEVELAND—Chamber of Commerce at Orwell, O., has offered $15,000 toward purchase of a site for Master Pneumatic Tool Co., Norris M. Brown, president, 5605 Herman Ave., with offices in the Keith Bldg. Company is seeking new location.

CLEVELAND—I. Schumann & Co., Israel Schumann, president, 3027 East 55th St., will build a warehouse and brass foundry at 4391 Bradley Road, to cost about $100,000.

CLEVELAND—Lempco Automotive Corp. has been incorporated by James F. Strnad, president of Lempco Products Co., 5490 Dunham Road, to manufacture automotive parts. Plant will be located in one-story 15,000-square foot building at 2953 East 55th St., leased from Cleveland Pressed Steel Co.

ELYRIA, O.—Western Automatic Screw Machine Co., has let contract to Brown Construction Co., 1900 Euclid Ave., Cleveland, for a one and two-story 200 x 200-foot manufacturing and locker building. J. B. Fischer, 7322 Lafayette St., Chicago, is engineer.

KINSMAN, O.—H. B. Salter Mfg. Co., Marysville, O., has bought the Glauber Brass Mfg. Co. plant at Kinsman, covering 45,000 square feet floor space and will consolidate with the 105,000 square feet of Salter facilities to make plumbers' goods.

NORWALK, O.—Edward R. Day, 159 Benedict St., and associates, have bought five acres from Norwalk Vault Co. and will build a plant for manufacture of chemicals.

SANDUSKY, O.—New Departure Division General Motors Corp., Bristol, Conn., will let contract soon for a one-story 600 x 600-foot ball-bearing plant and 60 x 480-foot engineering building, boiler house, sewage disposal plant and truck garage, to cost over $1 million. Albert Kahn Associated Architects & Engineers Inc., 345 New Center Bldg., Detroit, architect.

MASSACHUSETTS

BOSTON—Armory Foundry Co., 380 Armory St., Jamaica Plain, is taking bids for a one-story foundry building to cost about $45,000. C. H. Erickson, 259 Walnut St., Newton, Mass., is architect.

GRAFTON, MASS.—Town has plans under way for a water system, five miles of mains and 500,000-gallon standpipe, to cost about $230,000. H. E. Bailey, 177 State St., Boston, is consulting engineer.

CONNECTICUT

BRIDGEPORT, CONN.—Bryant Electric Co., 1421 State St., H. E. Seim, president, will let contract soon for a three-story 95 x 240-foot grinding and finishing building.

BRIDGEPORT, CONN.—Bullard Co., 286 Canfield Ave., has let contract to E. & F. Construction Co., 94 Wells St., for a one-story, basement and mezzanine machine shop addition 80 x 300 feet, to cost about $225,000.

BRIDGEPORT, CONN.—Progress Mfg. Co., care M. C. Kitchell, 140 James St., has let contract to Frouge Construction Co., 74 Goodsall St., for a two-story 45 x 75-foot plant building on Mountain Grove St., to cost about $50,000.

MILFORD, CONN. — Connecticut Light & Power Co., 36 Pearl St., Hartford, Conn., has let contract to United Engineers & Contractors Inc., 347 Madison Ave., New York, for an 80 x 157-foot power plant on Naugatuck Ave., to cost about $250,000.

STAMFORD, CONN.—Atlas Powder Co., 269 Ludlow St., has let contract to Edwin Moss & Son, 555 Bridge St., Bridgeport, Conn., for a boiler plant and equipment, to cost about $40,000.

RHODE ISLAND

PROVIDENCE, R. I.—Circular Tool Co., 765 Aliens Ave., is taking bids for a one-story 30 x 62-foot plant addition to cost over $40,000, with equipment. C. H. Lockwood, 171 Westminster St., is engineer.

NEW JERSEY

HILLSIDE, N. J. — Westinghouse Electric Corp., East Pittsburgh, Pa., plans a one-story plant on a 20-acre site on Chestnut Ave., to cost about $1 million.

PENNSYLVANIA

MEADVILLE, PA.—Talon Inc. has let contract to George A. Rutherford Co., 2725 Prospect Ave., Cleveland, for a three-story 110 x 200-foot warehouse, to cost about $350,000. Wilbur Watson & Associates, 4614 Prospect Ave., Cleveland, are engineers.

NEW CASTLE, PA.—Pennsylvania Power Co., care Ohio Edison Co., New Castle, plans second 35,000-kw turbo-generator plant and boiler unit, with transmission lines, to cost about $200,000.

MICHIGAN

DETROIT—Revere Copper & Brass Inc., 5851 West Jefferson Ave., has plans under way for a brick and steel plant, including warehouse, to cost about $100,000.

DETROIT—Michigan Rust-Proof Co., 2128 Jos. Campau Ave., has let contract to John Weinhart Construction Co., 15077 Mayfield St., for a one-story plant addition estimated to cost about $60,000. Stephen J. Stachowiak, 11838 Jos. Campau Ave., is architect.

DETROIT—National Broach & Machine Co., 5600 St. Jean Ave., has let contract to F. H. Martin Construction Co., 955 East Jefferson Ave., for a one-story plant to cost about $70,000. Giffels & Vallet, 1000 Marquette Bldg., are architects.

INDIANA

BLUFFTON, IND.—Board of public works, C. B. Arnold, clerk, City Hall, plans erection of 300,000-gallon elevated steel water tank, to cost about $40,000. H. B. Freeland is city engineer.

FORT WAYNE, IND.—Production Foundries Inc., 1601 South Hanna St., has been incorporated with 1000 shares no par value to operate a foundry, by Robert R. Keeton and associates.

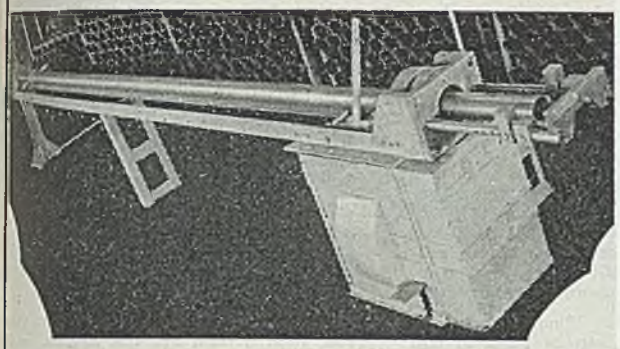
INDIANAPOLIS—Turner of Indiana Inc., 635 Virginia Ave., has been incorporated with 1000 shares no par value to manufacture machinery and industrial equipment, by Peter Turner and associates.

MUNCIE, IND.—Muncie Iron & Metal Co. Inc. has been incorporated with 25 shares no par value to deal in waste materials, by William I. Oshry, president, and associates.

ILLINOIS

AURORA, ILL.—All Steel Equipment Co., Aurora, has let contract to Algot B. Larson Co., 3837 West Lake St., Chicago, for a one-story 240 x 326-foot plant addition. E. O. Sessions & Co., 1 North LaSalle St., Chicago, are engineers.

CHICAGO—Ingersoll Steel & Disc Division of Borg-Warner Co., 310 South Michigan Ave., has let contract through A. J. Boynton & Co., engineers, 58 Washington St., for a one-story 100 x 440-foot heat treatment building, 19 x 41-foot substation, and other



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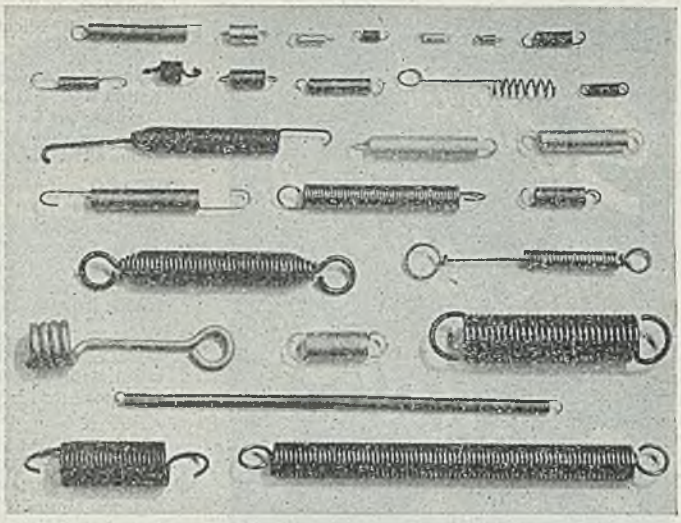

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structures, to Van Etten Bros. Builders Inc., 310 South Michigan Ave., to cost about $125,000.

CHICAGO—Lafayette Steel Co., 4106 South Karlov Ave., has let general contract to Poirot Construction Co. 2001 West Pershing Road, for a one-story 173 x 482-foot plant, to cost about $275,000.

CHICAGO — International Molding Machine Co., 2616 West Sixteenth St., has let contract to L. B. Strandberg & Son Co., 608 South Dearborn St., for a 200 x 200-foot plant and 43 x 140-foot office building, estimated to cost about $300,000. W. S. Armstrong, 109 North Dearborn St., is architect.

LINCOLN, ILL.—Central Illinois Electric & Gas Co. plans water softener plant to cost about $100,000. B. P. Hallock, care owner, is engineer.

MARYLAND

BALTIMORE—Chevrolet-Baltimore Division of General Motors Corp., 2122 Broening Highway, is building a plant addition 160 x 320 feet and rearranging facilities for start of automobile assembly operations in December.

BALTIMORE—Danke Pattern & Mfg. Co., 2021 Annapolis Ave., is building a new plant at 4810 East Wabash Ave., foundry expected to be completed for operation this month and pattern shop next spring.

BALTIMORE—Middlestadt Machine Co., 5113 Belair Road, is building a one-story 55 x 75-foot addition to enlarge production of tools, dies, and metal stampings.

BALTIMORE—General Electric Co. will start alterations to a plant at 920 East Fort Ave., acquired more than a year ago, to be used as an apparatus service shop, one story, 37,000 square feet.

MISSOURI

KANSAS CITY, MO.—Clipper Mfg. Co., N. C. Coates, president, 1517 Cherry St., plans a two-story plant and office building at 28th and Warwick Way, to cost about $100,000.

WISCONSIN

MILWAUKEE—Western Hardware & Specialty Co., 228 South First St., has let contract to Thomas H. Bently & Son Inc., 4610 West Mitchell St., for a two-story 146 x 147-foot plant and 50 x 72-foot office building.

WAUKESHA, WIS.—Industrial Clutch Co., 1300 West National Ave., has plans by R. H. Sutherland, 259 East Wells St., Milwaukee, for a one-story reinforced concrete industrial building.

MINNESOTA

MINNEAPOLIS—Crown Iron Works, 1229 Tyler St. NE, has let general contract to C. O. Field Co., 2940 Harriet Ave., for a one-story 50 x 150-foot shop building, to cost about $60,000.

SAVAGE, MINN.—Village, M. F. Zeller, clerk, plans waterworks system, including tank on tower, distribution lines, etc., to cost about $60,000. H. A. Davis, 303 Commerce Bldg., St. Paul, is engineer.

ST. LOUIS PARK, MINN.—Lincoln Tool & Die Co., 1108 Second Ave. South, has let contract to Leck Construction Co., 2834 Stevens Ave., Minneapolis, for a one-story 70 x 200-foot plant at Natchez Ave. and Highway 7, estimated to cost about $50,000. Lang & Raugland, 502 Wesley Temple Bldg., Minneapolis, are architects.

FLORIDA

JACKSONVILLE, FLA.—City has plans for two garbage incinerators, to cost about $250,000. R. McDonald Smith, S667 Arden St., Jacksonville, is consulting engineer.

IOWA

HAMPTON, IOWA — Federated Co-operative Power Association, Hampton, plans two generating plants, to cost about $375,000.

CALIFORNIA

BEVERLY HILLS, CALIF.—Payne Furnace & Supply Co., 9261 West Third St., will build a plant addition costing about $250,000. Marshall P. Wilkinson, 6807 Hawthorne Ave., Hollywood, is architect.

BURBANK, CALIF.—Lockheed Aircraft Corp. will build five additional hangar buildings at its plant here for manufacture, assembly and servicing of airplanes, with about 150,000 square feet floor space.

BURRELL, CALIF.—General Petroleum Corp., 108 West Second St., Los Angeles, has let contract to Bechtel, McCone Corp., 601 West Fifth St., Los Angeles, for a gasoline reduction plant near here, to cost about $2 million.

LOS ANGELES—McCulloch Aviation Inc. has been incorporated with $500,000 capital and is represented by George W. Manierre, Merritt Bldg., 307 West Eighth St., Los Angeles.

LOS ANGELES—General Mold Co. has been formed by Jesse J. Goodheart and associates and has established operations as a machine shop and rubber mold manufacturer at 10900 South Main St.

LOS ANGELES—Junior Steel Co. will build a plant addition at 1960 South Alameda St., 46 x 51 feet, to cost about $15,000.

LOS ANGELES—Lillian Hinkle, 3151 Los Feliz Blvd., will build a machine shop 48 x 116 feet, to cost $18,000, at 4523 Alger St., Eagle Rock District, Los Angeles.

LOS ANGELES—Jos. T. Ryerson & Son Inc., Chicago, is considering bids for a steel warehouse unit on Bandini Road, including warehouse building with 150,000 square feet floor space, with central craneway of 110-foot span and side spans of 55 feet. Includes one-story office building with 10,000 square feet floor space and railroad sidings. Cost is estimated at $500,000.

LOS ANGELES—Southern California Gas Co. and Southern Counties Gas Co., both of 810 South Flower St., Los Angeles, have applied for permission to construct a 26-inch gas pipe line 214 miles long from Blythe to Santa Fe Springs, Calif., and 10,000 hp compressor station at Blythe, at cost of about $15 million. Will connect with pipeline 720 miles long to be laid by El Paso Natural Gas Co., El Paso, Tex.

LOS ANGELES—Seaboard Coil Spring Co. is building an addition 97 x 140 feet at 1731 South Wall St., to cost about $40,000.

LOS ANGELES—United Metals Co. is having plans drawn for a new plant 46 x 135 feet at 37th and Main Sts.

LOS ANGELES—Ford Motor Co., Dearborn, Mich., plans an assembly plant at Maywood, a suburb, to cost several million dollars. William P. Neil Co. Ltd., is preparing engineering details and Harry T. Miller, 4814 Loma Vista Ave., Los Angeles, is architect.

LOS ANGELES—Alloy Welding Co., 3479 Randolph St., Huntington Park, Los Angeles, is erecting a steel addition 20 x 120 feet.

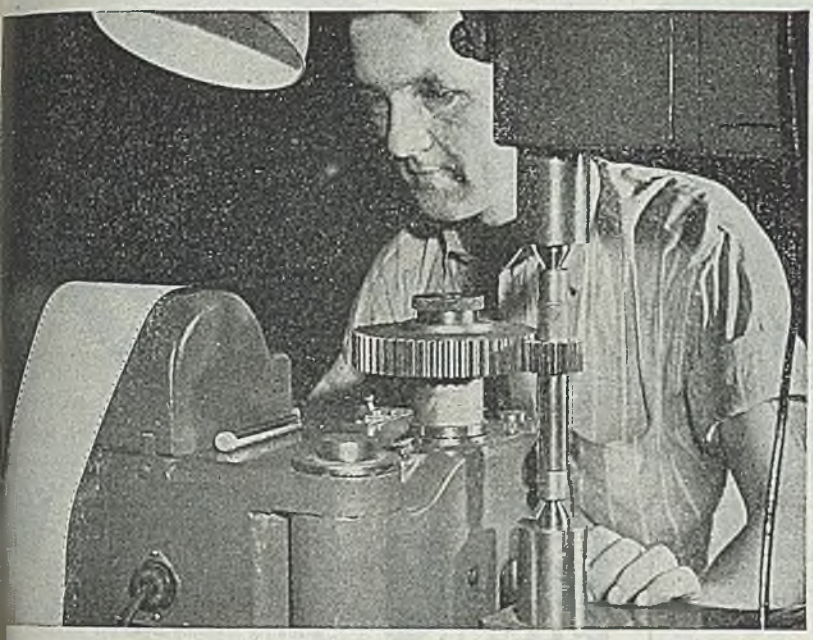
LOS ANGELES—Dependable Motor Parts Co., 1524 Long Beach Ave., has let contract for a one-story plant and office at 1733 East Fifteenth St., to cost about $18,000.

LOS ANGELES—Field Auto Body Co. will erect a plant at 1608 Essex St., 59 x 137 feet, one story.

LOS ANGELES—Commercial Steel Co. has been incorporated with 50,000 shares no par value, represented by Tapper & Tapper, 1202 Broadway Arcade Bldg., Los Angeles.

NORTH HOLLYWOOD, CALIF.—Champion Engineering & Mfg. Co. has been formed by Walter P. Eyres and associates and has established operations at 6206 Elmer Ave.

SOUTH GATE, CALIF.—Building permit has been granted to Rheem Mfg. Co., 4361 Firestone Blvd., for a crane runway extension to cost about $7000.



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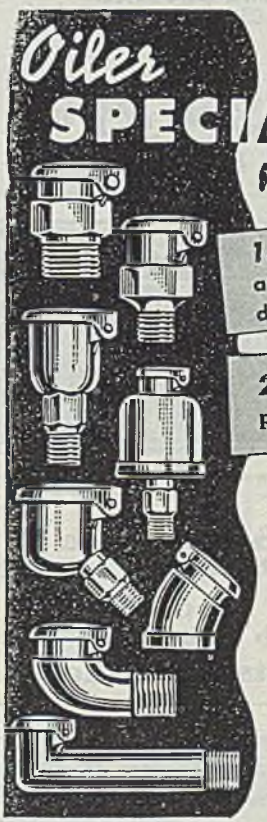

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The Treasury Department acknowledges with appreciation the publication of this message by

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1 W.N. Best (Dempsey) HEAT TREATING FURNACE—oil fired—chamber size 36 x 58½ x 15

1 Same as above, 27 x 40½ x 15 with alloy bottom plates

All with motor operated valves.

All in perfect working order.

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2009 Fenkell Ave., Detroit 3
Phone—Townsend 8-1172

HAMMERS, 3-B & 4-B Nazel M.D.
LATHE, Turret 24" Gisholt, 6-1/4" hole.
PRESS, Forging 1000 ton United Steam-Hyd.
PLANER, O.S. 60" x 60" x 14'. D&H M.D.
SHAPER, 36" Morton Draw Cut.
SHEARS, Alligator 1"—4".
SHEAR, Open End 22" blades 2-1/2" sq. M.D.
SLOTTER, 12" Putnam, 35" table, B.D.
STRAIGHTENER PLATE, 110" x 1-1/4" H&J.
STRAIGHTENER, 42" W-F, 11 roll, 2-5/8" dia.

WEST PENN MACHINERY COMPANY
1208 House Bldg. Pittsburgh 22, Pa.

FOR SALE

2 — Metal Alligator Shears

Address Box 335
STEEL, Penton Bldg., Cleveland 13, O.

CLASSIFIED

Help Wanted

DRAFTSMEN

Large steel company in Pittsburgh area has several opportunities for draftsmen with high school or college education and experience in the following areas: design of steel mill and steel foundry products; railroad track accessories; layout and design of steel mills, blast furnaces, open hearth furnaces, and power plants; design of fabricated concrete bars; layout of electric power and control equipment; general mechanical design and layout. Please submit details, statement of experience and education, inexpensive photograph, and required minimum earnings. Address Box 142, STEEL, Penton Bldg., Cleveland 13, O.

PLANT SUPERINTENDENT WANTED FOR MEDIUM SIZED STEEL FABRICATING PLANT LOCATED IN SOUTHERN CALIFORNIA, WITH A GOING CONCERN. APPLICANT MUST HAVE EXPERIENCE IN LARGE VOLUME PRODUCTION OF PRESSURE VESSELS AND OTHER TANKS OF VARIOUS SIZES AND WEIGHTS; AND ALSO A THOROUGH KNOWLEDGE OF STEEL PLATE FABRICATION. GIVE COMPLETE PERSONAL AND EXPERIENCE RECORDS. INDICATE SALARY DESIRED. ADDRESS BOX 308. STEEL, PENTON BLDG., CLEVELAND 13, O.

WANTED: GENERAL MANAGER BY MIDwestern company to take charge all divisions of the company. Must be proven executive with ability to get results, type of business general steel plate and alloy fabrication, construction, etc. Write stating experience, education, age, salary expected, companies worked for, positions held, etc. Address Box 287, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: SALESMAN BY LARGE TUBING manufacturer of both seamless and welded in carbon, alloy and stainless steels. Must have Mechanical or Metallurgical Engineering college degree, or suitable alloy steel field sales experience. Give full details with application. Write Box 265, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: MANAGER FOR CONSTRUCTION division to take full charge. Executive with ability to organize and get results. Must be experienced with oil refineries, chemical, steel construction, etc. Write stating age, education, experience, references and salary expected. Address Box 286, STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

MACHINERY SALESMAN

Excellent opportunity for advancement and a real money-making opportunity with old established concern. Apply Box 289, STEEL, Penton Bldg., Cleveland 13, O.

WANTED - ESTIMATOR

Competent estimator for ship work, structural steel and plate work. State experience and references. Excellent opportunity. Write M. S. Esslinger, Ingalls Shipbuilding Corporation, Pascagoula, Miss.

WANTED: SALES ENGINEER FOR MEDIUM SIZED STEEL FABRICATING PLANT LOCATED IN SOUTHERN CALIFORNIA. MUST HAVE THOROUGH KNOWLEDGE IN THE SELLING OF LARGE VOLUME OF PRESSURE VESSELS: ALSO OTHER TANKS OF VARIOUS SIZES AND DESIGNS. GIVE COMPLETE PERSONAL AND EXPERIENCE RECORDS. INDICATE SALARY DESIRED. ADDRESS BOX 307, STEEL, PENTON BLDG., CLEVELAND 13, O.

CHIEF ENGINEER: EXECUTIVE WITH ABILity to take full charge of all engineering, research, and development. Must be familiar with oil refinery equipment and construction, general steel plate construction, and general process equipment. Location midwest. Write giving full information, age, education, experience, salary, references, etc. Address Box 288, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: PRODUCTION MANAGER FAMILiar with scheduling, planning and production. Location East. Give full particulars, age, education, positions held, salaries earned, references, salary expected, enclose picture. Write box 315, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: STEEL FOUNDRYMAN WITH some knowledge of heading and gating of small and medium sized steel castings. Permanent position with old established steel foundry. Address Box 305, STEEL, Penton Bldg., Cleveland 13, O.

POSITION AVAILABLE
for qualified individual experienced in supervision of Board Drop Hammer Shop, Hot Upsetting, Forging, Die Design, and Estimating. Address P. O. Box 1798, Columbus, Ohio.

Help Wanted

SHEET STEEL REPRESENTATIVE CHICAGO AND VICINITY

Old established steel warehouse handling Sheet and Strip Steel, Coils, Prime—Secondary Products. Excellent opportunity. Experience essential. Address Box 273, STEEL, Penton Bldg., Cleveland 13, O.

SALES MANAGER

With successful sales record by one of the leading manufacturers in the metal cutting tool industry. State age, education, experience, special qualifications and compensation desired. Address Box 311, STEEL, Penton Bldg., Cleveland 13, O.

Opportunities

MACHINE SHOP WANTED

Will pay cash for a one-story Machine Shop suitable for medium-heavy work. Equipment required—66" horizontal boring mill, 3" bar horizontal, No. 3 milling machine, 16" engine lathes, large shaper, 6' radial drills, 2" turret lathes, tool room 5 to 10 ton crane. Will also consider sub-contracting our work with or without capital investment. Eastern Penna. district preferred. Principals only.

Address Box 266,
STEEL, Penton Bldg., Cleveland 13, O

NEW PRODUCTS FOR MANUFACTURE

Manufacturing connection sought for varied line valuable and proven inventions on royalty basis by owner having broad experience production, distribution new products.

Address Box 236
STEEL, Penton Bldg., Cleveland 13, Ohio

CLASSIFIED

Positions Wanted

PURCHASING AGENT: 12 YEARS' PURCHASing experience in Mechanical Marine Equipment —Alloy Process Equipment—Heavy Industrial Materials. Excellent contacts with ferrous and nonferrous mills, foundries, fabricators, marine engines, manufacturers of component parts for heavy machinery, etc. Responsible for 24 million dollars of purchases, year 1944. Successful background in organizing and supervising Purchasing, Contracting, Expediting, Material and Stores Control—Also experienced in Steel Warehousing and 2½ years' Shop Experience as Assistant Superintendent in heavy metal manufacturing plant. Age 35—Efficient—Aggressive—Can get results. Address Box 313, STEEL, Penton Bldg., Cleveland 13, O.

AFTER FIRST OF YEAR, SERVICE MAN, 30, desires position West Coast involving purchasing, warehousing, disposal of prime and scrap steel, metals, used equipment, etc. AB, MA degrees specializing in governmental-business relationships. Director of steel warehouse in East, formerly business specialist, Iron and Steel Branch, OPA, Washington, D. C.; Technical Consultant to War Department; since entering army assigned to scrap and salvage activities. Reply Box 310, STEEL, Penton Bldg., Cleveland 13, O.

FACTORY MANAGER FOR METAL STAMPing and machine products industry. An efficient, progressive organizer with sound business judgment. 25 years of broad technical executive and administrative experience in all elements of product development, economical production and general factory operations. Desires change in near future. American. Age 46. Address Box 312, STEEL, Penton Bldg., Cleveland 13, O.

Accounts Wanted

SALES REPRESENTATIVE CONTEMPLATING opening Manufacturers' Sales Agency Office in Detroit, Michigan, or Buffalo, New York, desires to contact concerns engaged in producing products for the automotive or foundry industries. Capable and well acquainted in Heavy Duty industry in the East. Write Box 316, STEEL, Penton Bldg., Cleveland 13, O.

MANUFACTURERS' AGENT: VETERAN, ENG. grad. formerly Sales-Engineer with major steel corporation in Kansas-Oklahoma territory is now establishing sales agency in same territory and desires to represent manufacturers of forgings (ferrous & nonferrous), tubular goods and related steel products. Address Box 295, STEEL, Penton Bldg., Cleveland 13, O.

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Accounts Wanted

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