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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 119, NO. 18 OCTOBER 28, 1946

NEWS

TECHNICAL

FEATURES

MARKETS

NEXT WEEK...

Copper Brazing Intricate Parts
Reducing Cast Iron Grain Growth
Standardization of Steels for Naval Aircraft
Casting Magnesium Alloys—Modern Foundry Practice
Liquid Coolers for Machine Tools

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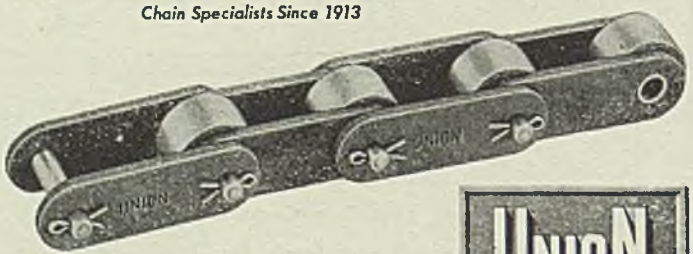

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- Roller chain type
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As the EDITOR VIEWS the NEWS

Sane Prices and Wages

One of the factors contributing to inflation to which little attention has been paid is the cost of wasteful practices necessitated by government controls.

For instance, consider the plight of a typical manufacturer. Because of government rulings he was forced months ago to give up some of his regular lines and to go into the manufacture of products he had not made previously. This involved many costs that would not have been incurred had he been able to continue his regular lines.

Due to shortages of materials and components, this typical manufacturer has been forced to spend large sums for expediting shipments, employing costly substitutes and storing nearly completed products that are held up for lack of one or two items.

Similarly, because of chaotic labor conditions, he has to operate on a hit-and-run basis. When he does manage to get materials and parts accumulated for a run of production, his employees choose that inopportune time to go hunting, to pull an unauthorized strike or to stage a work stoppage under some other pretext. When finally he is lucky enough to achieve a balance between supplies of materials and parts and supply of labor, he is forced to indulge in excessive overtime to meet commitments to customers.

Throughout these difficulties he is filling out endless reports for government agencies, collecting his employees' income taxes for the government at his expense, possibly collecting union dues at his own expense and performing numerous other services which rightfully should be rendered by others or at least paid for by others.

Next consider a typical employee. He has received numerous wage increases under government controls until his rate per hour seems fantastically high. But this rate is distorted by the current artificial provisions for overtime, holidays, sick leave, and vacations. It is a rate high enough to permit the worker to make out rather well even after he has lost time because of strikes by others, shutdowns caused by material shortages and other factors.

The point is that the typical manufacturer has had no opportunity since V-J Day to know what prices he needs to meet normal costs, nor has the typical employee had an opportunity to know how much take-home pay he could expect under normal conditions.

If unnecessary controls were abandoned and industry were permitted to operate smoothly and uninterruptedly for say six months, manufacturers could entertain more moderate ideas about prices and employees could adopt more reasonable ideas about wages.

STEEL
October 28, 1946

KEEP GOVERNMENT OUT: Speaking at the eighteenth annual meeting of the Gray Iron Founders' Society in Cincinnati last week, Senator Wayne L. Morse of Oregon made a strong plea for true collective bargaining as contrasted to the political type of bargaining that has prevailed so frequently settling labor disputes in recent years.

His remarks in regard to national labor policy are particularly timely in view of the current threat of a reopening of the coal miners' contract on Nov. 1 and of numerous other disputes that are likely to rise in the near future. Senator Morse declared that there is too great a tendency on the part of business to run to the government for the settlement of disputes. He believes that the government should stay out of the field of wages, hours and conditions of employment. He suggests that collective bargaining be made to work as one step in removing government domination of business. He is definitely opposed to the hysterical type of labor legislation which merely entrenches government as the dictator of conditions affecting labor.

This emphasis upon establishing a type of collective bargaining that is independent of government

(OVER)

meddling has a strong appeal. It should cause employers to reappraise the Case bill and other labor bills on the basis of the role in which they cast the government in collective bargaining. —pp. 43, 48

° ° °

CONSERVE COKING COAL: At a meeting of blast furnace and coke oven operators in Chicago, which attracted a record-breaking attendance from the Chicago and Pittsburgh districts, W. T. Brown, a Pittsburgh consultant, presented an exhaustive study of the reserves of coking coals in Pennsylvania, West Virginia, Kentucky and Virginia.

In his opinion, the problem of coking coal boils down to the sulphur content of the coals and the quality of coke produced from them. He decried the use of byproduct coal for steam and domestic purposes, urged blast furnace operators to blend high sulphur coals with low sulphur coals to conserve the latter and advised coke oven men to seek better coal by insisting that their purchasing agents be more exacting on specifications on moisture and cleanliness.

The emphasis placed by Mr. Brown on the need for conserving low-sulphur coal is timely. Perhaps, as one pig iron producer pointed out, sulphur may not be as important in the blast furnace as has been believed in the past. —p. 90

° ° °

KEEP INDUSTRY STRONG: If this nation ever were drawn into another world war, the metalworking industries probably would be called upon to supply a volume of weapons that would dwarf the tremendous output for World War II.

Already the Army and Navy have developed fantastic units that would be standard fighting equipment if another major war occurred. Among these are the "bat" and the "assault drone." Manufacture of these robots on a large scale would require not only large tonnages of rolled steel, aluminum, castings and forgings but also extensive machine tool and other manufacturing facilities for the airframes, fuselages, radar sets, gyroscopes, television sets and numerous other intricate parts and instruments involved.

The prospect of providing materials and facilities for these weapons—to say nothing of atomic bombs, satellite vehicles, rockets and other new devices for war—is a challenge to our country to keep its industries strong. —p. 55

SIGNS OF THE TIMES: Sometime in the future the present sellers' market will give way to a buyers' market. When that times comes, manufacturers who have been foresighted enough to have developed their sales forces into the pink of condition will be amply rewarded. Officials of Allegheny Ludlum Steel Corp. probably were thinking along these lines when they instituted a new intensive sales training course (p. 62), under which carefully selected candidates will receive eight weeks classroom instruction and training in mills and plant departments and eight weeks of supervised sales training in the field. . . . Members of the Wire Association, meeting in Buffalo last week (p. 48), compared notes on effective methods of dealing with absenteeism, seniority, disputes and other labor relations problems. . . . Decision as to what will happen to the long drawn out effort of the administration to introduce certain reforms in the United States patent system may be influenced to a considerable extent by the attitude displayed by the new Secretary of Commerce W. Averell Harriman (p. 52) after he has had an opportunity to review the history of the case. . . . Now that the strong position of cotton in the economics of the design of conveyor and transmission belts has been challenged, there is an opportunity for belts reinforced with steel cord (p. 72) to establish themselves on a basis of low cost per unit of belt strength. . . . The French automobile show held in Paris recently emphasized the zeal of European builders to concentrate on standardized models and to give preference to exports over domestic sales. A 10-hp. Citroen, which sold for 24,700 francs in 1939 (p. 57), now is priced at 120,125 francs—equivalent to slightly more than $1000—which represents a year's wages for a skilled French workman. . . . Sixty-five sets of roller bearings have been installed in the foundation of a Los Angeles office building (p. 64) to permit the structure to glide 6 inches in any direction in order to ease the shock of an earthquake. . . . Strikes in plants manufacturing electrical equipment and material shortages have slowed the completion of new power generating capacity in public utility plants (p. 134) to the extent that total capacity exceeds peak demand by a margin that is too narrow for comfort. . . . In England, as in America, foundrymen (p. 56) are experiencing a serious shortage of foundry workers. The government is making a renewed effort to recruit 20,000 additional employees for casting shops.

E. C. Shaner

EDITOR-IN-CHIEF

What Are Your Stainless Requirements?

Ryerson Service Meets Varied Needs Promptly

Are you adding eye appeal with stainless steel? Do you need stainless for resistance to heat or corrosion? Whatever the requirement, your nearby Ryerson plant is the logical stock source.

Diversified stocks plus high-speed equipment for cutting, handling and shipping enable Ryerson plants to give faster service on most orders. While there is continued shortage of a few kinds and sizes, Ryerson usually ships your steel, accurately cut to size, within a day or two. Prompt service that helps avoid the inconvenience and expense of production delays.

In addition, stainless service from Ryerson means delivery of Allegheny Metal, finest of stainless steels. It means flat rolled products with good forming qualities. Accurately-sized bars with faultless surface. It means stainless that does an efficient job because every bar, plate, sheet and tube is of uniform high quality.

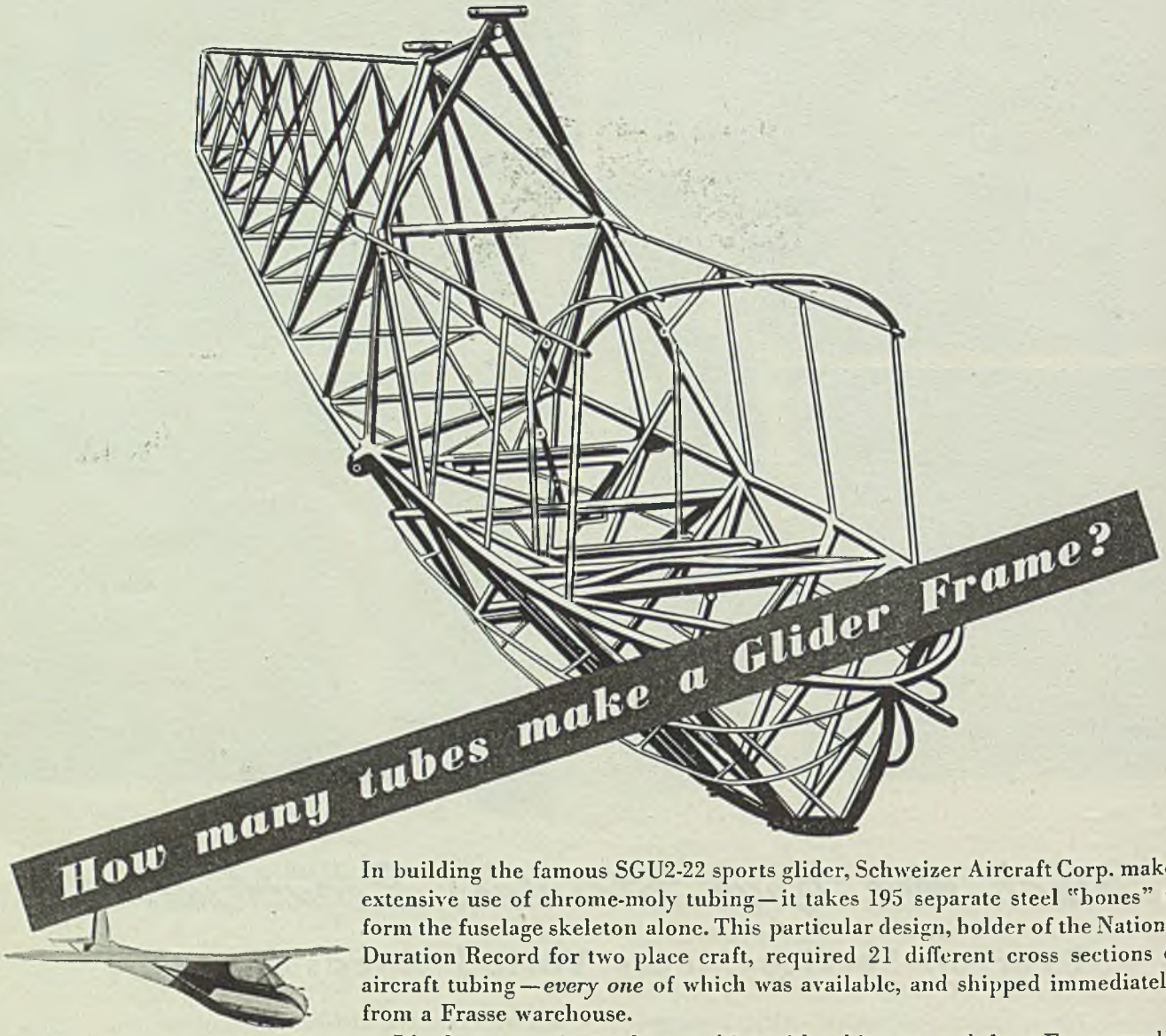
Technical assistance is a third advantage of Ryerson service. Each plant has a staff of stainless steel specialists whose wide experience is always available to you.

So contact the nearest Ryerson plant for practical service on all stainless requirements. Products in greatest demand such as Allegheny stainless sheets may not always be in stock but we suggest you keep in touch with us.

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

Stainless and other Products in Stock: Allegheny Stainless bars—rounds, squares and hexagons, including free machining grades; angles, plates, sheets, strip; seamless and welded tubing and pipe; pipe fittings; welding flanges and welding rod; bolts, rivets, washers. Also Carbon and Alloy Steels, Safety Floor Plate, Metal Working Tools & Machinery, etc.

RYERSON STEEL



How many tubes make a Glider Frame?

In building the famous SGU2-22 sports glider, Schweizer Aircraft Corp. makes extensive use of chrome-moly tubing—it takes 195 separate steel "bones" to form the fuselage skeleton alone. This particular design, holder of the National Duration Record for two place craft, required 21 different cross sections of aircraft tubing—*every one* of which was available, and shipped immediately, from a Frasse warehouse.

It's *that* convenient, when working with tubing, to work from Frasse stocks. Frasse is a warehouse specialist in tubing—not only in aircraft grades, but in carbon mechanical and stainless as well.

Frasse stocks of seamless mechanical tubing alone range from 3/32" all the way up to 10½" O.D.—not to mention the square tubing, condenser tube, or welded. In stainless steel you can get any one of three types—304, 316, or 347—in both tubing and pipe, right out of warehouse stock. All grades are maintained in broad, convenient size ranges.

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STEEL
October 28, 1946

Second Postwar Wage Drive Starting

Auto workers, coal miners, farm equipment builders in van as unions ready campaigns to push hourly rates up again. Annual wages, portal-to-portal pay, pension funds also to be made bargaining issues

THE SECOND major postwar drive for wage increases is getting underway. First demands for upward adjustments already have been made in important segments of the economy—in the auto industry, coal mining and farm equipment.

Other unions are ready to join in the campaign when present contracts expire or can be reopened for new wage negotiations. However, many contracts do not expire until after the first of the year and the big drive may be delayed until then.

The new campaign may well mark the beginning of another cycle in the postwar inflationary spiral which started just a year ago when the President and his advisers came out with the declaration that industry could afford to grant substantial wage increases without raising prices.

The fallacy of that position has been more than adequately demonstrated during the past 12 months. The wage increases granted last winter and spring, combined with work stoppages and artificial limitations on production, have caused prices of many commodities to rise sharply and have injected many and serious distortions into the economy.

Workers who believed in the administration's promise of higher wages without higher prices or greater productivity now feel they have been betrayed. The advantages of their wage increases were at best fleeting and now have been lost to the rising cost of living. In their confusion, they can see only further wage increases as the answer to their problems.

Arguments by industrial economists, some government men and a few labor leaders that the essential need at present is for a period of uninterrupted and high production appear to have fallen on deaf ears. And now the labor unions are back asking for further wage increases, even while acknowledging that these will be followed by more price increases.

Most industrialists view the situation ahead gloomily. They fear that the new wage demands may be accompanied by serious work stoppages, especially since they are linked up with other new and costly demands. These latter include the guaranteed annual wage, portal-to-portal pay, health and welfare funds, retirement programs and similar concessions with which neither management nor labor has had much experience and the feasibility of which has not yet been demonstrated.

Philip Murray, left, CIO president, and Walter P. Reuther, UAW head, enter meeting of auto workers at Cleveland to discuss plans for new wage campaign

Should new work stoppages interrupt the relatively high production enjoyed during the past four months, scarcities will be accentuated, prices will rise still higher and we will enter a more extreme phase of inflation.

Meanwhile the government is caught without a wage policy worthy of the name. It has no effective machinery to deal with work stoppages. In fact, top government officials disagree among themselves as to what should be done in industrial relations.

One school of thought favors the government stepping out of the picture as much as possible. These men believe wages should be decontrolled and compensation to workers left to free collective bargaining. Proponents of this theory believe the government should abandon plant seizures and should speak only when spoken to in industrial disputes, then offering mediation and conciliation services.

Industry members of the Wage Stabilization Board, who resigned after Reconversion Director Steelman overruled the board's decision in the maritime strike case a month ago, support the complete release of wages from government control.

A second school is reluctant to give up all wage controls. Officials of the Office of Reconversion last week claimed they had a tentative White House decision for retention of wage controls. Spokesmen for this school argued wage controls should not be abandoned because such action would: 1.

Bring on more wage demands than either industry or the government could cope with; 2. start a new and greater strike wave; 3. start a fresh inflationary spiral.

Regardless of which way the administration finally leans, it is not likely to cut as large a figure in determining the new wage pattern as it did last spring when it virtually dictated an increase of 18½ cents an hour.

In the metals industry the new wage drive is being spearheaded by the United Automobile Workers-CIO as it was a year ago. This time, however, the UAW's target is Chrysler Corp. instead of General Motors.

Meeting in Cleveland a week ago, the UAW executive board approved plans to demand a "substantial" wage increase from Chrysler. This is possible because the Chrysler contract permits reopening of the contract for wage negotiation after 60 days' notice, which was filed by the union Aug. 20. The General Motors contract cannot be reopened for wage discussions until next April and the Ford contract runs to next May.

In addition to higher wages, the UAW executive board called for a health and welfare fund or insurance program to cover hospital and medical care and other emergency expenditures. It also asked for a retirement program for workers to supplement social security and to provide for retirement of workers at ages under 65.

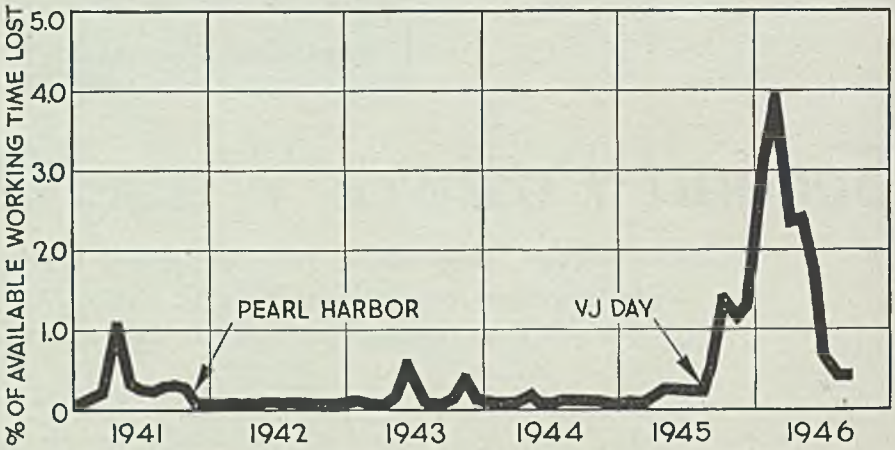
The UAW's final demand is for an "adequate annual wage."

Adjustable Increases May Be Asked

In Detroit last week, observers predicted the union will proceed rather cautiously with its demands. Although some loud talk was heard of demanding a 20-cent hourly increase, it was believed the union would be glad to settle for something considerably less than that. Some observers thought the union would press for an adjustable cost of living increase to compensate for the rise in prices this year.

Of immediate and basic importance to the metals industries is the strike threat posed by John L. Lewis in the coal industry. Mr. Lewis charges that the government, which has been operating the mines since May after seizing them from the owners during the spring strike, has breached its contract with the miners and asks that the contract be reopened for new negotiations on wages and other issues. The government questions the legality of Lewis' efforts to reopen the contract. To this the United Mine Workers chieftain replies with an ultimatum that the present agreement will be void unless new negotiations are started by Nov. 1.

The miners traditionally have refused to work without a contract and if Lewis calls the present contract void there is little doubt that the miners will refuse to "trespass."



Time lost by strikes during the war and postwar periods is shown in this chart by the Office of War Mobilization & Reconversion

A shutdown of the coal mines would be quickly reflected in industrial operations. Stockpiles were depleted during the two-month strike in April and May and have not been built up to normal. Coal production for 1946 is lagging 8.7 per cent behind 1945 output. To Oct. 12, output of soft coal for 1946 totaled 414,071,000 tons, compared with 453,626,000 tons in the comparable 1945 period.

In asking for new negotiations Lewis pointed out that "significant changes in government wage policy" have occurred. A considerable number of wage contracts throughout industry contain provisions permitting them to be reopened upon notice in the event of significant changes in the economy.

A government survey several weeks ago indicated about 70 per cent of current contracts may be reopened when government policy undergoes major changes or when the cost of living rises above specified limits.

Should the UAW obtain any considerable concessions in negotiations with Chrysler, contracts with a number of other auto and parts companies would be reopened as quickly as possible. In fact, union officials last week pointed out that contracts with Briggs Mfg. Co., Packard Motor Car Co., Budd Wheel Co. and Timken-Detroit Axle Co. permit reopening of wage clauses. Studebaker's contract can be canceled on 30 days' notice.

In the farm implement field, the CIO Farm Equipment Workers have announced reopening of negotiations for wage increases in 10 International Harvester Co. plants, because rising living costs have nullified the 18-cent hourly increase won last spring after an 80-day strike. Union also is asking for a guaranteed annual wage and elimination of piece work.

How far the unions will go in pressing for a guaranteed annual wage in the negotiations now coming up is questionable. Experience of both management and the unions with annual wage plans is limited and neither profess to know at the present how such guarantees can be made feasible.

However, most of the larger unions have incorporated the idea in their platforms and will make annual wage programs an issue in negotiating new contracts. The idea has been endorsed in numerous conventions of organized labor during recent months. Union leaders have held the annual wage up as the next major goal for their members.

The CIO department of research and education has just completed and released a sound film entitled "Guaranteed Wages the Year Round" intended to drum up sentiment for the idea.

In approaching the guaranteed wage issue, union leaders generally suggest a study by labor and management on the problem of stabilizing production and employment.

Portal-to-portal pay, first won by the miners, will be asked by other industrial unions. Unions in the metals industries now are asserting that the principle of portal-to-portal pay has been established and upheld by the Supreme Court. They cite the Supreme Court's refusal to rehear the Mt. Clemens Pottery Co. case, which, they say, validates a CIO union's claim for portal-to-portal pay. Philip Murray, CIO president, in a recent Chicago address indicated the union was planning a campaign to establish portal-to-portal pay throughout industry.

Demands for health and welfare funds, insurance, and retirement programs vary somewhat from industry to industry and are not particularly new. During the coming negotiations they may be reserve issues for bargaining purposes.

Novel Incentive Plan Working Out at Bundy's

Some 1200 employees average about 22 cents hourly above base rates through cost-savings-sharing plan

DETAILS of a "collective bonus" plan under which some 1200 employees have been averaging about 22 cents per hour over and above their base rates during the past six months were disclosed by officials of Bundy Tubing Co., Detroit, last week.

The bonus arrangement is known as a cost - savings - sharing plan and covers all hourly rated employees of the company which produces a wide range of small-size copper-coated steel tubing, principally for the automotive and refrigeration industries. Briefly, it is set up as follows:

A typical 16-week operations period from Oct. 1, 1945, to Jan. 22, 1946, was selected to determine the proportion of the net sales dollar being paid out in hourly wages; this was found to be very close to 30 per cent. Each month the dollar net sales figure of the company is converted to an "allowance on hourly rated labor" by applying the 30 per cent factor. If sales, for example, were $800,000, then the allowance would be $240,000. From the latter figure is deducted actual base rate wages paid, leaving a difference which is gross earnings under the plan. These are divided 50-50 between the company and hourly rated employees.

To determine each employee's share, the total is divided by the total number of man-hours worked to give an hourly bonus rate. Then each employee is given an amount equal to the hourly bonus multiplied by the actual number of hours he may have worked. Earnings for each quarter are computed separately, and extra earnings are paid quarterly.

As an example of how payments have worked out, in the first quarter of the plan's functioning, April through June, extra earnings were 24 cents per hour in April, 18 cents per hour in May and 24 cents per hour in June, for an average of 22 cents per hour. Of 1178 workers eligible to participate in the plan, 197 men and women worked full time, or 528 hours during the quarter and realized total extra earnings of $118.27. Others participated proportionately, total payments being $114,219.

In the second quarter, earnings for July totaled 13 cents per hour—lower because of hot weather and vacations. In August they rose to 22 cents and in September also 22 cents. Average for the quarter was thus 20 cents and total payments for the period were $99,009, shared by 1291 men and women. Of these, 187 worked full time and received $94.56 each.

Many favorable effects of the bonus plan, approved by both the local and international UAW-CIO, have been apparent. Absenteeism over five months decreased 35 per cent from the base period. Overall employee efficiency had risen 35 per cent by the end of August. There has come a marked reduction in loafing, unnecessary time in washrooms and stopping work ahead of the quitting signal. Scrap production in the first three months of the plan decreased 7 per cent under the figure for the last three months of 1945. There has been no adverse effect on employment, for all male and female employees on the company's seniority list have been recalled to work, all returning veterans rehired and additional help employed.

Nature of grievances has undergone a marked change. Stewards are on the alert for bottlenecks in the flow of materials, machine breakdowns and other stoppages. In one instance, a "hair pulling" incident resulted when one woman employee did not match up to another's standard of production. Many suggestions have been received from employees for production short-cuts, improved materials handling and equipment improvements.

There is no ceiling on the amount of extra bonus employees may earn, and one company official has stated under present conditions it might be possible for workers to double the amount of quarterly bonus achieved thus far.

Rise in Republic Earnings Reflects High Operations

A high operating rate in the third quarter of this year enabled Republic Steel Corp., Cleveland, to show for that period net income of $5,039,070, compared with net profit of $4,802,756 in the second quarter and net loss of $347,412 in the strike-affected first quarter. In third quarter of 1945 the company had net profit of $1,617,675.

Net profit for the first three quarters of 1946 totals $9,494,414, compared with $7,973,927 in the corresponding period of 1945.

The net profit of $5,039,071 for the third quarter of 1946 was after provision of $3½ million for federal income taxes. For the first nine months of 1946 the company has set aside $5 million for federal income taxes.

Present, Past and Pending

■ STOCKHOLDERS APPROVE SALE OF APOLLO STEEL CO.
PITTSBURGH—Sale of plant and inventories of Apollo Steel Co., Apollo, Pa., to Irving Grayson for a sum in excess of $2.5 million has been approved by Apollo stockholders.

■ SHEFFIELD STEEL SEEKS TO BUY COAL MINES
DALLAS, TEX.—Sheffield Steel Corp. is seeking to purchase the government-owned coal mines at McAlester, Okla., as source of fuel for the government-owned blast furnace at Houston. Sheffield also has pending a bid for the blast furnace.

■ NEW ELECTRIC STEEL MILL STARTED IN MEXICO
MEXICO CITY—Orders for furnaces, rolling mills and other equipment for a new electric steel mill 10 miles northwest of here have been placed with American suppliers. Plant is scheduled to be completed by mid-1948, and will have capacity of 5000 metric tons of finished products per month.

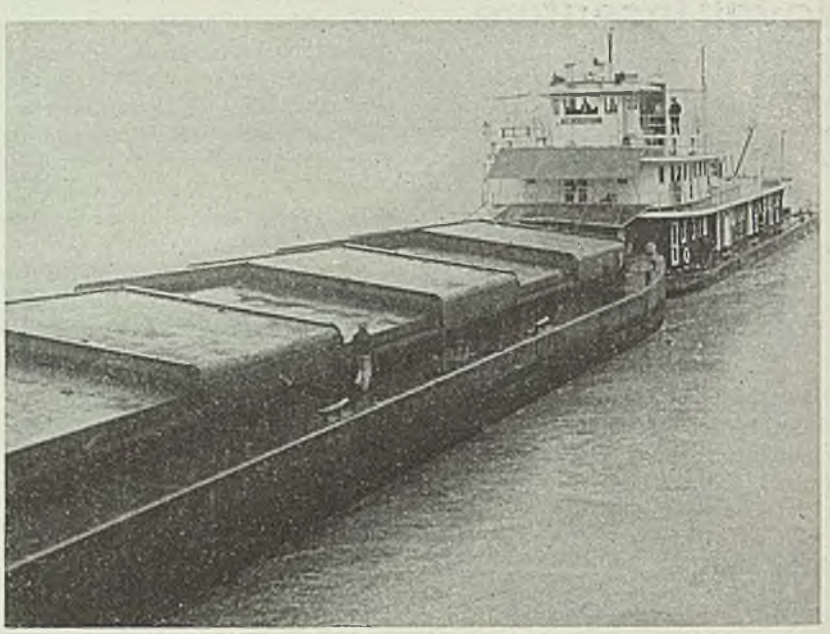
■ CARNEGIE-ILLINOIS TO HOLD OPEN HOUSE AT GARY
CHICAGO—Carnegie-Illinois Steel Corp. will hold open house at its Gary sheet and tin mill Oct. 30 for the first time in its history. Thousands of high school students, workers' families, county and state officials and others are expected to attend.

■ PIG IRON OUTPUT DROPS IN SEPTEMBER
NEW YORK—Pig iron production in September was 4,687,390 net tons, against 4,897,980 tons in August, according to American Iron & Steel Institute. Cumulative output for nine months was 32,094,783, against 42,430,001 tons in the comparable 1945 period.

■ DPC BLAST FURNACE RESUMES IN ALABAMA
GADSDEN, ALA.—A government-owned blast furnace at Gadsden resumed production Oct. 21 and will produce 20,000 tons of iron monthly for the veterans' emergency housing program. Stack is being operated by Republic Steel Corp. under a lease agreement providing for an incentive payment of $12 a ton.

Decontrol Of Steel To Be Delayed

OPA indicates regulation of basic industrial commodities will continue indefinitely though some easing is likely before yearend



TRIAL RUN ON MISSOURI: Carrying steel from Granite City, Ill., agricultural implements from Chicago, and other commodities, a Federal Barge Lines barge pushed by a diesel twin-screw tow boat leaves the Kansas City wharf on a 250-mile run up the Missouri River to Omaha, Nebr. Test run is being made to determine the commercial navigability of the river above Kansas City. NEA photo

FREEING of the economy from the depressing hand of government control is going to take more time than had been thought recently. At any rate, as things now stand it looks as though decontrol is going to be piecemeal for the next few months, though some talk is heard that the Civilian Production Administration is planning to liquidate many of its activities by the end of the year.

Last week it was evident the Office of Price Administration planned to continue at the old stand as long as possible, lifting price regulations only where it had been clearly demonstrated supply and demand were near balance. While a long list of products to be decontrolled Nov. 1 is being prepared by OPA, last week it was said this list will not include such basic commodities as iron and steel, pig iron, malleable and gray iron castings, scrap, coal and coke. However, there may be some easing of existing regulations on these items by the end of the year, and certain relatively minor steel products which are in substantial supply-demand balance may be removed entirely from the control list by that time.

Meanwhile, the OPA continues to look into the question of raising iron and steel price ceilings. Last week a meeting of the Steel Industry Advisory Committee was held in Pittsburgh at which the price matter was discussed, these conversations being incident to the study now being made of the steel price structure preliminary to filing with OPA of formal application for price relief. The study is being made on the industry's showing for the period June, July and August. How long it will take to complete is not clear but it is believed formal application probably will not be made for several weeks at earliest. Also, it is not yet certain whether the request will be made under the Barkley amendment to the price control law or under the original provision in the law allowing for such action. Expectations are specific product price increases will be sought.

Rapid Decontrol Favored

DETROIT—In this area there is little support for anything but rapid, complete and final decontrol of everything placed under government regulation during war time. While it is recognized the aftermath may have some unpleasantness, the feeling is the sooner the readjustment the quicker all industry and trade can return to normal relationships between wages, costs and prices.

No great pressure has appeared for decontrol of automobile retail prices because of any hardships it is working; rather it is urged as a part of throwing out all government controls. It is doubtful whether auto prices would rise much higher, since the industry in some quarters feels the danger of pricing itself out of the market, and is seeking every means to hold down costs so that a profit may be realized at present prices, which average 40-50 per cent over 1939, overlooking increased values built into automobiles.

Some Price Advances Expected

PITTSBURGH — Decontrol of steel prices, except for alloys and some specialty items, is not anticipated before end of this year at earliest. If and when such does occur, prices of high-cost products undoubtedly will be advanced.

Industry officials state everything possible will be done to keep prices down, but this will be impossible should another round of wage increases be forced by the unions.

Ernest T. Weir, chairman, National Steel Corp., Pittsburgh, states: "The first effect of removal of price controls may be some increase in prices, but I am convinced this will be temporary. The important thing is that the country will get the production it is not getting now because of these controls, and the buying public will get the goods it needs and wants. When production is in full swing, the normal restraints of a free market will operate to bring prices into proper balance, and if production is not interrupted, I believe this will occur in from three to six months."

The critical supply situation in scrap is expected to indefinitely delay abolishing price regulations on this commodity.

R. A. Neal, vice president in charge of sales, Westinghouse Electric Corp., Pittsburgh, states: "Prices of electrical apparatus over the near future will depend almost entirely on cost of raw materials and labor used in its manufacture. It is our aim to keep prices just as low as possible, but if cost of the basic materials and labor increase, then prices on the completed apparatus will have to move up also."

"Artificial price controls have aggravated the shortage of raw materials and

parts," T. P. Phillips, vice president in charge of Westinghouse Electric Corp.'s East Pittsburgh works, states. "Other manufacturers cannot be expected to make things we need at a loss. The time has come to cut loose from artificial controls and let the prices of manufactured articles find their natural levels."

"Galvanizing jobbing shops have been operating under a decontrolled price basis since July 26, and in but a few instances, where selling prices were seriously out of line with production costs, prices have held relatively steady," S. J. Swensson, secretary, American Hot Dip Galvanizers Association, states. "The industry's production capacity is more than adequate to satisfy present heavy demand. However, due to critical shortage of zinc, current output is falling slightly behind consumers' immediate needs. The industry, in view of recent one cent per pound increase in zinc, is reviewing costs and may have to adjust prices upward should the prospective general lifting of price controls result in added increases in production costs."

"Gear manufacturers are unanimous in their contention that price decontrol is necessary to stimulate production and balance plant operation," according to Newbold C. Goin, executive secretary, American Gear Manufacturers Association. "Quite a few companies have not raised prices on all products the full 13 per cent granted by OPA last May, although most concerns have advanced individual products that were out of line pricewise to this extent. There are even some reports of price cutting for the run of mine industrial gears.

"Should price controls on gears be abolished prices may be advanced as much as 30 per cent for certain types of open gears, with average advance likely to be closer to 5 to 10 per cent, and that only for a relatively short time. The industry's capacity is more than 3 times indicated demand for 1947 with the result that a highly competitive market exists not only from within the industry but also from related substitutes for gear drives such as V-belts, chain drives, slow speed motors, etc. The industry's 1944 output was valued at approximately $225 million, in contrast with $45 million in 1939, while output this year is expected to reach about $120 million. If material was available the industry could handle twice the present demand. Industrial present order backlogs range up to 18 months, but this does not represent current needs for forward ordering has been practiced on a large scale."

No Runaway in Steel Likely

CHICAGO — The metalworking industry here contemplates the prospect of decontrol of its operations with little elation. It is not sure lifting of regulations will come as quickly as some believe. Also, its thinking is tempered by threat of labor disturbances.

Opinion leans to the view that considering the fact acute shortages exist, it seems reasonable to expect major controls will be among the last to be dropped.

Rapid decontrol, say some observers, would undoubtedly bring higher commodity prices and would hasten new wage demands by labor. Consequently, beneficial results resulting from decontrol could easily be wiped out by work stoppages and strikes.

In steel, complete decontrol, it is believed, would bring price increases on those products which are being produced at a loss.

As to manufactured goods, Price Administrator Paul Porter already has announced that control will be continued for automobiles, farm equipment, household appliances, building materials, and some others.

Manufacturing plants today suffer more from unbalanced inventories of raw materials, parts and components, than from any other factor. They claim these shortages result from inept government control, and feel certain they could improve their situation if they and their suppliers were left to work out their problems jointly and without interference.

Would Welcome Adjustment

YOUNGSTOWN — Executives of Youngstown steel, fabricating and scrap concerns indicate they would welcome complete decontrol of their industries —and quickly.

One fabricator said he didn't feel prices of steel products and fabricated items will increase much even if controls are lifted.

He pointed out 75 per cent of his company's output is held up under government orders for housing and other purposes and commented that this not only is affecting the company itself but also its dealers, warehouses and distributors.

Adjustments Seen Hastened

NEW YORK — Decontrol continues top subject in iron and steel circles. When decontrol of steel will come is uncertain. There is nothing definite yet as to precisely when this can be expected. In general, the trade, including consumers and producers, hopes it will not be delayed too long.

Decontrol may lead to higher prices, especially in view of the likely decontrolling of raw materials as well, but it is an adjustment which all believe will have to come sooner or later anyway and the sooner, the quicker market operations will resume normal.

Furthermore, while prices may be advanced on various steel items not under consideration at present between steel producers and OPA, it is believed sellers will move as conservatively as conditions will permit and that with the likelihood of a better and more balanced rate of production, supply and demand will come more quickly and will not only check whatever upward advance in prices might take place, but actually cause a leveling off with a possible reduction as competition becomes keener.

Except for manganese products, ferroalloys have already been decontrolled, with the result sellers are taking no more than an academic interest in much of the decontrol talk that is now going on.

Steel Priorities Aid to Small Business Continues Under Terms of Regulation 28

SMALL business concerns will continue to receive priorities aid in obtaining steel under the terms of Priorities Regulation 28, John D. Small, civilian production administrator, said last week.

Mr. Small explained reinstitution of priorities for steel on Oct. 1 (following suspension of priorities ratings since Jan. 21, because of work stoppages in the industry), had created some rumors that CPA policy outlined in Priorities Regulation 28 had been changed.

Further aid to small business in obtaining steel will be available through CPA's announced policy to keep steel warehouses stocked with adequate supplies of virtually all steel shapes. These warehouses received exceptionally large shipments from the steel mills during the third quarter of 1946. CPA expects to continue its policy of keeping warehouses well supplied throughout the fourth quarter.

However, the steel situation is so tight no business, large or small, will be able to obtain all of the steel it needs in this quarter, Mr. Small emphasized. The automobile industry recently reported that it was obtaining only about 58 per cent of its requirements. This percentage may be somewhat lower than the average, Mr. Small said, because automotive demand is concentrated on steel sheet, which is in particularly short supply.

Manpower and Merchandising Are Major Topics at Foundry Meeting

Speakers at eighteenth annual convention of Gray Iron Founders' Society discuss subjects bearing significantly on the industry's outlook over the long term. Howard A. Stockwell elected president for 1946-47 term

HOWARD A. STOCKWELL

DESPITE the fact difficulties in obtaining sufficient supplies of raw materials continue a major concern of gray iron casting producers, the Gray Iron Founders' Society gave its principal attention at its annual convention last week to problems of manpower, merchandising and other subjects which significantly affect the industry's outlook over the long term.

The eighteenth meeting of the society was held at the Netherland-Plaza Hotel, Cincinnati, Oct. 22-23, and attracted approximately 300 to its two-day program of technical and business sessions.

New officers chosen by the board of directors for 1946-47 at the conclusion of the convention include: President, Howard A. Stockwell, treasurer, Barbour Stockwell Co., Cambridge, Mass.; vice president, Ronald E. Kucher, president, Olympic Foundry Co., Seattle; secretary, E. B. Smith, vice president, American Brake Shoe Co., New York; treasurer, Homer Britton, vice president, Cleveland Foundry Co., Cleveland.

Nine members of the society were honored at a luncheon meeting by the presentation of scrolls in recognition of distinguished service to the gray iron foundry industry. Recipients were: Walter L. Seelbach, president, Superior Foundry Inc., Cleveland; C. R. Culling, president, Carondelet Foundry Co., St. Louis; A. E. Hageboeck, president, Frank Foundries Corp., Moline, Ill.; Ronald E. Kucher, president, Olympic Foundry Co., Seattle; R. D. Phelps, president, Francis & Nygren Foundry Co., Chicago; J. H. Pohlman, president, Pohlman Foundry Co. Inc., Buffalo; P. E. Rentschler, president, Hamilton Foundry & Machine Co., Hamilton, O.; H. S. Washburn, president, Plainville Casting Co., Plainville, Conn.; W. J. Grede, president, Grede Foundries Inc., Milwaukee.

A plea for true collective bargaining, rather than the political bargaining which has prevailed so frequently in settling labor disputes, was made by Wayne L. Morse of Oregon addressing one convention session. He said there is too great a tendency on the part of business to run to government for settlement of such disputes; government, he believes, should stay out of the field of wages, hours and conditions of employment. Senator Morse urged that collective bargaining be made to work, as one step in removing government domination of business, and warned against the hysterical type of labor legislation which merely entrenches government as the dictator of conditions affecting labor.

H. L. Edinger, Barnett Foundry & Machine Co., Irvington, N. J., and retiring president of the society, in reporting on the past year's activities expressed what is probably typical of the industry's expectation that at least one to two years of continued active business is in prospect.

One session devoted to manpower problems included discussion of such subjects as the development of management skills in supervisors, means of getting and keeping foundry workers, and veteran's training program. Speakers were Dr. J. S. Kopas, Fenn College, Cleveland; Frank O'Malley, Ferro Machine & Foundry Co., Cleveland, and Dr. Frank August, Veterans' Administration, Cincinnati.

A panel session on merchandising brought out discussion emphasizing the necessity of selling not merely a gray iron casting as such, but of marketing an engineering material service. Participants in the session were Carl W. Bonbright, General Foundry & Mfg. Co., Flint, Mich.; Hermann P. Good, Textile Machine Works, Reading, Pa.; A. E. Hageboeck, Frank Foundries Corp., Moline, Ill., and D. J. Vail, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.

Labor Problems Discussed by Speakers at Annual Convention of Wire Association

BUFFALO

REGARDLESS how trivial the incident that occurs in handling labor in operating departments, a permanent record should be kept, it was emphasized by several wire mill executives at the opening session of the seventeenth annual convention of the Wire Association, Hotel Statler, here last week.

In speaking on "Present Day Labor Problems," J. L. Sanderson, assistant superintendent wire mills, Keystone Steel & Wire Co., Peoria, Ill., mentioned that at his plant each wire drawer is given a sheet listing various jobs and he is asked to check the job he prefers. The men are asked to bid for enough jobs so that when the opportunity arises they can secure one of their choice. Bidding for jobs occurs every six months.

Mr. Sanderson stated the plan followed at his shop included a 3-day layoff for the first offense of absenteeism, a 1-week layoff for the second, and dismissal for the third.

C. E. Johnson, superintendent rod and wire mills, Bethlehem Steel Co., Sparrows Point, Md., discussing seniority, stated the plan followed at his plant was to put a new man on a beginner's job and have his seniority start at that point.

W. C. Harrison, vice president, Atlantic Steel Co., Atlanta, Ga., pointed out that absenteeism at his works amounts to 10 per cent. At a meeting with the workmen it was decided that if a man had three unexcused absences in 90 days he was asked to relinquish his job.

As against the bidding system there is the alternative of establishing a line of progression and this line usually ends up in what the unions consider a high earning job. This fact was brought out by R. M. Hussey, president, Wire Association, and superintendent, wire department, Jones & Laughlin Steel Corp., Aliquippa, Pa.

H. B. Clark, general sales manager, Vascoloy-Ramet Corp., North Chicago, Ill., raised the point that management and labor often do not look at industry as a unity.

Twelve papers were presented at the six technical sessions in addition to the Mordica Memorial Lecture, "Galvanizing Steel Wire," by F. M. Crapo, president, Indiana Steel & Wire Co., Muncie, Ind. A digest of various papers will be presented in the Nov. 4 issue of STEEL.

Speaker Urges Caution at Porcelain Enamel Meeting

S. Morris Livingston, acting chief, Economic Programs Division, Office of Business Economics, U. S. Department of Commerce, advised members of the Porcelain Enamel Institute at their fifteenth annual meeting at French Lick, Ind., Oct. 23-25, they should base their plans on the fact there are temporary and unstable elements in the current strong demand for goods.

"Continuation of the present boom," he said, "depends on inventory accumulation at a rate which may continue for some time but obviously cannot go on forever. The excess of government expenditures over government receipts, which was still an important inflationary influence in the early part of 1946, has now disappeared. From now on there should be a surplus which will offset rather than encourage inflationary tendencies. Present tax rates will take an important share of any increase in incomes resulting from increased production, higher prices and wage rates."

Near-Capacity Steel Operations Are Seen Easing Shortages Soon

Continuance of high-level production pointed to by American Iron & Steel Institute president as assuring early attainment of better balance between supply and demand. Production loss due to strikes exceeded 12 million tons

ALTHOUGH steel supply continues critical with shortages preventing expansion of manufacturing operations in many directions, signs are beginning to appear that, barring further work interruptions and other difficulties, conditions will steadily improve from month to month with the situation fairly well in balance in many products by mid-1947 at latest.

With the steel industry now operating around 90 per cent of capacity, production for 1946 should total something in excess of 68 million tons of ingots, a record for peacetime. Meanwhile, expectations are that as supply pipelines fill, much duplicate tonnage on mill books will wash out, opening gaps in rolling schedules for tonnage which is labeled for rather distant delivery.

Furthermore, the view is increasing that pentup demand for consumer goods, the area of consumption in which steel supply is tightest, is not as huge as generally believed, and consequently in time will become evident in a noticeable easing in buying pressure from steel users who had ordered in anticipation of consumer goods buying far beyond normal peacetime volume.

As a matter of fact, it is pointed out that much so-called pentup business is based on distorted reasoning that needs for specific items have multiplied through the war years. Actually, in many instances, such deferred buying simply has been transformed into current demand of normal volume. For instance, an individual who ordinarily purchases an automobile every two years but through the war years was compelled to forego this luxury, today is in the market for only one motor car, though on the basis of theoretical buying habit he should be a prospective purchaser of three cars.

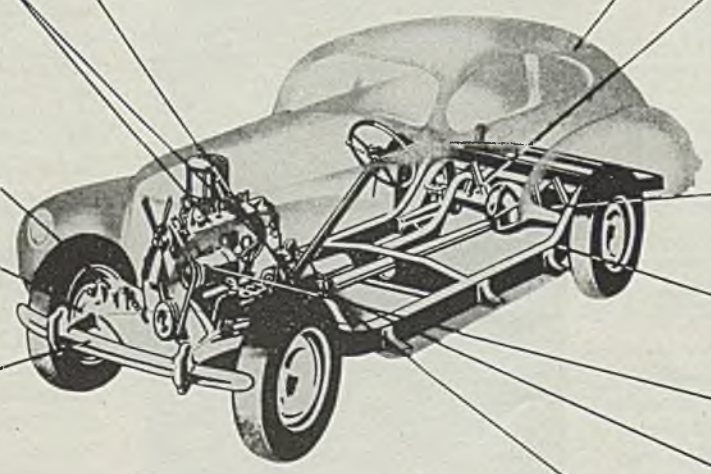
Another point made is that high prices have killed off considerable demand.

Much deferred demand for heavy dur-

(*Please turn to Page* 160)

FORMS OF STEEL PURCHASED FOR A TYPICAL AUTOMOBILE

Figures Are Pounds of Steel Purchased



STEERING MECHANISM

Hot rolled bars	6.10
Cold rolled bars	6.74
Wire products	2.42
Pipe and tubes	2.94

ENGINE AND CLUTCH

Hot rolled bars	160.97
Cold rolled bars	13.23
Wire products	4.56
Structural shapes	2.46
Hot rolled sheets and strip	25.92
Cold rolled sheets and strip	7.14
Plates	17.00
Terne plate	3.50

FRONT END SUSPENSION

Hot rolled bars	87.90
Cold rolled bars	6.37

BRAKES, WHEELS AND TIRES

Cold rolled bars	5.42
Wire products	6.50
Hot rolled sheets and strip	199.14

BUMPERS, GUARDS, ETC.

Hot rolled bars	13.21
Hot rolled sheets and strip	37.70
Cold rolled sheets and strip	28.62

OTHER PARTS NOT MENTIONED PREVIOUSLY

Hot rolled bars	91.95
Cold rolled bars	36.32
Wire products	79.73
Hot rolled sheets and strip	488.05
Cold rolled sheets and strip	273.22
Plates	3.35
Pipe and tubes	1.61
Terne plate	11.78
Structural shapes	4.11

BODY

Wire products	83.76
Hot rolled sheets and strip	514.06
Cold rolled sheets and strip	347.01
Plates	6.22

REAR AXLE AND REAR END SUSPENSION

Hot rolled bars	138.68
Cold rolled bars	3.24
Wire products	3.33
Hot rolled sheets and strip	32.38
Cold rolled sheets and strip	10.67
Plates	12.46
Pipe and tubes	2.24
Terne plate	4.95

FUEL TANK AND EXHAUST SYSTEM

Hot rolled sheets and strip	9.28
Cold rolled sheets and strip	5.33
Terne plate	22.89

FRAME

Structural shapes	23.46
Hot rolled sheets and strip	307.87
Plates	6.17

CHASSIS ELECTRICAL SYSTEM INSTRUMENTS

Cold rolled sheets and strip	7.12

TRANSMISSION

Hot rolled bars	33.18
Cold rolled bars	9.97
Wire products	3.32
Pipe and tubes	3.56

CHASSIS SHEET METAL

Wire products	3.38
Hot rolled sheets and strip	37.67
Cold rolled sheets and strip	284.37

The weight of the steel purchased for a typical 1942 passenger automobile by a large manufacturer was 3545 pounds. Approximately 2615 pounds, 74 per cent of the steel bought for each vehicle, was sheet and strip steel. This chart was made by the American Iron and Steel Institute from data supplied by the manufacturer.

Shipments of Machine Tools Reduced by Parts Shortages

September shipments, estimated at $25,468,000, constitute second lowest monthly volume in 1946. Scarcity of pipe fittings reported to be currently the most serious supply problem. Export shipments also drop to lowest monthly rate of year

CONTINUED shortages of what normally are considered minor parts are held primarily responsible for a drop in machine tool shipments during September to the second lowest monthly volume in 1946.

Estimated total shipments in September were $25,468,000, compared with $22,360,000 in July, lowest month thus far in 1946, according to the National Machine Tool Builders' Association, Cleveland. Estimated total September shipments were 5.3 per cent below August estimated shipments of $26,911,000.

High month thus far this year was January, with estimated shipments of $30,263,000. The total for the first nine months of the year was valued at $242,545,000.

Among the problems currently perplexing machine tool builders, the shortage of pipe fittings is reported the most serious. However, shortages of electrical items containing copper, such as motors and controls, still plague the industry.

Effect of both lowered optimism over future business conditions and a substantial volume of sales of government surplus tools appear to be reflected by a 12 per cent decline in new firm orders in September, compared with August. A number of projected industrial expansion programs were recently cancelled or held in abeyance because of unfavorable economic conditions.

With respect to government surplus sales, James Y. Scott, president, Van Norman Co., Springfield, Mass., stated at the recent annual meeting at Quebec of the National Machine Tool Builders' Association that the War Assets Administration is selling approximately as many machine tools per month as the machine tool industry.

Although new firm orders declined in September reportedly because of the dropping of some industrial expansion programs that were only in the "talking" stage, the reduction in the volume of cancellations is attributed to the sustained demand for machine tools for expansion and modernizing programs that have progressed sufficiently far that their sponsors want to push them to completion. Net result on the order backlog in September was a 1.4 per cent reduction from the August level.

New lows for 1946 in monthly foreign shipments and new foreign firm orders were registered in September. Compared with August, foreign shipments in September were down 10 per cent and new foreign firm orders were off 16 per cent. The decline in new foreign orders is attributed to lack of foreign credits in the United States and the domination of British empire markets by England's machine tool builders.

Cancellations of foreign orders in September were 21 per cent less in dollar volume than in the preceding month, while the backlog of foreign orders showed little change.

Steady Demand for Tools Is Reported at St. Louis

St. Louis—Machine tool demand is steady at a brisk level. Deliveries of standard equipment continue from four weeks to 24 months late, depending on type. No surplus machinery has reached

New Garden Tractor To Be Produced by Machine Tool Company

MASS PRODUCTION of a new garden tractor is to be started soon by the Special Products Division of the Lodge & Shipley Machine Tool Co., Cincinnati.

Called the Choremaster, the new tractor is described as having finger tip controls, streamline design, and light weight. First public demonstration was given last week in Cincinnati.

Final experiments on the tractor, which weighs less than 100 pounds, and multiple attachments that make the unit adaptable to all-purpose applications around the home or acre-farm are being completed. Already tested are the universal lawnmower hitch and various types of cultivating tools, including sweeps, duckfeet, hoes, and furrowing tools. Other attachments in course of test completion are a sickle bar and a lawnmower, while a snow plow and a small soil-turning plow are scheduled to be offered as soon as experimentations are approved by the company's engineering department.

Much of the equipment which the Special Products Division used in wartime production has been converted to garden tractor manufacture. In addition, some new machine tools for cutting and machining gears have been added.

An organization to market the tractor, designed by Carl Van Ausdall, Liberty, Ind., is being developed, with Louis G. Albers, who has had wide experience in the equipment and mechanical appliance sales field, as sales manager. Even before the tractor had been publicly demonstrated the company had received orders for 1250 units to be delivered in first quarter of 1947.

Being demonstrated is the new Choremaster garden tractor with a seeder attached

Sales Restrictions Extended On Construction Machinery

National Housing Agency has extended the "freeze" on the following kinds of new and used construction machinery until Nov. 17: Batching plants, truck-mounted and tractor crawler type cranes, ditching machines, portable air compressors (100-500 cfm), rock crushers (25 tons per hour or under), track-laying tractors, and tractor-type scrapers. These items are set aside for exclusive sale to veterans holding a NHA or CPA directive or certificate. Motor graders and wheel tractors (100 hp or over) have been set aside for sale to persons holding a directive or certificate.

the market recently in quantity which tends to bolster orders for new tools.

Much confusion persists in the handling of veteran priorities for surplus, which is having the effect of penalizing both distributors and non-veteran buyers. A small but continuing number of new enterprises which manage to surmount construction difficulties are entering the market.

Parts Shortages Hamper Tool Production at Pittsburgh

Pittsburgh—Inadequate supply of electrical motors and controls continues to retard machine tool output and there is little indication this situation will ease before the first of the year. Standard machine tools, such as lathes and small shapers, are available in four to five months, while shipments of equipment requiring special design are extended nearly a year. Hacksaw and similar type items are available from stock.

Demand for machine tools appears leveling off, but retooling and modernization programs are expected to sustain active production schedules for many months ahead. Current deliveries are failing to meet present requirements.

Surplus Tool Disposal Is Being Speeded Up by WAA

Government surplus machine tool disposal program is being speeded up by the War Assets Administration. Accelerated disposal is authorized by Revised Regulation No. 13 which becomes effective Oct. 28. This applies to new and used standard general purpose machines. In the case of new machine tools, a maximum depreciation of one month's period of active use is authorized.

WAA plans to dispose of the bulk of surplus government-owned machine tools during the next four months.

To accomplish this, WAA has established fixed prices on approximately $350 million worth (acquisition cost) representing nearly 60 per cent of present surplus usable inventories. Fixed prices reflect current values.

A further amendment provides for sale of special or standard attachments or tooling, the price of which will be computed on the same period of active use as the basic machine tool. However, if the purchaser cannot use the accessories or tooling for his production, these can be sold to him at a nominal sum upon presentation of a scrap warranty. Purchase can be made of all or part of the equipment on this basis. If use can be made of all the equipment, then price is based on the same period of active use as the basic machine.

Under another amendment all machine tools manufactured during 1921 or any prior year, as well as special purpose tools used in the production of ammunition and covered by Order No. 1, Regulation 13, will be offered on a competitive bid basis. This will expedite placing the usable machine tools into peacetime production and those tools that have no further commercial use into scrap.

The present WAA offering of over-aged and special purpose machine tools represents more than $75 million (acquisition cost) of which approximately 50 per cent may end up as scrap.

The fixed prices apply to sales by War, Navy, Maritime and RFC on the same machines sold to contractors in possession. In the sale of machine tools to these contractors, who have leased the tools from the government, the price is 5 per cent higher as the machine tool is already in operation and there is no expense involved in the transfer of the equipment.

The new fixed price program is designed to accomplish the following objectives: (a) Encourage all types of manufacturers to replace their worn out and obsolete machinery with government-owned, up-to-date machine tools; (b) Assist small business, particularly veterans, in the purchase of tools essential to civilian production; (c) Provide equipment for re-builders and machine tool manufacturers for rebuilding for domestic and export sales; (d) Encourage the foreign trade to make purchases for their own production requirements; (e) Make it possible for many shops to acquire specialized equipment which can be used, with some reconversion, as general purpose equipment.

This intensive sales campaign to dispose of WAA's vast inventories of surplus machine tools to the domestic, as well as the export trade, is initiated in conjunction with recommendations made to WAA by the Metal Working Machinery and Equipment Contract Dealers Advisory Committee.

All machines will be offered concurrently to priority holders and the general public on a first-come, first-served basis.

GOVERNMENT CONTROL DIGEST

OFFICE OF PRICE ADMINISTRATION

Tin: Ceiling prices for export sales of pig tin by jobbers and distributors who buy tin from Office of Metals Reserve advanced, effective Oct. 26. Percentage additions to their acquisition costs vary with the quantity sold and replace the cents per pound differentials formerly provided. (MPR-17; OPA-T-5109)

Automotive Parts: Resellers of automotive vacuum brake and heater hose who are covered by MPR-452 and who perform some manufacturing operation on these parts may pass on the recent 26.8 per cent increase in their producer-suppliers' ceiling prices, effective Oct. 21. OPA regional offices have redelegated to their district offices authority to price rebuilt parts and those new parts made by manufacturers whose total sales the previous year were less than $500,000. (MPR-452; OPA-T-5084)

Cable Scrap: Ceiling price of lead-covered telephone and power cable scrap sold on a flat price basis raised from 6.04c a pound to 7.54c a pound, effective Oct. 26. (MPR-20; OPA-T-5104)

Price Adjustments: Effective Oct. 23, a firm's most recent quarterly statement, instead of 1945 calendar year figures, shall be used as the basis for computing adjustments in ceiling prices on products covered by the automatic repricing formula recently provided for "hardship" relief in 33 minor industries, including: Household tinware and galvanized ware; logging tools, axes, adzes, hatchets; hand-operated oilers and grease guns; soldering irons and copper; blow torches and fire pots; wheelbarrows; hand-operated insecticide sprayers and dusters; cutlery, pruning equipment and scythes. (SO-160; OPA-T-5101)

Export Prices: Specific mark-ups for merchant exporters are now listed for the following groups, effective Oct. 26: Building materials, 15%; glass, 20%; trailers, 10%; coke 75 cents to $3 a ton; briquettes, 60 cents a ton. Specific mark-ups for producer-exporters are: Coke, 35 cents to $2.50 a ton; briquettes, 40 cents a ton; radios and phonographs, 15%. (Export Price Reg.; OPA-T-5116)

Pig Iron: Pig iron producers may apply for special ceiling price adjustments to cover total costs plus average freight on shipments into New England made under emergency directives of the Civilian Production Administration. This action, effective Oct. 21, terminates on Dec. 31, or automatically before that date if the CPA directives should expire. (MPR-10; OPA-T-5125)

Machinery: Automatic adjustable pricing, formerly permitted with the filing of an individual maximum price adjustment application on machinery, equipment and parts, is no longer allowed, effective Oct. 22. (SO-142; OPA-T-5118)

CIVILIAN PRODUCTION ADMINISTRATION

Priorities: Three types of textile machinery added to the list for which no more priority ratings will be granted, except in emergencies, until the supply of machinery more nearly approaches demand. Manufacturers of this equipment (buttonhole machines, button sewers, and 36-inch high post sewing machines) may now sell up to half of their monthly output to nonpriority purchasers. Women's full fashioned hosiery machinery also has been placed on the list of textile machines for which priority ratings are no longer given. (PR-28; CPA-LD-345)

Building Materials: HHH-rating special assistance procedure for contractors on veterans' temporary reuse housing projects has been broadened to cover any material on schedule A to PR-33, except cast iron soil pipe, gypsum board, building board and the lumber materials group. (PR-33; CPA-LD-351)

Steel Priorities: All applicants for priorities assistance in obtaining iron castings and steel must furnish complete information regarding their sources of supply in the year to date. In addition to the other information required on the regular application form CPA-541A, the applicant must show the total 1946 quarterly receipts of these materials from each supplier for the plant activity covered by the application. For the fourth quarter the receipts shown from each supplier should include estimated amounts expected to be received after the date of application, plus amounts received up to the date of application. (PR-28; CPA-LD-360)

Scrap: Scrap consumers must limit inventories of usable scrap, except cast grades, to 45 days' supply. Stocks of cast scrap must be held to a 30-day supply. Dealers and brokers are prohibited from accepting scrap which is not expected to be shipped in the following two months. They must report monthly, beginning Jan. 5, whenever shipments for any two months had not equalled receipts for the month preceding that period. (M-21)

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Review of administration's patent policy seen as one important result of Commerce Department change of secretaries. With antimonopoly drive likely in next Congress indications are White House will press "reform"

ONE important result of the appointment of a new secretary of commerce should be a review of the administration's patent policy. Under President Roosevelt there was a feeling among the White House staff that the American patent system needed some revision but there was disagreement about details. A great deal of study was devoted to the patent recommendations of the old Temporary National Economic Committee, but some of the administration economists criticized these as being too "radical."

Mr. Roosevelt after much study appointed a National Patent Planning Commission under the chairmanship of Charles F. Kettering, in the hope i would improve on the TNEC program. But when that body reported finally, its recommendations were rejected as being too "conservative."

Mr. Roosevelt decided that the thing to do was to chart a middle-of-the-road course but died before he could take action. So Mr. Truman carried out this idea by appointing for that purpose a Patent Survey Committee of the Department of Commerce. This committee originally consisted of: Chairman, William H. Davis, selected for his experience in the field of patent law and because of his ability as a mediator; Charles F. Kettering and Dr. Vannevar Bush, both recognized as advocates for the patent system as it now exists; and Tom Clark, who, as attorney general, was supposed to know just how the patent system permits abuses that encourage the growth of monopoly.

Later Mr. Clark resigned because of "pressure of other duties" and his place was taken by Morris Llewellyn Cooke. The latter was chosen by former Secretary Wallace because of Mr. Cooke's leanings toward the side of "the public interest."

When the appointment of this committee was announced there were strong expressions of resentment in Congress. The House Committee on Patents was particularly vocal in claiming that its domain had been invaded.

Whatever the reason, the committee never has reflected any signs of work done and never has filed a report. Investigations at the Commerce Department indicate that the committee never has had an active staff there; if any preliminary findings have been reached nobody at Commerce knows about them. The impression is that the committee feels it has nothing important to recommend with reference to the patent system.

With an antimonopoly drive likely in the Eightieth Congress, the White House will not want to be caught napping on this matter of "reforming the patent system." It is likely, therefore, that Mr. Harriman will be called on soon to look into the subject. Whatever action he takes, of course, will be an indicator of the Truman administration's patent policy. So far the White House under Mr. Truman has not reflected any ambitions in the direction of patent reform.

REPORTING: Soon after his recent arrival from the Paris Peace Conference, Secretary of State James F. Byrnes, right, called on President Harry S. Truman to make a report on the 79-day meeting. NEA photo

"Reluctant Russians"

One of the best headlines of the year read "Reluctant Russians." It appeared in a recent issue of the *Wall Street Journal* over a story on a press conference held by two Commerce Department officials just back from Europe. They are E. C. Ropes and Lewis Lorwin, both of the Office of International Trade. They had been sent over by former Secretary Wallace to try to stimulate trade between the United States and the Russians.

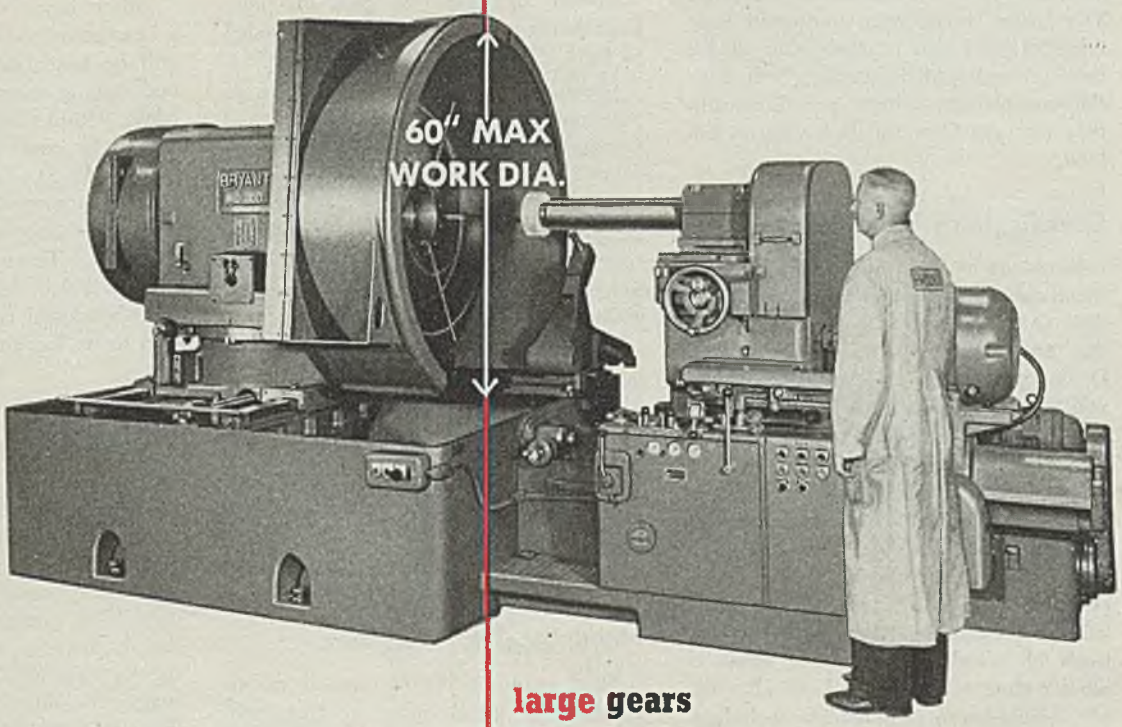
"They treated us fine," said Mr. Ropes; "we stand ace-high with those fellows." But the trip had resulted in just one achievement. That was a Russian promise to exchange scientific and industrial publications with the United States. On everything else the Russians were noncommittal. They told Messrs. Ropes and Lorwin that they do not know what Russian production will be, and how much of this can be spared for export. It probably would be "two to four" years before they would be ready to enter into any definite arrangements.

The two Commerce Department emissaries, however, found that Russia has effected barter arrangements with countries in the Russian zone of influence. These will absorb surplus Russian production largely. The Commerce men could find no signs that the Russians are looking to American industry for help in rebuilding their war-torn industrial plants. Whether Messrs. Ropes and Lorwin will write a report of their trip for public distribution depends on the decision of the new Commerce Secretary, W. Averell Harriman.

Latest Commerce statistics show we are doing a rather small business with Russia, and that even on this small volume the Russians have the better of us in terms of dollar exchange.

Our exports to Russia in the first half

NEW No. 150 HYDRAULIC INTERNAL GRINDER



large gears
large bushings
large bearings
large dies, etc.

Another Bryant Postwar Development for

The new No. 150 grinder is a great Bryant postwar achievement to vastly increase the internal grinding capacity of your plant. This big machine is easily controlled and produces the finest finish on gears, bushings, castings, etc., *up to 60" in diameter.* The many functional features of the new No. 150 assure extremely accurate work on a high production basis. The famous Bryant three point wheel slide suspension is basic and closely maintains wheel alignment at all times. A preloaded anti-friction cross-slide insures smooth hand and power cross feed, and a hydraulically retractable wheel slide simplifies the loading and unloading of parts. The work spindle is designed for the mounting of work fixtures on either end, and is hollow to facilitate the chucking of special spindles or long work.

In a single chucking, the new No. 150 can grind a bore, or a bore and face—the bore may be either straight or tapered. When grinding a face and straight bore the new No. 150 is particularly advantageous because it assures maintenance of squareness between bore and face. Outside diameters, or outside diameters and faces can also be finished in one chucking. A copy of the new catalog sheet giving full details is yours for the asking.

If you have internal grinding work in the range from 1/16 inch diameter bore to 60" diameter swing, Bryant has machines that will economically meet your requirements. It will pay you to—

Send for the man from Bryant.

BRYANT

BRYANT CHUCKING GRINDER CO.
SPRINGFIELD, VERMONT, U. S. A.

of 1946 were valued at $228,293,000. This included lend-lease shipments of $105,234,000, to be settled for later, and UNRRA shipments of $88,082,000. Shipments valued at $8,752,000 were paid for in United States dollars collected by Russian relief societies. The remainder, $26,225,000, represents cash paid by the Russians.

As against these exports, our imports from Russia during the same period came to $56,894,000—for which we paid cash. The largest items were undressed furs, tobacco and brush bristles. One of the most intriguing of the imports from Russia was ant eggs; inquiry reveals we import ant eggs from Russia for use as fish food.

Specifications Tests Planned

Revisions in numerous Army purchase specifications are expected as result of three winter tests to be inaugurated by the Army Ground Forces. The Task Force "Frigid" at Ladd Field, Alaska, will test equipment in a cold dry climate. Wet cold and storm conditions will govern with Task Force "Williwaw" at Adak. Task Force "Frost" at Camp McCoy, Wis., will work under heavy temperate climatic conditions.

The groundwork will be laid for standardizing vehicles for use in arctic and subarctic climates; traction of various types of wheel treads will be studied. Similar studies will be made of all sorts of vehicle-borne equipment including such items as immersion water heaters, case water heaters, work benches, cabinets, cutlery, utensils and necessary tools and appurtenances.

The Quartermaster Corps envisions a special type of prefabricated refrigerating and food insulation equipment.

The task forces will try a new type of stainless steel knife, fork and spoon kit. Shelters to be tried out include not only new types of tentage but a portable squad shelter with collapsible and nesting metal frame and with corrugated aluminum roof and vents.

Communists in Government

Communists have infiltrated into the government — especially the Labor and Treasury Departments—and have driven out many faithful public servants, the United States Chamber of Commerce charges, on the basis of a report by its Committee on Socialism and Communism. The committee demanded that the Communist party be forced to disclose its membership and finances. It also declared that Communists have bored into labor unions and that two of the "top advisers of the CIO Political Action Committee are Communists" who take direct and frequent orders from the very top levels of the Communist party. It denounced the Communist party as an agent of a foreign power "constantly professing hostility toward us."

The report recommended that since "Communism thrives upon deceit, exposure of the facts would be a potent counter weapon" and held that "both private groups and the government have a responsibility here." It recommended education of labor "to give the non-Communist majority the training needed to fight their disciplined opponents."

Communists should be excluded from government service, said the report, and Congress should appropriate adequate funds for a stringent but fair loyalty test.

The United States should enforce strict reciprocity with the Soviet Union in regard to the number and freedom of movement of nationals of either country within the other.

The report charged that organized labor, when captured by the Communists, is to the Communists "a source of funds, and propaganda, a means of stirring discontent and, if necessary, a weapon of sabotage." "It is doubtful prudence for any free government to tolerate movements which are directed toward violent destruction of democracy."

Need Steel for Furniture

Steel requirements of smaller manufacturers of metal office furniture will be the subject of an early action by the Senate Small Business Committee, probably putting more pressure on the Civilian Production Administration in their behalf. Spokesmen for this industry are understood to have complained that price actions by OPA, affecting their needs, have little effect in enabling them to get steel under present shortage conditions.

Temporary Structures Out

Quonset type huts and buildings for whose manufacture huge tonnages of sheet steel—mostly galvanized and corrugated—were consumed during the war, have been ruled out as acceptable construction in the western Pacific. This decision has been arrived at as result of huge damage wrought by recent typhoon which struck Guam. All "temporary" buildings on Guam, Saipan and Tinian, Kwajalein, Iwo Jima and other bases are to be replaced by permanent construction, which means steel and reinforced concrete.

According to Admiral John M. Towers, while in Washington for conferences with the President and with heads of the State and other interested departments, the retention and development of a number of Pacific bases will be in accordance with political decisions at the "top government level." In the meantime the Navy is going ahead in the belief that the Marianas—Guam, Tinian and Saipan—will constitute a forward base second only in importance to Pearl Harbor. Also that Kodiak will be the main naval base in the northern Pacific.

Other bases will be maintained on a "caretaker" basis for the present, and will be available for use as anchorages and staging areas. These include Kwajalein, Ulithi, Eniwetok, Truk, etc. In regard to conferences now under way with Philippine leaders, Admiral Towers said "it is generally recognized" that we must have bases in the Philippines. Also in the conference stage is our future use of Palau and Manus. The Navy has abandoned Okinawa for the present due to its location in the typhoon path.

Antimonopoly Drive Stalled

Abandonment by the House Monopoly Subcommittee of its plan to hold a series of hearings this fall means that the projected antimonopoly drive has been stalled as far as the Seventy-ninth Congress is concerned. But the drive has only been postponed. A real antimonopoly drive is expected to be launched in the Eightieth Congress, and this no matter whether the Republicans or Democrats win the election. It will result from a conscientious belief on the part of some so-called "liberal" congressmen that our system is wrong in that it seems to permit and encourage concentration of economic power in comparatively few hands.

Chairman Estes Kefauver (Dem., Tenn.) of the subcommittee said the hearings had been canceled "because of the inability of the members to devote sufficient time during the balance of this year to do justice to the subject."

But the subcommittee has gathered extensive data and these will be set up in a report to be issued before the end of 1946. The report will be concerned mainly with whether the Federal Trade Commission has enforced the antitrust laws effectively or ineffectively; in fact, one of the main purposes of the hearings was to investigate reports that the FTC has failed to carry out its responsibilities under the laws.

Of particular interest in the forthcoming report, it is expected, will be a section discussing reasons why the Federal Trade Commission should be given a mandate in regard to labor union activities which "affect monopoly or concentration of economic power."

Army and Navy Making Progress In Development of New Weapons

Fantastic instruments but recently in dream stage have advanced to point they are now standard fighting equipment. Give rise to question of adequacy of steel and other raw materials supply in event of mass production for war

INSPECTION of some of the new weapons which the Army and Navy have perfected for use in another war certainly warrants the conclusion the United States should be able to take care of itself. Weapons which only recently were regarded as fantastic have been moved out of the dream stage and now are standard fighting equipment.

Acquaintance with these weapons arouses a deep feeling of confidence in the Army and Navy for the work they have done and are continuing to do. But a study of them also causes a feeling of alarm. The question arises: Where are we going to get the steel and other materials to manufacture these weapons in the quantities that may be needed to bring victory in an all-out war of the future? To consider just steel alone—this metal gives promise of being needed in a future war on a scale that would dwarf steel needs of World War II.

Take just one of these weapons which the Navy unveiled to a group of writers at Chincoteague, Va., and demonstrated in an attack on a grounded tanker off the North Carolina coast on Oct.14. It is a radar-guided missile known as the Bat. Live bats give out a short pulse of sound and guide themselves by echo. The Bat works the same way. It sends out signals and catches the echoes by radar as they bounce back from the target. The Bat is launched from an airplane at a distance as great as 10 to 15 miles from the target— thus keeping the mother ship safely out of the zone of enemy fire. The Bat homes to the target as a pin or carpet tack homes to a magnet. It totes a standard 1000-pound bomb.

The Bat won its spurs by sinking much enemy tonnage in the latter part of the Japanese war. Its accuracy was phenomenal. It avoided the misses that occur so frequently in dropping bombs vertically from great heights. It never got "nervous" or developed "cold feet." It altered its direction of flight to compensate for evasive tactics of the target. It performed its work in any kind of weather, and by day or night. It did this without bringing our airmen into the zone of enemy fire. Only one precaution was necessary: The Bat's robot brain could not distinguish between friend or foe, so that it could be launched only after the target had been positively identified.

How much material will be used in the production of the Bat? The Navy is not yet ready to give out much information but the following data are suggestive to anyone familiar with manufacturing operations in the metal-working industries. The Bat is a glider-type craft 12 feet long and with 10-foot wing spread. Its weight, loaded, is approximately 1700 pounds. This is largely steel—mainly steel sheet and strip and tubing, also some castings and forgings—in the glider airframe and fuselage, in the bomb and bomb straps, in the wings and ailerons and in the instruments.

Manufacture of the Bat in quantities also will call for machine tools and other production equipment in huge numbers, together with a large amount of manpower, as suggested by this brief description of the way it works: The radar set operates a gyroscopic stabilizing unit, as well as a mechanism known as the "servo" which actuates the wing stabilizers. In other words, the Bat is a highly complicated assembly of parts made largely of metals.

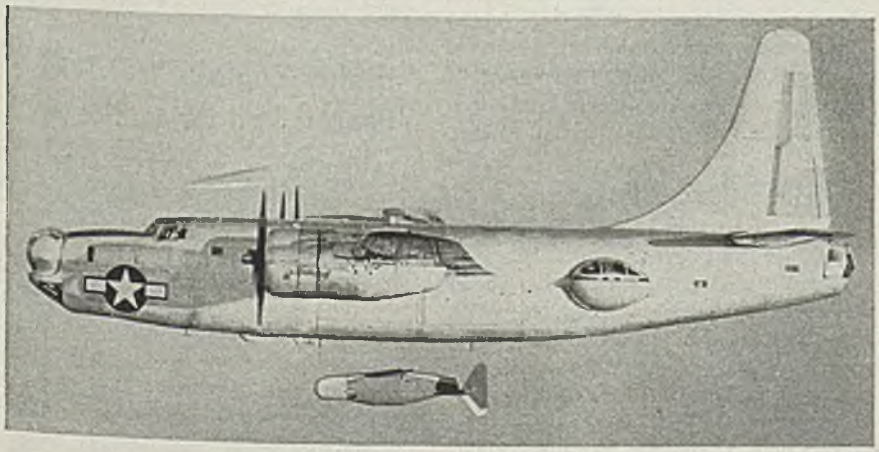
Both the Navy and the Army Air Forces are ready with another weapon that will consume metals in huge quantities—mainly aluminum but also steel in large tonnages. That is the guided robot plane known as the "assault drone." It was used with success in destroying Japanese installations at Rabaul, and was tested in advanced form during the atom bomb tests at Bikini. Briefly, the assault drone is operated by radar from a mother plane. In addition, it has a television broadcasting set by which it informs the mother ship of anything and everything that comes within the range of its "sight." It is armed with a bomb, rocket or other implement of destruction. The drone is flown 10, 20 or 50 miles away from the mother plane and thus is ready to be launched at enemy targets entirely over the horizon from the mother ship.

Surplus Bombers Would Be Used

The AAF right now is ready to employ this new weapon on a large scale. For drones it would use surplus bombers of World War II, stripped of armament and other accessories. There are large numbers of these surplus bombers and they would serve as a stop-gap supply until specially-designed drones would start to come off the production lines.

Among Navy objectives are certain new "heavy missiles." These would be "launched at shore objectives from ships or submerged submarines."

Another fantastic weapon which gives signs of fairly early emergence from the Buck Rogers stage is a "satellite" vehicle which would circle the earth hundreds of miles up, like a moon. After preliminary Navy and AAF investigations using German V-2 rockets as instrument platforms, the Navy just has placed with a large aircraft company the contract for a high-altitude research rocket. It will be 40 feet long and, with instruments, will weigh 5 tons. At the White Sands Proving Ground in New Mexico it will be launched to a height of 120 miles above the earth's surface.



Navy Privateer bomber looses a radar-guided "Bat" during training exercises at the naval ordnance test station, Chincoteague, Va.

Labor Shortage Limits British Castings Output

Government presses effort to recruit additional workers. Steel output falls short of consumers' needs

BIRMINGHAM, ENGLAND

SERIOUS shortage of foundry workers has been recognized by the British government for some time and new efforts are to be made to bring in some 20,000 workers. Present labor force is only about 117,000 against 140,000 before the war and production cannot be brought up to capacity until the difficulty is overcome.

It seems likely more blast furnaces will be brought into commission over the next few months to provide more foundry pig iron because if the foundry labor force is increased to any extent present output of high phosphorus iron will not be sufficient. Steelworks are getting all the basic iron they need, and there is also a good supply of other grades such as low phosphorus iron and hematite.

The beginning of the last quarter of the year found the steel industry hard pressed for supplies. Control Board announced it intends to sift orders so that priority needs are met such as those of the automobile works and fabricators of steel houses. This "comb-out," however, can only add to the difficulties of other trades which are clamoring for steel.

Sheet, Plates in Short Supply

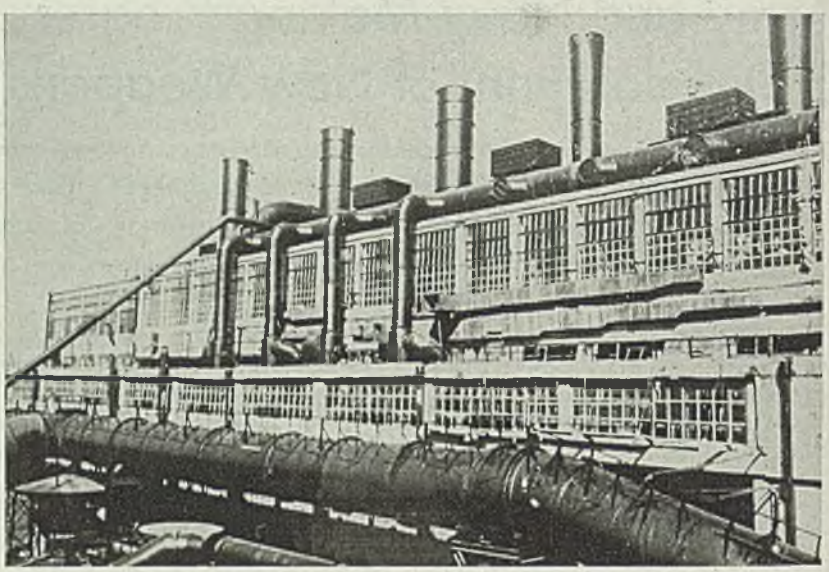
Primarily, the need is for sheets, but many other products are in equally pressing demand. Plate mills have to meet extensive demands for shipbuilding and ship repair. Boiler makers and builders of railroad cars need plates to keep up production. Export orders have been pruned severely so as to allow more steel for the domestic market.

Rerollers have been in difficulties for some time because of the shortage of semifinished steel, but arrival of cargoes from the United States will help to ease the situation in the next few weeks and production is likely to improve in the sheet mills. The scheme of the Control Board is that all uncompleted orders by Oct. 31 will come up for reconsideration.

Following the recent jump in tin prices, costs of manufacture of tin plate have increased. Mills, however, are fully booked for a long time ahead and there is little prospect of placing additional orders during the last quarter of the year as far as export is concerned.

Col. J. M. Bevan, chairman, Briton Ferry Steel Co., said his company had turned over a portion of its furnaces and boilers to oil burning in place of coal, despite the fact the works are situated in the Welsh coalfield. This was urged upon the company, he said, by the Ministry of Fuel and incidentally it emphasizes the seriousness of the coal situation.

Great activity continues in Scottish shipyards and the high level attained in September will be maintained until the end of the year. One of the best known shipbuilders, Harland & Wolff, have launched a cargo vessel of 4450 tons, one of three they are building for the French government. Other Scottish shipbuilding firms have orders from the same source. Records show that throughout the United Kingdom there are under construction or on order 92 vessels of over 117,000 tons gross. They include passenger liners, cargo liners, coal-carrying ships, dredgers and coastal tankers.



RUSSIAN POWER: Russia's electric power supply has been augmented by this new power station built at the Zaporozhstal Works in the Zaporozhye region in Russia. NEA photo

British Enlarge Import Product List by 34 Items

The British Board of Trade has added 34 items to the list of products which may be imported into the United Kingdom in limited quantities under an arrangement between the British and U. S. governments.

The plan, announced last July, originally provided for importation into the United Kingdom of an initial list of 47 U. S. brand-name products which before the war had a broad market in England.

Each American producer is permitted to ship a yearly amount of each item not to exceed 20 per cent of the value of his average annual shipments of the item to the United Kingdom during the base years 1936, 1937, and 1938. For the remainder of 1946, the quota for each producer is 2/3 of 20 per cent of the average annual amount of his shipments in the base years. During the war none of the products could be imported into the United Kingdom.

Among the additional items which may now be shipped are the following: Axes, forks for garden and farm use, cultivators for garden and farm use, aluminum cooking utensils, nails and staples of all kinds (including hobnails) and boot and shoe studs, bolts and nuts of all kinds other than precision bolts and nuts, and rivets of iron and steel.

Higher English Steel Price Seen if Rail Rates Rise

Asserting that a proposed increase of rail freight rates on English railroads would raise the price of English manufactured steel 4s a ton, Robert Schone, economic director, British Iron & Steel Federation, and formerly director, Ministry of Supply, Iron & Steel Control, declared higher rail rates were unreasonable and that: "Increases in steel prices at the present time would be most undesirable."

Mr. Schone, who appeared in London before the Railway Charges Consulta-

tive Committee, conducting an inquiry into rates and fares, gave as a strong reason for his stand against the increased rates the estimates of 1946 and 1947 British pig iron and steel production which have been prepared by the Iron & Steel Federation. These estimates are as follows: Pig iron production in 1946 will be 7,700,000 tons, in 1947, 8,500,000 tons; steel output in 1946 is expected to be 12,500,000 tons, and in 1947, 13,250,000 tons. The increased production in 1947 would mean additional traffic for the railroads, Mr. Schone contended.

Commenting on imports and exports of steel, Mr. Schone announced imports in 1946 are expected to be 500,000 tons, and in 1947 may reach 2,500,000 tons. Exports, on the other hand, will be reduced in 1947 from 2,500,000 tons to 1,250,000 tons to make additional supplies of steel available for domestic consumption.

Foreign Notes . . .

Russian mines are reported to be testing a new type of coal cutter, developed by Soviet engineers, for soft and medium grades of coal. According to Russian sources, the cutter is a steel casting with fixed blades operated by two winches, one in the driftway and the other in the ventilation shaft. The blades cut the coal and load it on conveyors as the machine moves along the seam. The cutter is said to be capable of cutting 300 to 400 tons of coal on each shift.

—o—

Plans to purchase aircraft parts, supplies and other aviation material and equipment from the United States with the aid of a special credit of 72,600,000 cruzeiros established by the Brazilian Air Ministry have been announced by the Brazilian Air Force, according to official information received from that country.

—o—

Chinese farms already are under cultivation with the aid of the first of 2000 UNRRA tractors from the United States.

—o—

Orders have recently been placed by the Brazilian Telephone Co. with English manufacturers for equipment amounting to £500,000, which will be used to extend systems originally supplied with American and German equipment, it has been revealed in reports reaching this country from abroad.

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Manufacture of the first monotype machine made in Russia has been reported from a Leningrad printing machinery plant. The machine has a reported capacity of 100,000 characters per work shift.

Few Model Changes Seen at First French Auto Show in Eight Years

Cars shown are much the same in appearance as those exhibited before the war though certain design and construction changes have been made. Builders plan to concentrate on standardized models to large extent

PARIS, FRANCE

A RECENT noteworthy event in France was the automobile exhibition, the first of the kind in Europe after an interruption of eight years. In general, the same makes as exhibited before the war presented models that did not differ greatly from 1939 in external appearance, although there were certain changes in design and construction.

In addition to these "classical" cars were some novelties in the form of small 4-hp cars and one cyclecar of 1.5 hp, such as appeared immediately after the first world war.

There were also some Citroen and Peugeot motor lorries.

These aspects of the French automobile industry are caused by the necessity of exporting rapidly those makes that were available in the home market, and also the need for an economical vehicle for home users. However, practically none of the cars shown was for sale to domestic users, who will have to wait for the completion of the long term plans evolved by the authorities.

Standardized Types Planned

According to these plans it is proposed to concentrate on the manufacture of a small number of types which have proved to be successful and which will be strictly standardized. The official plan covers a period of five years, during which it is proposed to make 401,000 cars of 6 hp and under, 265,000 cars of from 6 to 8 hp, 304,000 cars of from 10 to 12 hp and 62,000 cars over 12 hp. This will make a total of 1,032,000 cars for private owners. In addition there will be 205,500 light commercial vehicles and 417,200 heavy lorries, plus about 46,000 special vehicles. The annual rate of construction ranges from 67,000 private cars in the first year to 350,000 in the third year; 61,450 heavy lorries in the first year to 75,700 in the third and 27,000 light commercial vehicles to 46,000.

Present prices are about five times the prewar prices; for instance a 10-hp Citroen sold at 24,700 francs in 1939 but is now priced at 120,125 francs, which represents about one year's wages for a skilled workman. Today's price is equivalent to just over $1000.

As to developments in design and construction of automobiles French constructors have first given attention to the reduction of weight by use of light alloys. The most interesting results were obtained by the Aluminum Francais, with the Gregoire car, the license for which was purchased in the United States by Kaiser-Frazer. Mathis has made a small car on three wheels weighing only 385 kilograms (approximately 850 lbs). The nationalized Renault works showed a "Juvaquatre" of the prewar type, and a new car with engine at the back, which consumes 6 litres for 100 kilometers (about 47 miles to the gallon); this car is claimed to reach 90 kilometers (56 miles an hour). The body is of sheet steel. The old make of Panhard showed a 2-cylinder car, and Fiat presented a 3-hp light car, a four-seater with a speed of 100 kilometers (62 miles) an hour; the body of this car is of duralumin. Ford showed its current models and Peugeot limited itself to the prewar 202 model. Talbot showed models of high luxury, whose lines were very much the same as the prewar lines of the same make.

Light alloys are also developing in the construction of commercial vehicles, and numerous types were shown by Panhard, Berliet, Renault and Citroen. There were only a very small number of foreign makes shown.

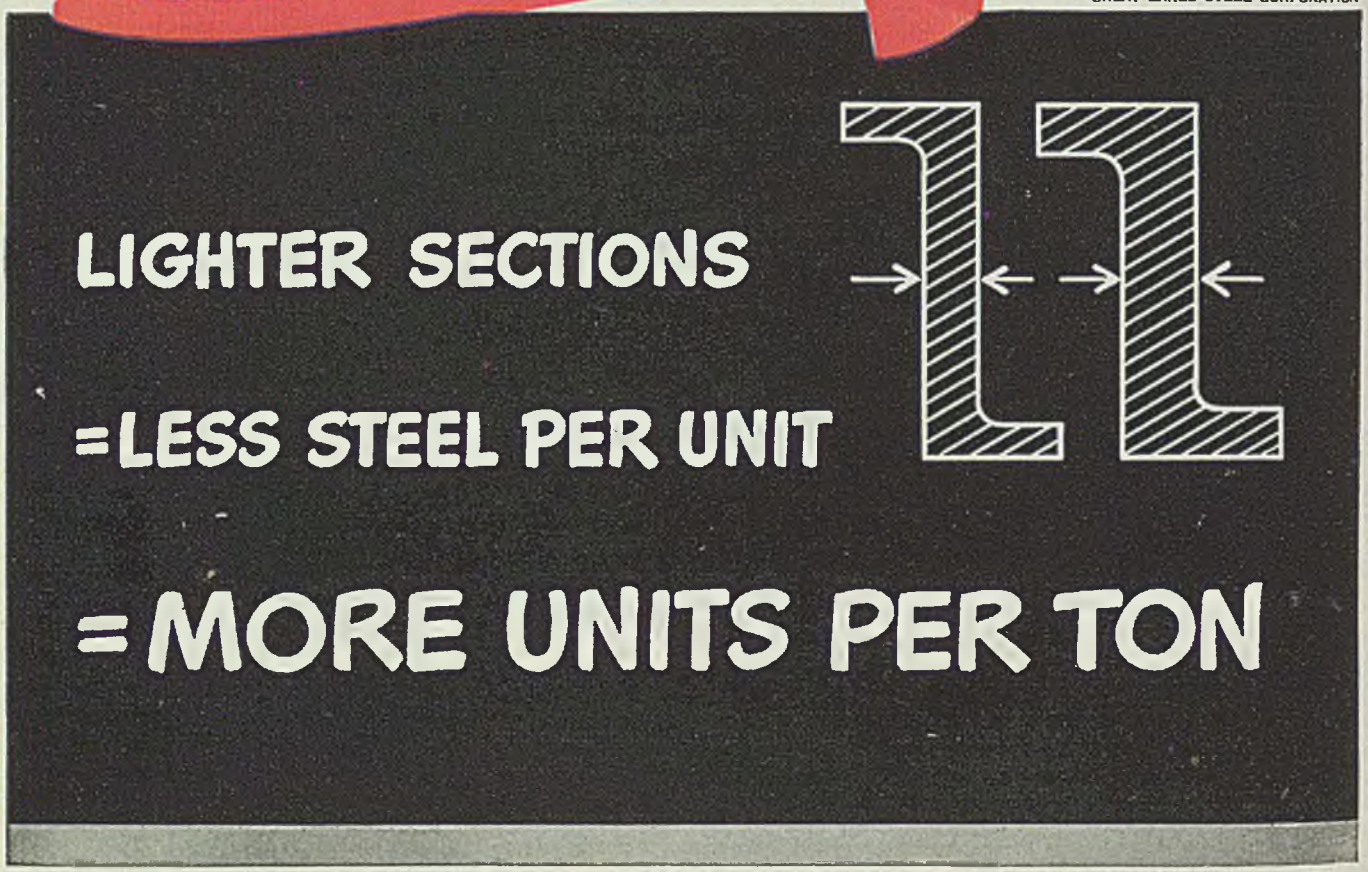
Coal Output Remains Steady

Coal production in France remains at about the same level as in recent weeks, 970,000 to 975,000 metric tons for six working days, and imports for the thirty-seventh week were 275,000 tons, mainly from the United States. For October the quota received from Germany will be reduced from 268,000 tons to 225,000 tons.

Output of iron ore in France during September totaled 1,412,000 tons.

Provisional figures of output for August are: Pig iron 138,000 metric tons; steel ingots and castings 386,000 tons; finished steel 249,000 tons. The output of tin plate had increased from 900 tons in April, 1945, to 5900 tons in June, 1946. Throughout the period of 14 months the output was 32,800 tons to which should be added 29,700 tons of imports from the United States and Great Britain.

THE NEW ARITHMETIC IN STEEL



THIS NEW ARITHMETIC SHOWS USERS OF HOT AND COLD ROLLED SHEETS HOW TO INCREASE PRODUCTION OF UNITS 33% WITH THE SAME AMOUNT OF STEEL

Here's a proved and practical answer to the problem of increasing production.

Make lighter sections of N-A-X HIGH-TENSILE steel. Use less steel per unit, get more units per ton. This low-alloy steel is so superior in tensile strength to carbon sheet steel that three tons will ordinarily do the work of four. Yet, with all its strength, N-A-X HIGH-TENSILE can be formed and drawn to intricate shapes because of its exceptional ductility.

You'll find other important advantages in N-A-X HIGH-TENSILE steel—excellent weldability, high fatigue- and corrosion-resistance, great impact toughness. This means a better and more durable product . . . and simpler and less costly fabricating, finishing and handling operations.

Until our metallurgists and engineers know more about your particular products and production methods, we can't tell you exactly how much N-A-X will help you. We're ready to investigate at your request.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
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GREAT LAKES STEEL CORPORATION

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UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Changes in 1947 models generally will be limited to modifications in styling, decorative trim, upholstery, instrument panels and finish. Builders will seek to avoid major expenditures for tooling and increases in manufacturing costs

DETROIT

IMPORTANT engineering changes in new car models going into production late in December or early January are not looked for, but there will be a number of modifications in styling, decorative trim, perhaps upholstery, instrument panels, paint combinations and the like. Strenuous efforts are being made to avoid any major expenditures for tooling, since manufacturing costs are already dangerously high with relation to selling prices. Although some hints are heard of plans to increase price tags again, most companies are extremely hesitant to do this, and are preferring to try to whittle down costs so that current prices will permit a small profit. There is even some thinking to the effect reductions in prices may be possible in 1947 if a sustained production level can be achieved. Likelihood of price cuts in 1948 models is even stronger, since by that time the sellers market may be ancient history and the race on again for the consumer's dollar.

Major Changes in 1948 Seen

Designwise the 1948 models should see some major advances, both as to bodies and chassis. New engine programs may shortly be revived, once the foul financial weather of 1946 has been penetrated. Details at present are somewhat nebulous, but there is plenty of conversation. Ford, for example, had some changes in the V-8 engine well along toward the production stage, but called them off for the time being. They involved principally an opening up of the V-8 block, or increasing the angle between the two rows of cylinders. Lincoln had been actively pushing a program for a new V-8 engine with numerous innovations, and this may be reopened for the 1948 series. Principal problem at the moment is location of foundry capacity for the unit.

The Cadillac V-8 engine of course has undergone a thorough beefing-up and redesign during the war because of the demand for rugged operating qualities in tank engines. Result is that now this engine far surpasses its counterpart before the war, and the Cadillac buyer is really getting a 1947 power plant in his 1946 automobile. There is talk of serious consideration being given to trying the Cadillac engine, or a slight modification, in the largest or Roadmaster Buick series for 1948, replacing the present straight-eight valve-in-head engine. This would prove an important sales point for the big Buick and likely result in stepping up its volume, without appreciably detracting from Cadillac sales. Meanwhile, stepping up the volume of production on the Cadillac engine would permit cost reductions reflecting favorably on both Cadillac and Buick. Rebuilding and expansion of the Cadillac gray iron foundry, now nearing completion, might provide ample facilities for supplying cast components for the engine in heavier volume.

Similarly, the General Motors hydra-matic transmission, used in the Cadillac-built tank, has been improved and simplified somewhat in design during the war years which should tend to ease the manufacturing problem and at least point the way to lower costs. Next step logically would be to make it available on at least one of the Buick series. Eventually, of course, this popular transmission unit will be engineered into the Pontiac and Chevrolet but whether this can be accomplished in time for 1948 models seems problematical, since it would probably necessitate additional plant facilities besides those operated by the General Motors transmission division. The competitive situation may determine progress here. If Ford, for example, should have its new automatic transmission ready for the 1948 Lincoln and Mercury models, and if Chrysler should offer its fluid drive on DeSoto and Plymouth, then GM might logically be expected to push its hydra-matic onto others in its line.

Chrysler activity on new engine development has been kept pretty quiet but it has by no means been dormant. A number of tests have been run on a V-8 design which is believed to have considerable promise; however, no indications are seen of its early speedy emergence into production.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

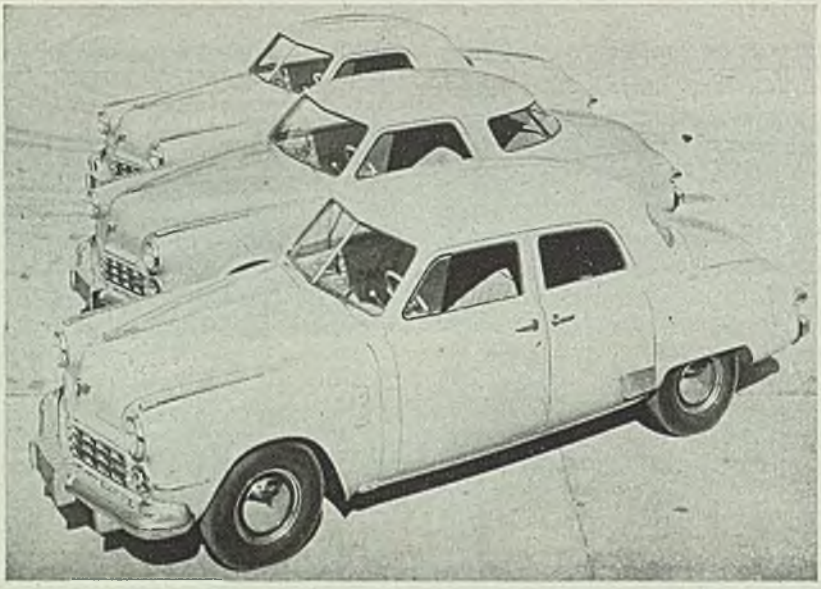
	1946	1941
January	121,861	524,037
February	83,841	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,321
June	214,511*	646,278
July	330,764*	468,897
August	359,180*	164,793
September	349,124*	248,751
Estimates for week ended:		
Oct. 5	91,925	76,820
Oct. 12	86,330	79,065
Oct. 19	89,687	85,600
Oct. 26	85,000	91,855

*Preliminary

D. S. Harder Joins Ford

If Ford Motor Co. has ever been understaffed on executive personnel, it is rapidly losing that affliction. Latest addition to the ranks, effective Dec. 1, is Delmar S. Harder, since January, 1945, president of E. W. Bliss Co., press builder, who becomes Ford's vice president, operations, continuing as a director and board chairman for the Bliss company. Harder is a top-flight production executive, starting his career in 1912 with Yellow Cab, then going with Chevrolet at Tarrytown, N. Y., and Janesville, Wis. After a brief period with Durant Motors in Oakland, Calif., and Elizabeth, N. J., he transferred to Detroit as plant manager for the Edw. G. Budd Mfg. Co. in 1928, and four years later was named manager of Budd plants in both Detroit and Philadelphia. In December, 1934, he joined Fisher Body Division of General Motors as general factory manager of the fabricating division, continuing in this capacity until joining Bliss.

As Ford staff executive directing all manufacturing and production activities, Harder will work closely with M. L. Bricker, vice president and director of manufacturing who will continue in his present position with direct-line authority over manufacturing. Harder thus becomes the latest in a long line of former General Motors executives now associated with Ford. Several of these men are prominent in a new lineup of the Ford engineering division annnounced recently by Director Harold T. Youngren. Passenger car engineering, for instance, has been divided into two separate departments, with Lincoln-Mercury headed by H. H. Gilbert, for many years with Cadillac, and Ford headed by H. S. Currier, for 17 years active with Oldsmobile. Test facilities are being expanded under direction of A. W. Fiehse, for 21 years



RETURNS TO MARKET: A Studebaker Commander series, off the retail market since early 1942, has been made available again. The Commander is larger, more powerful and more luxurious than the lower-priced 1947 Champion series. The new Commander series emphasizes a strong trend to individualistic body type treatment, as may be seen by comparing the business coupe (rear), the five-passenger coupe (center), and the four-door sedan (front)

with Chevrolet. W. S. James heads up the Ford research department. He came with Ford over a year ago and prior to that for 18 years was prominent in Studebaker engineering activities. E. T. Gregorie, with Ford since 1931, heads the styling department, and administration of the engineering division is under supervision of V. Y. Tallberg, veteran Ford engineer. Dale Roeder, a 20-year Ford veteran is chief engineer of the commercial vehicle department.

McCaslin Leaves Kaiser-Frazer

A recent surprise resignation was that of H. C. McCaslin, vice president in charge of engineering for Kaiser-Frazer Corp. He had held this post since the organization of the corporation, coming from a similar position in the Graham-Paige setup, after a long close association with Joseph W. Frazer. He is succeeded by John L. Hallett, now vice president and chief engineer, who has been plant manager of the southern California division of Kaiser-Frazer at Long Beach, Calif., and prior to that served in engineering capacity with Kaiser industries. He will direct engineering work on the Kaiser Special and Frazer automobiles, and Graham-Paige farm equipment, also presumably whatever may be done in future months on the original Kaiser front-wheel drive passenger car. The latter was taken out of production after preliminary tests disclosed a considerable amount of engineering development remained to be done before this design could be considered entirely roadworthy.

Costly Transportation

Some of the typical emergency or "hand-to-mouth" steps necessary these days to keep materials moving to automotive assembly lines have been disclosed by Fisher Body. At 10 a. m. one day the Fisher general office learned that its plants at Kansas City and St. Louis would be forced to close the following morning if a supply of window channels was not available by 7 a.m. The channels were at a plant in Amesbury, Mass. An express shipment would have been too late, so traffic experts began looking for air transport. None of the passenger lines could handle the shipment because doors of the planes were not large enough to admit the 70-inch channels. Finally is was learned that a commercial carrier had a C-47 cargo plane at Chicago which could be sent to Boston to pick up the shipment, if the supplier could get them there by truck. Timing their moves, the truck and airplane arrived at Boston airport on time and approximately 9000 pounds of channels were flown to Missouri the same day to keep production going on Chevrolet bodies.

Another example was the recent "pony express" movement of cushion springs from Jackson, Mich., to Baltimore. Realizing that time would be lost in loading and unloading trucks and freight cars if the shipment went by freight, Fisher traffic arranged for a motor trailer with the springs aboard to leave Jackson at 4 p. m. At 10:30 that night the springs arrived in Cleveland; the trailer was rehooked to another truck ready and waiting. A new driver climbed aboard and after an all-night run the springs arrived in Baltimore by noon the next day.

Such expedients could be multipled by the hundreds and are practiced by all manufacturers. What they do to costs is sad, but at least they keep assemblies going forward. Little doubt exists that their use will be terminated speedily once it is possible to get a better balance of inventories and operations generally are adjusted to a normal basis. This will have to be soon.

September Sales Drop

Inventory imbalance is the explanation behind the 6 per cent drop in factory sales figures for passenger cars from August to September, although it must also be remembered September had two less working days than August, or about the equivalent of the production drop. At any rate, September sales are calculated at 232,280, against the postwar peak of 247,261 in August. Total sales for the first nine months of the year were 56 per cent less than the comparable figure for 1941.

Triple-Alloy Steels Gain

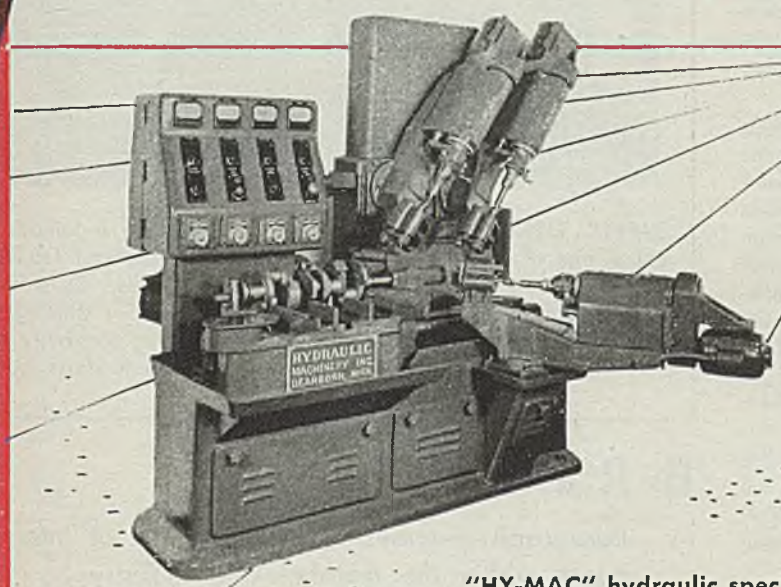
Commenting on trends in the use of alloy steel in the automotive industry, R. L. Wilson, Timken Roller Bearing Co., Canton, O., told a recent regional metals conference here that the 8600 type was now the most popular but in general there had been a large increase in the triple-alloy types which last year accounted for 55-60 per cent of the total. The steel industry produced in the first half of 1946 some 2,500,000 tons of alloy steel ingots, 25 per cent of which was electric furnace alloy. It is expected the full year will see 6,000,000 tons of alloy steel melted. As to the future, Mr. Wilson said he looked for less alloy steel in proportion to the total steel used in automobiles, but for the overall tonnage requirement still to be large.

Sets Aside Cars for Workers

Kaiser-Frazer is setting aside an aggregate of 5 per cent of its daily production, after the first 5000 units have been shipped, for purchase by employees. This will be one car out of 20 for employees, and sales will be handled through authorized dealers.

HY-MAC

Emblematic OF NEW HORIZONS



"HY-MAC" hydraulic special purpose machine for deep drilling oil holes in automotive crankshafts, includes the use of electronically controlled Kirkman Torque Heads. Each head feed rate, together with the forward and reverse movement of the tables, upon which it is mounted, are independently controlled hydraulically . . . Normal cycle of each Drill Head: (1) Head advances in rapid traverse, just short of the drilling position where it is slowed down to a feed rate by a limit switch. (2) Drilling continues (at feed rate) until an excessive torque force develops, due to pressure (heat, accumulation of chips in the flutes, etc.). (3) Electronic Torque Control then functions, operating a relay which in turn actuates a solenoid hydraulic valve, causing the head to be retracted to the starting position, at the rapid traverse rate. (4) At this point, a limit switch is tripped and the Head is rapid traversed back just short of where it left off drilling. Then it is slowed down, and, at the feed rate, begins drilling again. This is repeated until the hole is completed . . . Send us a print of a part that is to be processed, together with the production requirement and our engineers will make recommendations and preliminary proposal without obligation.

Also send for eight page brochure which completely outlines our facilities.

HYDRAULIC MACHINERY, INC.

12825 FORD ROAD — Dearborn, Michigan

HYDRAULIC MACHINERY—Western Division — Glendale, California

Steel Company Starts Course For Salesmen

Sales training program, discontinued in 1940, resumed by Allegheny Ludlum Steel Corp.

SALES TRAINING on a new and intensified basis has been instituted by Allegheny Ludlum Steel Corp., Pittsburgh. Designed to increase efficiency and interest in product sales, the new program represents the company's first formal sales training since 1940.

The first class of trainees was selected on a competitive basis from various divisions and departments of the company. For this initial course, only men now employed by the company were chosen because lack of a training program during the war resulted in a backlog of potential salesmen on the company rolls. However, future courses will be open, on a strict competitive basis, to those not now employed by the steel company.

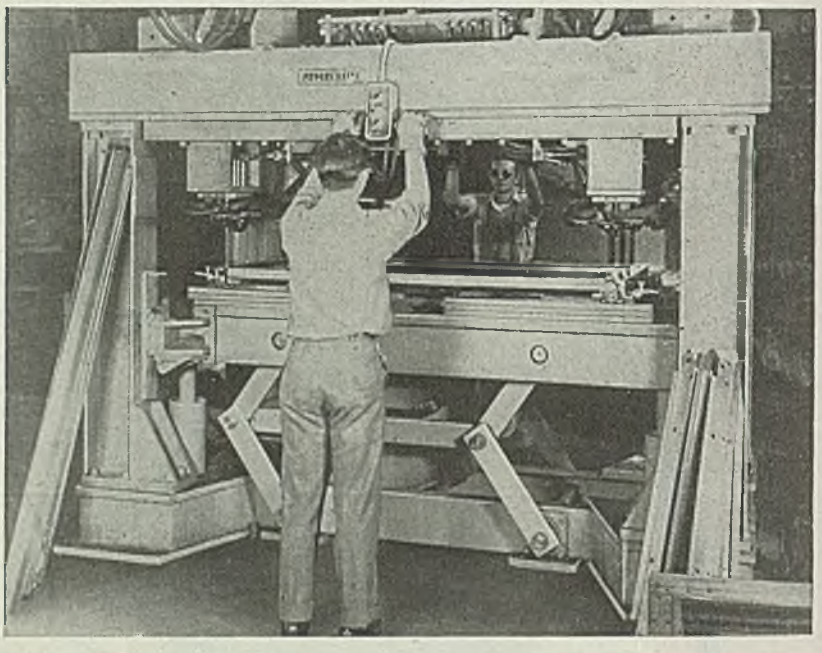
The first course will include eight weeks of lectures and practical classroom work and will be followed by an equal number of weeks of supervised training in the field.

A five-man board of company officials interviewed each applicant and made the final selection on personality, character, mentality, business knowledge, appearance, education, health, willingness, and adaptability and background.

The first part of each early week of training will be spent in the various mills and departments of the corporation's Brackenridge, Pa., plant, with the latter part of the week being devoted to lectures, discussions and reports. The eighth week will be used entirely for recapitulation lectures.

Instructing the men to insure their thorough knowledge of the products they eventually will sell will be Allegheny Ludlum's expert craftsmen, technicians, chemists and executives.

Upon completing the course, the men will go to the Pittsburgh office of Allegheny Ludlum to be selected for orientation in special products and to receive further instruction under product sales managers. The new salesmen will begin their sales careers in the corporation's district offices and will travel with experienced salesmen for a number of weeks to become thoroughly acquainted with practical sales techniques.



SAFETY FIRST: Safety is a feature of this new automatic welding machine, one of a battery recently installed by Fruehauf Trailer Co., Detroit, for multiple spotwelding of all-metal door frames. To start the machine, each operator must raise his hands and press two starting buttons simultaneously. This precaution guards against the possibility of either man having his hands in the machine when it starts operating

BRIEFS . . .

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

Emerson Radio & Phonograph Corp., New York, has announced plans to buy the radio communications division of Jefferson-Travis Radio Mfg. Co., New York, and will operate it under the Jefferson-Travis name.

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Seiberling Rubber Co., Akron, has postponed its $4 million expansion project at Garland, Tex. The company had planned to convert a former war plant to production of tires and tubes.

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Youngstown Sheet & Tube Co., Youngstown, recently received two safety awards at the National Safety Congress in Chicago. Its South Chicago works had the lowest accident rate among plants in its classification, and the Brier Hill works at Youngstown was first in improving its safety record over the previous year.

—o—

Kaiser Fleetwings Inc., Bristol, Pa., has begun production of water jet-propelled dishwashing machines. The aluminum dishwasher is being distributed and serviced through Kaiser-Frazer Corp.'s dealers, and the aluminum is being supplied by Permanente Metals Corp. from its Trentwood, Wash., plant.

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Foxboro Co. Ltd., Montreal, Que., affiliated with Foxboro Co., Foxboro, Mass., has broken ground for a manufacturing plant in the Ville LaSalle section of Montreal.

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Jones & Laughlin Steel Corp., Pittsburgh, has announced that renegotiation of the business of the corporation and its subsidiaries for the year ended Dec. 31, 1945, has been completed and that no excessive profits were realized for that year.

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General Instrument Corp., Elizabeth, N. J., is planning an expansion program which will involve decentralization of factory operations, production of new items and strengthening of sales organization. Locations being considered for new plant sites are those normally not industrial in character.

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Shell Chemical Corp., subsidiary of Shell Union Oil Co., New York, has announced plans to expand its chemical

plant in Houston, Tex., at a cost of $25 million. The facilities, when completed, will produce more than the total output of the company's four West Coast plants.

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Bendix Aviation Corp., New York, has formed a Special Products Development Group to engage in research on controls and engine accessories for guided missiles and pilotless aircraft.

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Invention Inc., Washington, a patent research organization, has printed a folder entitled "Telling the Age of a U. S. Patent by its Number" which contains a dated tabulation of numbers of patents, reissues, designs and trademarks dating from 1836 to 1946.

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Industrial Powders Inc., Brooklyn, N. Y., has been formed to manufacture electrolytic copper and copper oxide powders. G. B. Cusrae is production engineer, and Arthur Bass, sales manager.

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Stinson Division, Wayne, Mich., Consolidated Vultee Aircraft Corp., has announced two 1947 model personal planes —the Voyager 150 and the Stinson Flying Station Wagon. Both planes will be exhibited at the National Aviation Show in Cleveland, Nov. 15-24.

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Ahlberg Bearing Co., Chicago, has moved its Kansas City office to a new building at 1517 Walnut St.

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Brown Instrument Co., Philadelphia, has developed a 25-cycle operation strip chart electronic potentiometer, designed for steel mills operating on a 25-cycle current.

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George Fry & Associates, Chicago, has established a Work Measurement Institute where intensive conferences for senior and junior industrial engineers and time study men will be offered.

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National Malleable & Steel Castings Co., Cleveland, recently awarded watches to 14 employees, each of whom has been with the company for 40 years.

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Edwards Valves Inc., East Chicago, Ind., has constructed a test hook-up to compute pressure losses through valves and piping. This testing equipment is reportedly the only one of its kind in existence.

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Buffalo Machinery Co. Inc., Buffalo, plans to triple present production facilities with the purchase of an adjacent city-owned property.

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Linde Air Products Co., New York, has opened a new oxygen filling station and acetylene producing plant in Charlotte, N. C. The oxygen plant is now in operation, and the acetylene facilities are expected to be completed by December.

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Budd Co., Philadelphia, recently delivered the first all-stainless steel railway passenger car built since the war for the New York Central System. New York Central has orders with Budd for 239 coaches, diners, sleepers and recreation cars.

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Independent Pneumatic Tool Co., Chicago, has announced plans for a $1 million expansion of its Aurora, Ill., plant, with construction to begin in March.

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Ekco Products Co., Chicago, has purchased Canadian Lapin Products Ltd., Toronto, Ont., plastic products manufacturer. The Canadian company will soon be expanded to include manufacture of plastic components for Ekco's line of houseware.

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Lister-Blackstone Inc., Milwaukee, has announced a new policy for manufacture of diesel engines; production will be concentrated almost entirely on straight diesel engines, and no diesel generator sets or combination auxiliaries will be produced. The company has set up a new parts department at 1568 W. Pierce St., Milwaukee, and its main office has been established at 740 N. Plankinton Ave., that city.

Ex-Cell-O Head Stresses Productivity, Teamwork

"Teamwork and hard work" were the key words of a recent address by Phil Huber, president and general manager, Ex-Cell-O Corp., Detroit, speaking at a dinner honoring employees with 20 years or longer service with the company.

Mr. Huber stated teamwork "is one of the greatest needs in the world today, whether you're interested in the peace conference at Paris or the state of relations between management and labor, or between any two individuals in the same shop . . ."

Equally important with teamwork, in Mr. Huber's opinion, is the need for hard work.

Continuing, Mr. Huber declared: "Now, as I see the business picture in this country, there are left two ways only whereby any company and its employees will be able to obtain more money to divide between them. These are by a reduction in taxes on one hand, and increase in individual productivity on the other hand."

Chicago Branch Expanded by Crucible Steel

New warehouse and office opened to meet increasing demand of metalworking industry for specialty steels

TO KEEP abreast of the metalworking industry's expansion in Chicago and the Midwest, Crucible Steel Co. of America, New York, has opened a warehouse and office at 4501-4531 Cortland St., Chicago.

This marks the third expansion of Crucible's Chicago branch since the turn of the century, and was brought about by increasing demands for specialty steels.

The new warehouse was designed in such manner that it can be expanded easily as Chicago industry grows.

Crucible Steel Co. of America was formed in 1901 as a merger of many tool steel specialty mills then operating. Many of these mills can trace their history back to Sheffield, England, and many of the craftsmen today operating these mills are direct family descendants from the skilled laborers who immigrated to this country before the Civil War.

Hartford Steel Distributor Holds 145th Anniversary

L. L. Ensworth & Son Inc., Hartford, Conn., said to be the second oldest hardware concern in the United States, is celebrating the 145th anniversary of the founding of its business. The company, which engages in warehousing and fabrication of steel bars, sheets, plates, structural steel and tools, has kept pace with the growing needs for its products until it now has three large centrally-located plants in Hartford.

Three Youngstown Steel Plants Plan Open House

Families and friends of employees of three Youngstown steel plants—Youngstown Sheet & Tube Co., Republic Steel Corp. and Carnegie-Illinois Steel Corp.—will have an opportunity to see these plants in operation during an open house on Wednesday, Oct. 30.

Purpose of the program is to show visitors how steel is made and how most of the city's workers earn their living.

Guaranteed Wage and Stabilized Employment Discussed at Meeting

Chairman of National Association of Manufacturers tells Industrial Relations Conference plan is desirable but there are many obstacles to bringing it about. Cites difficulties in planning due to seasonal fluctuations and other factors

LOS ANGELES

IRA MOSHER, chairman, National Association of Manufacturers, last week discussing the guaranteed wage as a factor in stabilized employment at the fourth annual Industrial Relations Conference at Palm Springs, Calif., declared the system is desirable and has much to recommend it to industrialists, "but the obstacles to bringing it about are many."

First requirement, he said, is full cooperation of management and labor, with each sharing its responsibilities. No wage can be guaranteed, he emphasized, unless business is profitable. It is thus the duty of unions to assist management in a successful operation as a fundamental to stabilization of wage rates.

"Guaranteed wages in any industry," Mr. Mosher continued, "depend upon long range planning and studies of employment fluctuation, the relationship between sales, production, employment and inventory, estimates of future labor requirements, standardization of products and of production methods.

"In many fields it is difficult to plan ahead because of factors of style changes, seasonal fluctuations, physical problems of warehousing, advance inventories, production schedules controlled by customers' requirements (sometimes unforeseeable) and new machinery and tool requirements for changing models and designs."

If stabilization of personnel could be achieved, he said, its rewards would follow. These he enumerated as better plant morale, reduced labor turnover, increased worker efficiency, reduction in fixed overhead in relation to production savings under the federal wage-hour law, and improvement in managerial efficiency.

Other speakers at the three-day conference included Irvin J. Hancock, assistant comptroller, Union Oil Co. of California, who pointed out that new California legislation covering disability benefits becomes effective next Dec. 1 and presents additional problems in the personnel field.

The program will add sick payments to the unemployment insurance now available to working people of the state.

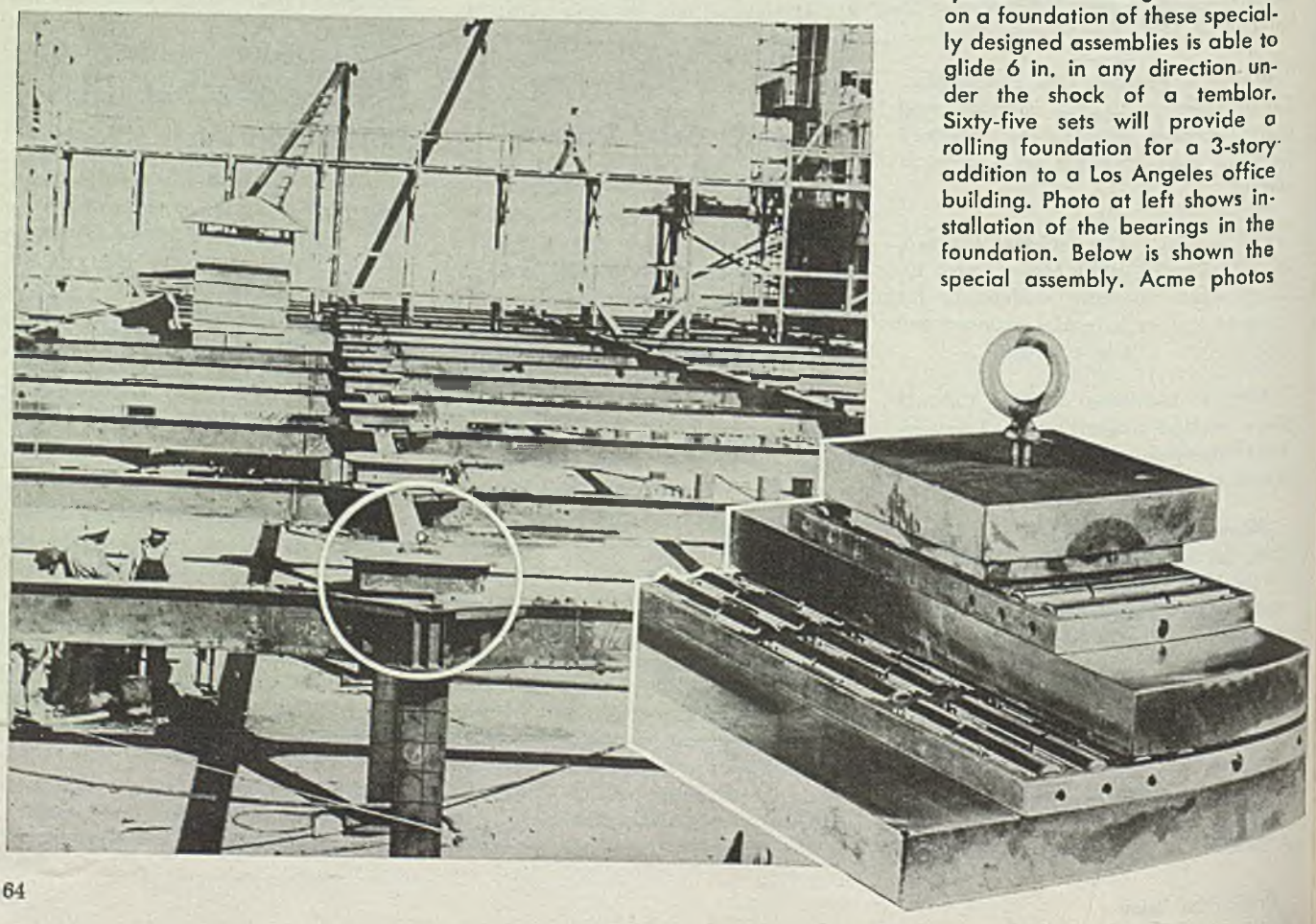
Some industries are proposing to institute their own sick benefit plans, he said, which they are allowed to do under the law.

"But the law provides that the voluntary plans must exceed the state plan in benefits and as details of the regulations have not as yet been issued regarding the state system, industry is unable to fix on a definite goal."

He declared that the unemployment insurance system has been in effect for 10 years and has attained its objectives. It has kept many persons off relief rolls, has sustained purchasing power and has stabilized employment.

"But as a byproduct, many a worker has suffered from too much independence and has arrived at the conclusion that it is not necessary to strive for his own interests, that the government will look after him anyway and find him a job."

Since Jan. 1, 1936, when unemploy-



ABSORBS TEMBLORS: This unique roller bearing is designed to absorb the punch of an earthquake. A building which rests on a foundation of these specially designed assemblies is able to glide 6 in. in any direction under the shock of a temblor. Sixty-five sets will provide a rolling foundation for a 3-story addition to a Los Angeles office building. Photo at left shows installation of the bearings in the foundation. Below is shown the special assembly. Acme photos

ment checks were first collected in California, it was brought out, the fund has accumulated $1,126,000,000 from employers and employees and $62 million in interest and from other sources. Payments have totaled $410 million. The sum of $103 million has been allocated to start the new disability fund.

Discussing the California constitutional amendment which contains the state's Fair Employment Practices measure, Randolph Van Nostrand, Los Angeles Merchants & Manufacturers Association executive, suggested that plants with union contracts should consult with union leaders on some of the implications of the measure. The orders of the state commission administering the measure take precedence over union contracts, he said, and as a result might tend to weaken or void some clauses in them.

Approximately 150 southern California business and industry authorities attended the conference, studying under experts such topics as government policies, employee relations, union negotiating practices and parallel information.

Material Shortages Limit Production in Northwest

SEATTLE

Material shortages are limiting production in this area. Plants are unable to meet local demands and steel buyers are complaining their usual sources of supply in the East are selling their output nearer to their plants. Consequently western industries are suffering severely and the situation has been greatly aggravated by the interruption of water transportation. Thousands of tons of steel are either delayed at shipping terminals or aboard idle ships.

Kenworth Motor Corp. has a $900,000 tentative award for 50 electric trolley coaches from the Portland Traction Co. They are 40 or 44-passenger type. The local firm is also building 30 busses for the North Coast Lines and 70 vehicles for South American buyers.

Rolling mills continue to produce the maximum tonnages permitted by labor turnover and inefficiency. Backlogs for six months are on books. First quarter business is being taken sparingly as the first concern is to complete current contracts.

Fabricators are working on the most essential contracts, badly handicapped by shortage of steel. What little new business is accepted is subject to indefinite delivery. Consequently many jobs have been postponed, among them the Narrows bridge which will involve about 17,000 tons of shapes. This project was to have been placed this month.

Proposed Roadbuilding Program Would Provide Big Steel Market

Plan calls for 2940 miles of expressways between major California cities and 8545 miles of trunkline highways. Project geared to population in state of 11,100,000 by 1960. Construction now far behind normal expectancy

SAN FRANCISCO

LARGE future market for steel is foreseen in planning for a huge increase in California road projects for the coming decade or so.

A report, prepared by G. Donald Kennedy, engineering consultant for a legislative committee, proposes a 10-year program to cost $2246 million. This plan calls for 2940 miles of "expressways" between major California cities and 8545 miles of "trunkline" highways. In addition, the plan proposes extensive improvement of country roads and city streets. Improvements on state highways alone would total $1187 million.

The program, if adopted by the legislature, could not be started before 1949 because of administrative details. However, on its completion by 1960, Mr. Kennedy declared, the program would bring California highways up to the standard held necessary to carry safely the traffic expected by that time.

Mr. Kennedy points out that registration of automobiles and miles of travel have increased twice as rapidly since 1920 as expenditures on streets and highways. Construction, he said, has been disrupted twice, by the war and by the depression, and is now far behind normal expectancy. The program is geared to an expected population of 11,100,000 in California by 1960.

Meantime, California already is well started on the largest highway building program in its history.

Between now and the middle of 1949, it is estimated the state will do $695 million of road building. This dollar figure may be larger, depending on the trend of prices and costs of labor. Costs of construction already have risen in some cases as much as 50 per cent over prewar levels.

At present, material shortages are holding up part of the work. For example, lack of structural steel needed for new bridges is delaying work on some roads. However, within a year it is believed materials will be more plentiful.

Establishment of Geneva, Utah, as a basing point for sheared steel plates in sizes, grades and specifications being produced at the Geneva mill at present, will result in a saving to consumers in Intermountain territory, but will not affect West Coast prices because of the longer freight haul.

After switching charges at Geneva, the quotation amounts to $53 a ton. At present rail rate of $12 a ton, the quotation on the West Coast thus becomes $65 a ton. However, the ceiling price for sheared plates on the West Coast is $62.20 a ton, or $2.80 less than the Geneva base plus freight costs.

Geneva, however, has applied for an $8 freight rate, which would mean a reduction to $61 a ton if that rate is granted, and if the base quotation stays the same. That would mean a reduction of $1.20 a ton under the ceiling price on the West Coast.

The largest single order for Geneva plates is the 60,000 tons which Consolidated Steel Corp. is taking for fabrication into large diameter pipe for the Texas-California natural gas pipeline.

Russian Pipe Order Conflicts

Incidentally, the pipeline order had repercussions of an international character last week when Governor Earl Warren, of California, protested to the State Department that a Russian order for 183 miles of steel pipe was conflicting seriously with delivery of pipe to the Texas-California project.

As a result the State Department announced that UNRRA will cancel the order for the Russian pipe.

H. H. Fuller, president of Bethlehem Pacific Coast Steel Corp., said his company is continuing with its plans for expanding its steel plants at Seattle, South San Francisco and Los Angeles.

The Seattle bolt and nut plant is being rebuilt, he said; a new mill depot has been erected in San Francisco, and new facilities are being added at the Los Angeles plant which will double that mill's present steelmaking capacity.

Preliminary estimates of manufacturing employment in California at mid-September indicate a 5600 drop from mid-August figures, according to reports of the California Department of Industrial Relations.

Lay-offs in non-durable goods industries accounted for the decline.

Men of Industry

CLARENCE JOHNSON

LOUIS G. ALBERS

QUENTIN GRAHAM

Clarence Johnson, for 18 years research engineer, Bailey Meter Co., Cleveland, has established himself in Beloit, Wis., P. O. Box 378, as a research consultant on inventions and engineering developments. Mr. Johnson was active in the systetm of developments of controls for machine tools recently purchased by Monarch Machine Tool Co., Sidney, O. He is a member of the American Society for Metals, and has many patents on mechanical, chemical, and automatic control inventions to his credit.

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George A. Jacoby has been named director, personnel departments' activities section, General Motors Corp., Detroit, succeeding the late **O. L. Beardsley.** Mr. Jacoby has been a member of the personnel staff of General Motors for the last year.

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Helmer Peterson has been appointed factory manager, Long Island City, N. Y., plant, Mack-International Motor Truck Corp., subsidiary of Mack Trucks Inc., New York. Mr. Peterson joined the company in 1942, and had been stationed at the firm's Plainfield, N. J., plant.

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James S. Lee has been appointed European representative for United Aircraft Corp., East Hartford, Conn. He expects to leave the United States about Nov. 1, to select a location for European headquarters. Mr. Lee, who has been with Pratt & Whitney Aircraft Division of the corporation for the last 9 years, was most recently airlines engineer.

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Johnson Steel & Wire Co. Inc., Worcester, Mass., announces realignment of the sales department officials. **Robert M. Jones,** sales manager, has headquarters at the Wiser Avenue plant, Worcester. **Charles E. Reardon,** assistant sales manager, with headquarters in Worcester, specializes in the promotion of sales of new company products. **William S. Darcey,** formerly head of the New York sales offices, has become sales market analyst. **E. Padron Wells** is now manager of export sales, with offices in New York.

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Louis G. Albers, of the Special Products Division, Lodge & Shipley Machine Tool Co., Cincinnati, has been appointed to direct the sales program for the Choremaster, new garden tractor soon to be marketed by the firm. Mr. Albers has been with the Special Products Division since 1941, where he was engaged in war production work. He was a manufacturers' agent for a number of firms prior to joining the Lodge & Shipley organization.

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W. C. Fahie, who joined the British Iron and Steel Research Association last March, has been appointed head of the instrument section in the physics department. He was with the Royal Air Force during the war.

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William P. Snyder Jr. has been elected a director of Crucible Steel Co. of America, New York. Mr. Snyder is president of Pittsburgh Plate Glass Co., Pittsburgh.

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Ben Kramer, Kramer-Orloff Co., Detroit, has been re-elected president, for a year, of Michigan chapter, Institute of Scrap Iron & Steel Inc., Washington. Other officers of the chapter are: Vice president, **Edward Elk,** Kasle Bros. Inc., Flint; second vice president, **Mannie Fishman,** Modell Iron & Metal Co., Detroit; secretary, **Norman Siegel,** Siegel Iron & Metal Co., Detroit; and treasurer, **Joe Newman,** Warren Iron & Metal Co., Detroit.

—o—

Quentin Graham has been appointed manager, Ridgway, Pa., Division, Elliott Co., Jeannette, Pa., replacing **H. S. Pahren,** who moves to New York as Elliott district manager. For the last 2 years, Mr. Graham had been manager of the Elliott electrical engineering department. From 1914 to 1944, he was with Westinghouse Electric Corp., Pittsburgh.

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William F. Langefeld has been appointed purchasing agent, Austin-Western Co., Aurora, Ill., succeeding **J. D. McMakin,** who has purchased an interest in Tri-State Equipment Co., Memphis, Tenn.

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John A. Vanecho, recently released from the Navy, has been named to the staff of Battelle Memorial Institute, Columbus, O. He has been assigned to the institute's division of research on high temperature alloys. Prior to entering the Navy in 1944, Mr. Vanecho was with the South Chicago, Ill., plant, Carnegie-Illinois Steel Corp., Pittsburgh, subsidiary of United States Steel Corp.

—o—

Ernest L. Ward has been elected vice president, Sprague Electric Co., North Adams, Mass. Mr. Ward, who joined the company in early 1946 as a member of the executive staff, will include among his new duties the co-ordinating of the manufacturing and service activities of the firm. **Robert S. Teeple,** formerly superintendent of several manufacturing departments, has been appointed factory manager of the Sprague Beaver Street plant, and manager of electrolytic manufacturing operations at the Marshall Street

plant. **Frederick H. Potter,** formerly in charge of the material and production control departments, has been appointed factory manager of the Brown Street plant. All three plants are in North Adams.

—o—

Ned Landis, recently released from the Navy, has been named branch manager, Syracuse, N. Y., office, Allis-Chalmers Mfg. Co., Milwaukee. He succeeds **Leonard R. Reid,** who is now attached to the electrical department at the company's main works. Prior to joining the Navy, Mr. Landis was with the Cincinnati office of Allis-Chalmers.

—o—

Nelson H. Stewart has been named resident representative at Bloomfield, N. J., of foreign licensees in electronics, Westinghouse Electric Corp., Pittsburgh. Mr. Stewart, who joined Westinghouse in 1929, had been superintendent of the company's electronic tube plant at Fairmont, W. Va., since 1942. **Hans N. Horst** has been appointed assistant superintendent in charge of sunlamp and heat lamp manufacturing at Fairmont. Mr. Horst joined the company in 1929, and had been staff supervisor in the incandescent lamp manufacturing department since 1943.

—o—

Clyde B. Colwell has been appointed special representative for stainless steels, Jessop Steel Co., Washington, Pa. He will make his headquarters in the company's Chicago offices. Mr. Colwell was with the sales department of Carnegie-Illinois Steel Corp., Pittsburgh.

—o—

Gene Henry has been promoted to supervisor of production control, American Central Mfg. Corp., Connersville, Ind. He was with the company's Sales Division. **Kenneth Cook,** training instructor in the firm's American Kitchens School, will be assistant sales manager of the Product Division. He also will continue to handle sales training. **Larry Coen** has been named distribution manager of the Product Division. He will work with the firm's regional sales managers and its distributor organization. Mr. Coen had been assistant sales manager of the Product Division.

—o—

H. Gray, chief draftsman, engineering department, Edgar Allen & Co. Ltd., Sheffield, England, has retired. He had been with the company since 1926. Mr. Gray will be succeeded by **A. Wadsworth,** of British "Rema" Mfg. Co. Ltd., subsidiary of Edgar Allen & Co. Ltd.

—o—

Joseph A. Moskowitz, of Samuel Sons Iron & Steel Co., Brooklyn, and **Barney H. Rubine,** of Hudson Iron & Metal Co., Bayonne, N. J., have been designated chairman and co-chairman, respectively, of the general convention committee for the 19th annual convention, Institute of Scrap Iron & Steel Inc., which will be held in New York next Jan. 6-7-8.

—o—

A. B. Campbell has been appointed executive secretary, National Association of Corrosion Engineers, with headquarters in Houston, Tex.

—o—

J. V. Schrock, assistant to the general superintendent of the Pittsburgh works, Jones & Laughlin Steel Corp., Pittsburgh, has retired after 23 years with the corporation and 51 years in the steel business. He joined Jones & Laughlin in 1923, in the Pittsburgh works accounting department. In 1929 he was made assistant to the general superintendent.

—o—

Leroy Salsich, president, Oliver Iron Mining Co., Duluth, subsidiary of United States Steel Corp., New York, has been awarded the William Lawrence Saunders Gold Medal for 1947, by the American Institute of Mining & Metallurgical Engineers. The award was in recognition of Mr. Salsich's conspicuous success in developing men and methods for the mining and transportation of iron ore, and for his contribution to the nation's production of steel during the war.

—o—

S. S. Bruce has been appointed to the newly created position of executive sales representative in Washington for Koppers Co. Inc., Pittsburgh. Mr. Bruce joined Koppers in 1916, and has been traffic manager since 1921. Recently he was named manager of the traffic and transportation department. His appointment in Washington is effective Nov. 1. **John B. Keeler** has been appointed to succeed Mr. Bruce as manager of the traffic and transportation department. Mr. Keeler has served as assistant traffic manager for Koppers since 1928, and recently was named assistant manager of the traffic and transportation department. For 20 months during the war, Mr. Bruce was in Washington as assistant director, Railway Transport Division, Office of Defense Transportation.

—o—

Lawrence L. Jones has been appointed superintendent of the new Anaheim, Calif., factory for the manufacture of Glyptal alkyd resins, General Electric Co., Schenectady, N. Y. Mr. Jones joined General Electric in 1928, in Schenectady. Since 1935, he was foreman, varnish section, Resin & Insulation Division.

—o—

Louis M. Kuilema has been placed in charge of the Wisconsin territory as district sales manager, Pennsylvania Salt Mfg. Co., Philadelphia. He was district sales manager in the company's Cincinnati office. On Oct. 1, he moved to his new headquarters in Chicago. Mr. Kuilema, who has been with Pennsalt 2 years, succeeds **H. A. Smith.** Mr. Smith continues as district sales manager of the Chicago area. **Charles W. Dermitt** succeeds Mr. Kuilema in Cincinnati, after 4 years as assistant Pittsburgh district sales manager.

—o—

Harold C. Day has been promoted to field manager, general sales, American Radiator & Standard Sanitary Corp., Pittsburgh. He was sales manager of the company's Buffalo office. **Daniel J. Keefe** has been appointed sales manager of the Buffalo office. He was with the firm's New York sales office.

—o—

Cornelius C. Coakley has been appointed Buffalo plant manager, National Aniline Division, Allied Chemical & Dye Corp., New York, succeeding **Leon A.**

CLYDE B. COLWELL

J. V. SCHROCK

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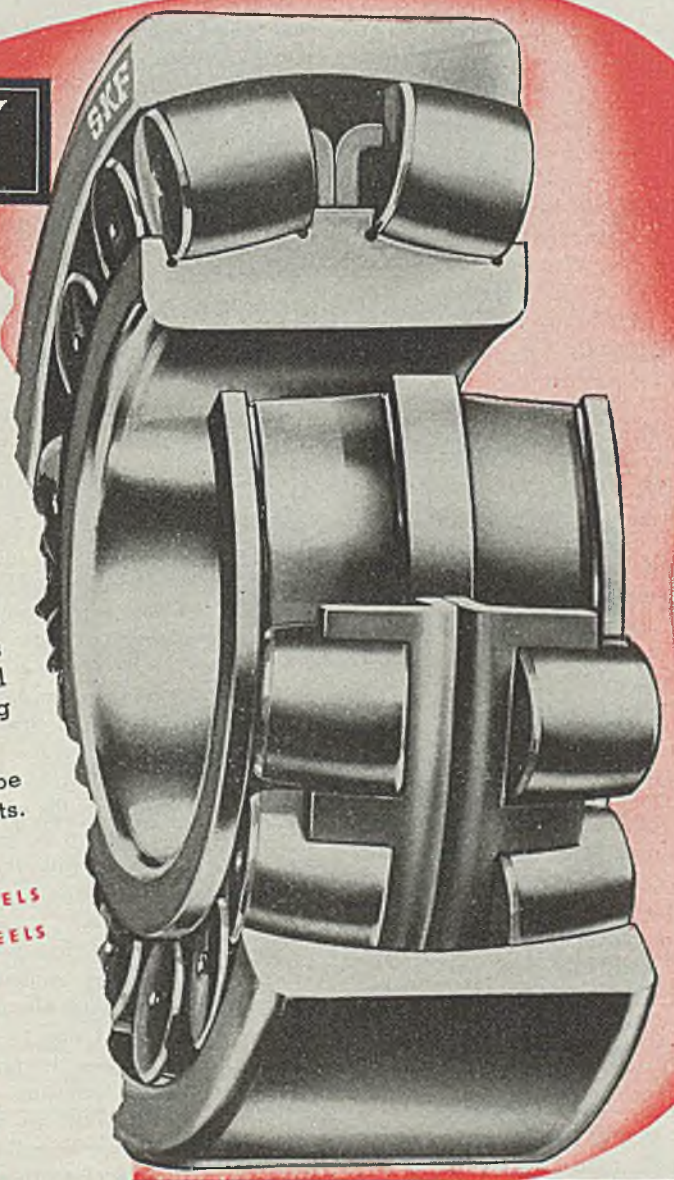
- ALLOY TOOL STEELS
- STAINLESS STEELS
- NITRALLOY STEELS
- SPECIALITY STEELS



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COPPERWELD STEEL COMPANY WARREN, OHIO

Piquet who has retired due to his health. Mr. Coakley was Buffalo area supervisor of operations and assistant plant manager in charge of engineering, construction, maintenance and power.

—o—

Scott Aviation Corp., Lancaster, N. Y., announces appointments of the following regional sales managers: **William G. Eckman**, Atlantic Coast territory; **Allan Cameron**, Region No. 2 territory; **W. D. Gilmour**, Region No. 3 territory; and **W. J. Zepp**, western territory.

—o—

Oscar L. Bowden has been appointed production superintendent, Standard Transformer Co., Warren, O. He was with Cities Service Co., New York, for 15 years, and was most recently with Ohio Public Service Co., Lorain, O.

—o—

Elmer A. Mulson has been named manager, Pittsburgh district office, Baldwin Locomotive Works, Philadelphia. For the last 10 years, he was a sales engineer with Barney Machinery Co., Pittsburgh.

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Edgar T. Obenchain has been appointed director of purchases, National Gypsum Co., Buffalo, succeeding the late **Harold Drake**.

—o—

George E. Muns, superintendent of the Midland, Pa., coke plant, Pittsburgh Crucible Steel Division, Crucible Steel Co. of America, has been promoted to manager of the Fuel Division of Pittsburgh Crucible Steel. In his new position, Mr. Muns will be in charge of mining operations and retain supervision of the coke plant.

—o—

John E. Anderson has been appointed manager of the new Indianapolis sales and service office, Wheelco Instruments Co., Chicago. Mr. Anderson will be assisted by **Walter A. Jones**, service engineer, at the Indianapolis office, and by **L. A. Wallingford**, district manager of the firm's Cincinnati office.

—o—

Walter R. Howell, president and general manager, Bliss & Laughlin Inc., Harvey, Ill., has been elected a director of Buda Co., Harvey, Ill.

—o—

Dr. A. B. Kinzel, vice president, Union Carbide & Carbon Research Laboratories Inc., New York, was elected chairman of the Engineering Foundation, at the annual meeting of the board in that city. Other officers elected were: **Dr. L. W. Chubb**, director of Westinghouse Research Laboratories, Pittsburgh, vice chairman; **Dr. Edwin H. Colpitts**, formerly vice president of Bell Telephone Laboratories, New York, director; and **John H. R. Arms**, secretary. Dr. Kinzel will represent the foundation on the executive board of the National Research Council, while Dr. Chubb will head the research procedure committee of the foundation.

—o—

Robert F. Ohmer has been appointed vice president in charge of administration, Hydraulic Press Mfg. Co., Mt. Gilead, O. Prior to being called into active service in the Army in 1942, Mr. Ohmer was president of Commonwealth Engineering Co., Dayton, O.

—o—

E. A. Irwin has been appointed general sales manager, E. W. Bliss Co., Detroit. For the last 5 years, Mr. Irwin was managing director of E. W. Bliss Co. of Canada Ltd. He has been with the company 27 years.

—o—

Henry J. Allison, president, Allison-Erwin Co., Charlotte, N. C., was elected president of the National Wholesale Hardware Association, and H. P. Ladds, president, National Screw & Mfg. Co., Cleveland, was elected president of American Hardware Manufacturers Association, at the recent convention of both associations in Atlantic City, N. J.

—o—

J. R. Barefoot has been named executive assistant to **H. A. Stix**, executive vice president and treasurer of Federal Machine & Welder Co., Warren, O. He was plant engineer for the company. Mr. Barefoot joined Federal in 1941, but interrupted his career with the company to serve in the Navy.

—o—

John S. Coleman has been elected president, Burroughs Adding Machine Co., Detroit, succeeding **Alfred J. Doughty**, who has retired due to his health. Mr. Coleman has been vice president and a director of the company since May, 1944. **Laurence V. Britt** has been named chairman of the board for the company, and also chairman of the new executive committee. He was executive vice president.

—o—

Dr. Merritt A. Williamson, recently released from the Navy, has been appointed director of research, Solar Aircraft Co., San Diego, Calif., succeeding **Harry A. Campbell**, resigned. Dr. Williamson will be assisted by **Dr. John A. Southard** and **Ralph V. Hilkert**. Dr. Williamson was with Remington Arms Co. Inc., Bridgeport, Conn., and Scovill Mfg. Co., Waterbury, Conn.

—o—

William F. Sanford is resigning as assistant treasurer, New York Trust Co., to devote his full time to the presidency of Atlantic Plastics Inc., Flushing, N. Y. He has owned a controlling interest in the company since its inception in 1939. Mr. Sanford served in the Navy during the war. **George C. W. Oberst** has been appointed Atlantic's new treasurer. **Carl T. Haugen** has been appointed chief engineer of the company. Mr. Haugen served in the Army during the war.

—o—

H. Herman Rauch has been named director of human relations, Geuder, Paeschke & Frey Co., Milwaukee. He was in charge of unemployment compensation work with the Wisconsin Industrial Commission. In his new position, Mr. Rauch will be assisted by **Florence V. Beadle** as unemployment service manager, and **Chester Ziolkowski** as employment and placement manager.

—o—

A. F. Pfeiffer, assistant general superintendent, Allis-Chalmers Mfg. Co., Milwaukee, has been named to head the 1946-47 Pattern Division program and papers committee, American Foundrymen's Association. **H. K. Swanson**, owner of Swanson Pattern & Model Works, East Chicago, Ind., has been appointed vice chairman of the committee.

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Harry W. Bearfoot has been appointed representative working out of the Philadelphia office, Kennametal Inc., Latrobe, Pa.

—o—

Carroll E. Lewis has been elected executive vice president, Perfex Corp., Milwaukee. He had been manager of the firm's Controls Division.

—o—

Dr. Willis R. Whitney, organizer and first director, Research Laboratory, General Electric Co., Schenectady, N. Y., has received the Industrial Research Institute Medal for his pioneer work. The medal, conferred for the first time, was presented by **H. W. Graham**, senior past president of the institute.

—o—

C. Scott Fletcher has resigned as executive director, Committee for Economic Development, New York, to become president of Encyclopaedia Britannica Films Inc., Chicago. He will continue with CED as a trustee and as a member of its research and policy committee.

—o—

John Madden has been elected vice president, James B. Clow & Sons, Chicago. He has been with the firm 25 years, and most recently had been general manager of Jobbing Division. He will continue to direct the jobbing activities. **Guy P. Clow**, manager of the company's Coshocton, O., shop, and **G. Warren Whitney**, manager of the

GEORGE A. HAYS

Named vice president and general manager, Hinderliter Tool Co., Tulsa, Okla., division of H. K. Porter Co. Inc., STEEL, Oct. 21, p. 90.

JOHN P. ROCHE

Appointed vice president, general manager of sales, and director, Heppenstall Co., Pittsburgh, noted in STEEL, Oct. 21 issue, p. 90.

SHERMAN MILLER

Named vice president in charge of production engineering, Schenectady, N. Y., works, American Locomotive Co., STEEL, Oct. 14, p. 100

firm's National Cast Iron Pipe Division, Birmingham, Ala., also were named vice presidents.

—o—

D. J. Hassinger has been appointed general manager, Paul & Beekman Division, Portable Products Corp., Philadelphia. He was with McCreary Tire & Rubber Co., Indiana, Pa. During the war, he was in the U. S. Maritime Service.

—o—

John A. Buckley has been appointed merchandise sales manager, chemical department, Pittsfield, Mass., General Electric Co., Schenectady, New York. He had been with the company's lamp department, Nela Park, Cleveland. Mr. Buckley joined the company in 1935.

—o—

Paul Hacker has been appointed operating manager, Pioneer Engineering & Mfg. Co., Detroit. He will direct all activities of the company's staff of engineers, designers, processors and draftsmen. Mr. Hacker was with Packard Motor Car Co., Detroit, for 27 years, and Pioneer Pump & Mfg. Co. for 4 years. During the last 4 years, he was sales manager, and finally operating manager, of Pioneer Pump. **Ted Campbell** has been appointed chief design engineer of the Pioneer company. He was with F. Joseph Lamb Co., Detroit, for 17 years.

—o—

Leighton M. Harvey has been appointed sales engineer, Metal Products Division, Ryan Aeronautical Co., San Diego, Calif. He will represent Ryan as a liaison engineer in the firm's contacts with aircraft and engine companies throughout the East, and will make his headquarters at the company's eastern office in Washington. Mr. Harvey was with Wright Aeronautical Corp., Paterson, N. J., for 7 years.

—o—

S. A. Newman, recently released from the Navy, has been appointed chief turbine lubrication engineer, Gulf Oil Corp., Pittsburgh. He will direct engineering activities for turbines in the 30 states comprising Gulf's marketing area. Mr. Newman joined the Gulf corporation in 1930, and advanced to assistant division manager in charge of industrial lubricating sales for the Pittsburgh Division.

—o—

Edwin R. Moore Jr. has been appointed to the public relations staff, Nash-Kelvinator Corp., Detroit. Mr. Moore, recently released from the Navy, will serve the company's automobile plants in Milwaukee and Kenosha, Wis.

—o—

William W. Coleman, chairman of the board, Bucyrus-Erie Co., South Milwaukee, Wis., has received the Crowell Gold Medal of the Army Ordnance Association, for distinguished service. Mr. Coleman was vice president of the association for more than 25 years, and is now serving as president.

OBITUARIES . . .

Fred T. Gaines, 76, who was general superintendent, Wisconsin Bridge & Iron Co., Milwaukee, when he retired in 1944, died recently at his home in Milwaukee.

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Calvin H. Taylor, assistant to the president, Strong Steel Foundry Co., Buffalo, died in Philadelphia, Oct. 14.

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Thomas E. Banning, 62, traffic manager, Columbia Steel Co., San Francisco, and formerly secretary, Utah Public Utilities Commission, died recently in Berkeley, Calif.

—o—

Edward J. Keough, 37, sales engineer, International Business Machines Inc., New York, died recently at his home in Stamford, Conn. He had been with the firm 18 years. Mr. Keough was released from the Army in April.

—o—

Frank H. Manley Sr., 73, retired treasurer, Carborundum Co., Niagara Falls, N. Y., died in that city recently.

—o—

Charles H. Wood, 80, former vice president and sales manager, Ohio Seamless Tube Co., Shelby, O., died Oct. 16. He had once been with the National Tube Co., Pittsburgh.

—o—

Horace E. Sibson, member of the board of directors, Cochrane Corp., Philadelphia, and, until a year ago, vice president and sales manager of the company, died recently. Mr. Sibson joined the company, then known as Harrison Safety Boiler Works, in 1903. He was also a director and vice president, Tacony-Palmyra Bridge Co., Philadephia.

—o—

Ernest H. Koenig, associate engineer for more than 10 years, Freyn Engineering Co., Chicago, died in that city recently. Previously he had been with Republic Steel Corp., Cleveland, and Colorado Fuel & Iron Corp., Denver.

—o—

Adoph J. Boehme, 69, who retired 7 weeks ago from Youngstown Sheet & Tube Co., Youngstown, died in that city, Oct. 21. From 1923 until his retirement, Mr. Boehme was land and tax agent for the company. He joined the company as chief field engineer 39 years ago.

Belt Tensioning with STEEL CORDS

Use of small, strong steel wires in rubber tires leads to successful development of steel cable-embedded industrial drives and conveyor belting

By PAUL D. SULOFF
Development Engineer
Goodyear Tire & Rubber Co.
Akron

USE of steel cables or cords as the tension or load carrying element in belting is not new. Patent files reveal that steel cables sewed into leather belting were first used 50 years ago.

Great strength and low elongation of steel cables were even then attractive to designers trying to handle extreme tensions with leather and cotton.

In 1925 a coal mining company using literally miles of cotton and rubber conveyor belting investigated the use of the small steel cables then available and saw some possibility of obtaining a given strength with steel cable at less belt cost than with cotton. They asked bids against a specification calling for some 1600 ft of 48 in. wide belting to handle 1500 tons per hour of run of mine coal. The cables specified were 3/16-in., 6 x 7 cotton center sash cord placed in the belt on ⅜-in. pitch.

Goodyear tested belting of the specified construction and found limitations preventing the use of such a cable. After a number of trials, satisfactory cables were found, but the cost of the belt became prohibitive and the idea was abandoned.

Study of steel cords was revived by development of small, very strong steel cords intended for tires. These proved so successful in flat and V-transmission belting that production of these items proceeded much more rapidly than this type of tire construction.

Early in World War II it became apparent that cotton V-belts driving fans, generators and water pumps of military vehicles were inadequate under extreme conditions in combat. The steel cable V-belt was developed to the point where it was ready to fit into this service and performed so outstandingly that some 3,000,000 belts were produced for military vehicles.

At the same time, flat transmission belting using steel cable was finding a place in industry handling drives that were out of range of conventional belting.

First commercial application of steel cord conveyor belting, late in 1942, was in a long inclined conveyor bringing ore out of the Morris mine, an open pit iron mine at the Mesabi range in Minnesota. This conveyor used 2230 ft of 30 in. wide belting. This conveyor is still in use and its performance resulted in the use of similar belts at two additional open pit mines of this same mining company.

At the time steel cord went into production on various kinds of belting, there was no other choice for very strong belts beyond the range of cotton.

Now other fibers such as rayon, nylon, glass and treated cotton offer possibilities of strength beyond that of ordinary

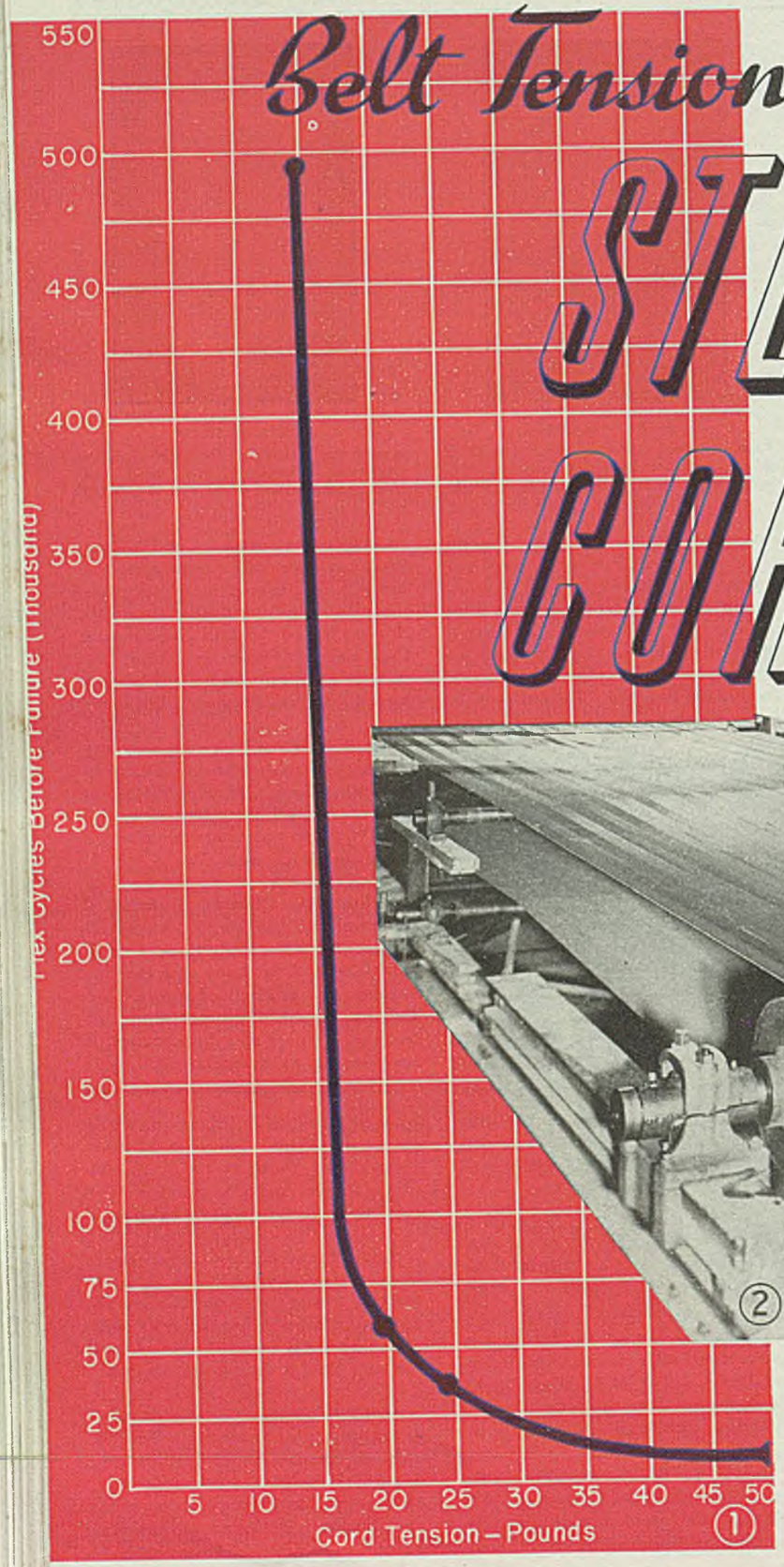
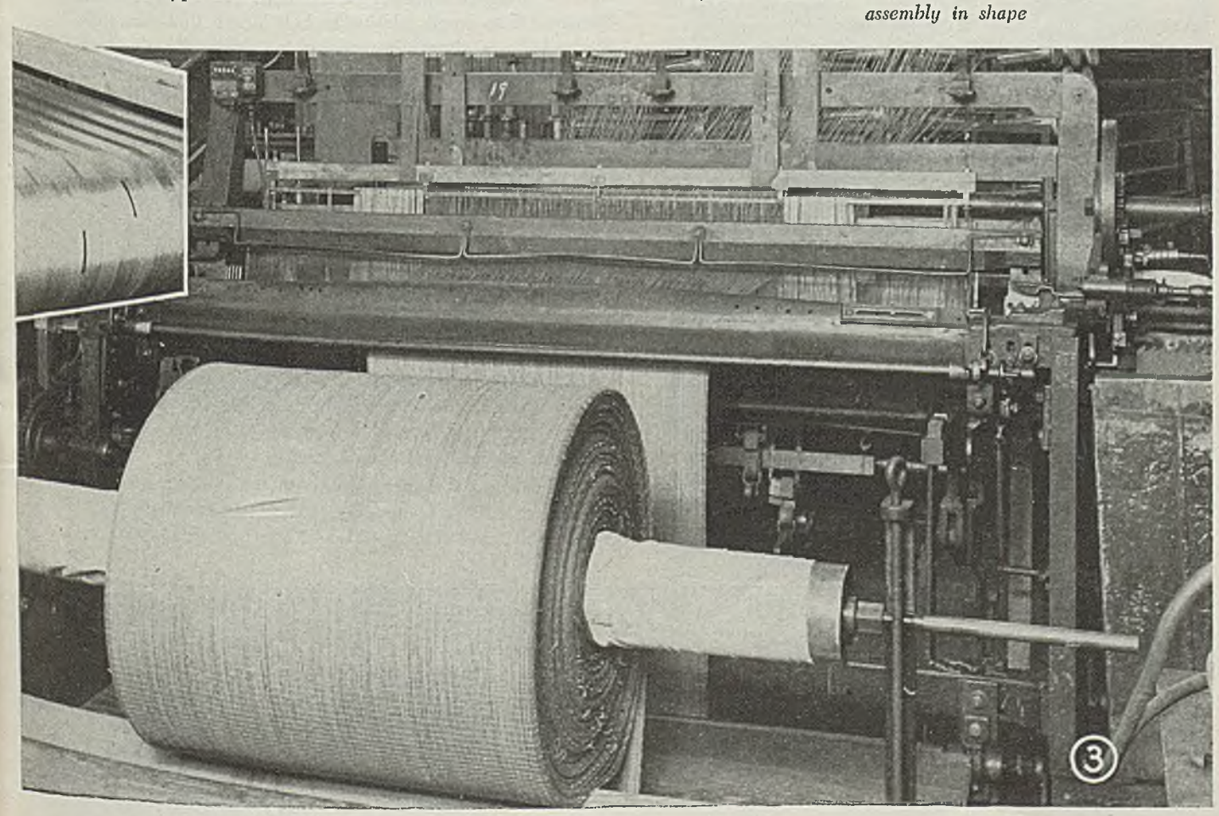


Fig. 1—Graph showing results of a flex test on steel cord belting using a 2 in. diameter hub. Number of flex cycles decrease rapidly with increase in cord tension

Fig. 2—Steel cords prior to fabrication into belt. Belts employing these cords are usually made in endless form

Fig. 3—Machine for forming steel cord. Note that sufficient transverse members are woven into belt to hold assembly in shape



cotton, and may overlap into the high strength field briefly held by steel alone. How far this overlap will extend, if at all, depends greatly on cost. At present prices on steel cord a distinct overlap exists but there is a good possibility that lower cost on steel cord obtained by means now under consideration may drive back this point of overlap and even allow steel to invade the present field of the heavier cotton belts.

The initial effort to use 3/16-in., 6 x 7 cotton center sash cord didn't leave much of an impression on present design except that 3/16-in. was an excessive diameter to use in getting the little strength that was obtained.

The steel cord that revived belt development in this direction was 0.036-in. in diameter. With this diameter, it was possible, by properly relating cord tension and pulley diameter, to eliminate flex failure of the steel cords as a cause of belt failure. With this cord, V and flat-transmission belts are run with pulley diameters as low as 3 in.

In conveyor belting, where both frequency and severity of cable bending are much less, it was apparent that such small cables and fine wire were not necessary. Here larger cables and coarser wire are being used.

The accompanying table is a tabulation of wire sizes and cable constructions used or experimented with in belting.

In all these cords the wire is a high carbon steel obtaining its extreme strength from the continued cold work of the drawing operations. An analysis of one of the rods for one of the very small cords was specified as follows:

Carbon	—0.070
Mang.	—0.035
Phos.	—0.010 or less
Sulphur	—0.04
Silicon	—0.02

Very small wires thus attain strength in the region of 350,000 psi.

Steel cord is treated mainly to obtain adhesion between the steel and the surrounding rubber or synthetic portions of the belt, and to protect the fine wires from corrosion.

From an adhesive standpoint an electroplated brass was used extensively. With a brass adhesive bond, small steel cords such as those used in V-belts develop a bond strength equal to the cord strength when embedded in rubber for a length of approximately 3-in., and then pulled parallel to the cord axis. In addition to brass adhesion, one or two metal to rubber cements were used with some success.

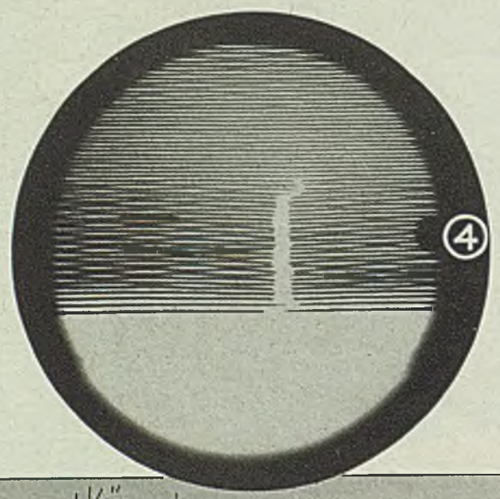
Protection of these very fine and highly vulnerable cords from corrosion is a problem that will still bear some study. While the cords are embedded and well bonded to the rubber, there is, apparently, no severe corrosion problem if we may judge by exposure tests and actual performance. However, when the cords are exposed by accidental damage to the belt, no protection yet devised will prevent rapid corrosion. Use of plating such as tin, prior to brass plating was investigated, but such coatings are so thin and so easily damaged that their use is of doubtful value. The use of stainless cords suggests itself, but cost and certain processing problems discourage this idea. Fortunately users of large conveyors are aware of the importance and value, even in cotton belts, of early repair of accidental damage. Thus it is not impractical to provide such maintenance to prevent exposure of steel cords. Moreover, location of the steel cords in conveyor belts is such that they are much less likely to be exposed by ordinary operating hazards than are the plies of a cotton belt.

Methods of Manufacture: Transmission belts employing steel cords are manufactured in nearly all cases as endless belts. In this case the steel cord is wound in a helix with an advance, each revolution depending on cord size and on strength required of the belt. In all cases cord diameter is so small relative to belt length that the angle of the helix is almost imperceptible. Note Fig. 2. In a few cases where the installation of endless transmission belts became impractical, straight lengths have been manufactured and made endless in the field with vulcanized joints. The nature of joints or splices in steel cord belts will be described more fully in another paragraph.

Conveyor belting, because of its much greater length, is almost invariably manufactured in rolls and spliced endless on the job.

Several methods of placing the steel cords in the carcass of the roll of belt have been used. Preassembly of the steel cords into a woven fabric with sufficient transverse members to hold the assembly in shape were used as in Fig. 3. This greatly simplifies subsequent assembly operations in the belt manufacture, but carries with it some inherent defects of the weaving operation which are more serious in a steel fabric than in cotton.

In other cases this preassembly of steel cords is made in a matrix of rubber compound. In still others there is no preassembly, and the operation of placing steel cords be-

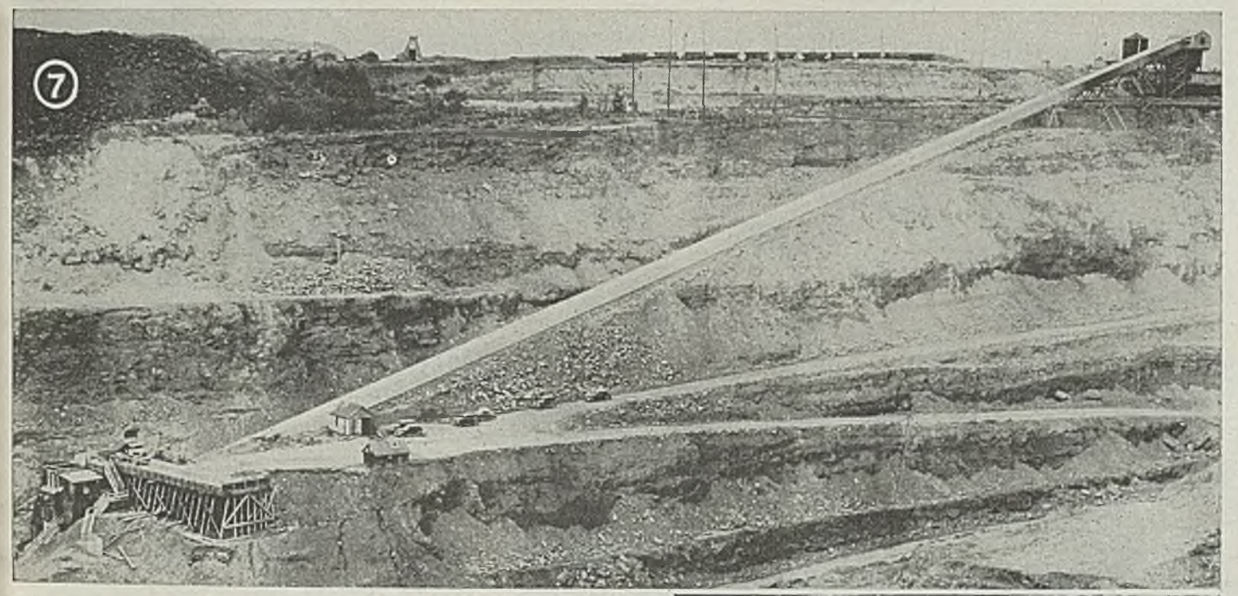


comes a part of the belt assembly. In any of these cases control of as many as 600 spools of steel cord being fed into the belt is a problem.

Fig. 5 shows cross sections of typical steel V-belts, flat transmission and conveyor belts. In all these belts the steel cords are embedded in a layer of rubber or synthetic compound designed to adhere to the brass plated cord, and to provide proper support for the cord under the radial forces on the pulleys. The cords themselves must be placed so they distribute the tension in the belt uniformly or in some predetermined pattern.

Fabric envelopes, usually of cotton, are provided to give transverse strength and stiffness in both transmission and conveyor and as a wearing surface in transmission belts. In conveyors, of course, rubber covers are provided for protection against abrasion and cutting by the material carried.

Strength of steel cord belts (*Please turn to Page* 93)



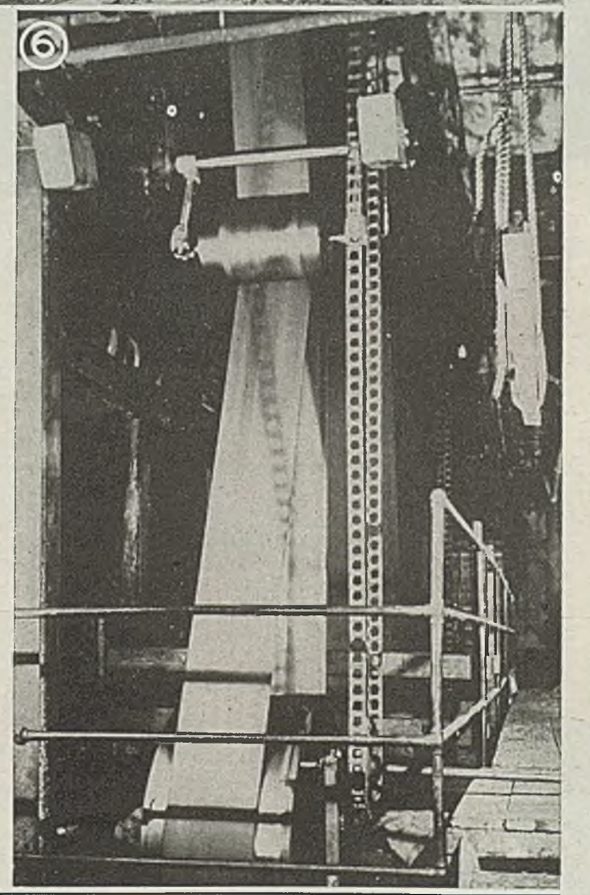
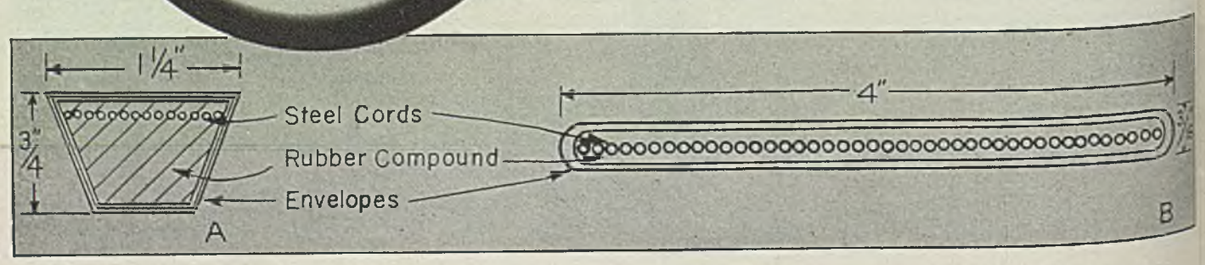


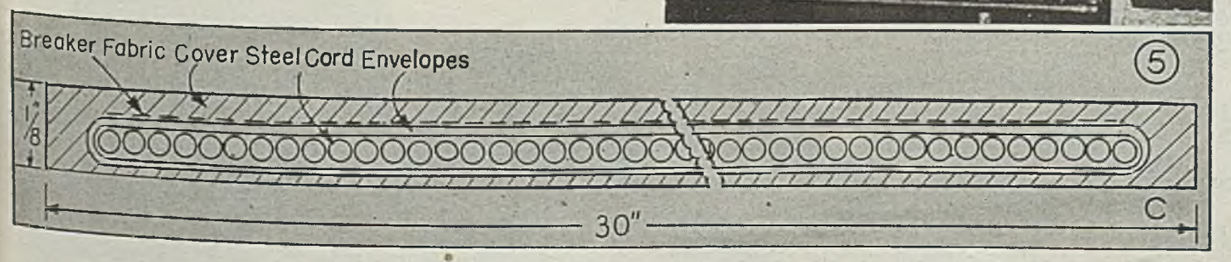
Fig. 4—Damaged edge of steel belt as revealed by use of fluoroscope

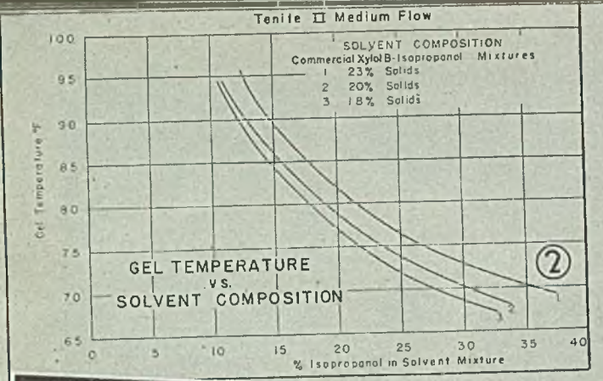
Fig 5—Typical cross sections of (A) *V-belt,* (B) *flat transmission belt and* (C) *conveyor belts, all of which have steel cord incorporated into design*

Fig. 6—Installation of large steel cord flat belt driving a Jordan machine used in paper industry. Installation is in Taggart Corp. plant

Fig. 7—View of inclined conveyor used to bring iron ore out of Morris mine of Oliver Iron Mining Co. at Mesabi range in Minnesota. Conveyor utilizes 2230 ft of 30 in. wide steel cord belting







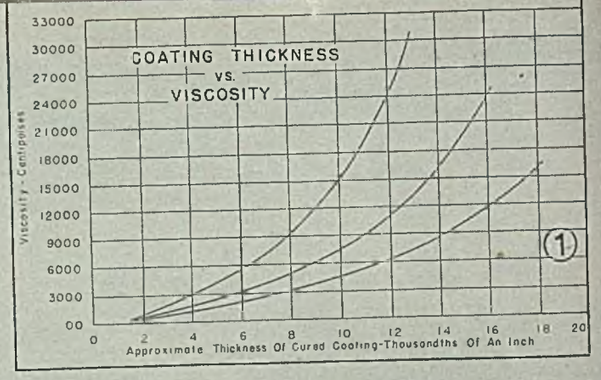
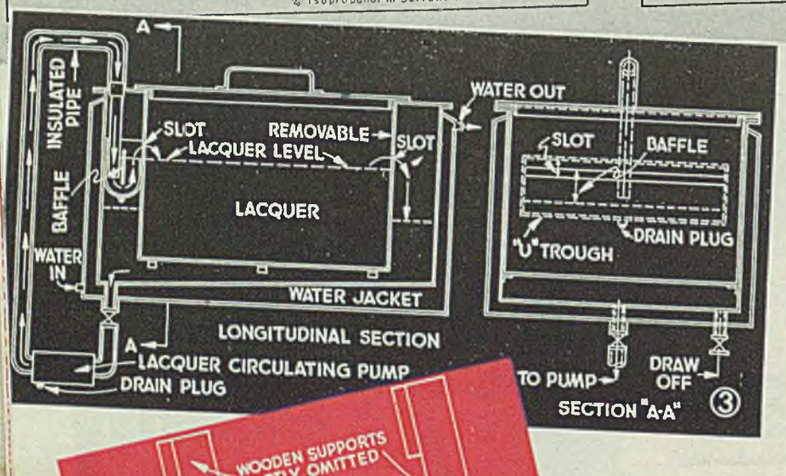


Fig. 1—As shown here, increased thickness of coating may be obtained by increasing solution viscosity. Repeated dipping accomplishes the same end. (All illustrations and graphs courtesy Tennessee Eastman Corp.)

Fig. 2—Graph shows that gelation occurs with temperature change alone. Increases in solvent proportions seriously affect gel temperature



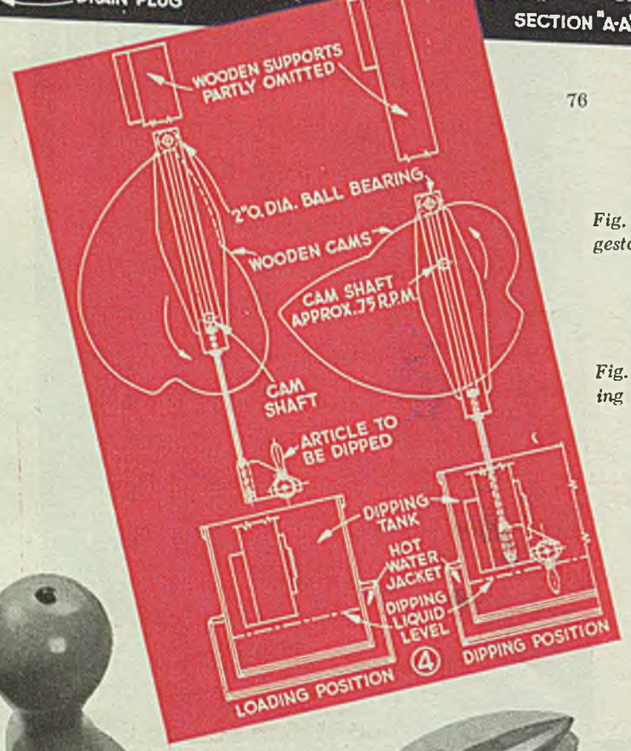
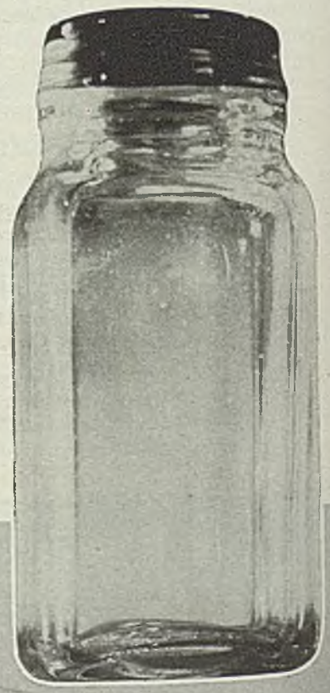


Fig. 3 — Drawing of suggested dipping tank for gel lacquer

Fig. 4—Outline sketch showing operation of gel-lacquer dipping machine



Gel Lacquer Coatings

New way to apply a durable "plastic veneer" finish by dipping articles in a gel-forming cellulose-ester lacquer

GELATION of lacquer at a temperature intermediate between dipping temperature and room temperature to give a heavy uniform coating is the basic principle involved in a new application method described to division of paint, varnish, and plastics chemistry at the spring American Chemical Society meeting by C. J. Malm and H. L. Smith Jr., of the Eastman Kodak Co., Rochester, N. Y. These gel lacquers offer a relatively inexpensive means of producing hard, thick, protective coatings in a variety of colors on numerous types of articles which lend themselves to dipping operations. An outstanding advantage is that thick coatings can be obtained much more quickly than is possible with ordinary lacquers.

Gel dipping lacquers are made using cellulose acetate-butyrate in a mixture of solvents blended to give the desired viscosity and gel point. This ester is available commercially as such or in the form of a plastic molding compound under the trade name "Tenite II"[1] which is available in various colors and in many degrees of opacity. A hydrocarbon, usually a commercial grade of toluene or xylene or a mixture of these two, and an alcohol, usually anhydrous isopropanol, are mixed to produce a suitable solvent.

In general, gel lacquers are used on suitably shaped articles wherever a premium finish offering excellent appearance, good protection, and permanence is desired. The coating has all the appearance and feel of a solid plastic article, since the heavy deposit completely hides the core material and changes the heat conductivity of the surface to that customarily associated with a plastic. Gel lacquers are particularly suited to the covering of handles of kitchen utensils and tools, towel bars, and the like, where mechanical adherence is obtained by shrinkage of the lacquer around the article on drying. Long bars, which would be beyond the capacity of a machine for covering by injection, can be coated satisfactorily with a gel lacquer to give as lustrous a finish as is obtainable by any other method. In the field of metal cores, tool handles are an excellent place for the use of gel lacquer; particularly for electricians' tools as the insulating power of the coating is desirable, note Fig. 6. Where wooden cores are to be used, tool handles, kitchen utensils, baby furniture, toys, etc. suggest themselves as possible applications.

Any use where the strength of metal but the appearance and feel of a plastic are desired is a natural outlet. Paper can be used as a core and the gel lacquer imparts considerable strength, as well as good appearance. It can be used with glass containers to produce shatterproof and spill proof bottles such as shown in Fig. 5, as well as for decorative effects. It can also be used to give a decorative finish to articles molded from cheap, scrap plastic or to low pressure laminates. Thus, a core molded from material of any color available, (*Please turn to Page* 98)

Fig. 5—Gel lacquer as used on glass containers to produce shatterproof and spillproof bottles as well as for decorative effects

Fig. 6—Typical applications of gel lacquer cooting

FUNCTIONS OF ALLOYING ELEMENTS IN Heat Resisting Steels

By HERBERT DOBKIN
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M. W. Kellogg Co.
Jersey City, N. J.

IMPORTANT role played by turbosuperchargers, gas turbines, and jet propulsion engines in the war effort placed greatly increased stress on the development of better heat resisting alloys for these applications. Now that the lid of secrecy is being lifted, an increasing amount of literature is appearing describing these alloys. Purpose of this article is, therefore, to explain some of the fundamentals of the metallurgy of heat resisting alloys, in order that the information now being declassified may be more adequately grasped and appreciated by those not completely familiar with the field.

For simplicity, most of this discussion will be based on the already familiar wrought 18-8 chromium nickel stainless steel, which is one of the original heat resisting analyses. The functions of the alloy content of 18-8 will be discussed, and the effect of the modification of this analysis by further alloy additions will be described. It will be shown that such modifications are the basis for the development of most of the wartime super alloys.

The first fact about the high temperature analyses which impresses the casual observer, is the large quantities of alloys which they contain. Some are so highly alloyed as to contain iron only as an "impurity". There are definite reasons for the addition of each of these alloying elements.

In a series of lectures given at the Twenty First National Metal Congress and Expositon in Chicago, Dr. Edgar C. Bain presented a fundamental treatment of the effects of alloying elements on steel. Dr. Bain directed most of his attention to a discussion of the enhancement of mechanical properties by alloying, and to those alloy steels which show a substantial response to heat treatment. In this article, however, steels containing such large amounts of alloying elements as to preclude the ordinary allotropic inversions will be discussed. Nevertheless, it will be shown that the effects of various alloying elements on the heat resisting steels are in accord with the effects which have already been described by Bain for ordinary steels.

In the industrial development of heat resisting steels the two requirements considered most important were: (1) A high degree of corrosion resistance, for which 18-20 per cent chromium was necessary; (2) satisfactory strength, ductility, and formability at normal temperatures, and relatively high strength at elevated temperatures, for which an austenitic material was known to be best suited. Thus the addition of considerable nickel was made necessary. Ordinary steels are austenitic when heated above their transformation temperatures, but ferritic at room temperature. Austenitic steels are those which retain the austenitic (gamma) phase even at room temperature, and do not transform on cooling.

It is well-known that chromium increases corrosion resistance, but Dr. Bain has shown that the maximum solubility of chromium in austenite in the presence of about 0.5 per cent carbon is about 20 per cent. This is shown in Fig. 1, which indicates the shrinking of the austenite field by higher chromium content, until at about 20 per cent chromium it is no longer possible to retain austenite as an exclusive constituent.

Since a structure of austenite was found desirable from the standpoint of high temperature strength properties, it became necessary to add nickel to the steel to overcome the ferrite forming tendency of the chromium. Nickel is one of the elements whose maximum solubility in pure gamma iron has been shown by Dr. Bain to be infinite. Unlike chromium, as in Fig. 1, nickel tends to enlarge the gamma loop, that is, the region in which austenite may exist alone. Eight per cent of nickel has been found sufficient to overcome the ferrite-promoting tendencies of 18 to 20 per cent chromium, and gives a steel which does not transform from austenite at all. This (*Please turn to Page* 106)

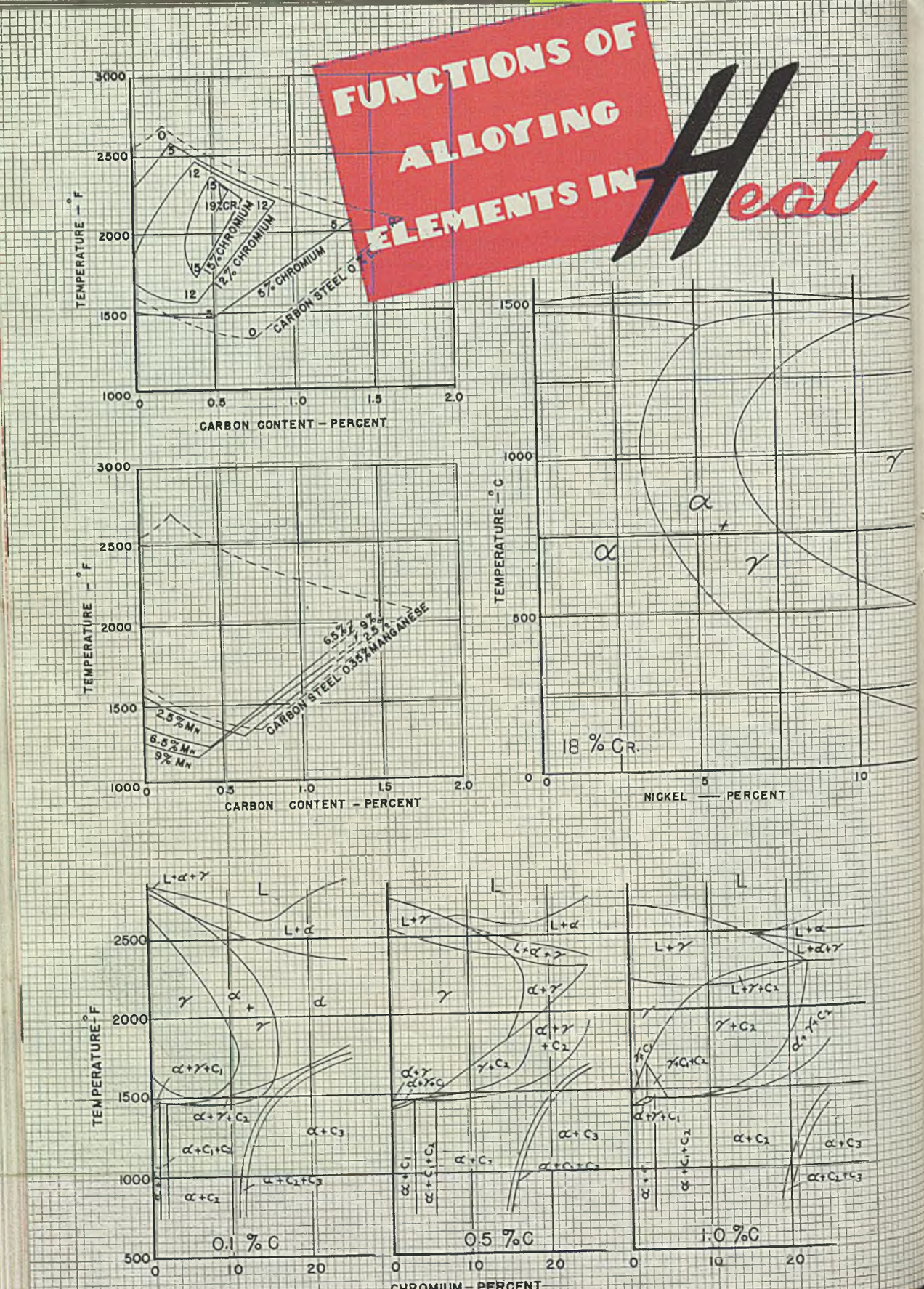


Fig. 1 (top, left)—Effect of several uniform chromium contents upon the carbon limitations for pure austenite at elevated temperatures[2]

Fig. 2 (left)—Effect of nickel on the phase changes of 18 per cent chromium steel[3]

Fig. 3 (extreme left)—Effect of several uniform manganese contents upon the carbon limitations for pure austenite at elevated temperatures[2]

Fig. 4 (bottom)—Effect of several uniform carbon contents on the phase changes of iron-chromium alloys[1]

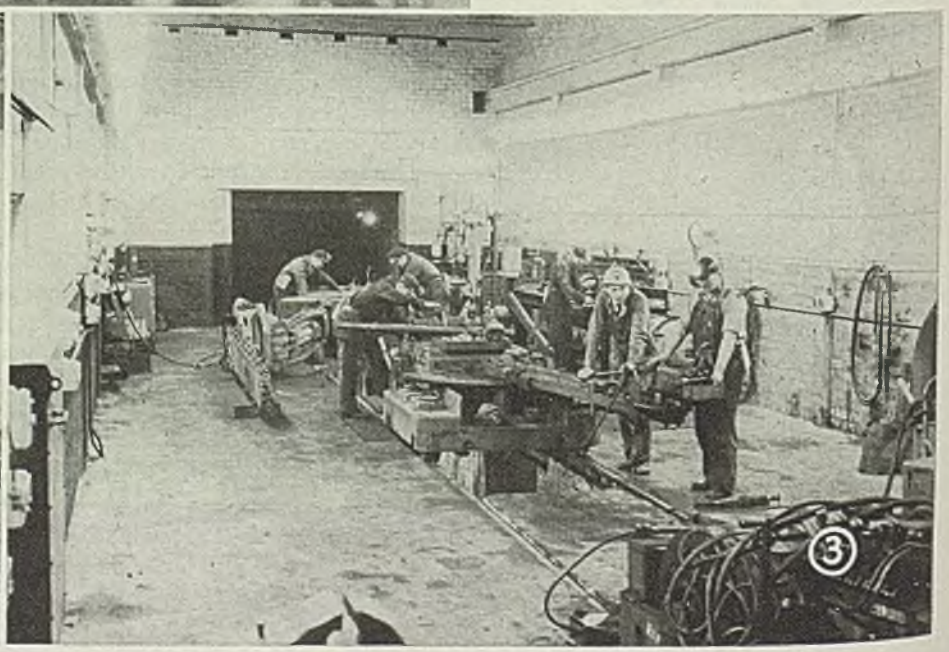
UNDERGROUND *daylight*

ONE of the best recent examples of co-ordinating lighting with handling to promote production efficiency is found in the underground mine installations shown in the accompanying views.

Repair shop shown in Fig. 3 is that of the Jones & Laughlin Vesta No. 4 mine. Located as near the mine face as practical to save travel time of mechanical equipment for periodic inspection and maintenance as well as overhaul, the 22 x 75-ft shop is lighted by sixty-four 40-watt Westinghouse fluorescent lamps which provide about 20 ft-c of light on the driller and cutter in the center of the room, and 30 ft-c on the work bench on the far side.

Light fixtures are mounted at an angle 10 ft above floor to eliminate shadows or interfering action of crane shown in Fig. 2 lifting a heavy unit during tear down and assembly. The pit, here, is lighted by Westinghouse recessed fixtures to facilitate underside repairs.

Fig. 1 shows how slate picking was speeded up and made easier on this "moving" coal picking table. Here 400-w mercury vapor lamps provide 200 ft-c of yellow-green light under which slate appears gray and coal jet black.



REPRESENTATIVES of 20 countries are at present engaged in setting up a new international standards association in London to co-ordinate standardization work throughout the world, it was learned in New York at American Standards Association headquarters. Both Dr P. G. Agnew, vice president and secretary of ASA, and E. C. Crittenden, associate director, National Bureau of Standards, are taking active part in the meeting which ends Oct. 26. The London gathering is expected to adopt formally a constitution and by-laws for the international body. It also will choose an international headquarters, if possible, elect a full time secretary, with the intention of having operations actively underway by the beginning of 1947.

RELEASE to industrial and commercial users of their process known as Chemoxiding was reported by the Technical Processes Division of Colonial Alloys Co., Philadelphia. The process is used to provide aluminum and aluminum alloys with lustrous glossy finishes that are relatively hard and of good corrosion resistance. Colorings imparted to the metals by the processes range from a light gray through marbelized to light brown, depending upon the timing and alloys of aluminum used.

INDUSTRIAL research, an inventors advisory service and technical information service including the dissemination of technical information gathered from former enemy countries are among the duties of the recently organized Office of Technical Services, the Department of Commerce announced in Washington recently. While units comprising OTS have been part of the department for six months or more, new activities were only recently sanctioned by Congress—with a substantial increase in its budget for 1946-47.

VARIATION in the carbon dioxide content of flue gas is recorded in 3½-sec after being detected by the analyzing cell of an extremely sensitive instrument now produced by Davis Emergency Equipment Co., Inc. at Newark, N. J. Because the analyzing cell is located close to the stack, percentage of change is indicated almost as soon as it occurs, the company reports. Pressure differential between the last pass of the boiler and stack side of the barometric damper is all that is necessary to assure a constant free flow of gas through the analyzer cell at desired rate. In addition, flow rate through gas sampling line does not exceed 25 cc. This eliminates need for extensive filtering trains and use of dryers.

LARGE part of its current production, according to Pittsburgh Lectrodryer Corp., Pittsburgh, is being concentrated on newly improved line of breathers especially designed for industrial organizations employing storage tanks. Officials of the firm trace the increased demand for the breathers to present difficulties in replacing corroded and outworn chemical and oil storage tanks, plus necessity of protecting contents of tanks against pollution and spoilage by atmospheric moisture. Breathers, designed to be mounted over a tank's vent or be piped to it, thoroughly dries incoming air by means of activated aluminas.

AVAILABILITY of a revolutionary Deci Point slide rule which determines automatically the location of a decimal point in any mathematical expression up to 19 places is reported by Burrell Technical Supply Co. of Pittsburgh. Biggest feature of the rule is the highly simplified arrangement of evaluation scales which facilitates computations. The cube root scale, for example, is actually a D scale tripled in length and then cut into three parts placed one below the other. Its operation is so simplified, it is said, that limited mathematical knowledge is virtually no handicap even in problems involving square root, cube root, trigonometric and logarithmic factors.

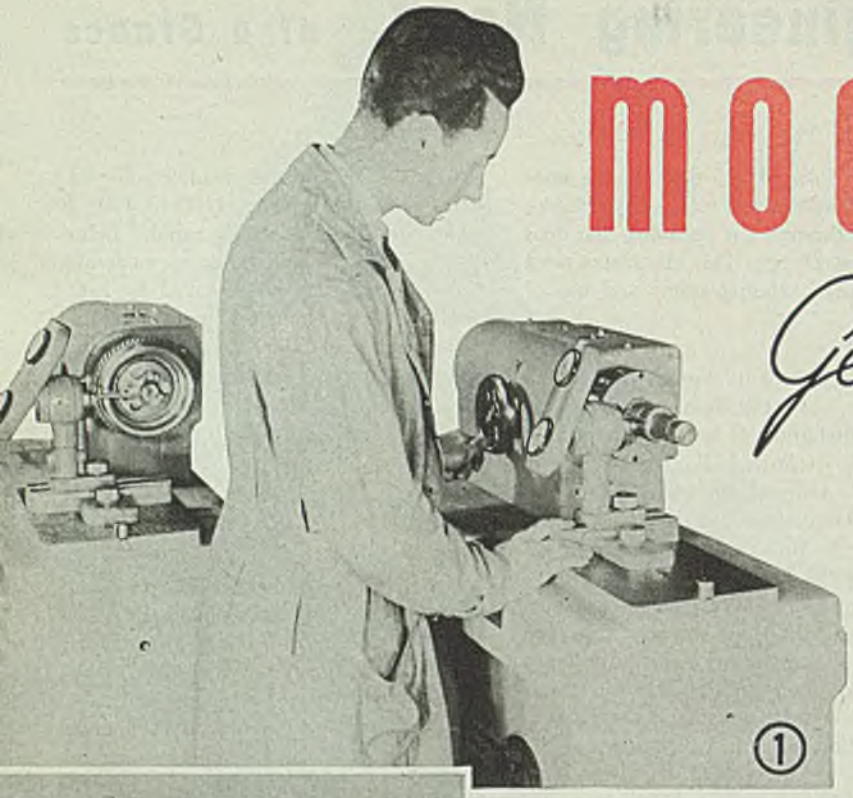
RECOMMENDATIONS for more effective use of 27 per cent chromium-iron equipment employed in making butadiene from petroleum were outlined recently in Beaver Falls, Pa., by H. D. Newell, chief metallurgist, Babcock & Wilcox Tube Co. These are based on studies originally made for the Rubber Reserve Co., now Reconstruction Finance Corp. He stated an understanding of the characteristics of this alloy—its grain growth in welding, its extreme notch sensitivity and tendency to become embrittled within temperatures encountered in the dehydrogenation process—warrant several suggestions. For welding, he suggested use of nickel-bearing or partially austenitic welding electrode, preheating before welding, stress relieving at 1300° F minimum immediately afterward, followed by rapid cooling. To avoid 885° F embrittlement, cooling after service through the 1100 to 700° F range should be relatively rapid. Below 700°, cooling should be more moderate. Sigma phase may be removed by heating for not less than 1 hour at minimum temperature of 1500° F, and cooling quickly through the range of 1100 to 700° F.

FACTUAL information on cutting tools and methods, particularly latest procedures on use of carbide-tipped tools, culled each month from research lab reports and industrial sources is included in the July issue of Metal Cutting Data Sheets published for industry by American Society of Mechanical Engineers, New York. New publication is an outgrowth of the data sheets issued during the war by the society under the War Production Board. Covering the metal cutting field under ten different classifications, it is to be financed through subscriptions on a self-supporting non-profit basis.

RIVETED joint connecting copper sheets might fail in any one of the following ways: By tear out of rivets to edge of sheet, by shearing pressure of rivets against hole edges in the sheet or by tension failure of sheet between the rivets. In pointing out these possibilities in a bulletin, "Investigation of the Strength of Riveted Joints in Copper Sheets," the authors, W. M. Wilson and A. M. Ozelsel, describe tests planned to determine the strength of riveted joints against failure by each of the four methods above. They also discuss several series of tests to determine effect of rivet pattern on the strength of the sheets. The publication is being made available by the engineering experiment station of the University of Illinois at Urbana.

EXTREMELY useful to companies instructing trainees, the first volume of instruction programs prepared by DoAll Co., Minneapolis, covers various aspects of contour sawing and filing, applications and operational techniques, all phases of sawing and shaping in all types of materials. According to the company, use of the instruction program enables operators to recognize sawing applications that might otherwise not be thought as such. DoAll spent 4 years in organizing the material, and is also offering it to vocational schools and other educational institutions.

modern Gear Inspection



Gear accuracy depends upon certain fundamental factors which are controlled by modern inspection methods

TO produce quiet and therefore accurate gears, it is necessary to control several elements, among the most essential of which are tooth profile, tooth spacing, helical lead and spur gear tooth alignment, size and concentricity.

Tooth profile can be checked on a machine built by Michigan Tool Co., Detroit — a sine-line involute checker working on a sine-bar principle. The gear, Don Moncrieff, assistant chief engineer, states, is mounted between centers and an indicating finger brought into contact with the tooth profile. Movement of the finger and rotation of the gear are synchronized so that one degree of rotation of the finger moves 1/360th part of the circumference of the base diameter of the gear being checked. Checker is operated by a hand wheel, each turn of which equals 2 degrees rotation of the gear.

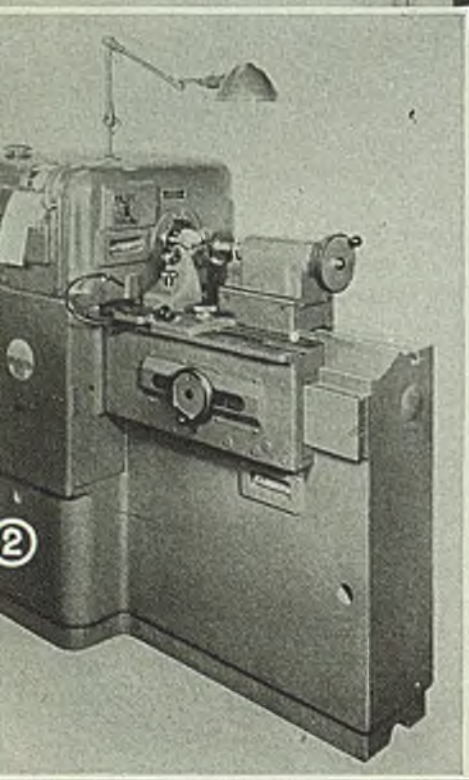


Fig. 1—Lead of both internal and external helical gears is shown here being checked on two single-purpose lead checkers

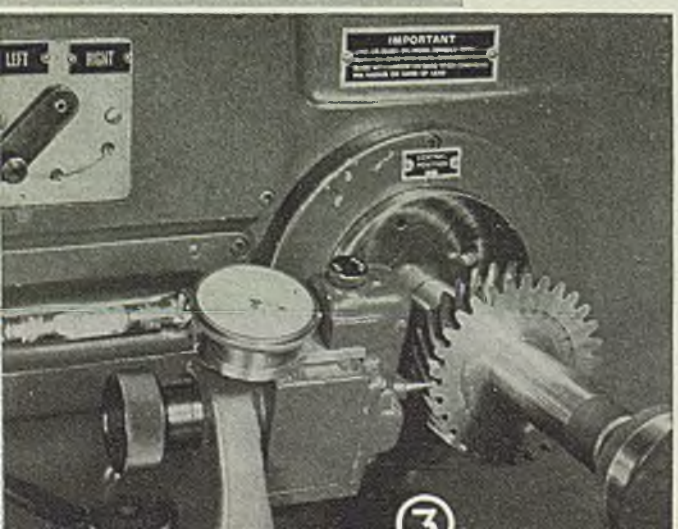
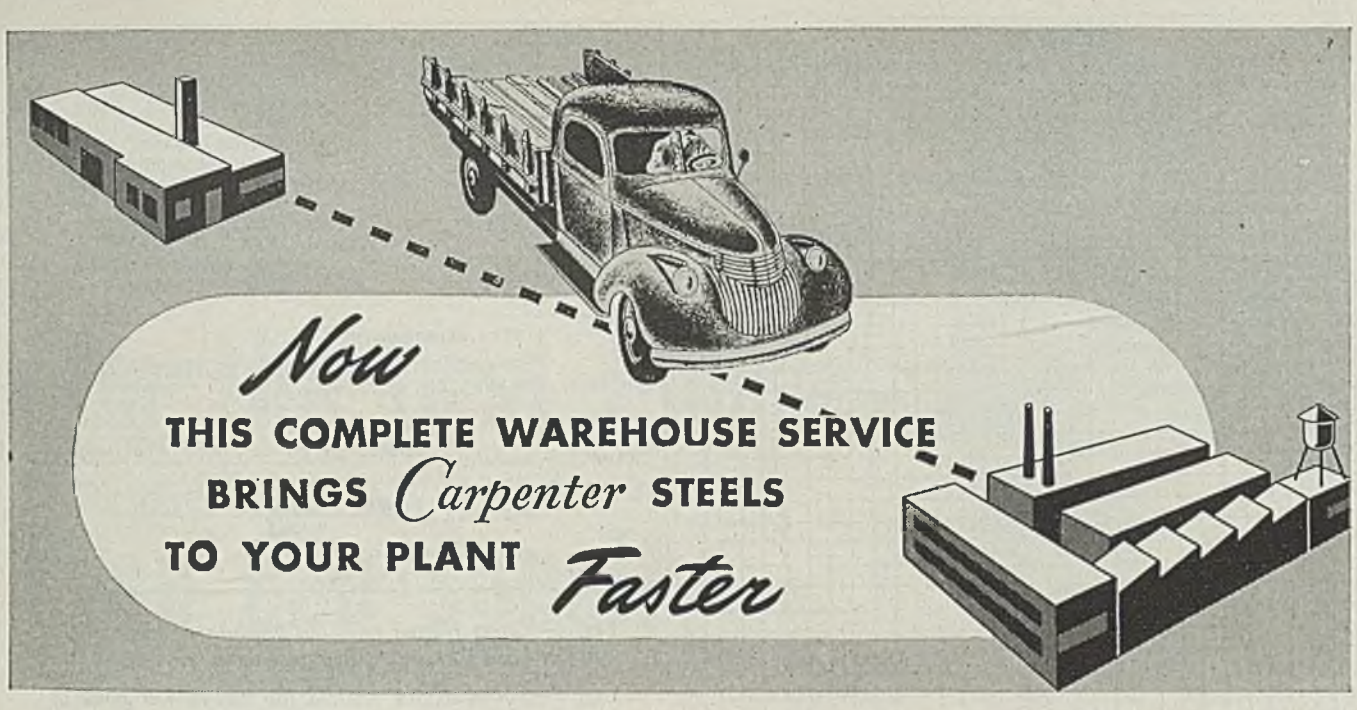


Fig. 2 — Lead measuring instrument with electrical recorder has capacity for gears up to 12 in. pitch diameter

Fig. 3 — Close view of instrument checking a right-hand helical gear. Device has measuring slide movement of approximately 10 in.

One form of record for retaining readings obtained with the checker is shown in Fig. 4. Charted lines on the left have a plus sign on the left of the vertical centerline of the graph. Charted lines on the right have the plus and minus symbols reversed. Thus the chart gives the impression of looking at a cross section of a gear tooth. Horizontal line at the bottom of the chart represents the base circle of the gear being checked. Gear rotates while it is checked, offering a basis for locating the last point of contact of the mating gear, pitch line, and outside diameter of the gear being checked. Degrees of rotation are given at the left of the chart. Horizontal lines indicate last point of contact, pitch line, and ouside diameter. Vertical lines of the graph represent 0.0001-in.

Lines are plotted by taking indicator readings every one or two degrees as required. If a perfect involute were charted, the resultant graph line would be straight. On the sample chart, the involute of the gear checks within one ten-thousandth from 11 to 30 degrees. From 30 degrees to the outside diameter there is a modification of about one one-thousandth. There is also a modification of 0.0012 to 0.0015, 11 degrees to the base circle. The chart therefore indicates that the gear would operate satisfactorily, since there is a modification below the active portion of the involute and a modification of a few tenths at the



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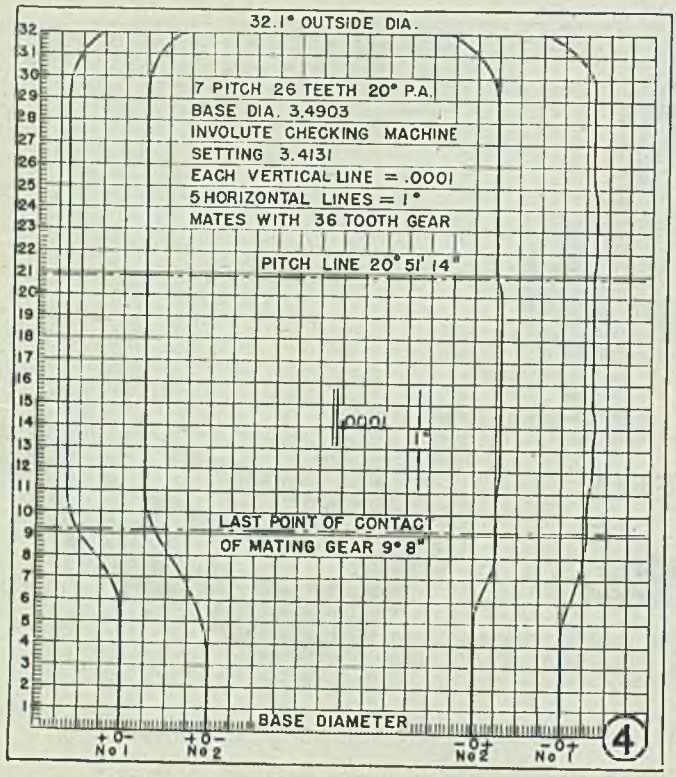

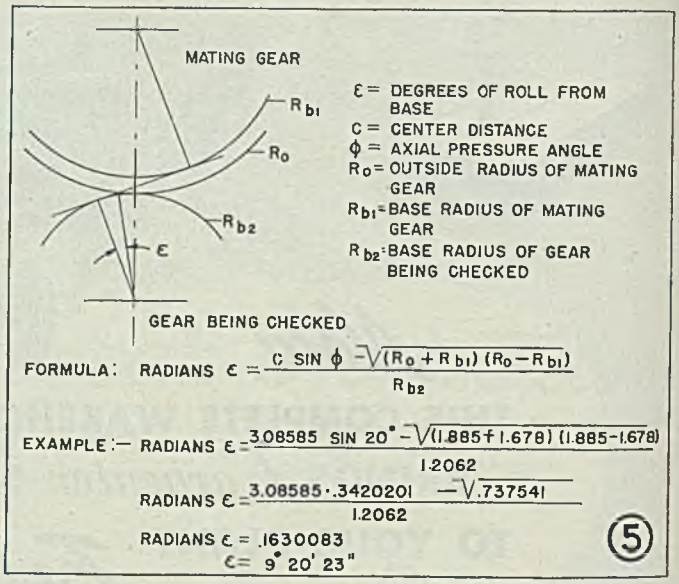

Fig. 4—Chart plotted to show involute profile of right and left-hand surfaces of two gear teeth on 7-pitch gear

Fig. 5—Formula and method for finding last point of contact of mating gear in number of degrees above the base circle

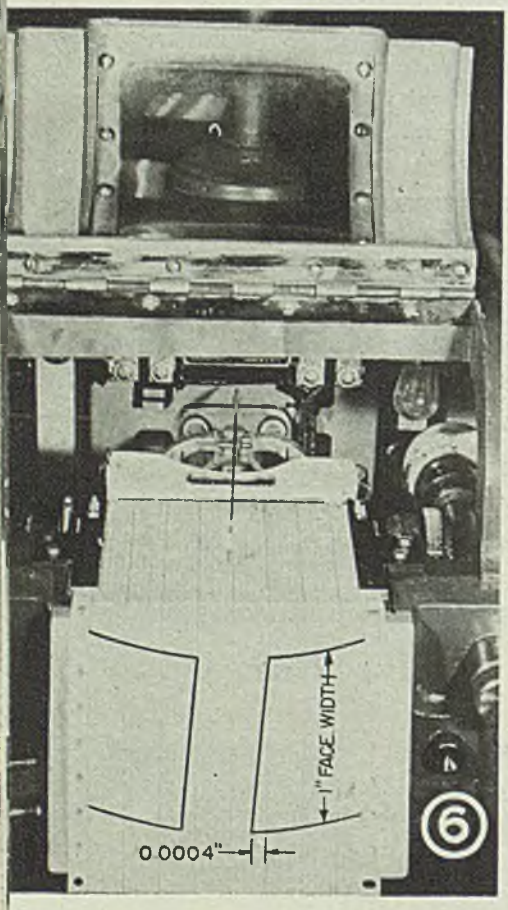

Fig. 6—Electrical recorder shown here with chart of adjacent sides of right hand helical gear tooth indicating that gear has 0.0004-in. displacement in helix in the face width measured

outside diameter to ease contact with the mating gears as the gear teeth come into mesh.

Fig. 5 is a formula for finding the last point of contact of the mating gears in number of degrees of rotation of the gear on the checker. Shaper cutters, master gears, and involute splines may also be checked on the involute checker.

A hob contour checker may be used for checking the profile of hobs. This checker, limited in use to inspection of hob and worm profiles, works on the sine-bar principle. The hob is mounted on an arbor integral with a sine-bar table which is adjusted to the proper angle. A knife-edge contact finger is brought into contact with the hob tooth profile and moved across the tooth surface to indicate irregularities. Use of the checker facilitates inspection of hobs for correct pressure angle, assuring the user that all hobs for the same job will be of identical tooth shape.

Tooth spacing is best checked along the line of action between two gears. The distance between adjacent involutes along the line of action is the base pitch. Tooth spacing and tooth form can be checked on an involute checking machine. The indicator contact finger is located tangent to the base circle (on line of action). The positive stop is located on the line of action and the distance between the contact finger and positive stop is equal to the base pitch of the gear being checked. In cases where the root diameter is above the base diameter, contact finger and positive stop are moved tangent to the base circle without disturbing their position relative to each other, until they are located in proper contact with the gear teeth.

Checking lead of helical gears up to 12 in. pitch diameter, and other surfaces is performed on new lead measuring instrument Figs. 2 and 3 manufactured by Fellows Gear Shaper Co., Springfield, Vt. Device incorporates arrangement to check lead of a helix by continuous motion of a measuring pointer, in conjunction with desired rotation of work.

If work is of correct lead, dial indicator remains stationary. If there is an error in lead, needle indicates in 0.0001-in. the displacement of helix in face width being measured.

Principle comprises two tangent bars and pins, both operating slides. One slide affects traverse movement of member carrying measuring pointer; the other slide controls rotation of work. Independently adjustable contact positions of pins on tangent bars are set by size blocks and micrometers. Dial indicators are provided so that setting pressure is maintained. Errors in gears are checked by using indicator on measuring slide; a permanent record chart can also be made.

Electrical recorder, Fig. 6, automatically produces a record of the displacement of tooth face on a paper chart. Heavy straight lines are 1/2-in. apart and represent 0.001-in. movement of the measuring pointer. Curved lines represent 0.200-in. on face width of the gear. For a gear 1 in. in face width, length of charted lines would occupy five spaces, or 2½-in. It is possible to analyze a chart and to determine accurately the amount

(*Please turn to Page 132*)

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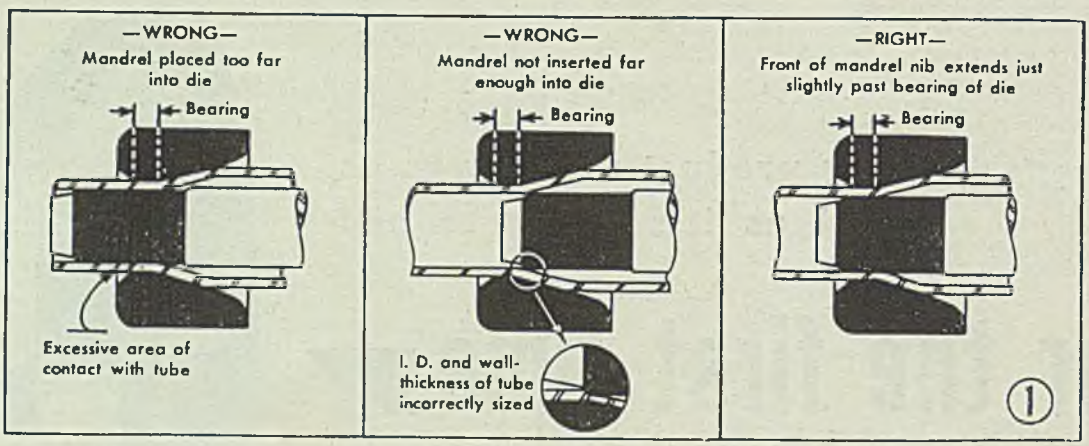
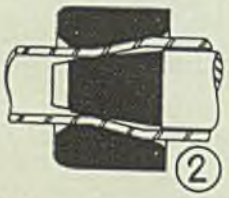




Use and Servicing of CARBIDE MANDRELS

A few simple precautions increase effectiveness of carbide mandrels in tube mills

INCREASING use of carbide dies and mandrels for production of tubing made from various metals, has brought with it a need for a wider understanding of the importance of correctly using and servicing these tools. The following hints provided by A. E. Glen of Carboloy Co. Inc., Detroit, on use and care of carbide mandrels were compiled to increase mandrel service life, obtain better inside finish on tubing, maintain closer tolerances on long runs, provide more continuous operation, and decrease rejections.

Component parts of a Carboloy mandrel, Fig. 4, are cemented carbide nib, hardened steel stud, straight steel shank.

An important factor in carbide mandrel usage is that all tubes should be so pointed that the reduced portion of the tube blends into the larger diameter with a radius rather than an angle, Fig. 3. This tends to lessen the shock on the carbide nib and makes for longer life of the equipment. All hot pointed stock should be pickled to remove the abrasive crust of scale formed by heating. Pointed end of the tube should be open to eliminate formation of air pockets and to permit free flow of acid and lubricant over the entire inside surface of the tube.

Proper annealing of tubes is desirable to obtain optimum economies and maximum mandrel life. Best practice is to anneal tubes, if possible, after each pass. Improper annealing will invariably result in tubes that are too hard, spotty, or otherwise below standard. Such tubes have a tendency to chatter while being drawn. Chatter eventually causes pickup and scratches on interior of the tubing and also causes excessive heating of the mandrel. Excessive heating sets up strains in the nib which in time will cause small surface cracks. These may lead to complete failure of the mandrel.

Carelessness during pickling and cleaning of tubes can cause scratches on tubing which may put excessive pressure on the mandrel, resulting in failure of the tool. Even one bad tube can materially decrease the service life of a carbide mandrel.

Tubes should have a light etch rather than a smooth surface on the interior. An etched surface will hold the lubricant better than a smooth surface, giving a more uniform drawing surface which reduces friction and eliminates scratching and pickup. Etching too deeply causes "acid burn" which may harm the mandrel.

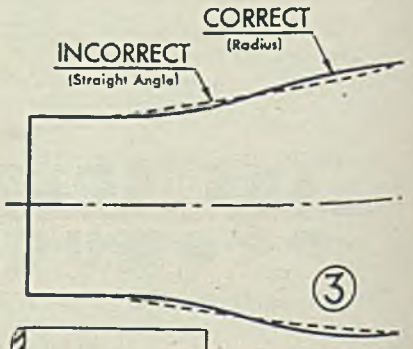
Correct lubrication is extremely important in tube drawing. Improper lubrication results in metal-to-metal contact which creates excessive heat. If allowed to continue, this heat will cause the lubricant to break down. When that happens, the carbide mandrel picks up and starts scratching the tubing. The amount of heat generated when pickup occurs is frequently enough to turn the mandrel blue. Heat may also cause surface cracks to

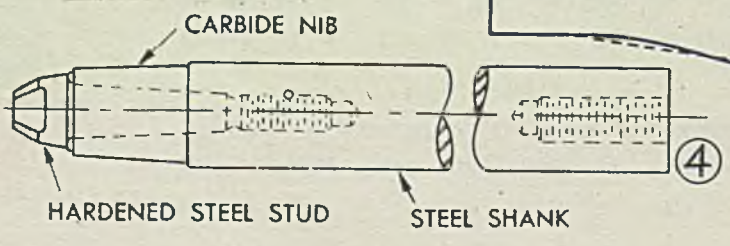
Fig. 1—Straight mandrel should be set into die so that end of chamfer extends slightly past bearing

Fig. 2—Tapered mandrel is set into die just far enough for the correct size

Fig. 3—Tubes should be pointed so that the reduced portion blends into larger diameter with a radius rather than with an angle

Fig. 4—Component parts of carbide mandrel





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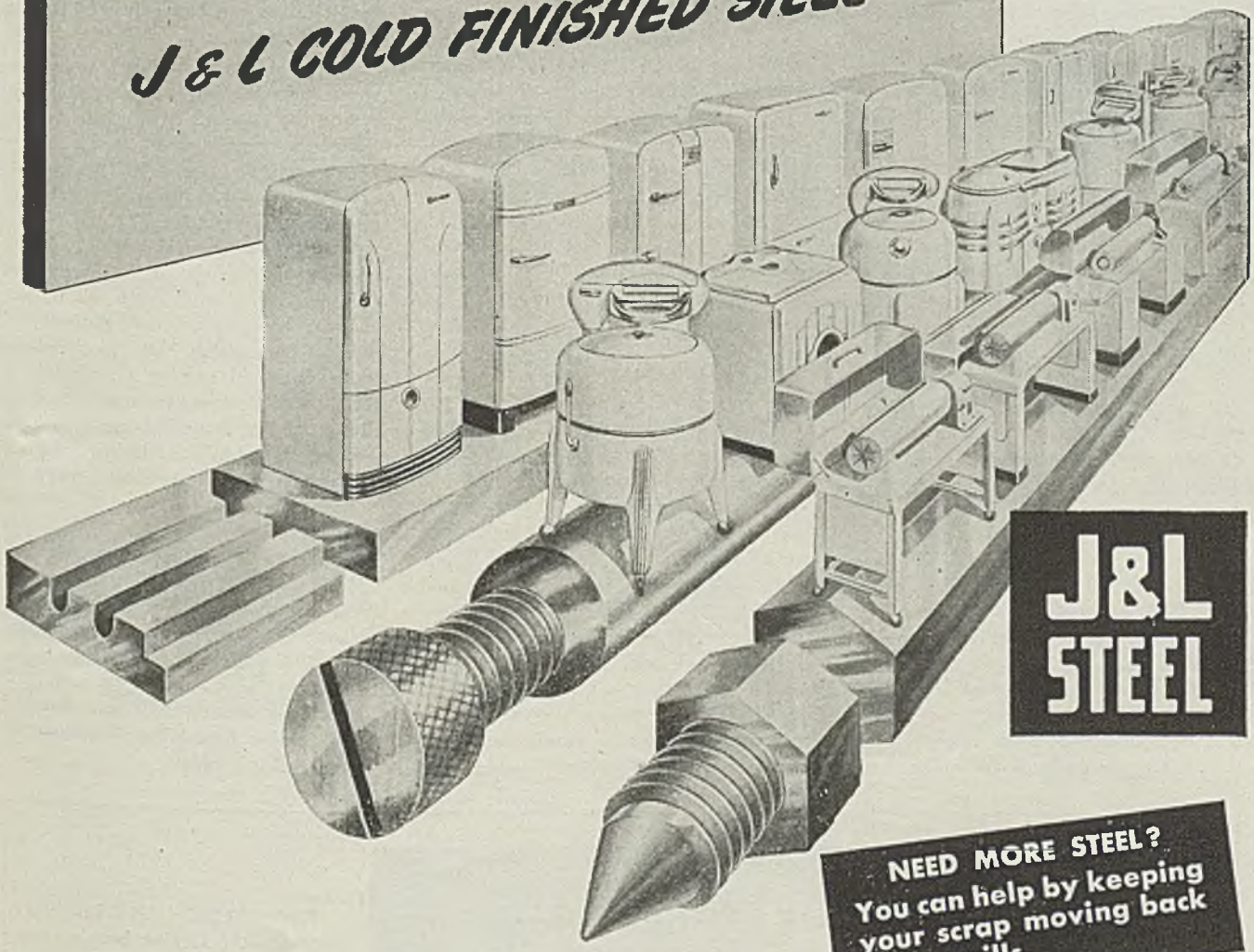

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appear on the carbide nib. Their appearance is usually followed by small particles of carbide falling from the nib, and eventually by complete failure of the mandrel.

To lubricate, place back end of tube in lubricant tank first. Gradually submerge entire tube. If done correctly, this expels all air and permits complete coverage of lubricant over interior surface of tube. If pointed end of tube is closed, cut it off and repoint tube, to provide an opening so the air can escape.

Correct draw bench alignment is also important in obtaining optimum benefits from mandrels. Die should be lined up accurately with the grip-and-pull carriage in order to draw the tube on-size and straight. Improper alignment produces bowed and off-size tubing. The mandrel rod must be properly aligned with the die. An off-center mandrel rod puts unnecessary strains on the mandrel, especially when back end of tube is passing over the mandrel.

In setting up mandrel, it is important that the mandrel be set in the correct position in relation to the die. Slightly different practices are required for tapered and straight mandrels, as shown in Figs. 1 and 2.

When setting a tapered mandrel, adjust it just far enough into the die to produce the correct size, Fig. 2. The setup should be checked to make sure that the tubing does not start to reduce on the steel shank in back of the carbide nib. If this occurs, wear marks will show after drawing. Experience to date shows that tapered mandrels are more efficient than straight ones. Ample clearance of the point is automatically provided by the taper after the inside diameter of the tubing has been sized. Area of contact is also reduced with tapered mandrels. This helps to maintain efficient lubrication.

The straight mandrel is set into the die so that the end of the mandrel's chamfer extends slightly past the bearing as shown in Fig. 1. When a straight mandrel has been properly set, its surface will show evidence of contact with the tube at a point from $\frac{5}{8}$ to $\frac{3}{8}$-in. away from end of chamfer on the mandrel. If a straight mandrel is extended too far through the die, too much of the mandrel's carbide surface will be in contact with the tube's interior. This condition may cause pickup due to unnecessary friction and strains on the mandrel. However, if the mandrel is not set far enough into the tube, it is virtually impossible to get the tube to start.

Pounding Causes Chipping

It is well to make certain the tube does not strike the mandrel's end too forcibly when the tube is being pulled over the mandrel rod prior to drawing. Constant pounding on the end may cause the carbide to chip off the front end, offering a starting point for longitudinal cracks in the nib.

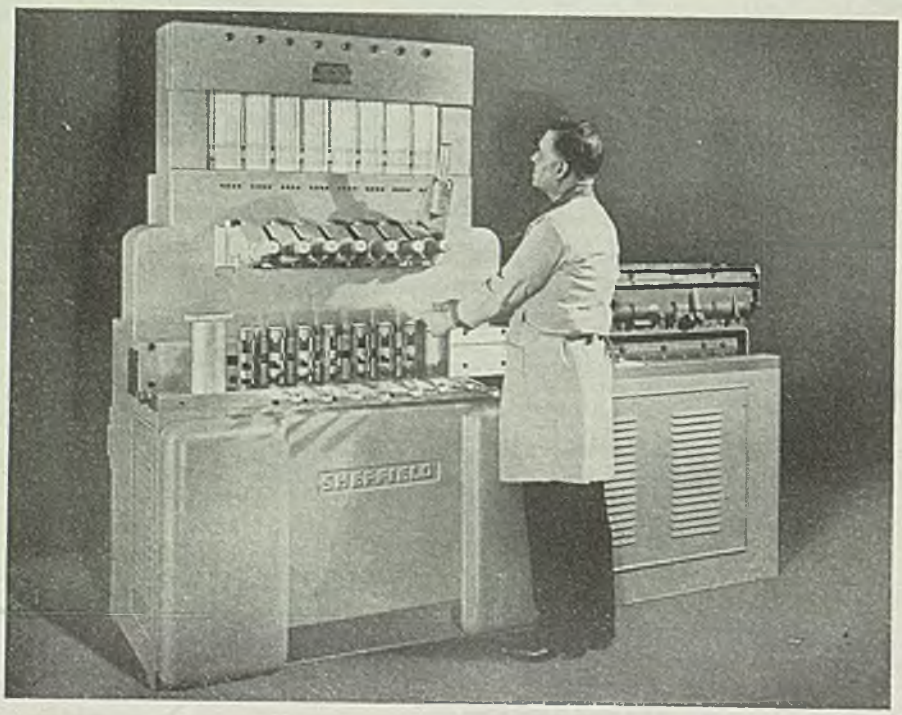
Tubing should always be trimmed regularly. After a tube has been drawn through several passes, the elongation will cause a "scalloped" back end to form on the tube. Quite a bit of stress is set up when such a tube is drawn over the mandrel. Moreover, the mandrel is twisted at the instant the "scalloped" end of the tube leaves the nib. Therefore, if the back end of the tube is regularly trimmed before "scalloping" becomes too pronounced, the life of the carbide mandrel will be materially lengthened.

After considerable use, it will be noticed that slight rings and wear marks will develop on the carbide nib of the mandrel at the point where tube reduction starts. If the mandrel is serviced as soon as these wear rings become visible, the rings can be removed by lapping and polishing.

A straight type mandrel which has worn undersize may be salvaged by resetting the mandrel farther into the die. Before doing so, however, it is important that a recess be ground into the mandrel nib so as to avoid too great an area of contact with the tube.

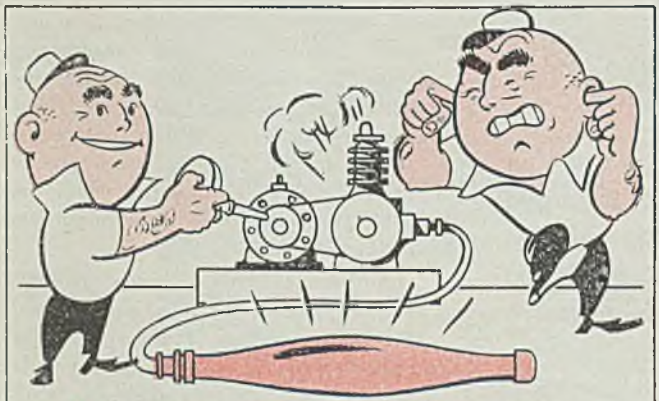
When drawing steel tubing, a sharp edged chamfer should be maintained on the mandrel nib's front end. If this chamfer becomes rounded, the mandrel will not immediately "bite" into the tubing as it should, causing no reduction of tubing wall thickness for some 6 to 8 in. during the first draw. This means that the mandrel must take a double reduction at the start of the next drawing operation. Sudden jerk that occurs when point of normal reduction is reached tends to put excessive strain on the carbide mandrel.

In case of a double reduction, the tube end should be cut off beyond the area of double reduction and then repointed. A sharp chamfer may be maintained on the mandrel nib's front end by grinding it with a 100 grit diamond wheel, or by turning it with a diamond boring tool in a lathe.

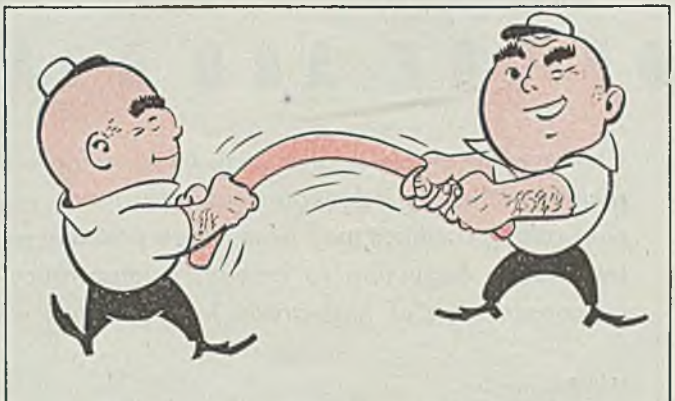


INSPECTING ENGINE BLOCKS: Gaging bore diameters of automobile cylinder blocks at 32 points for go and no go in less than one minute, this multiple spindle Precisionaire, developed by Sheffield Corp., Dayton, O., is an integral part of production line at Buick division of General Motors Corp. Instrument, weighing several thousand pounds, checks for diameter, taper and out-of-roundness of eight cylinder bores at four different points in each cylinder, and classifies them to an accuracy of 0.0003-in.

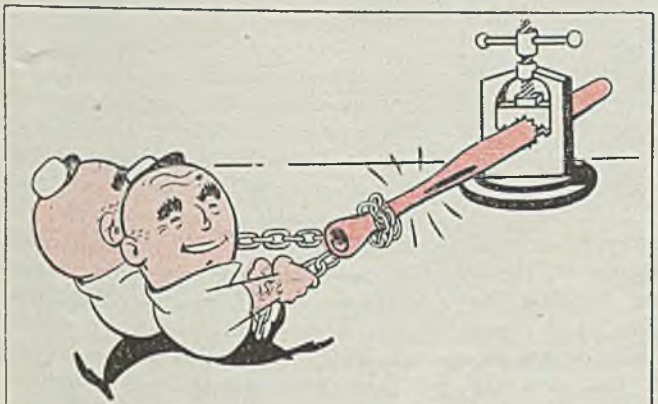
Four pages from Bundyweld's TEXTBOOK ON TOUGHNESS



1. Is pressure your problem? Ultimate bursting strength for Bundyweld ¼" x .028" Annealed Steel Tubing is 12,500 lbs. per square inch.



2. Vexed by vibration? Bundyweld has a record of unusually high fatigue strength . . . especially recommended for use where vibration occurs.



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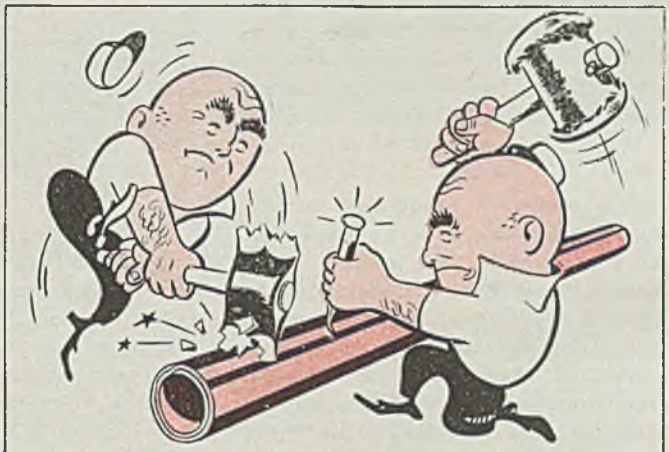

4. How about temper? On a Rockwell 30T scale, Bundyweld Steel Tubing rates up to 55 max.

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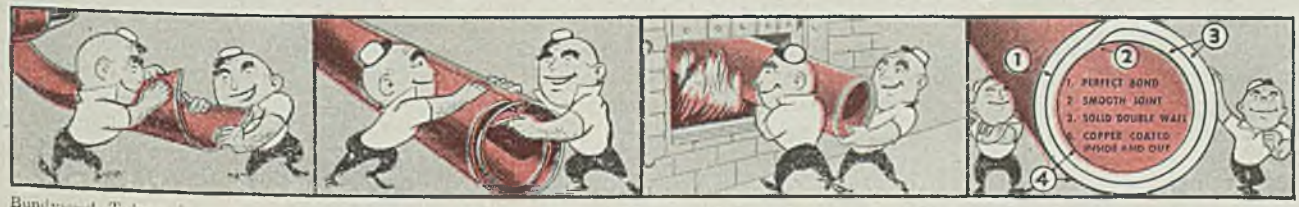

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Steel Industry Concerned over

FUTURE SUPPLIES OF ORE AND COAL

Conservation of low-sulphur coals by blending with high-sulphur grades will assure adequate supply for many years. Enlarged cold rolling facilities may pose future problem in strip industry. Ironmakers beginning to recognize importance of balancing consumption of high-grade iron ores and concentrates

FUTURE supplies of coal and iron ore for ironmaking are rapidly becoming a matter of concern to blast furnace and coke oven operators, and the time is not far off when positive steps must be taken to slow down exhaustion of high-grade reserves by developing and using significant amounts of lower grade deposits. The high rate of depletion of rich resources of the United States during the war years has hastened the day for action in this direction.

This matter of future raw material supply was given critical analysis Oct. 11 at the annual joint meeting of the Eastern States Blast Furnace and Coke Oven Association and the Blast Furnace and Coke Association of the Chicago District at Hotel Del Prado, Chicago. The meeting set a new all-time high attendance of 355, of which about 65 per cent were blast furnace and coke men from the Chicago district and 35 per cent from the Pittsburgh district.

At the coke plant operating session, W. T. Brown, consultant on coal, coke and by-products, Pittsburgh, presented an exhaustive study of the "Reserves of Coking Coals in Pennsylvania, West Virginia, Kentucky and Virginia." In great detail, the speaker presented statistics for the four states and their individual districts which produce the bulk of the nation's high-grade coking coal for metallurgical use. The problem boils down to the matter of sulphur content of coals and the quality of coke made from them.

Mr. Brown emphasized that by-product coal should not be used for steam and domestic purposes and the supply must be conserved. Pittsburgh blast furnaces should conserve the low-sulphur coals by blending with them high-sulphur grades. If this is done, reserves are adequate to last many years. The speaker pointed out that coking coal has now become a high-cost raw material, and coal operators must mechanize as fully as possible and install cleaning plants at mines to continue profitable operations.

In conclusion, Mr. Brown asserted that coke ovens can obtain better coal by putting pressure on their purchasing departments. Specifications on moisture and cleanliness can be made more rigid. The good coal which mines can recover from their properties can pay for cleaning plants, in his opinion.

Coal Higher in Sulphur

Complimenting Mr. Brown on his excellent contribution, George W. Hewitt, assistant vice president, Wheeling Steel Corp., Wheeling, W. Va., raised a question as to how definitely do we know our coal reserves. Be that as it may, however, it is certain that coal available in the future is going to be higher in sulphur and the industry will be forced to use it. And it may also be, he hinted, that sulphur is not going to prove too important in the blast furnace. Mr. Hewitt said that in his mind there is some question as to whether coal washing can be made to pay for itself.

What would happen when coke ovens are shut down cold has always been a lively topic among oven operators. General agreement has been that the results would be disastrous and costly. A paper, "Operation Morgantown," by P. B. MacCoy, Wilputte Coke Oven Corp., New York, demonstrated convincingly that in one major case damage resulting from a cold shutdown did not prove disastrous.

The Wilputte coke oven plant built during the war by DPC at Morgantown, W. Va., and operated by E. I. du Pont de Nemours & Co. Inc., became a war casualty after the end of hostilities and was ordered closed down abruptly. Mr. MacCoy described the precautions taken to preserve the facilities should they be needed again in the future. This need developed sooner than expected. When Sharon Steel Corp. purchased two blast furnaces from Carnegie-Illinois Steel Corp., it needed a coke supply and negotiated a lease with the government for the Morgantown plant.

In the process of readying the plant for operation, the ovens were given critical examination. Two regenerators were torn down in this process, and while numerous cracks were found, none were as serious as had been expected. It was judged that the ovens were in good condition, a conclusion which was later borne out when they were put into production.

Addressing the luncheon meeting, F. M. Gillies, works manager, Inland Steel Co., Indiana Harbor, Ind., discussed trends in the steel industry. He mentioned briefly the obstacles which have interfered with capacity steel production this year, namely, the steel and coal strikes, shortages of raw materials, lack of manpower, and loss in worker efficiency.

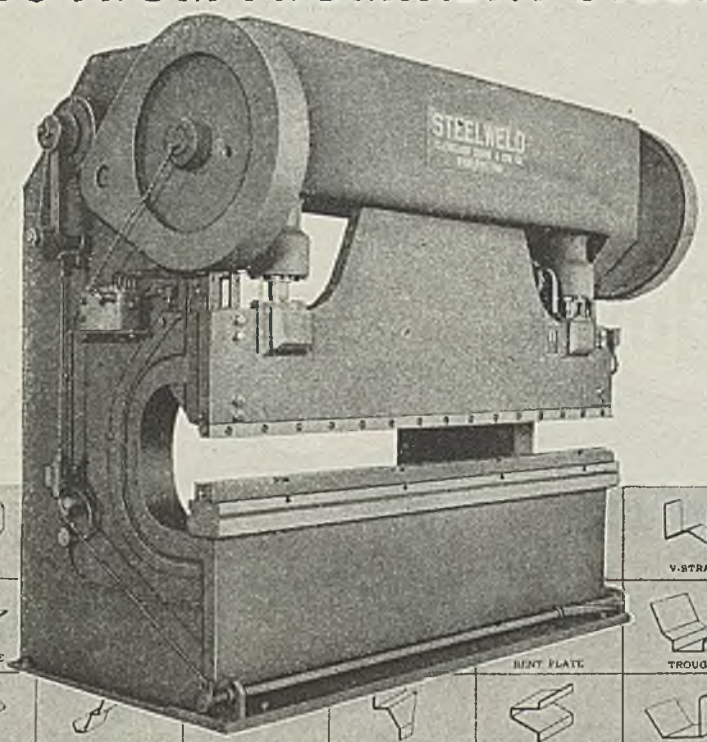
Looking ahead, Mr. Gillies expressed the opinion that ore and coal supplies will be adequate but scrap shortage will likely cause some holding down of steel output during the winter months, after which supply will become normal. Manpower probably will grow more plentiful as discharges from the armed services continue, and some increase in worker efficiency can be expected. What happens when union contracts expire Feb. 15, 1947, is anybody's guess.

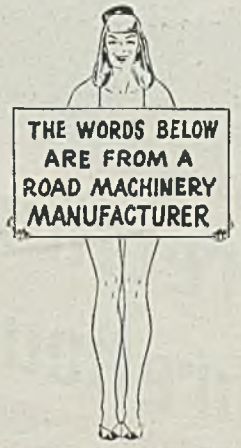
Mr. Gillies said that one of the developments arising from end of the war has been the tremendous demand for flat-rolled steel products. Even though present capacity is 25 million tons a year, pent-up demand exceeds production by a wide margin. In a 20-year period, production of flat-rolled has doubled and capacity has tripled, the latter possibly because of the profit angle involved. However, in the speaker's opinion, the increase in capacity may pose a problem in the future. There may be some question as to whether facilities can be maintained at a satisfactory level.

Pointing out that the steel industry consumed Lake Superior iron ore at the average annual rate of 80,000,000 tons for the last 6 years, an important factor in winning the war, George W. Hewitt, assistant vice president, Wheeling Steel Corp., Wheeling, W. Va., asked whether the United States would be in a position to win another war. Contributing a paper, "Lake Superior Iron Ore Reserves for the Future Operation of the United States Iron and Steel Industry," the speaker asserted that estimated

(*Please turn to Page* 124)

WORDS FROM PROMINENT STEELWELD PRESS USERS





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Steel Cords

(*Continued from Page 75*)

can be varied both by size of cord and by pitch of cord in the belt. Thus any belt strength from the range of 3500 lb per inch of width where cotton belts leave off up to 18,000 lb per inch is possible. The strongest such belt made so far is one using 3 3/32-in. 7 x 7 aircraft cord which has a strength of approximately 11,000 lb per inch of width.

The tension at which such belts can be operated depends on the frequency and severity of bending around pulleys. Under some conditions of very infrequent application of maximum tension, belts were designed so that maximum tension is as great as one-half the ultimate strength. Under ordinary conditions of conveyor operation, maximum operating tensions in the range of 15 to 20 per cent of the ultimate strength have been used. As pulleys become smaller and belt speeds greater in transmission use, relatively lower operating tensions are necessary to assure normal belt life.

It is frequently true that the limit on operating tension which can be assigned to a steel cable belt is not dictated by strength or bending of the cable itself, but rather by other components of the belt. Advantages of steel cord belts follow:

A. Strength: Strength beyond that of any textile reinforced belt of practical proportions is probably foremost. In conventional belts constructed in plies, thickness and stiffness builds up almost directly with strength. Since thickness must be kept in proportion to width to permit transverse flexibility for troughing, there is a definite limit on strength for each belt width in conventional plied belts. In steel cord belts longitudinal strength and transverse flexibility can be controlled independently in the belt design, thus removing a limitation on strength. This great strength permits greater lengths of conveyor and/or greater lifts eliminating the hazard and cost of transfering material from one conveyor to another. Lifts up to 300 ft vertically on inclined conveyors handling fairly light materials such as coal are now about the limit with cotton belts. Steel cord belts have immediately doubled this lift and are capable of handling still more difficult slopes.

B. Length Stability: Cotton belts change length with tension and with moisture content and gradually grow or permanently elongate. In most cases the net result is a lengthening belt, but in some cases due to increased moisture content, a belt of decreasing length. In not all cases is it possible to predict which will take place. Length changes of 2 per cent which means 40 ft of belt on a 1000 ft C. C. conveyor are not an impossibility.

Steel belts change so little in length due to change in tension, moisture, or temperature that stretch or shrink is negligible. The steel cord conveyor at the Morris mine mentioned above elongated only 0.05 of 1 per cent in its 4 years of operation.

C. Tension Induced by Bending: Belts built up of plies of textile material, principally cotton, put the designer in the middle. He wants a high modulus material to keep length changes in his belt low as changes in tension take place. But when a section of the belt approaches the head pulley under high tension, its outer plies must elongate with respect to the inner plies and in doing so build up tensions in themselves which are greater as the modulus of the ply fabric is made higher. Thus the fabric or cord plies are a compromise and become an increasingly difficult compromise as stronger and greater numbers of plies are required.

Cotton belts in which the load is carried in a single layer of large cords provided a way out of the compromise by practically eliminating tension due to bending, but the strength of such a belt was limited by loss of tensile efficiency in unusually large textile cords.

The steel cord belt takes over this single layer principle, in fact such a high modulus material could not possibly be made on the multiply principle, and extends the tension capacity for beyond the strongest cotton belts.

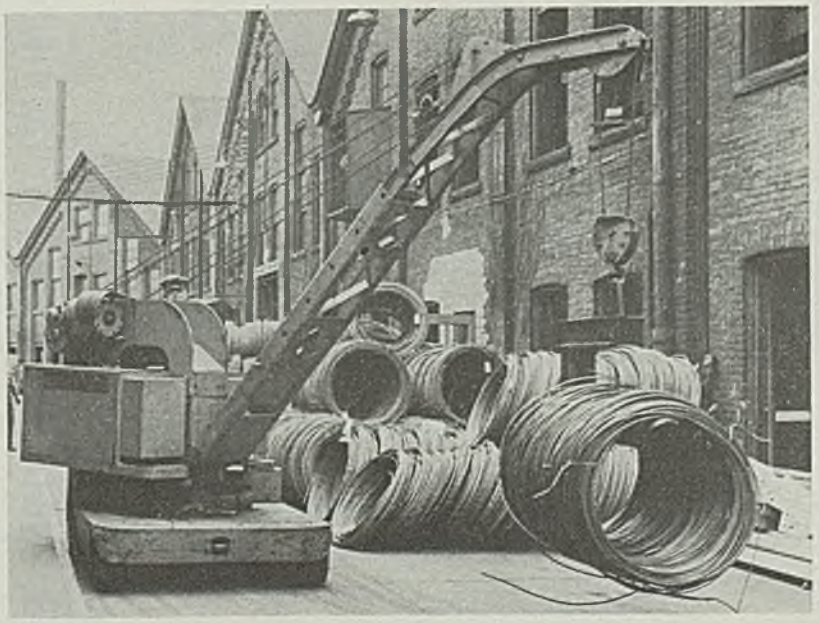
D. Inspection: Inspection of cotton belts in service depends on more or less expert interpretation of surface indications of what is taking place in the carcass. This can be a very revealing method of inspection when practiced by conveyor operators of long experience. One conveyor operator has repair men who can actually spot incipient ply separation by cover appearance before the deterioration has become an actual separation. But as a general thing, users of conveyor belts are not able to determine the condition of a belt carcass with much certainty.

The steel cord belt lends itself to more precise examination by means of the fluoroscope. With this apparatus the x-ray shadow of each steel cord is thrown on a screen for visual inspection or can be photographed. Thus, any damage or breaks in cables can be detected and repaired. Fig. 4 is photo of a damaged edge of a steel belt revealed by this method of inspection.

Both in flat transmission and conveyor splicing of steel cord belting in the field is practical and successful. Early efforts were mainly in the direction of socketing cable ends in various fittings or in making the usual short cable splice in individual cables.

With the present small cables and the large number of them placed in wide belts, both of these methods are usually impractical. With larger cables a modified cable splice in individual cables was used in at least one case.

However, the most practical splice is one devised for single layer cotton cord



STACKING HOT COILS: This special ram-hook-equipped battery-powered crane truck removes coils of rod from hot roll department and stacks them four-high in outside cooling space at Copperweld Steel Co., Glassport, Pa. Five or six coils weighing approximately 250 lb each can be handled in one movement

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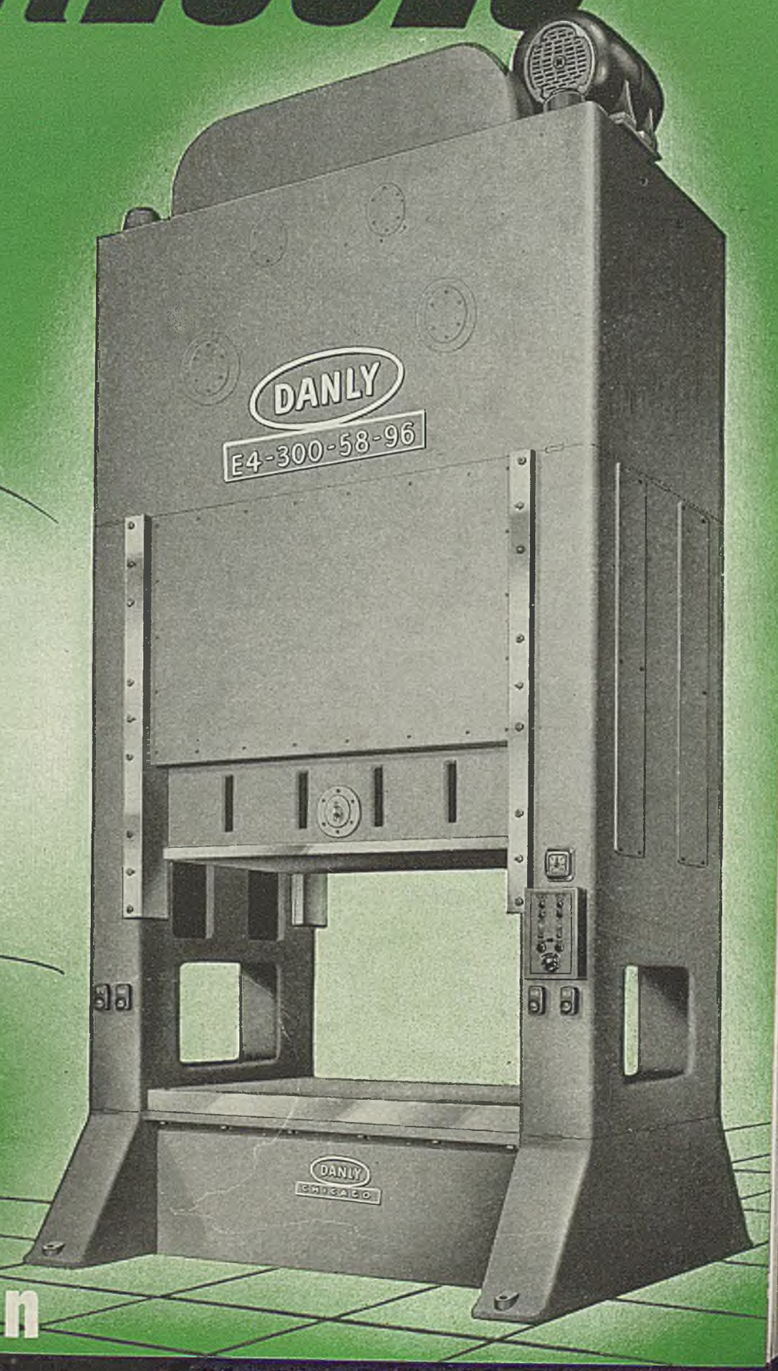

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belts, and now adapted to steel cords. In this splice the steel cords themselves are not joined. The tension in one cord end is transferred to an adjacent group of cords through a thin layer of rubber compound in shear, and in a zone further along the belt transferred back again to the opposite end of the original cord. Each of the cords in the transfer group is handled the same way at a separate zone in the splice. Thus all the cord ends are dispersed through the region of the splice in a calculated manner.

WIRE SIZES AND CABLE CONSTRUCTIONS USED OR EXPERIMENTED WITH IN BELTING

Diameter				
Wire	Cable	Construction	Min. Break	Used in Belts
0.0058	0.036	7 x 3	165 lb	V & Flat
0.008	0.047	7 x 3	300 lb	V & Flat
0.010	0.062	7 x 3	450 lb	Conveyor
3/32"	7 x 7	Aircraft Cord	920 lb	Conveyor & Tracks*
1/8"	7 x 19	Aircraft Cord	2000 lb	Conveyor & Tracks*
5/32"	7 x 19	Aircraft Cord	2800 lb	Conveyor & Tracks*

* Endless belt or band tracks for track-laying vehicles.

The extent of this dispersal of ends determines the strength of the splice. It can be carried to almost any extreme, but usually a splice length of 6 to 8 ft providing a strength of 80 per cent of the balance of the belt proved satisfactory. This splice is stronger than splices in plied belts. In addition it is much more durable in bending since all of its joints are in a single plane and are relieved of tensions due to bending which are destructive to plied belt splices.

Design Questions

One of the common questions brought up in discussion of steel cable belts is that the cables may not stand the repeated bending in a belt drive. This was well investigated, but even without investigation it is obvious that cables running over pulleys 500 to 1000 times the cable diameter, and doing this at intervals not much shorter than 5 min, as is the case in conveyor installations, are not in very serious situation. Of course cables running on pulleys down to 100 times their own diameter and at belt speeds of 8000 fpm are another problem. Even so by adjusting allowable tension used in designing to compensate for pulley diameter reduction such drives can be handled. Cable or cord tension has a very rapid effect on life on a pulley of given diameter as shown in Fig. 1. A second question stems from the belief that steel cords will cut down through the supporting rubber compound. This will happen if the bond between rubber and steel fails and if radial pressure is high enough. With good bonding and proper relation between cold tension and pulley diameter this is no problem.

Conditions which require vertical curves and transition from troughed to flat in conveyor or those requiring edges of a belt to be longer than the center, or vice-versa, are more difficult to provide for than in cotton belts because the high modulus of the steel cord belt makes bad distribution of tension across belt width. However, by using a more conservative curve length, and by more gradually flattening the belt approach to the pulleys, the maldistribution of tension can be kept within allowable limits.

Uses of V and flat belts in industrial drives are well known. The use of steel cable belts permits narrower, more compact drives and practically eliminates any problem of stretch. Tests on steel V-belt drives with high belt speeds show that in place of falling off at high belt speeds as it is expected when belts elongate under the influence of centrifugal tension, the ability of the drive to transmit load remains and may even increase. Fig. 6 shows a large steel cord flat belt driving a Jordan machine. Steel cord flat belts found application in many places where load increased to the extent that pulley width was no longer great enough to carry the required cotton belt. Here steel belts of much less width can be used to handle the problem. Some very heavy oil wells and extremely severe wood chopper drives are examples of this.

Conveyor uses are more spectacular. The application which gave the steel cord conveyer its start is in installations such as the slope conveyor shown in Fig. 7. Underground coal mining, quarries and open-pit mines have very large quantities of material to raise to the surface. Belts were long recognized as a most reliable, safe and economical means of transport here. But with very high lifts and particularly with heavy material, such as iron ore, the tension in the belt built up so rapidly that it was necessary to break the conveyor into several units. The transfer of material from one unit to another adds costs in the form of terminal machinery. In many cases an attendant is required at the transfer point. The tension capacity of the steel conveyor makes it possible to handle almost any slope as a single conveyor, without transfers, without attendance and without hazard to the belt from pit to loading pocket or tipple.

In addition to actual belt uses the great strength, flexibility and low elongation of the steel cord belt suggest such uses as load carrying strap and slings. Attachment of metal fittings on a regular pitch permits the steel belt to serve as a chain free from the wear and lubrication problems. This use parallels that of using steel belts for tracks of crawler vehicles.

The economics of belt design long fixed by the unique position of cotton are now astir under the influence of increasing cotton cost and high production with lowering cost of other fibers such as rayon. Now, with cotton being disturbed for the first time, comes an opportunity for steel cord to establish itself with the lowest cost per unit of belt strength, in addition to its other advantages, and take a substantial place in the expanding production of conveyor and other belting.

Photomicrographs to be Exhibited by ASM

An exhibit of photomicrographs is to be sponsored by American Society for Metals at National Metal Congress and Exposition in Atlantic City, Nov. 18 to 22, giving metallographers an opportunity to compare their best productions.

A committee of judges, appointed by the congress management, will award prizes in various classifications, a blue ribbon and an ASM book being awarded to best in each class. Honorable mention and a book go to print judged next best, while grand award certificate will go to best photograph in the show. Classifications are: Cast iron; carbon or low-alloy steel; stainless or heat-resisting alloy; aluminum or magnesium alloy; other nonferous alloy; weld structure; best micrograph in natural colors; best micrograph using penetrating rays (nonoptical); best micrograph (10 diameters or lower power) showing structure however developed; and best series showing transitions during phases or composition changes during manufacturing processes, plastic deformation, etc.

A study of steel metallurgy in two Messerschmitt airplane factories in Germany is the subject of report No. 304 issued by publication board of Department of Commerce, Washington, D. C.

The report covers interrogation of several people concerning analyses, treatment and physical properties of steels used, by a member of the Technical Industrial Intelligence Committee.

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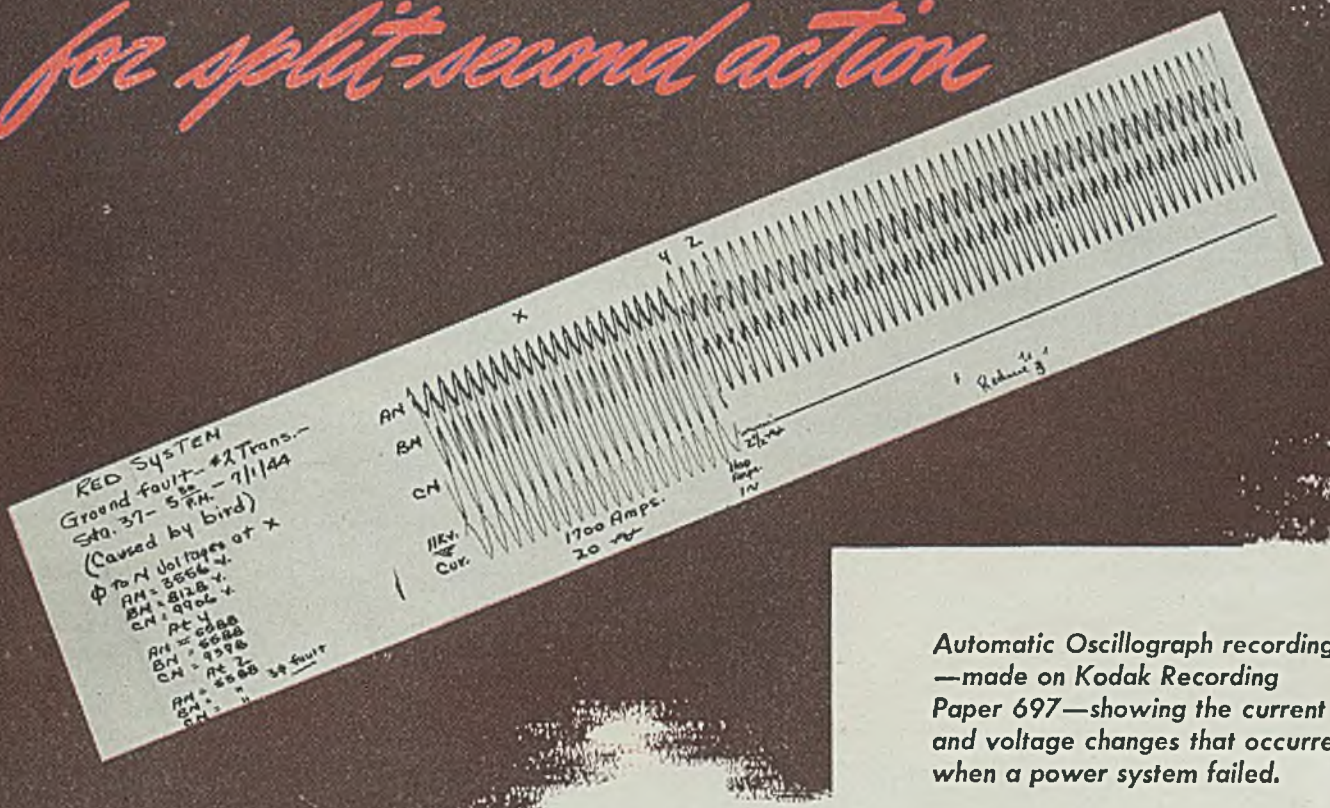

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Gel Lacquer Coatings

(*Continued from Page 77*)

including mixed ground scrap, may be provided with an attractive finish.

Gel lacquer solutions are prepared at elevated temperatures. While hot, they are fluid; when allowed to cool to room temperature, they set to nonfluid gels. Surface coatings applied from such hot lacquers set quickly upon cooling and partial loss of solvent. The coatings rapidly become nontacky and, within 10 min after dipping, are sufficiently hardened not to be marred by ordinary handling. Ultimate hardness is obtained by complete evaporation of the solvent.

Preparation of Gel Lacquers: In brief, the process[2] consists of dissolving the ester or the molding compound in a carefully balanced solvent combination at a temperature of 140-150° F. Recommended solvent mixture for these gel lacquers is three to four parts by weight of industrial xylol and one part of isopropyl alcohol (99 per cent grade). Suggested proportion[3] of total solvents for initial trial is four to five parts of solvent to one of ester. A more viscous solution is sometimes desired, depending on the job. The solvents and ester are heated, with agitation, in a container at a temperature of 130 to 150° F. Complete solution will usually take place in about 2 hours.

If the ester is used, any desired plasticizer and pigment may be incorporated at the time of dissolving, or "Tenite II"[1] molding granules may be used directly thus obtaining film former plasticizer, and pigment in a thoroughly dispersed state. When solution is complete, the temperature is dropped to approximately 120° F and bubbles allowed to escape and the lacquer is ready for use.

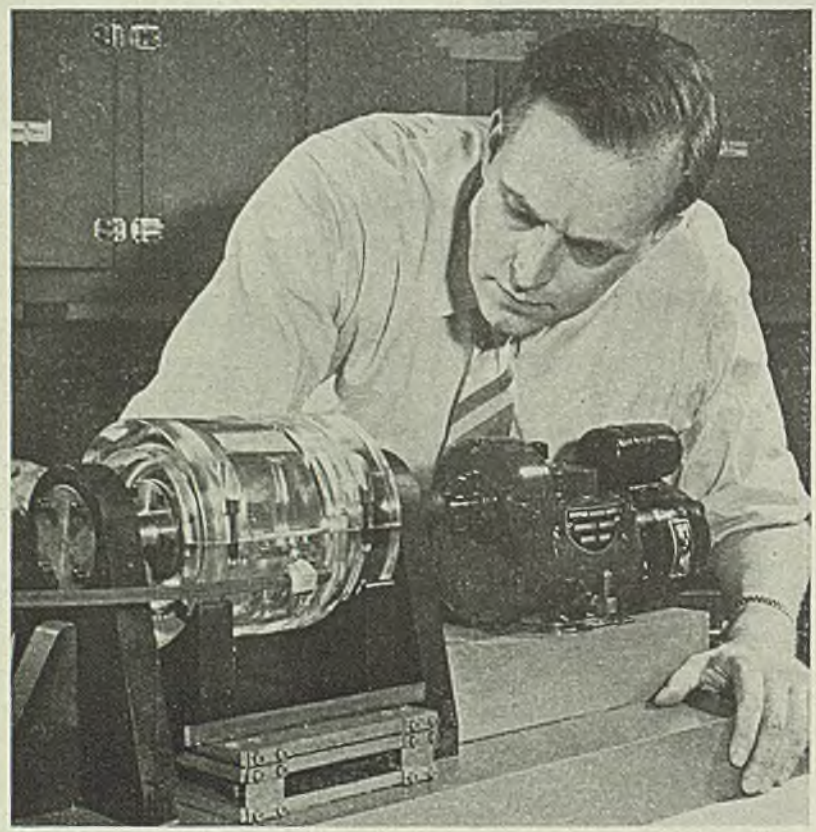
At elevated temperatures, the lacquer is a smooth, flowable, though viscous liquid. On cooling to room temperature, however, it sets immediately to a firm, nonflowable gel, maintaining the applied coating in its original form without sagging or wrinkling. The gelation occurs with temperature change alone and is not dependent on solvent evaporation, though the latter normally accelerates setting, as shown by curves in Fig. 2.

Equipment Required: Jacketed hot-water circulation is considered the best source of heat for gel-lacquer solutions. Open water baths may be used, but are often troublesome because of excess moisture vapor, which tends to cause a lowering of the gel point. On account of the risk of igniting the vapors, open flames or even electric-resistance heaters should be avoided. Any motor driving the agitator, the dipping machine, or other near-by equipment should be of the explosion-proof type.

In small-scale production or experimental work, the solution may be made during the day, poured into the dipping container, covered (but vented), and maintained at temperature over night in an oven. For large-scale work, it is desirable to have continuous circulation from a stock solution. Although both the mixing and dipping operations can be conducted in one tank, two tanks in series are suggested for continuous operation. Fig. 3, prepared by the Tennessee Eastman Corp. shows a suggested type of dipping tank. The mixing tank should be mounted on a platform so that the bottom of the tank is even with the top of the dipping tank and as close to it as possible. The mixing tank should be equipped with a bottom drain line, at least 1½-in. in diameter, leading down along one corner of the inside of the dipping tank to within about 2 in. of the bottom. This line should be equipped with a valve, preferably of the plug-cock type, located somewhere below the top edge of the dipping tank. Exposed portions of the pipe should be insulated.

In preparing the gel lacquer the necessary material should be loaded into the mixer, and the mixer allowed to run as long as is required to get the ester into solution. When the motor is shut off the solution should stand long enough to allow the bubbles to rise to the surface. With such an arrangement material can be run from the mixing tank into the dipping tank at any time it becomes necessary to raise the level of the solution so that it will totally envelop the articles to be dipped.

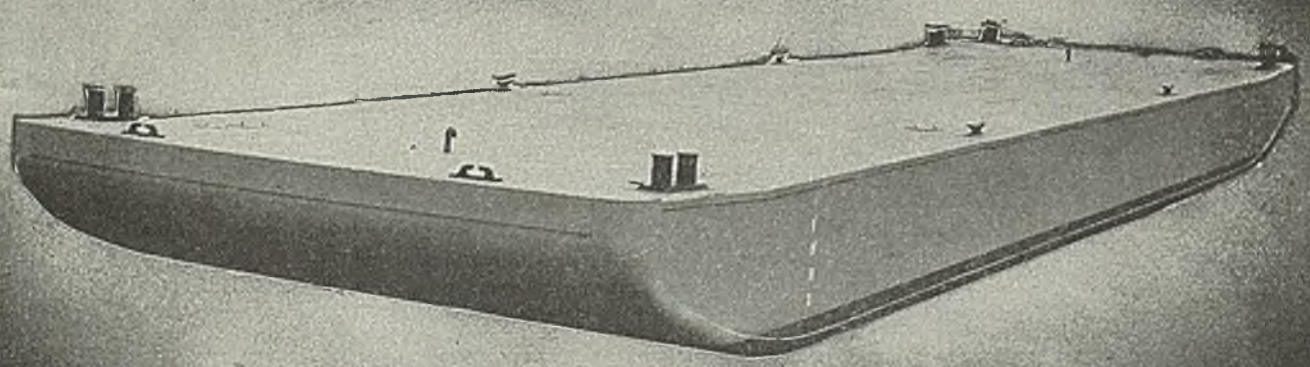
Application of Gel Lacquers: After the ester has been completely dissolved, agitation should be stopped and the container allowed to stand at 140 to 150° F until all bubbles have risen out of the solution. Articles should be dipped slowly in the hot solution and withdrawn in a continuous motion not faster than the excess lacquer can run back into the container. This pull out rate will vary with the viscosity of the lacquer and the shape and size of the article being dipped, but is usually of the order of 1 in. every 6 to 12 sec. For an instant after removal, the article should remain in the vapors of the solution above the surface. Surface tension and shrinkage tend to draw into the



TRANSPARENT BEARINGS: Using this transparent plastic model, research engineers at Westinghouse Electric Corp., Pittsburgh, can see what happens to lubricating oil inside a moving bearing. Oil, colored red, is fed into the plastic bearing; effectiveness of lubricant working its way through bearing is immediately apparent. According to the company, the new technique eliminates guess-work and makes possible more efficient bearing design

BARGES

for every purpose



Liquid—dry cargo—drilling rigs—derricks. Look over our stock designs—or let our engineers design a barge to suit your particular needs.

Pictured here is an all-purpose barge to meet post-war requirements. It can be used for either deck or liquid cargo. Notice the long, plated rake—for swifter, easier towing. Dimensions: 110' x 30' x 7'. Capacity: 450 tons of deck or 3,200 barrels of liquid cargo.

STEEL

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RIVER FRONT, NEW ORLEANS DISTRICT, WESTWEGO, LOUISIANA

gel lacquer any globule at the bottom of the dipped piece; therefore, after withdrawal from the solution the dipped piece should be promptly inverted to effect on the bottom the same smooth surface which will exist on the piece as a whole.

An arrangement for accomplishing this inversion is shown in .Fig. 4, prepared by the Tennessee Eastman Corp., which suggests a type of mechanical equipment to be used for production dipping operations. A rack raised and lowered by cam action, such as that detailed in the sketch, is satisfactory. The articles to be coated should be attached rigidly to a dipping frame. A rotating wheel with radial projecting spindles may also be used. These spindles are usually rigged for rotation about their major axis by means of pinions which, shortly after the dipped articles clear the solution, engage a stationary rack as the wheel rotates and inverts the article.

The recommended solution, used at the recommended dipping temperature, normally provides a coat about 0.005 to 0.010-in. thick after drying. Increased thickness of coating is obtained by increasing the solution viscosity or by repeated dipping, note Fig. 1. Normally, a second coat may be applied after 10 min drying at room temperature. Other factors affecting the thickness of coating obtained are the size and shape of the article being dipped, the gel temperature of the lacquer, the temperature of the article being dipped, and the rate at which it is withdrawn. As has already been pointed out, for the best appearing coatings, the object should be withdrawn from the lacquer at a rate equal to the runoff of the excess lacquer, thus allowing a minimum of draining and tailing as the object is removed from the dipping bath. The preliminary drying and thorough gelling of the lacquer coat is allowed to proceed at room temperature. Final drying or curing may be carried out in a drying chamber of the tunnel type with a conveyor moving through it. Air at 130 to 140° F is blown countercurrently to the conveyor.

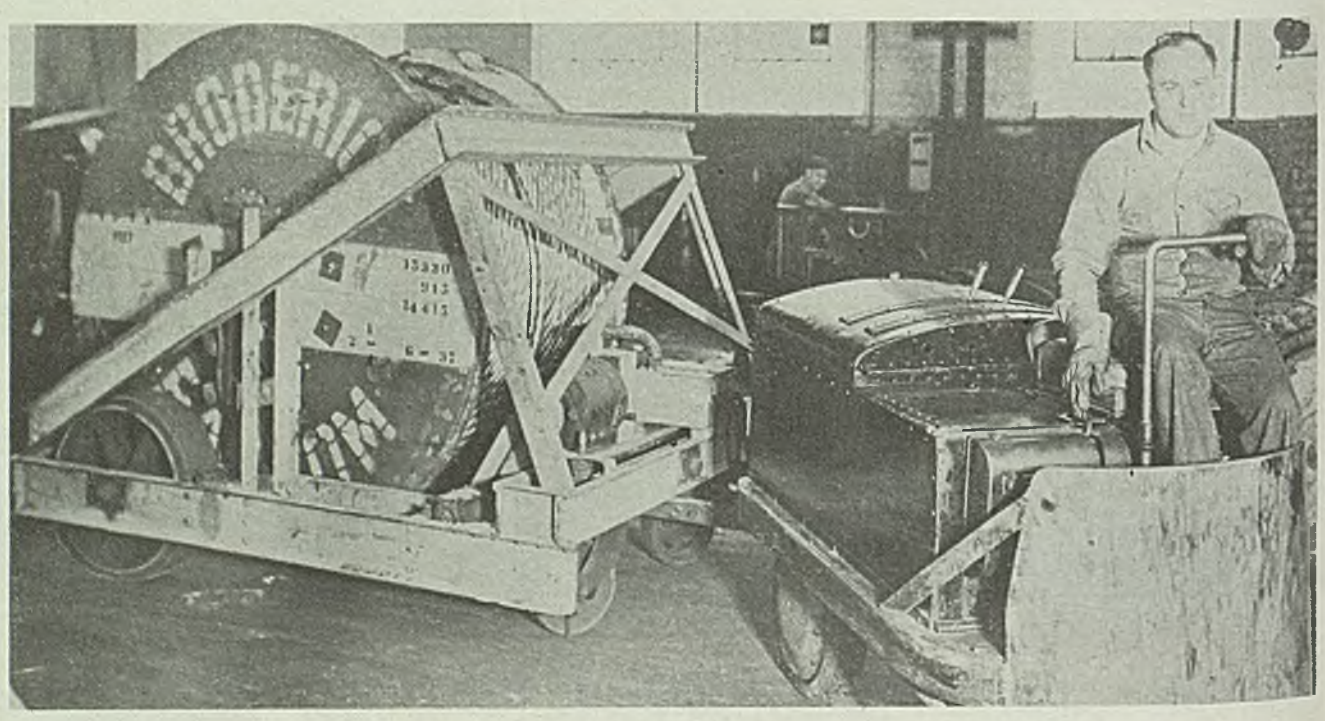
The usual coating produced by gel lacquer has a high gloss and no polishing is necessary. Improved surface luster is obtained by a final dip in a clear-transparent type gel lacquer. Such a coating also gives additional depth of color.

Maintenance of Compositions: If because of solvent evaporation, the solution tends to become too viscous during use, more solvent mixture may be added as needed. Usually this make-up solution contains equal quantities of isopropyl alcohol and xylol. The ratio in the make-up solution is different from that in the original solvent mixture, because isopropyl alcohol evaporates faster than xylol. As the relative percentage of isopropyl alcohol in the lacquer decreases, the gel temperature (temperature of gelling) increases. The gel temperature should be adjusted to that which produces the best results on the particular article being coated. If the isopropyl alcohol content becomes too low in proportion to the xylol present, the coating may turn white (blush).

So long as proper amount and ratio of solvent are maintained, unused lacquer left over from any day's operation can be employed subsequently merely by heating it again to the proper temperature for the desired viscosity. Two precautions should be strictly observed: Only anhydrous solvents should be used, and the gel lacquer should be kept as free from dirt and dust as possible.

Another solvent combination which produces good gel lacquer is 95 per cent toluol and 5 per cent isopropyl alcohol. This solvent combination has a rapid drying rate, but a gel lacquer made with it requires much closer temperature control than one made with xylol. Small changes in solvent proportions seriously affect the gel temperature, note Fig. 2.

Precooling for Heavy Coats: Precooling of the core material prior to the first dip offers a means of obtaining unusually heavy gel-lacquer coatings of up to 0.020-in. thickness of dried ester per dip —almost double the thickness of coatings obtained by the usual gel-lacquering procedure. In addition, this method of gel dipping gives a coating which has less tendency to follow the contour of small irregularities in the core. It permits the use of metal castings taken directly



WHEELS FOR REELS: Electric tractor-trailer shown here is maneuvering reel of 1918 ft of 2¼-in. preformed wire rope weighing 15,330 lb through Broderick & Bascom Rope Co. plant at St. Louis. The two front wheels of the four-wheel trailer are designed to swivel in a complete arc, so that the complete unit will make a 180-degree turn in an area 17 ft wide. Powered by storage batteries on the tractor, the specially designed trailer will accommodate reels 76 in. in diameter and 40 in. wide

there's a peacetime "E," too!

The olive branch of peace now spreads its cheerful shade over all our people. And with its note of optimism there comes a new degree of responsibility which American business must meet.

The only sure way to be able to meet this new responsibility is to have planned for it and to put those plans into effective operation. For over fifty years the principle of planning for the future has been one of the basic policies here at Falk.

It is this policy which has always enabled Falk to change its operations quickly from peacetime to wartime production.

Long ago Falk ingenuity, skill and experience in perfecting gears for power transmission enabled Falk to develop and perfect successive marine drives, which each in its time set new standards of excellence.

As a result, in 1940 Falk was already prepared for the greatest naval program in history, with the amazing result that 40% of all major combat vessels were Falk-equipped. Marine drives then being used in commercial vessels were accepted almost without change for the vast invasion fleets of LST's. Six "E's"—the Navy's code for excellence—were awarded Falk for this fine effort.

There is a peacetime "E", too. Today Falk is winning *that* "E" through its policy of anticipating the needs of the future. Many industrial users of Falk Gears, Speed Reducers, Motoreducers, Marine, Heavy Duty, and High Speed Drives and Steelflex Couplings are again depending upon Falk to supply these needed tools of industry, the normal flow of which was interrupted by the war.

These industrial purchasers have come to know that as they must adopt newer and more efficiently designed tools, they can once more turn to Falk, as they always have, for developments that were on the planning boards long before the need was apparent.

As it always has won the Navy's award for excellence in the past, so, too, will Falk win the industry's commendation for excellence today.

The more than fifty years of experience, leadership, vision and know-how which are a part of the Falk tradition again offer tangible evidence of the fact that it always pays to consult Falk . . . a good name in industry!

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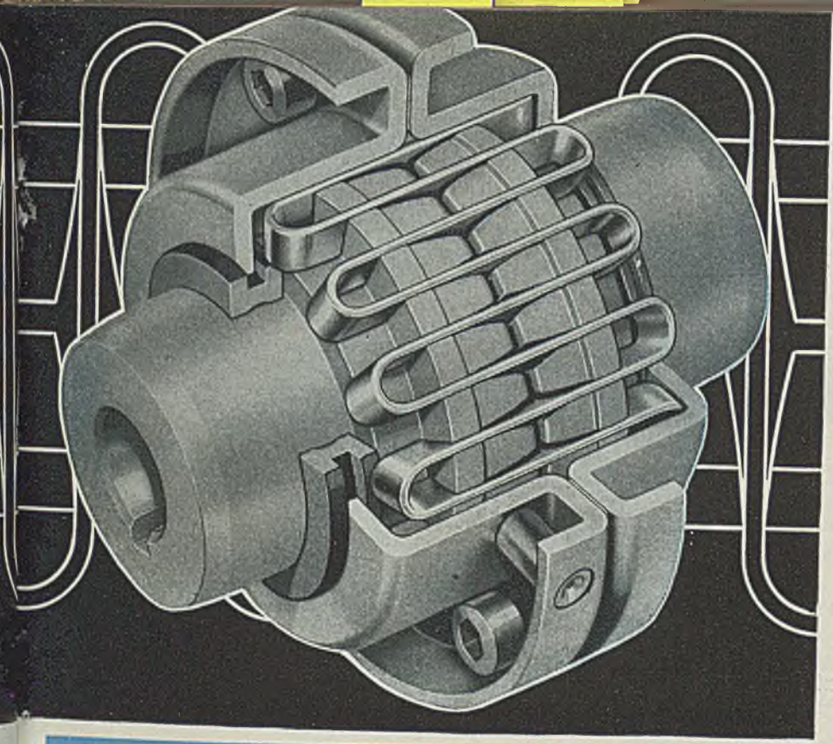
FALK . . . a good name in industry

Here's how Falk Steelflex Couplings completely protect connected machinery



from *Shock...*

Vibration...Misalignment

Only Falk Steelflex Couplings provide all three: Flexibility, Torsional Resilience* and Applicability to 90% of all industrial requirements.

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How Falk Steelflex Couplings are designed and produced to provide these factors is important. The diagrams on the opposite page explain how the Falk "grid-groove" design functions to protect machinery against ordinarily damaging conditions . . . how it compensates for parallel and angular misalignment and permits free end float.

A simplified method for selection, load classifications, service factors and dimensions is available to you in a booklet. You are enabled to meet your requirements dependably, quickly —with a reduced parts inventory.

In addition to the standard Type "F" which is applicable to more than 90% of all installations, Falk offers a line of large Steelflex couplings and couplings featuring the Steelflex principle but used for special service and dual-purpose applications.

Get the complete information on Falk Steelflex Couplings either from your Falk representative or distributor, or write to Falk.

* **Torsional Resilience is the ability to spread the peak or shock loads over a relatively long increment of time, thereby greatly reducing stresses in the connected machinery.**

Fig. I **Fig. II** **Fig. III**

Fig. I. Grooves, in a precise arc, and with a radius and length proportional to the capacity of the coupling, are cut into two identical hubs of moderately high carbon steel—forged of Falk alloy cast steel . . . Fig. II. These grooves provide a slot for a grid member made of chrome alloy steel with an elastic limit of 180,000 pounds per square inch and an ultimate strength of 220,000 pounds per square inch . . . Fig. III. This grid fits snugly into the curved grooves cut into the hubs of the coupling. The grooves provide a scientifically cut bearing surface for the grid. This bearing surface extends from the outer to the inner edge of the grooves. The grid bears on the grooves in proportion to the load . . .

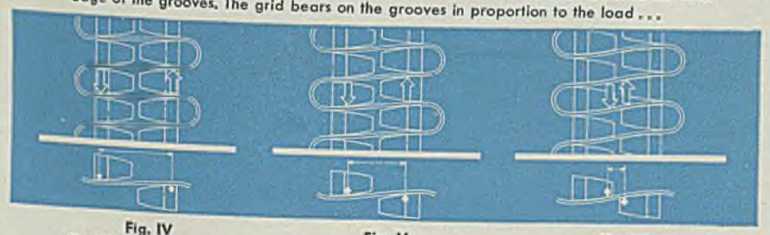
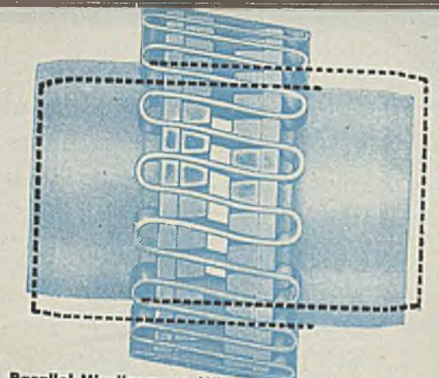
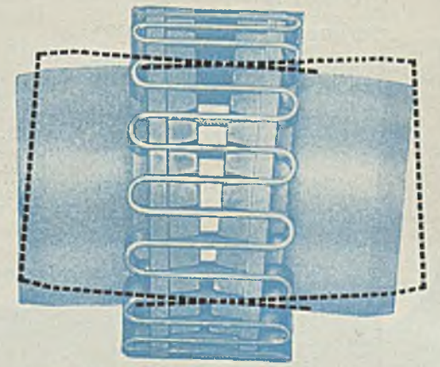


Fig. IV **Fig. V** **Fig. VI**

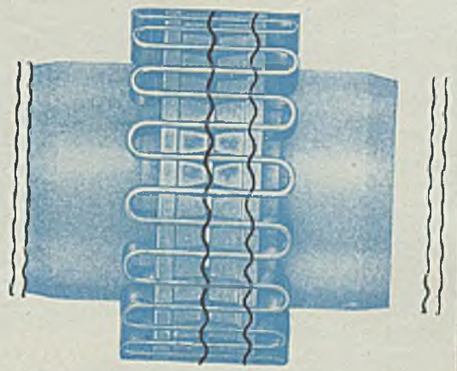
Fig. IV. Under light loads, the grid bears only at the outer edges of the grooves. This permits a long, free, elastic span between the outer edges of both hubs. Power is transmitted through almost the entire length of the grid rung . . . Fig. V. Under normal loads, the grid bears on a larger area of the grid grooves and the span of the grid run is shortened. It transmits more power and maintains its capacity to absorb shocks and dampen vibration . . . Fig. VI. Under peak loads, the grid rungs bear over almost all of the curved surfaces of the grooves. The span of the grid rung becomes very short. Under the impact of shock loads the grid flexes and continues to transmit power smoothly.



Parallel Misalignment. When parallel misalignment is involved, the grid-groove combination comes into full play. The movement of the grid in the lubricated grooves accommodates the misalignment, while still permitting full functioning of the grid-groove action of the coupling in absorbing shock and dampening vibration.



Angular Misalignment. Under angular misalignment the design of the Falk Steelflex Coupling permits a rocking and sliding action of lubricated grid and hubs that allows the greatest freedom of accommodation to angular misalignment, while at the same time transmitting the power through the resilient grid.



Free End Float. Because the grid member slides freely in the lubricated grooves, the Steelflex coupling permits unrestrained end float for the shafts of both the driving and driven members, or of either one. If it is desired that end float be restricted, provision can be made to limit it to any required amount.

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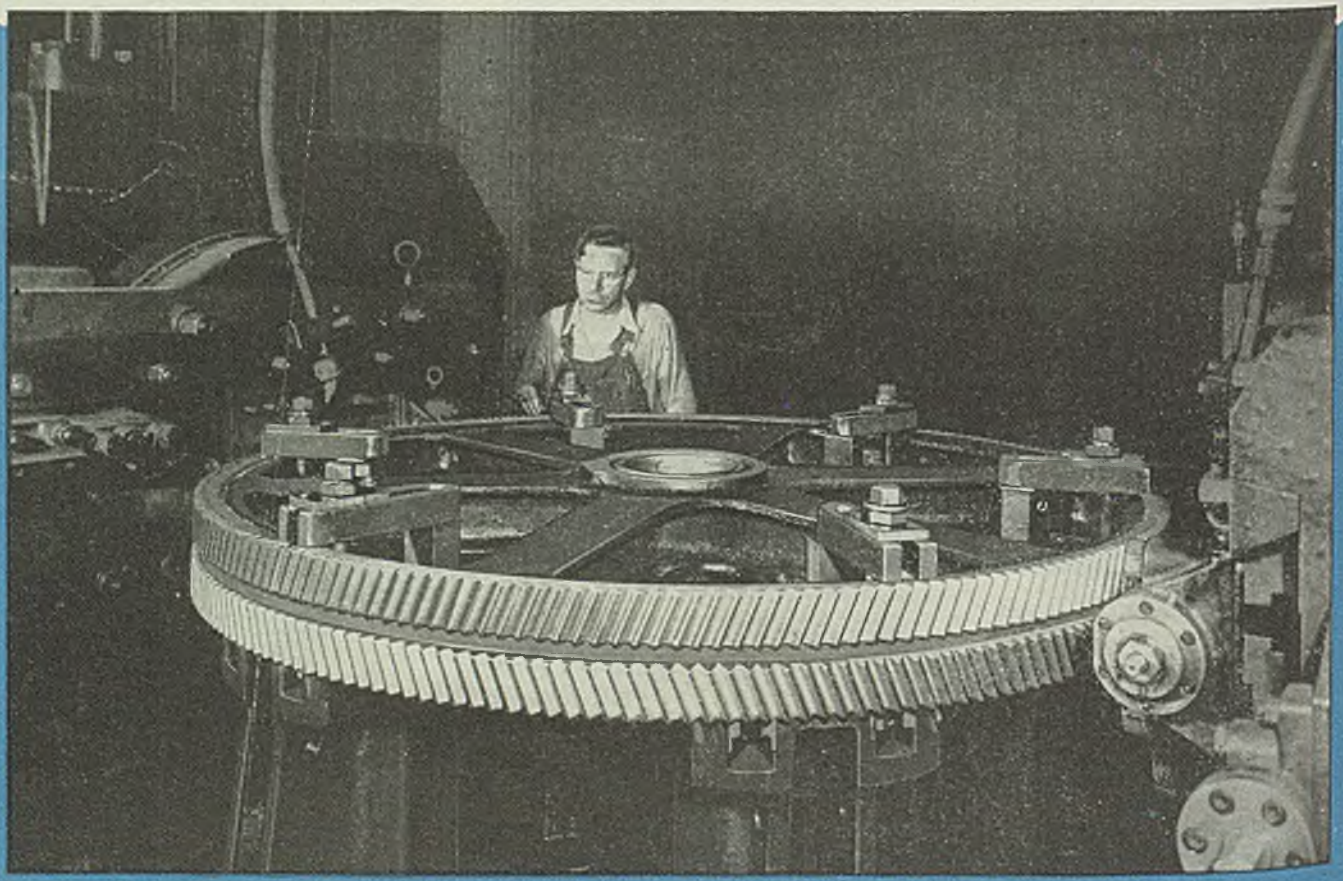
This Falk Herringbone Gear for Road Building Equipment, is being cut on a 9 foot vertical gear cutting machine.



FALK ... A GOOD NAME IN INDUSTRY

Cable Failures

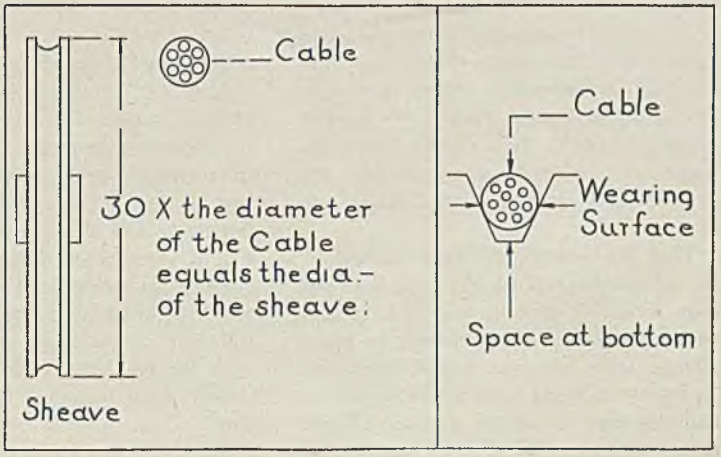
Reduced by Sound Engineering Analysis

IN many industrial plants cable failure is followed by a feverish investigation that assumes causes and recommends immediate increase in cable size, rather than analyzes the failure according to sound engineering textbook principles.

According to Robert A. Shaw, Detroit, the following "book-larnin" might profitably be remembered: Sheave should be at least thirty times the diameter of the cable. This rather simple fact is based on the theory that the breaking of any steel bar or wire depends on how short the bend is; if gradual, breaking or fatigue time is in proportion to the degree and repetition of the movements. Sheaves are often below the required standards because of lack of head room caused by building design.

In any V-shaped groove, cable should have its bearing surface on the sides. An over-sized groove will allow spreading of the cable. If in your investigation cable looks worn on the sides and bottom, take a look at the groove.

Lubrication will bear watching if cable is rusty or dry. Cable life will be shortened considerably unless each wire is properly supported. It might be well to keep a log of cable applications to prevent repeating negative experiences—with their attending dangers.



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from the mold as core materials, without the expensive finishing operations necessary to get a satisfactory surface for ordinary lacquering.

For this technique the core is cooled to a temperature of about 40° F, immediately immersed in the heated gel-lacquer solution, withdrawn, and inverted as usual. It should then be returned to the air at a temperature of 40° F for 15 min or so during its initial curing; after which it may be given a second dip (the core and coating both now being chilled), or the drying may be completed at room temperature and later at elevated temperatures, if desired.

Pretreatment of Cores: If strong adhesion to the coated article is required, gel lacquers may require a prime coat, particularly when used on flat or concave surfaces. The prime coat also serves to seal the coated article, eliminating formation of bubbles caused by air escaping from porous substances, such as wood or paper, immersed in the warm solution. This can be done by the use of certain nitrocellulose-resin solutions. Formulas in center column were recommended by the Tennessee Eastman Corp.

If the under coat is to be sprayed, these compositions may be diluted to suit the spraying equipment by means of a thinner made of the solvents in the proportions indicated. Solvents may be any combination ordinarily used for nitrocellulose lacquers. With lighter tones it has been found that a better appearance is obtained in the finished piece if the primer is tinted to approximately the color of the gel lacquer. If a sealing action alone is desired, without appreciable increase of adhesion, a solution of

	Per Cent By Weight
½-Second Nitrocellulose	12.7
50% Shellac-alcohol sol	12.4
Butyl Phthalate	5.0
Ethyl Acetate	8.1
Denatured Alcohol	20.7
Cellosolve	17.2
Xylol	15.7
No. 3 Naphtha	8.2
	100.0

	Per Cent By Weight
½-Second Nitrocellulose	15.4
Bakelite Resin XR3180	7.2
Butyl Phthalate	5.0
Solvents	72.4
	100.0

	Per Cent By Weight
½-Nitrocellulose	17
Shellac	13
Butyl Phthalate	10
Ethyl Alcohol	8
Butyl Acetate	52
	100.0

	Per Cent By Weight
½-Second Nitrocellulose	7.3
Rezyl No. 12	6.8
Titanox A	7.4
Butyl Phthalate	3.8
Solvents	74.7
	100.0

10 per cent gelatin in water or a good grade of glue may be employed. This method not only seals the surface but also prevents the penetration of the gel lacquer solvent into the material. In general, a nonporous material such as metal will show less tendency to exhibit bubbles in the coating. Similarly, hardwood, being less porous than softwood, is a better material for cores.

For many types of articles the technique of gel lacquers has numerous advantages over the customary methods of dip lacquering. The most obvious is the thickness of coating deposited—up to 0.015-in. of dried lacquer per dip, as compared to the usual 0.001 to 0.002-in. It is certain that the phenomena of temperature gelation of a lacquer made from a high viscosity film former opens up many new and interesting fields in protective coatings.

REFERENCES

[1] Manufactured by Tennessee Eastman Corp., Kingsport, Tenn.

[2] U. S. patent 2,324,098 Malm and Clark; U. S. patents 2,350,742, 2,350,743, and 2,350,744 Fordyce and Clarke.

[3] Based on recommendations of Tennessee Eastman Corp., Kingsport, Tenn.

—o—

A group of ten extractors designed to remove broken pipe-threading taps is offered by Walton Co., 94 Allyn street, Hartford, Conn. Said to remove taps quickly and easily, the extractors are being manufactured for all sizes of pipe taps from 1/8 to 1 in. for both regular and interrupted thread styles. Both 4 and 5-flute styles are available as are extra fingers for each style.

Heat Resisting Steels

(*Continued from Page 79*)

steel is the familiar 18-8 stainless. Fig. 1 is also typical of such elements as molybdenum, silicon, titanium, and other ferrite formers, but in different amounts.

From the metallurgist's point of view, steels of the 18-8 class are of a radically different nature from the straight chromium steels. As is the case with all austenitic alloys, they have one characteristic property, namely, when quenched from a high temperature they are substantially nonmagnetic and in their softest condition instead of in their hardest condition as in the case of ordinary steels. Since they do not pass through the gamma-alpha transformation, they are nonhardenable.

This fact is more clearly explained by the phase diagram of Fig. 2. If 3 per cent nickel is present and the 18 per cent chromium alloy is heated, no phase change takes place at any temperature. If, however, 8 per cent nickel is present and the alloy is heated, a phase change occurs at about 350° C, and some of the alpha (ferritic) solid solution changes to gamma solid solution. If the alloy is heated still further, this allotropic change continues, until at 650° C all the alpha has changed to gamma. There is no further change even if the alloy is heated almost to the melting point. Now, if the alloy is cooled, the reverse change should take place, the gamma should start to transform to alpha at 650° C, and should be completely transformed at 350° C. Owing, however, to the sluggishness of the reaction, only a small amount of alpha is actually formed on cooling; this is relatively easy to suppress by rapid cooling and thus obtain an alloy that is entirely austenitic at room temperature. Manganese, or even cobalt, produces this sluggish transformation and therefore may be used in place of all or part of the nickel.

However, considerable larger amounts of these elements than nickel are needed for the same srtucture. For instance, a steel containing 18 per cent chromium and 15 per cent manganese is still partly ferritic instead of being wholly austenitic. Fig. 3 shows how the austenite field is enlarged by manganese. This diagram is also typical of nickel and cobalt, but in different percentages, and is in accord with the teachings of Dr. Bain who has shown these elements to be "austenite-formers".

Since the austenite does not transform in these alloys, heat treatment for increasing strength cannot be performed as in ordinary steels. In ordinary steels, the allotropic transformation from austenite to a ferritic or martensite structure produces the well-known hardening and strengthening which gives them such valuable properties as engineering materials. Austenitic alloys of the 18-8 type can only be strengthened by cold working. However, as will be explained later, some of the wartime super alloys can be strengthened to a certain extent by a different type of heat treatment.

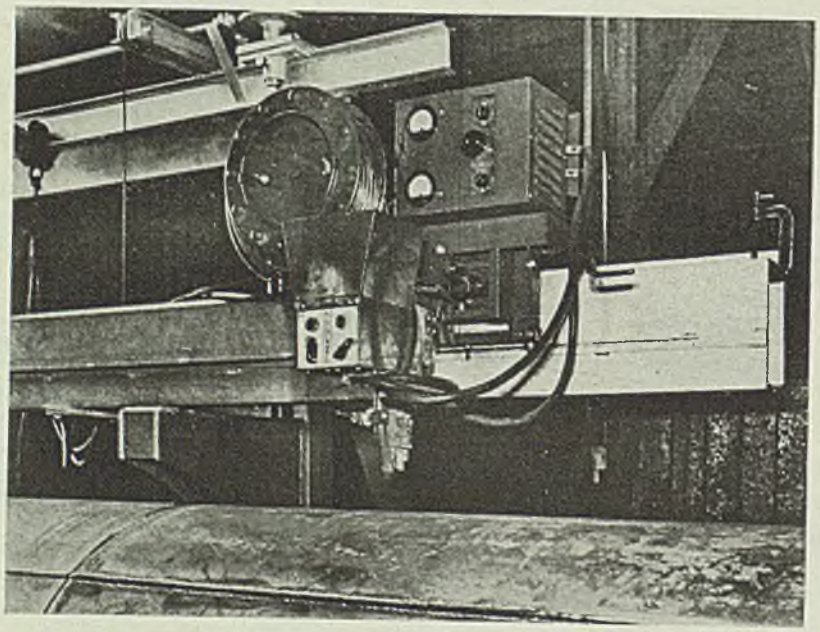
The only heat treatment used for 18-8 is rapid cooling from 1800-2200° F, if the carbon content is less than 0.10 per cent. This treatment produces a soft and ductile material of a wholly austenitic structure, with all the carbides in solution. Increasing the amount of nickel in the material to 14 per cent produces the greatest stability, since it promotes the austenite formation and retention. Bain has shown carbon to be an austenite-former also, and, as would be expected, increased carbon produces the same effect.

Increased Carbon Not Advantageous

It is not advantageous, however, to increase the carbon content too much because the excess carbides tend to precipitate out of solution at the grain boundaries. This leaves the grain boundaries impoverished of chromium and subject to attack by a corroding medium (a condition often referred to as intergranular corrosion). Fig. 4 shows the manner in which carbon promotes austenite formation, and also the manner in which the excess carbides are formed as carbon content increases. The tendency for chromium carbides to form is not surprising, since Bain's work has shown that chromium is one of the elements which has definite carbide-forming tendencies. Other such elements are molybdenum, tungsten, vanadium, columbium, and titanium, all having increasingly greater carbide-forming tendencies than chromium, and also manganese, whose carbide-forming properties are slightly weaker than those of chromium.

Increasing both chromium and nickel so that the material has a composition between 20-25 per cent chromium and 10-20 per cent nickel, increases the strength at elevated temperatures. (See accompanying table). In these high alloy steels the carbon content may be raised to 0.20-0.25 per cent maximum for wrought materials, and 0.50 per cent for castings. Their room temperature static properties are about the same as for 18-8 material when subjected to similar heat treatment. Increasing chromium to about 25 per cent and nickel to about 12 per cent also increases the strength but decreases ductility. With 12 per cent nickel, good heat resistance is also obtained.

Low carbon 18-8 has a creep stress of at least three times, and in some cases ten times the creep strength of pearlitic and ferritic steel for 1 per cent



AUTOMATIC WELDING SETUP: This Lincolnweld installation at Heintz Steel & Mfg. Co., St. Louis, is used in fabrication of pressure vessels such as butane tanks. Structure is rotated at predetermined welding speed by power driven rolls located on rails for easy positioning. Work is manually or automatically welded in any direction without removing it from fixture. Welds are made in 3/8-in. plate using 7/32-in. bare wire electrode which, along with the welding equipment, is supplied by Lincoln Electric Co., Cleveland. Illustration shows closeup of automatic controls, electrode reel and method of mounting on beam

Oakite offers practical help to you in CLEANING or SURFACE CONDITIONING work or parts fabricated from STAINLESS STEEL

In plant after plant fabricating parts from stainless steel, the wide and successful use of Oakite materials designed for cleaning and conditioning surfaces, for use as coolants in machining and grinding operations or for neutralizing after pickling, has resulted in accumulating valuable experience, a small part of which is briefly referred to on this page.

If you are performing any of the operations described, our Technical Representative in your locality can be of service in submitting recommendations that should prove helpful in reducing unit cost and in obtaining improved results. Your problems invited and promptly answered.

Cleaning Stainless After MACHINING

Lubricants used in drilling, tapping, reaming, milling or other operations on stainless steel are easily and rapidly removed by various specialized Oakite cleaning materials used either in connection with dip tank, electro-cleaning method or in automatic washing machine. Enlist Oakite experience.

Cleaning Before ANNEALING

In drawing chromium nickel stainless, the lubricants used should be removed before annealing. Neglect to do this results in formation of a crusty scale. Dip tank, anodic or automatic washing machine cleaning with recommended Oakite materials does fast, low-cost job. In spinning stainless, same cleaning operation is good practice to remove spinning lubricants before work is annealed.

WET GRINDING Stainless

For keeping work cool and wheel free cutting in wet grinding, use Oakite Soluble Oil in recommended dilution. It provides a stable emulsion and may be used in a wide range of dilutions.

Cleaning Before BLACKENING

Before the application of color, blackening or similar chemical finishes to stainless steels, either for increasing corrosion resistance or appearance, or both, it is extremely important that all oil, grease, scale and other foreign matter be completely removed. Dip tank or automatic washing machine method, using recommended Oakite materials will help you do this work quickly, and economically.

Cleaning After Oil QUENCHING

Where oil quenching follows annealing, parts or work may be immersed in recommended Oakite cleaning solution to remove oil quickly and thoroughly to condition work for subsequent operation.

NEUTRALIZING Stainless After PICKLING

After acid pickling procedure to remove scale, thorough rinsing and neutralizing should follow. To help you handle this work on a fast, low-cost, efficient basis various performance-proved Oakite materials are available to put parts or work in prime condition for subsequent operation.

Oakite Products, Inc., 26 Thames Street, New York 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* **CLEANING**

MATERIALS • METHODS • SERVICE

CREEP STRENGTH OF STAINLESS STEELS

Temp. ° F	0.11% C 12% Cr	0.10% C 17% Cr	0.06% C 18-8	0.12% C 25-20
	Stress Causing Creep Rate of 1% Elongation in 10,000 Hrs			
900	....	....	24,000	....
1000	13,000	8500	17,000	....
1100	5200	5200	11,550	....
1200	2100	2100	7000	7400
1350	1200	1200	3000	3300
1500	....	....	850	1100
	Stress Causing Creep Rate of 1% Elongation in 1000,000 Hrs			
800	....	....	25,300	....
900	....	....	18,000	....
1000	10,000	7000	11,500	....
1100	4000	4500	7100	....
1200	1600	1600	4250	5400
1350	900	900	1600	2800
1500	....	....	....	800

elongation in 10,000 hours above 1000° F. The addition of 8 per cent or more nickel about triples the creep strength of the high chromium steels in the range between 1100° F and 1500° F, this can be seen in the accompanying table. From the table it can also be seen that the higher alloy steels (20-25 per cent chromium and 12-20 per cent nickel) have a higher creep strength than the 18-8 material. Increasing carbon also increases creep strength.

Austenitic chromium-nickel steels have been modified by the addition of certain alloying elements in the interest of improving resistance to elevated temperatures, intergranular corrosion, welding characteristics, and certain other specific properties. Silicon, for instance, is introduced into chromium-nickel steels to prevent oxidation of the chromium in high temperature service. Dr. Bain has shown that silicon provides oxidation resistance to several heat-resisting compositions. Toughness, however, is seriously reduced by silicon in excess of 2 per cent, especially at high temperatures. This is probably due to the formation of ferrite, since Bain has shown that silicon is one of the elements which promotes the formation and retention of ferrite.

Silicon above 1.5 per cent increases the difficulty in hot working wrought steels, but this amount is sufficient for improved resistance to scaling. Since 18-8 steels have a coefficient of expansion which is almost 50 per cent greater than that of ordinary steels, repeated heating and cooling causes the scale to flake, permitting progressive oxidation. With about 0.5 per cent silicon, the loss due to scaling at 1800° F may be as much as 8000 milligrams per square decimeter per day. With 2½ per cent silicon, it is reduced to about 50 milligrams per square decimeter per day. Silicon is also added to 25-12 and 25-20 chromium-nickel steels to improve resistance to oxidation.

Tungsten modified 18-8 increases hot strength. However, not more than 4 per cent should be used if this steel is to be hot worked economically. Addition of 0.3-1.5 per cent tungsten renders the alloys partly ferritic, regardless of the rate at which they are cooled from the heat treating temperature, and also increases the resistance to intergranular corrosion. The addition of 2-4 per cent molybdenum will also improve hot strength and resistance to intergranular corrosion, and in fact, is better for that purpose than tungsten.

Both tungsten and molybdenum have been shown by Dr. Bain to be stronger carbide formers than chromium, and it is therefore probable that the resistance to intergranular corrosion which they impart may be due to the fact that tungsten and molybdenum carbides are formed in preference to chromium carbides, thus leaving all the chromium available for corrosion resistance. Formation of the ferritic constituent by both these additions may cause difficulty in hot working since it is accompanied by a loss of ductility, but this can be partly counter-balanced by increasing nickel from 8 to 10 per cent.

Increases Strength of Steel

In general, both tungsten and molybdenum increase the strength of the austenitic chromium-nickel steels at elevated temperatures. Although they both retard the development of the condition which produces intergranular corrosion, neither is sufficient for that purpose, and neither is considered a solution to the problem.

Columbium and titanium are also used as additives to secure immunity from intergranular attack. Titanium is a powerful carbide-forming element, and consequently is not used in excess of about four times the carbon content. Columbium is not as strong a carbide former as titanium and is used in the amount of about ten times the carbon content. For best results carbon is kept at 0.07 per cent maximum and columbium between 0.70 and 1.0 per cent. These effects of titanium and columbium are in accord with the teachings of Bain, who has shown these elements to be the most powerful carbide formers of all. In fact, the maximum solubility of titanium in pure gamma-iron is about 0.75 per cent.

Both columbium an titanium tend to increase the proportion of high temperature ferrite in austenitic 18-8 steels, and consequently 2 per cent more of nickel or manganese or both are added in order to make the steel substantially austenitic at rolling temperatures. This prevents tearing, and in general, improves rolling characteristics. Since titanium is a strong deoxidizing agent while columbium is not, the former is not added to steels for welding rods because it would be lost in the welding process. Both titanium and columbium bearings steels are welded with columbium bearing rods.

Sulphur additions of the order of 0.20-0.40 per cent and selenium additions of the order of 0.20-0.30 per cent are also added to 18-8 steels to improve machinability. Both tend to reduce the frictional effect of the chromium which causes chips to cling to the tool, and both decrease the work hardening tendencies of the 18-8 material. Also, the inclusions act as maniature notches to aid in breaking off chips of metal by shear. Elongation, reduction of area, and impact resistance values are lowered by sulphur but not by selenium and selenium is therefore preferred.

The above modifiers may be used singly or in combination. Molybdenum-columbium bearing steels for instance are not uncommon. When used in conjunction with molybdenum, is is permissible to reduce the columbium to carbon ratio somewhat, say from 10:1 to 6:1. It must be remembered however, that the addition of strongly ferrite-forming molybdenum, plus either columbium or titanium which are also ferrite formers, requires the increase of the nickel or manganese content in order to restore the austenitic character of the steel.

The knowledge of the fundamental effects of the additions of the various alloying elements just described, has been used to great advantage in designing most of the super high temperature alloys developed during the past few years. This has been particularly true in the case of wrought alloys.

Bulk of these alloys contains at least 16 per cent chromium for oxidation resistance and at least 20 per cent nickel for the promotion and retention of austenite. Large additions of cobalt of the order of 20-40 per cent have also been used for this purpose and have further been found to be very effective in producing high strength at elevated temperatures. Most of the best wrought alloys contain cobalt in these amounts. Small manganese additions of about 2 per cent are also generally added for austenitizing purposes.

Carbon contents vary between about 0.07-0.35 per cent depending upon the combination of strength and forgeability

Red Lead halts Rust-Producing ELECTRO-CHEMICAL ACTION

The invisible safeguard against corrosion
This diagram shows the interfacial-film, located at the metal and paint-film interface. The formation and the maintenance of this shield by Red Lead halts electro-chemical action . . . safeguards the metal against rust.

No other protective paint for metal has ever known such wide acceptance by industry, through the years, as Red Lead. And recent scientific research has disclosed that Red Lead's outstanding performance results from basic characteristics of the pigment itself.

Not the least important of these is the ability of Red Lead to halt electro-chemical action — the fundamental cause of rusting.

In this action weak currents are generated, due to physical and chemical differences in the metal and to other factors. These lead to corrosion of the iron.

These factors are always present, but their effects are eliminated by Red Lead.

Here's what happens: Red Lead, because of its singular composition, possesses properties which enable it to form a compact, tightly adherent, protective film, located at the interface of the metal and the paint coating. See cross section diagram above.

This film — so thin that it is not apparent to the human eye — is in very intimate contact with the metal, and its formation halts electro-chemical action — and the corrosion of the metal.

Once formed, it is essential that the continuity of the film be maintained — if the shield is to be effective. When Red Lead pigmented paint is used, any small breaks in the protective shield, due to abrasive action or otherwise, are readily healed. The metal remains in a rust-inhibited condition as long as Red Lead coats the surface.

Specify RED LEAD for All Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal, if it contains Red Lead.

Write for New Booklet "*Red Lead in Corrosion Resisting Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 8; Chicago 80; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va. (Evans Lead Division).

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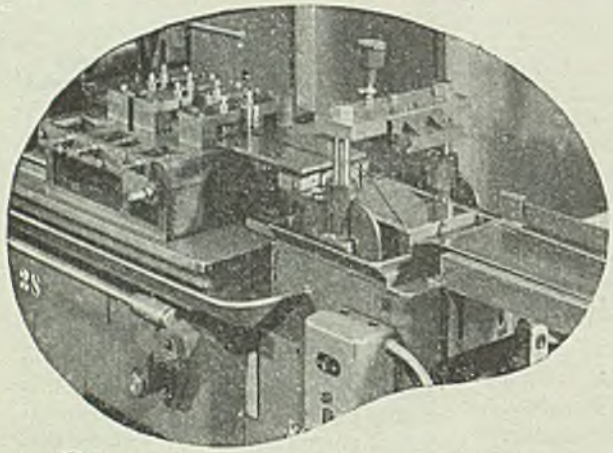

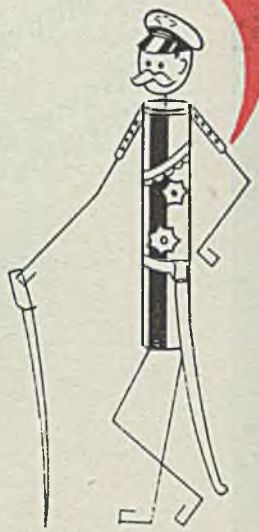

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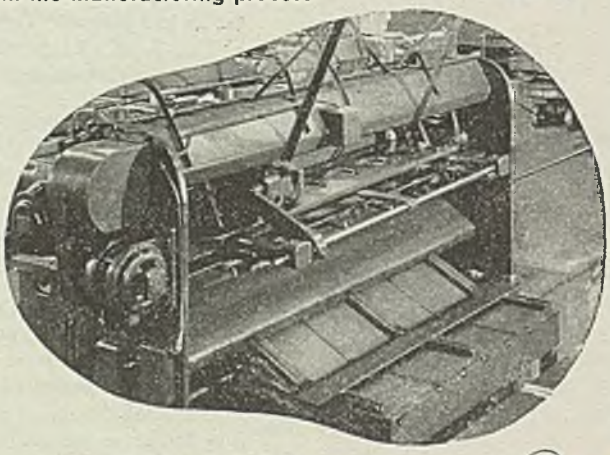
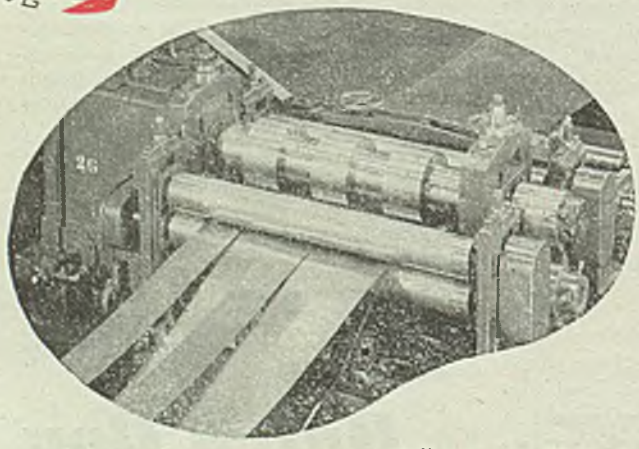
Heavy-duty edgers used at the Gensco Plant are manned by skilled steel warehouse men. Strip steel can be round edged to your exacting requirement. To the user this service frequently means a reduction of one or more steps in the manufacturing process.

STEEL SHEARED TO ANY SIZE . . .

Sheet and Strip Steel can be sheared in any size to the customer's specifications. Many steel users prefer this Specialized Gensco Steel Service.





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Modern Slitters provide Gensco customers with strip or sheet steel in any desired widths . . . for any fabricating task. Up-to-date machinery assures steels of greater uniformity and precise dimensions.

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COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTH • SHEET STEEL
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ROUND WIRES • TEMPERED AND ANNEALED SPRING STEEL
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desired. High carbon content improves strength, but generally has a deleterious effect on the working properties of these alloys.

Molybdenum and tungsten are used for improved heat resistance either singly or in combination up to a total of about 6 per cent or even higher. These elements strengthen the alloys both by their solid-solution effect and by the formation of carbides.

Small additions of titanium and columbium, singly or in combination, are almost always added to stabilize the carbon content by the formation of carbides. The entire composition is balanced however to give a single phase austenitic matrix.

For best properties at temperatures up to about 1350° F, these alloys are generally strengthened by "cold" working at about 1200-1300° F. At higher operating temperatures these "cold" worked properties are rapidly lost, but it has been found possible to strengthen these alloys for such service conditions by an age hardening treatment.

This treatment consists of three steps. First, the material is heated to a high enough temperature to put all the carbides and excess constituents into solution, generally about 2200° F. Then the material is rapidly quenched usually in water, in order to retain them in solid solution. In the final step the material is aged by holding it for periods of time varying from several hours to as many as 50 hours in some cases at a temperature in the neighborhood of the expected service temperature. The aging permits the carbides and excess constituents to reprecipitate from solution. If the treatment is properly performed this precipitate comes out as a fine, critical dispersion in both the grains and in the grain boundaries to strengthen the material, and to increase its resistance to slip and deformation at high temperatures.

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Electronics as Applied For Industrial Purposes

Electronics in Industry, by George M. Chute; cloth, 461 pages, 5 x 8¼ inches; published by McGraw-Hill Book Co. Inc., New York, for $5.

Purpose of this volume is to give a broad introduction to the use of electronic circuits and equipment. Intended mainly for men in industry, the book outlines industrial uses of tube circuits and gives detailed explanation of a large number of electronic equipment now serving in industrial plants.

No previous knowledge of tubes is assumed and tubes are introduced gradually in simple operating circuits, to acquaint the reader with the purpose of electronic equipment before exploring the nature of the tubes. No mathematics except simple arithmetic is used.

This book will supplement rather than duplicate the material found in other texts. By explaining many kinds of complete circuits it aims to awaken interest in various phases of industrial electronics so that the reader is encouraged to use other texts to obtain more complete coverage.

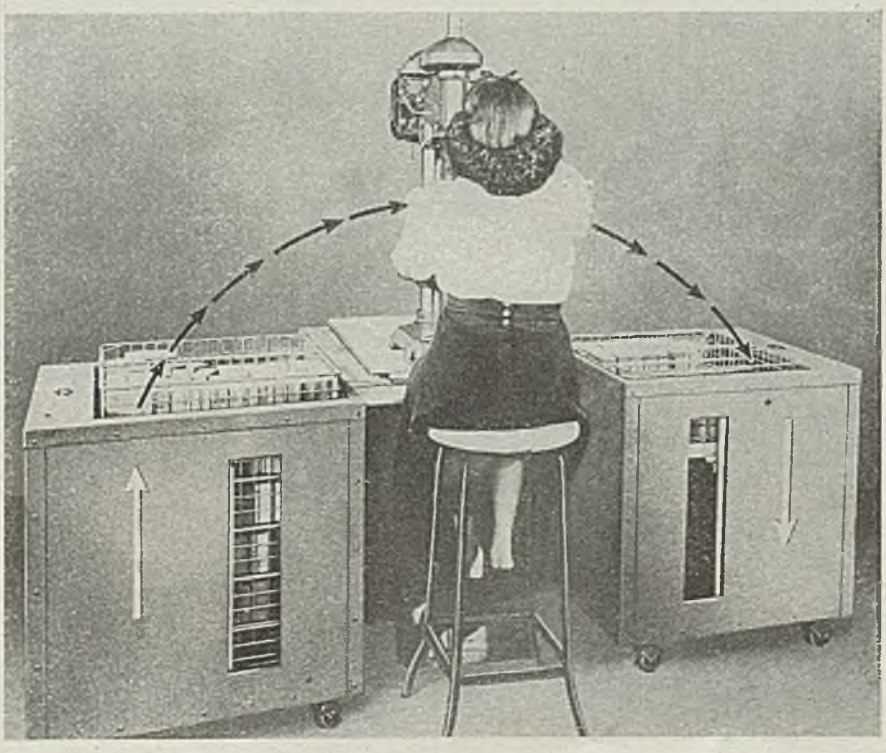
Spring-Powered Rack

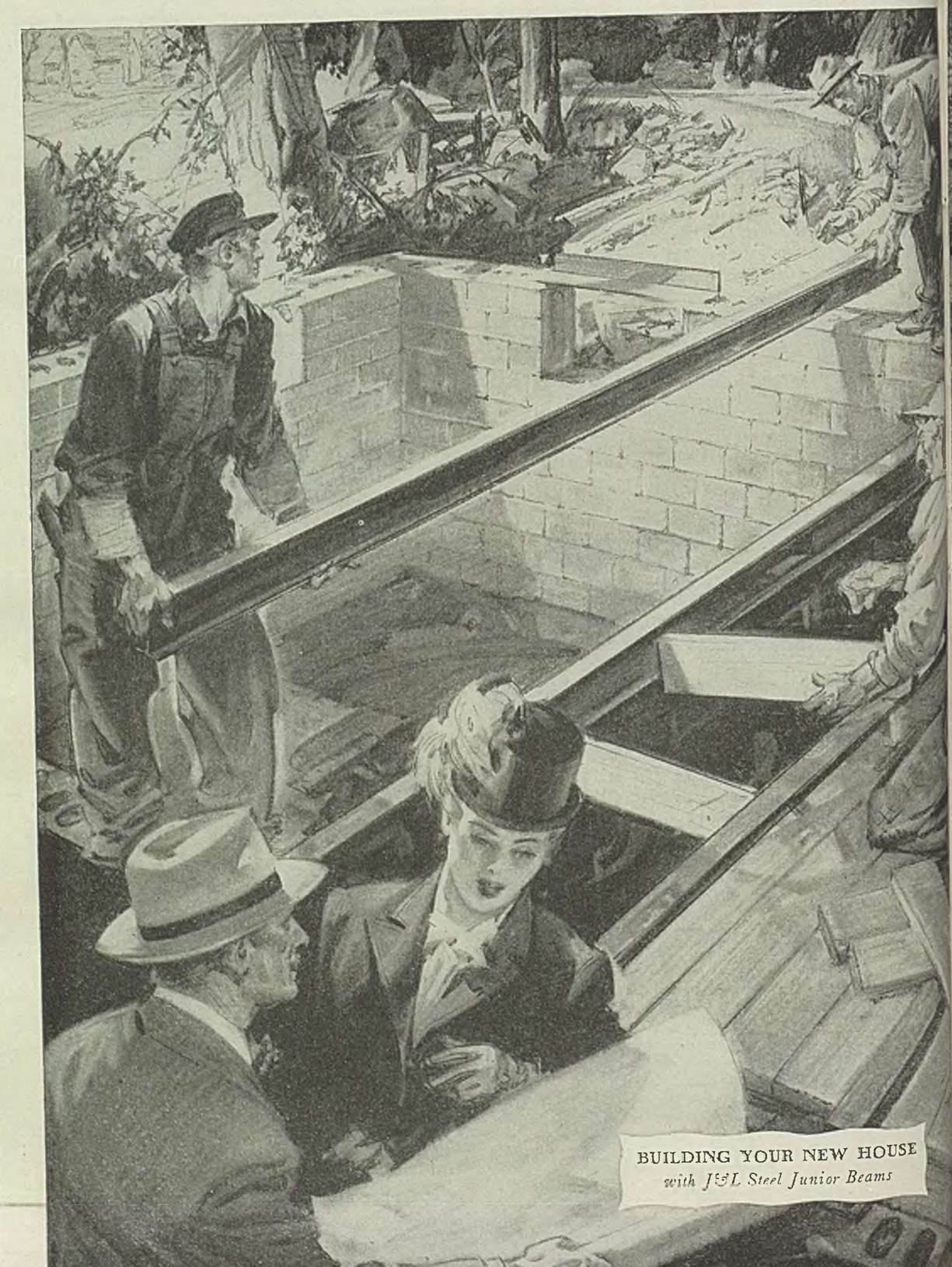
Combines Material Handling, Storage and Transportation

SELF-LEVELING material racks shown in the accompanying photograph were developed by Lowerator Division of American Machine & Foundry Co., New York, to assist machine operations, parts assembly, storage and transportation.

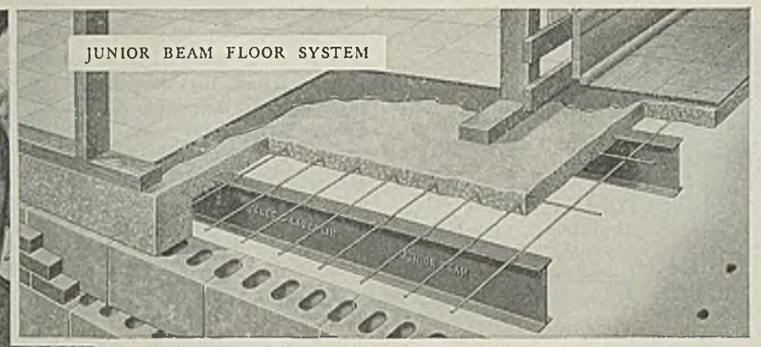
Units on either side of machine operator are activated by calibrated spring mechanism that maintains racks constantly at convenient working level. As trays in rack at left are emptied, they automatically rise to working level; finished parts placed in racks at right cause trays to depress into rack. Filled rack can be rolled away and used as storage unit. No outside power source is required.

Reloading is accomplished by placing material on platform where it automatically finds its proper level. Loads are changed by unhooking one end of the springs which are reached through doors. Parts or materials may be placed in tote boxes or directly on platform.





DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON



STEEL JUNIOR BEAMS FOR FLOORS OF YOUR NEW HOUSE CAN BE SHIPPED AT ONCE FROM J&L WAREHOUSES

A J&L steel Junior Beam floor will give strength and long life to that new house of yours at no extra cost. The steel beams for this unique floor system are waiting for you now at the nearest J&L warehouse. Junior Beam steel-and-concrete floors provide a rigid, vibration-free, shrinkproof floor system as an integral part of the house foundation. They form a firestop between the basement and the remainder of your house. Also, they prevent moisture from rising through partition walls.

With Junior Beam floors you eliminate settling caused by shrinking of wooden joists. Consequently, your beautiful plaster walls and ceilings will not be marred by unsightly cracks. Your doors and windows will not twist and stick. Junior Beam floors reduce the hazard of fire. They protect from termites, mice and other vermin.

Now is the time, in the blueprint stage of your hopes and plans, to consult your architect or builder about the fine, solid floor system provided by these exclusive J&L light structural steel members. You will appreciate them for the expense they save on upkeep. Their long life will protect your investment in your home for many years.

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STOUT STEEL FLOORS

Simplicity of placing Junior Beam floors is demonstrated in large illustration. Steel beams though strong are light, can be handled easily by one or two men. Wooden form is built around beams. When concrete is poured it forms solid cap over foundation of house. Small, cut-away drawing above shows Junior Beams, reinforcing rods, concrete slab and detail of partition wall that will interest your architect and builder. It also shows parquet hardwood floor laid in mastic. Provision can be made just as easily to place nailing strips in concrete to receive conventional floor. Carpets, linoleum, tile, terrazzo, composition block coverings are readily laid on this slab, too.

Steel-and-concrete floors available now. Junior Beams are being stocked in seven strategically located J&L Warehouses in New York, Chicago, Cincinnati, Detroit, Pittsburgh, Memphis and New Orleans.

Hollywood studio technique will be adopted by University of Illinois in new housing demonstration center and production yard. It will provide unlimited possibilities for experiments which cannot be done in individual homes. Complete homes or houses without roofs or with cut-away sections for study and photography can be built on the "set."

Junior Beams and Channels, exclusive Jones & Laughlin products, are structural steel sections literally "junior" to the well-known heavy structural members. Rolled on a J&L designed bar mill, they afford strength with minimum weight. Junior Beams have fiber stress of 18,000 pounds per square inch, yet 10" beam weighs only 9 lbs. per foot compared to 25.4 lbs. per foot for same size standard beam.

Ornamental stairs in many houses are fabricated from J&L Junior Channels. They give rigid support to slate, tile, marble, or terrazzo treads, risers and heavy wrought railings. Junior Channels and Jal-Tread checker floor plate provide non-skid, fireproof basement stairs.

Your recreation room will be more attractive in your Junior Beam house. The underside of the concrete slab and the beams, when painted, provide an attractive ceiling. Electrical conduit can be concealed in the slab itself. If you wish, metal lath can be clipped to underside of beams and ceiling plastered as in any other room.

Booklets available on Junior Beams and Junior Channels. Prospective owners, contractors, engineers, architects will be interested in folder "Nine Simple Steps," showing how easily Junior Beams are installed. Other booklets, "Engineering Data," "Junior Channels" and "Floors for Residences," give additional information. For copies write Publicity Manager, Jones & Laughlin Steel Corporation, Pittsburgh 30, Pa.

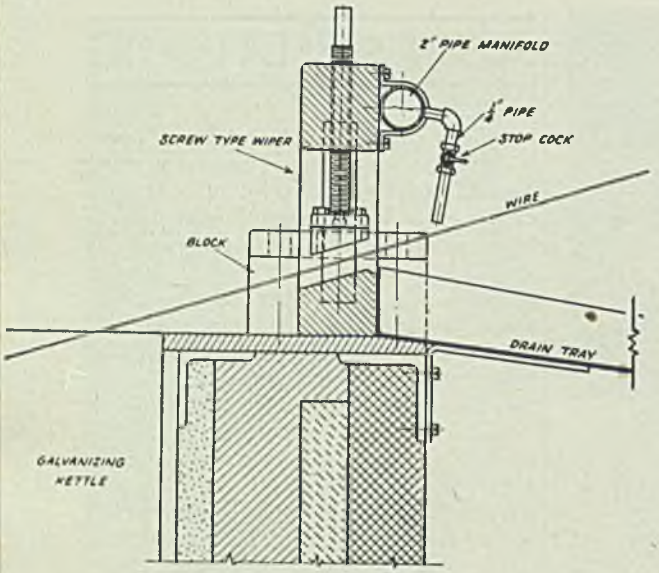


Fig. 35 (left) — Standard water quench for silver bright wire

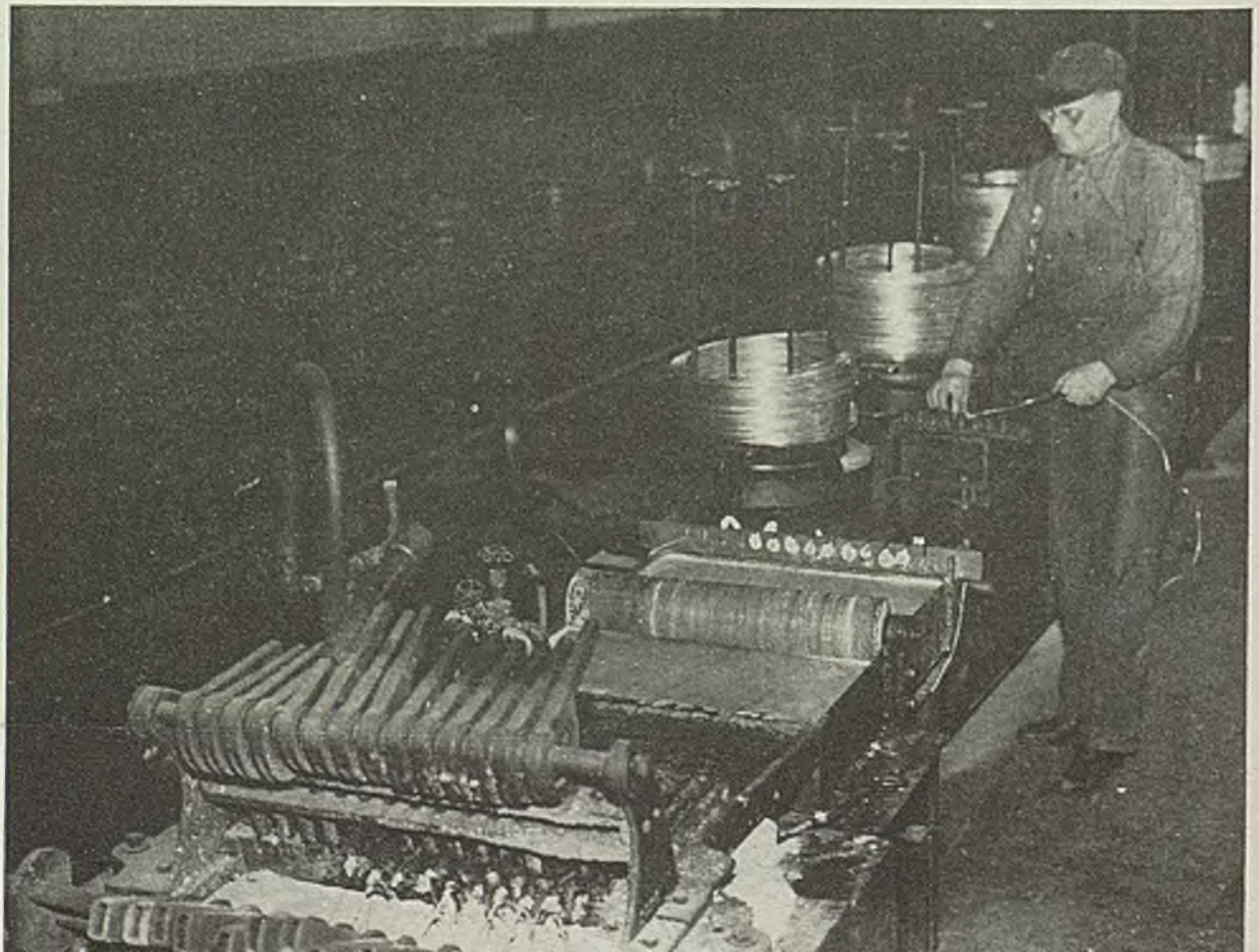
Fig. 36 (below) — A single-pan galvanizing unit. Wire passes through molten zinc, a set of wipers and water rinse before passing on to take-up reels

Hot-Dip Galvanizing Practice

By WILLIAM H. SPOWERS JR.
President
Spowers Research Laboratories Inc.
New York

ART of galvanizing wire has undergone many radical changes of late years, because of a combination of circumstances. Upon the development and adaption of deep-fired full-capacity settings and the perfection of the No. 20 neutral fluxing technique, the wire galvanizing industry found itself in a position to offer heavier coats of tighter and more ductile bonds. This situation was followed by an insistence on the part of purchasers to secure coats of higher quality. As rapidly as these improvements were developed, better grade wire was demanded by consumers.

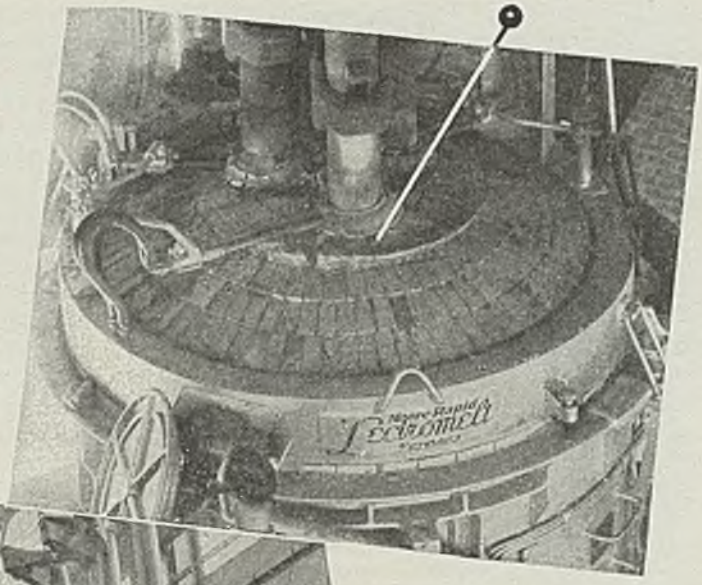
Straight wire galvanizing is a continuous technique. The wire first is an-



Costs Cut

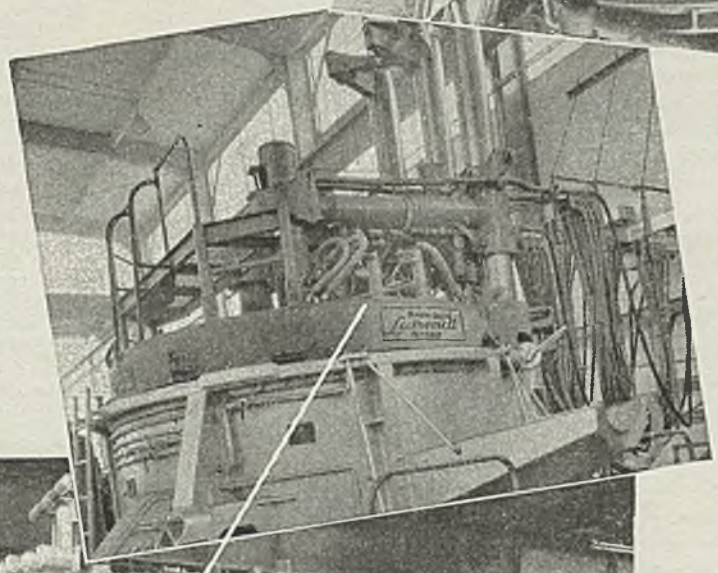
BY ECONOMICAL METAL MELTING . .

Lectromelt Furnaces have proved conclusively three points of Economical value.



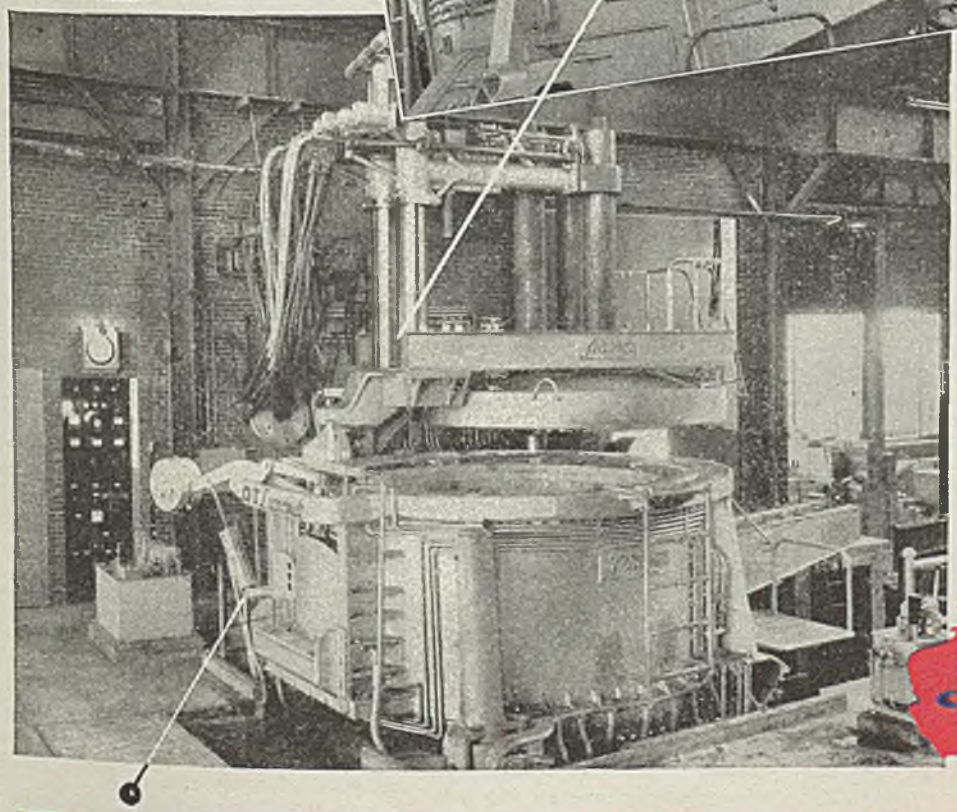
ELECTRODE CONSUMPTION

Users find that electrode consumption during operation of Lectromelt Furnaces is 14% less than with fixed roof furnaces on the same type of work. One user reports as much as one-third reduction in electrode consumption.



ROOF LIFE

Users of Lectromelt Furnaces have found that roof life with top charge furnaces is 18% longer than with door charge furnaces on similar production.



POWER CONSUMPTION

In instances where top charge Lectromelts have replaced door charge furnaces of equivalent shell capacity savings of as great as 50 KWH per ton have been realized.

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nealed, either in double pans or open furnace, then pickled in hydrochloric acid, washed in clear running water, fluxed, galvanized, wiped, and reeled.

The annealing operation is accomplished preferably in two lead pans, held at temperatures which will yield the desired degree of anneal. The temperature of the lead bath in the first pan is approximately 1000° F for a dead soft anneal and 1300° F for a semianneal. The lead bath in the second pan is held at about 1300° F for a dead soft anneal and 800° F for a semianneal.

The method of firing these lead pans is not of great importance for there are no such problems as dross control, life of pan, etc., as is the case with a zinc kettle installation.

The wire then passes to the pickling operation which is of great importance. Hydrochloric acid is universally used because of the speed of action required. The strength of the acid is adapted to the length of the tub as is the temperature. The shorter the tub, the higher the strength of acid and the higher the temperature.

Upon the adoption of the strength and temperature suitable for the operation, additions of acid are made until the iron content reaches approximately 0.5-lb per gallon. The temperature then should be raised sharply for a short period of time without further additions of acid. This procedure will use up all the free acid before dumping the solution.

Because of the necessity of absolute constancy in this entire technique, suitable testing equipment should be available and the acidity of the bath determined at frequent intervals. Inhibitors are not generally used in this operation.

After the wire has been freed of its oxide by the muriatic acid, it must be washed thoroughly in clear running water. This washing operation is important inasmuch as its function is to protect the flux bath from any contamination which will result in excess dross accumulation in the galvanizing operation.

The next step is the flux bath upon which depends, to a large extent, the meeting of specifications. This tank is filled with a solution of zinc salts, known as No. 20, this material will not contaminate the kettle and form dross as will muriatic acid.

Absolute Cleanliness Important

With the use of No. 20 flux it is not important that the rinse water be heated, although it is preferable in order to maintain continuity of temperature. The most important feature of this step is absolute cleanliness and freedom from iron, as will be seen later.

Use of neutral fluxes for galvanizing is becoming popular where the proper technique is thoroughly understood. The proper preparation and use of this neutral flux is a relatively simple operation and one which will effect in every case economies in dross losses in the bath.

The largest contributing factor in the formation of dross in galvanizing kettles is the salts resulting from the use of the pickling acid. These salts are high in iron and are of such a nature as to rapidly contaminate the fluid zinc and turn it to dross. As a matter of fact, fully 50 per cent of the dross made in many galvanizing operations where active fluxes are used is traceable to these iron salts.

Details for the use of No. 20 flux for straight wire galvanizing are as follows:

In the first place the wire after pickling must be washed thoroughly to remove the iron salts resulting from the use of the pickle. The wire then must be immersed promptly in the flux bath before there is a chance for it to rust or dry.

The flux bath should be prepared as follows: The gallonage capacity of this tank should be determined. A mixture of approximately 1½ lb of No. 20 flux to a gallon of water should be made. This percentage will result in a gravity of 10° Be at 150° F. Additions of water and No. 20 flux should be made to maintain this degree Baume. The bath should be kept constant at approximately 150° F.

No drying operation between the flux bath and the kettle is needed, but in case of high-speed operation the wire may be drawn through a bed of waste or similar material to remove the excess flux. The galvanizing kettle is dammed off a few inches beyond the entrance point of the wire.

Sufficient flux will be carried over on the wire to maintain a volatile bath cover at the entrance end of the kettle and keep away from this point any accumulation of zinc oxides.

To obtain uniform bond between the wire and zinc coat, a thoroughly clean wire must enter clean zinc. The wire must not come in contact with any foreign matter, such as dirt, zinc, oxides, etc., between the time it leaves the flux bath and the time it enters the molten zinc. Therefore, maintenance of a clean bath surface at the point of entrance is absolutely necessary, and a valuable function of this flux. The amount of volatile cover on the portion of the bath where the wire enters is controlled by the Baume of the flux wash bath which may be raised or lowered as desired.

The density in degrees Baume should be kept high enough and no more to result in a small billow or wave of flux blanket at the entrance point of the wire. This will maintain a clean surface under the wire and the cover as it grows will protect the adjacent surface on the entering side of the dam and avoid the formation of costly zinc oxide.

A similar dam is placed in the kettle just before the exit point of the wire. These dams are constructed of a rather heavy gage steel sheet attached to a crossbar of angle iron and made just slightly wider than the width of the

(*Please turn to Page* 126)

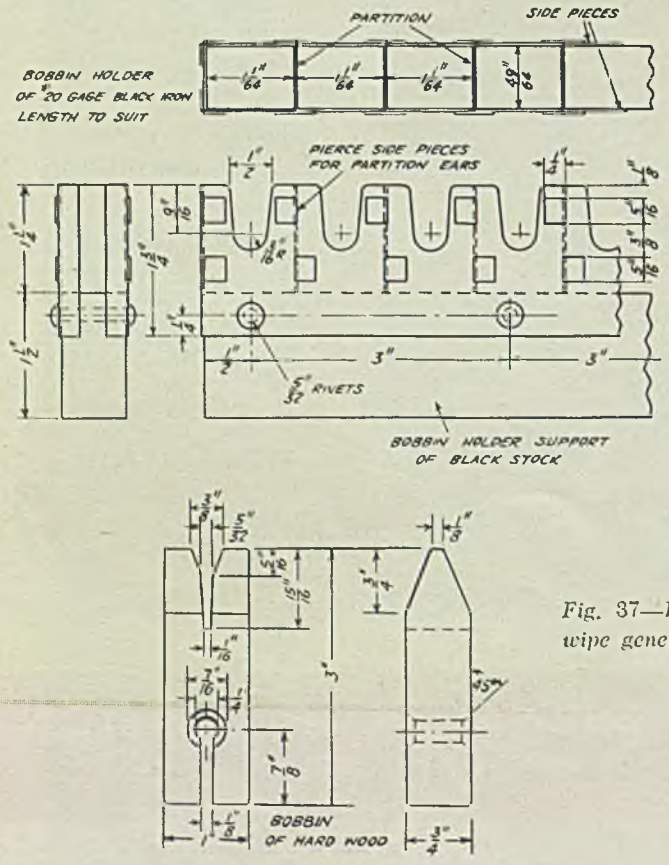


Fig. 37—Details of bobbin wipe generally used on fine wire

Notice the sound design and rugged construction of this Saflex Switch Unit

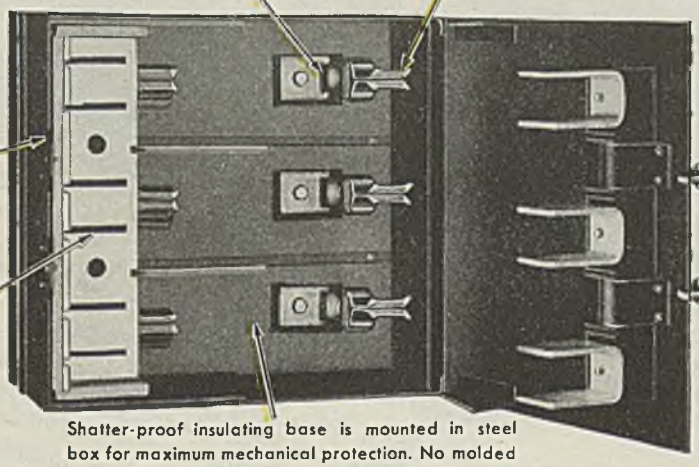
A good reason for choosing Saflex Distribution Panelboards

Solder-solderless lugs can be used either as solderless connectors or as solder lugs or both. Furnished on all except 30 ampere, 250 volt units.

Positive pressure fuse clips have high conductivity and assure automatic contact pressure at the fuse terminals without auxiliary parts.

Cam-action provided by handles near switch jaws where it is most needed. This cam-action supplies (with minimum manual effort) the considerable force necessary to provide high contact pressure.

Cover can be locked in either the ON or OFF position by means of a padlock on the bracket.

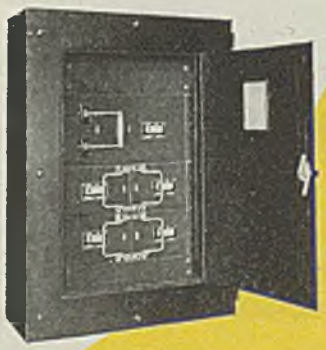


Arc suppressor block greatly increases the rupturing capacity.

Ranging from 30 to 600 amperes, Saflex Switch units are for use in systems up to 575 volts A.C. or 250 volts D.C.

Shatter-proof insulating base is mounted in steel box for maximum mechanical protection. No molded parts are exposed when cover is closed.

● Notice how simplicity, sturdiness, and safety are built into Saflex Switch units. Opening and closing unit doors operates switch units. Door is permanently anchored; it carries switch blade assembly only, and covers all live parts when closed. When door is open, all accessible live current-carrying parts are dead. All circuits may be opened safely under maximum load. All poles are broken simultaneously, preventing single-phasing. All units except 600 ampere size have rotary switch units. Yale locks on panel cabinet doors prevent unauthorized access. • For fast, simple installation, panel box has oversize wiring gutters and may be shipped separately for roughing in during early stages of construction. Interior and front are separate units, and may be installed later.



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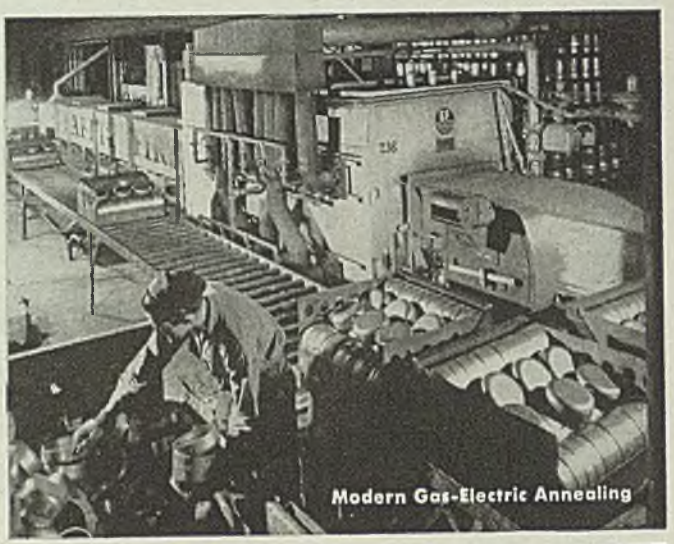
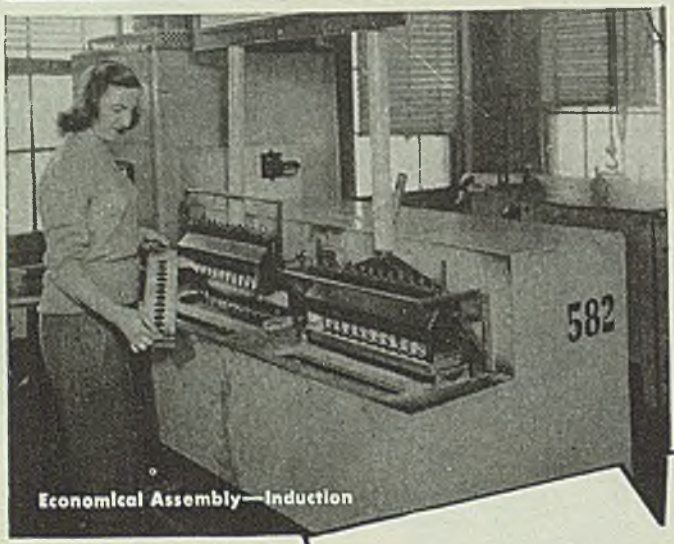
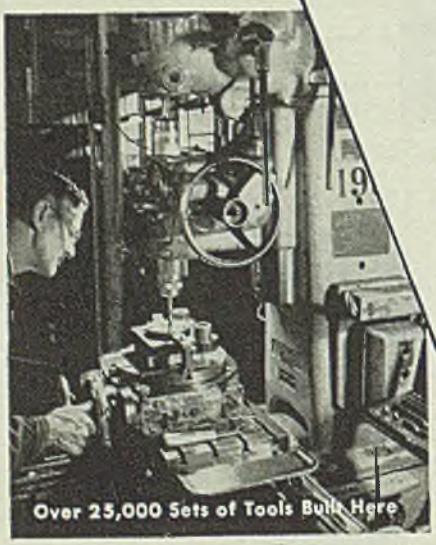


Modern Gas-Electric Annealing



Economical Assembly—Induction

Aluminum Heat-Treating by Controlled Temperature



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Aluminum Melting Furnace

Pattern shops, smaller foundries and other plants can make good use of the gas or oil-fired aluminum melting furnace, immediate right, manufactured by Kindt-Collins Co., 12651 Elmwood avenue, Cleveland 11. Designed for moderate production needs, the furnace in 50 or 100-lb capacity units, is also used as supplemental equipment for large foundries. Aluminum can be melted in and poured directly from the alloy metal pot, minimizing agitation and resulting porosity.

Steel 10/28/46; *Item No.* 9882

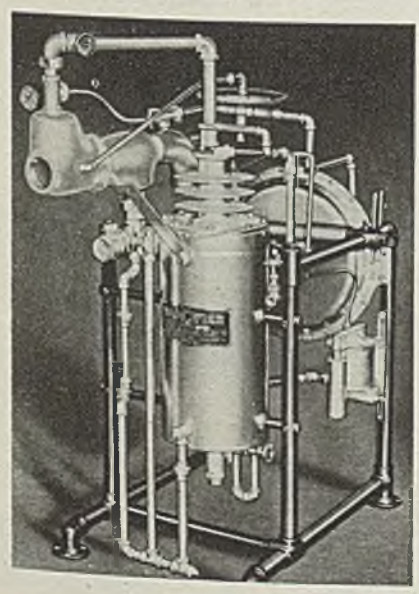
Fluid Motor

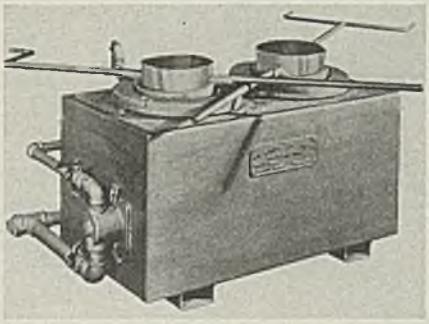
Rotary power with controlled variable speed, particularly where shock loads present problems, are furnished by the fluid motor, extreme right, manufactured by Denison Engineering Co., Columbus 16, O. Available in 3 and 5 hp capacity, completely self-lubricating motor is self-starting, can be instantaneously reversed and operates efficiently in either direction. To meet rapid traverse requirements a plunger device interlocked with a speed control valve permits instant acceleration from any preset speed to full speed.

Steel 10/28/46; *Item No.* 9879

Gas Generating Unit

Utilizing fuel oil, the gas generating unit, directly below, generates and supplies a vapor which is then mixed with air and is piped, burned and controlled in exactly the same manner as utility gas. Called Vapofier, the unit manufactured





by Vapofier Corp., 10316 South Throop street, Chicago 43, can serve as a standby for all industrial gas heat processing operations, or as a mixer of utility gas. It is made in eight standard sizes with capacities of 70,000 to 2,000,000 Btu's per hour.

Steel 10/28/46; *Item No.* 9880

Spring Steel Nuts

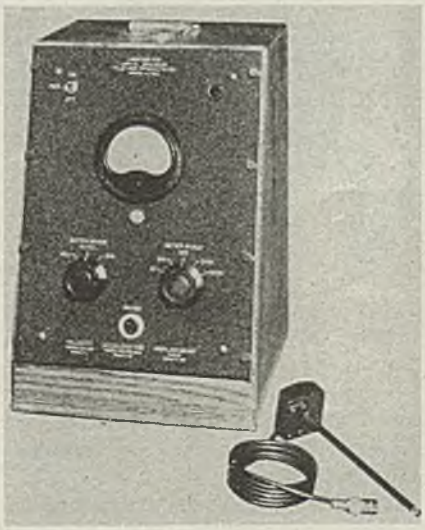
All sizes required to fit the most popular sizes of machine screws and sheet metal screws are included in a new line of heat treated spring steel speed nuts manufactured by Tinnerman Products Inc., 2039 Fulton road, Cleveland 13.

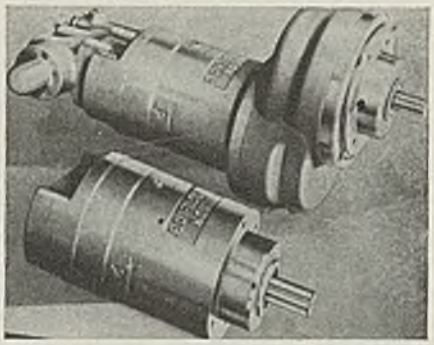
Known as C7000 series, this line is engineered to a formula based upon diameter and strength of screw with which it is used. As a result, these nuts are compact, withstand high torque tightening and provide great tensile strength.

Steel 10/28/46; *Item No.* 9845

Vibration Meter

Three types of vibration: Displacement, velocity and acceleration are measured electronically on a calibrated meter scale on the Vibrometer, center





below, a product of Televiso Products Co., 7466 West Irving Park road, Chicago 34. The 31-lb instrument, operating on 105-125 v, 50-60 cycle current, is an integrated amplified vacuum tube voltmeter with a cable attached search prod. Designated as model 11-B, the instrument covers 95 per cent of all vibration measurements in industry.

Steel 10/28/46; *Item No.* 9877

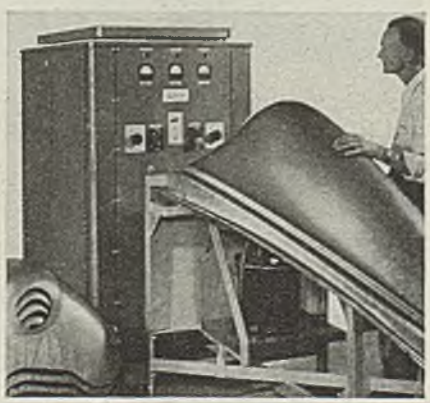
Induction Heater

Annealing an automobile front fender the induction heater, directly below, is particulary useful for hardening and heat treating parts such as gears, tools, dies, and is also used for silver or copper brazing, soldering, forging. A product of Weltronic Co., 19500 West Eight Mile road, Detroit 19, the unit is adapted for specific production problems and requirements. The work coil can be arranged to focus heat precisely on the desired area, and depth of heating can be minutely controlled.

Steel 10/28/46; *Item No.* 9881

Bench Punch Press

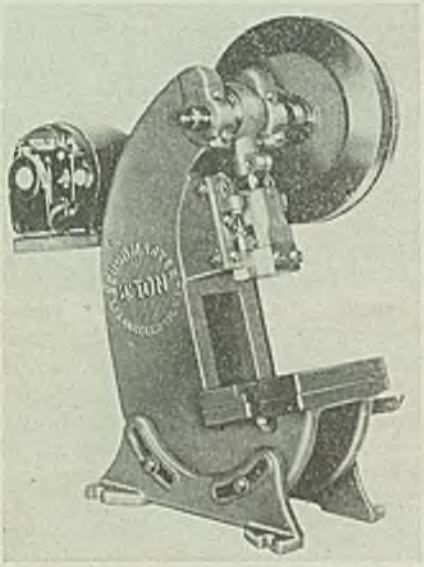
Compact 4-ton bench punch press designed to approximate the performance of larger presses is now being produced by Benchmaster Mfg. Co., 2952 West Pico boulevard, Los Angeles 6. Weighing only 215 lb, it operates at a speed of 285



(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 122.)

rpm with a 1725 rpm electric motor.

Features include a precision-ground shaft keyed by means of a press fit to a large eccentric, thereby offering a shock-absorbing bearing surface. An over-size bronze bushing encloses the eccentric, and full diameter bronze bushings encase shaft

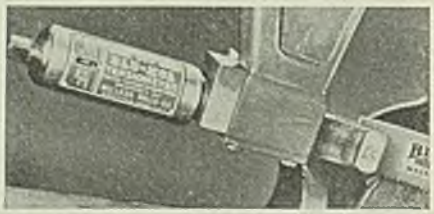


at wear points. Frames are cast in one piece from semisteel, and heavily reinforced at stress points.

Open back of press makes it possible for work to be inserted from the front as well as from the sides. Floating motor mount maintains tension of V-belt drive. When ram is in up-position, a 5¾-in. die space is available. The 6 x 8 in. bolster plate of the machine has a thickness of 1 in. and a 2-in. hole in its center.
Steel 10/28/46; *Item No.* 9698

Saw Tension Meter

Millers Falls Co., Greenfield, Mass., recently developed a Tensiometer that sets and maintains correct blade tension on power hack saws. It is a small cylinder,

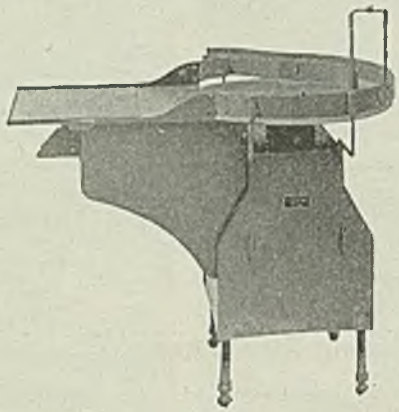


enclosing a strong, calibrated spiral spring and is easily attached to blade holder of machine.

Acting as a shock absorber for the blade, the device automatically compensates for changes of feed pressure, thermal expansion and contraction, and unusual shocks such as the blade striking a hard spot in the metal being cut. By positively controlling any desired tension from 0 to 4000 lb the device improves accuracy of cut, maintains substantially constant tension, absorbs shocks, and minimizes blade breakage. It is easily set by hand to a tension of 3000 lb without the use of wrench.
Steel 10/28/46; *Item No.* 9699

Unscrambling Table

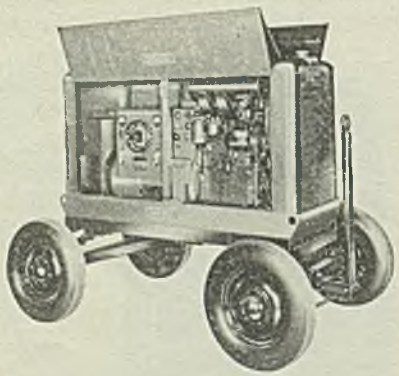
Island Equipment Corp., 101 Park avenue, New York 17, is placing on the market a new rotary unscrambling table capable of handling a full carton or case



of cans or other items. After the carton is lifted off the table, each item is individually and automatically sent on its way to destination in an orderly, constant procession, no manual effort or attention being required.
Steel 10/28/46; *Item No.* 9653

Diesel Driven Arc Welder

Latest addition to Multi-Range welder line of Hobart Bros. Co., Troy, O., is a diesel engine driven arc welder of 300-amp capacity, made for use in locations where electric power is not available. Powered by a 2-cylinder, unit-injection diesel engine that features oil cooling, displacement blower, fuel fil-

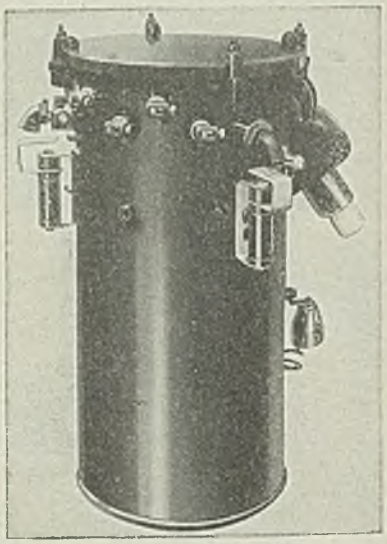


tration and easy starting, the welder permits operator to make fine volt-ampere adjustments right at work. It has 1000 combinations of voltage and amperage, separate excitation and two way ventilation.

Welding generator has a rating of 300 amp at 40 v while current range for welding duty is from 20 to 40 v, 60 to 375 amp.
Steel 10/28/46; *Item No.* 9713

Transformer

The CSPB transformer announced by Westinghouse Electric Corp., Pittsburgh, is designed especially for banked sec-



ondary operation, differing from the standard CSP by addition of a secondary breaker and two extra low voltage bushings for sectionalizing faulted or overloaded secondaries.

The transformer, when used in a banked secondary system, reduces light flicker resulting from appliance motor load, increases service reliablity and reduces necessary installed capacity. Transformers are available in the 10 and 15 kva sizes in standard high voltage ratings from 2400 to 14,400 v inclusive.
Steel 10/28/46; *Item No.* 9692

Panel Type Tachometer

An electric tachometer for permanent installation is announced by Ideal Industries Inc. 5076 Park avenue, Sycamore, Ill. It is designed for use where

the pick up unit or generator must be mounted permanently on a machine, and meter mounted on a panel far removed from generator position.

Generator consists of a small, permanent Alnico magnet rotor mounted on

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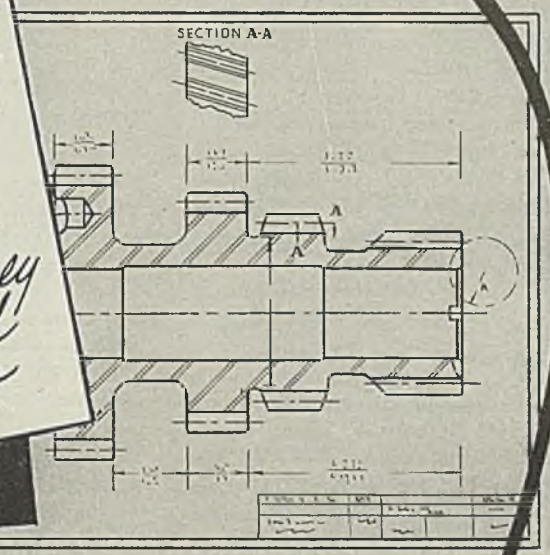
Bill

P.S. Undoubtedly they can give us some good engineering service, too



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Meter is rectangular in shape and is offered in two sizes 3, and 7 in. Both are available in three scale sizes— 0-1250 rpm; 0-2500 rpm; and 0-5000 rpm.
Steel 10/28/46; *Item No.* 9709

Midget Solenoid

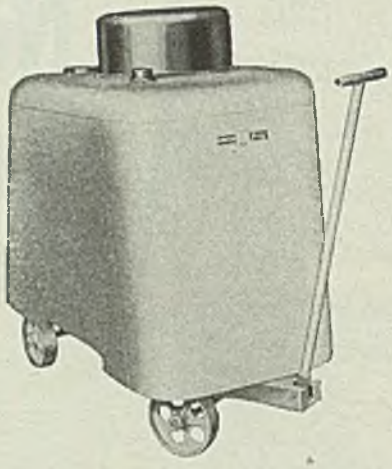
John S. Barnes Corp., Rockford, Ill. is producing a midget size solenoid which is unaffected by oil or coolant. It is made with heavy feet and side plates integral to provide strength and rigidity. Phosphor bronze plunger guides offer better bearing surfaces and compact design assures economy of space.

A pull of 4 to 7 lb is exerted by plunger when it is extended between ¼ and 1⅛-in. When plunger is seated, hold-in pull is 13 to 15 lb. Solenoids are manufactured for 110, 220, 230 and 440 v, 25 and 60 cycle ac and dc current in either push or pull models.
Steel 10/28/46; *Item No.* 9694

Steam Cleaning Machine

Steam cleaning machine known as model JO Hypressure Jenny is announced by Homestead Valve Mfg. Co., Coraopolis, Pa., for all types of industrial applications. Cleaning is accomplished by an atomized mixture of steam, hot water and cleaning compound applied under pressure through a spray nozzle. Normal operating pressures range from 80 to 120 lb at 90 gph water capacity.

The compact, portable, steel-fabricated unit with all machinery end mounted and fully accessible is furnished with or without a removable cover. Large wheels and steering tongue afford portability and permit transfer from one



cleaning job to another. Machine is offered as an oil or gas fired unit.
Steel 10/28/46; *Item No.* 9747

Diffraction Camera

New micro x-ray diffraction camera which permits study of minute sections and charting of changes over microscopic areas is announced by North American Philips Co. Inc., 100 East 42nd street, New York 17. Designed to fit the Norelco x-ray diffraction unit, it consists of a substantial precision-machined body which is readily removable from its carriage for loading.

Two specimen holders are provided, one comprising a special positioning and tensioning device for fibers, narrow strips or similar objects. The other holder utilizes a flat plate insert. A film cassette with beam stop is provided and a hose connection on the body permits gas filling or pressure reduction.

Accessories include an additional smaller pinhole system, ring adaptor to be used on microscope, extra spacing insert for film cassette, adjusting wrenches and film punch.
Steel 10/28/46; *Item No.* 9686

Fluorescent Lampholder

An individual fluorescent circline lampholder with two spring-loaded tension supports is announced by General Electric Co., Bridgeport 2, Conn. Lampholder and supports comprise a 3-piece unit to be used for 3-point mounting. All pieces are made of clear plastic and have die cast hubs with 1/8-in. pipe threads and two ter screws. Lampholder has four 24-in. leads, two each for lamp and starter connections.
Steel 10/28/46; *Item No.* 9449

Automatic Frame Drill

Snyder Tool & Engineering Co., 3400 East Lafayette, Detroit 7, is offering a new machine for drilling a series of holes for mounting bodies, motors and spring suspensions in automobile frames. It accommodates three different size frames, adjustment to longer or shorter frames being made by moving entire clamping bracket as well as spindles, and positioning in correct location for each frame.

Frames are located on equalizing clamps and positioned and clamped by means of air cylinders and cam clamps. Sides of frame near front end are drilled with multiple heads driven from standard self-contained hydraulic units. Series of vertical and angular spindles are driven from individual motors and are fed through work by one hydraulic cylinder which actuates action pinions. This cylinder and feed mechanism is mounted on the inside of the welded steel base.
Steel 10/28/46; *Item No.* 9733

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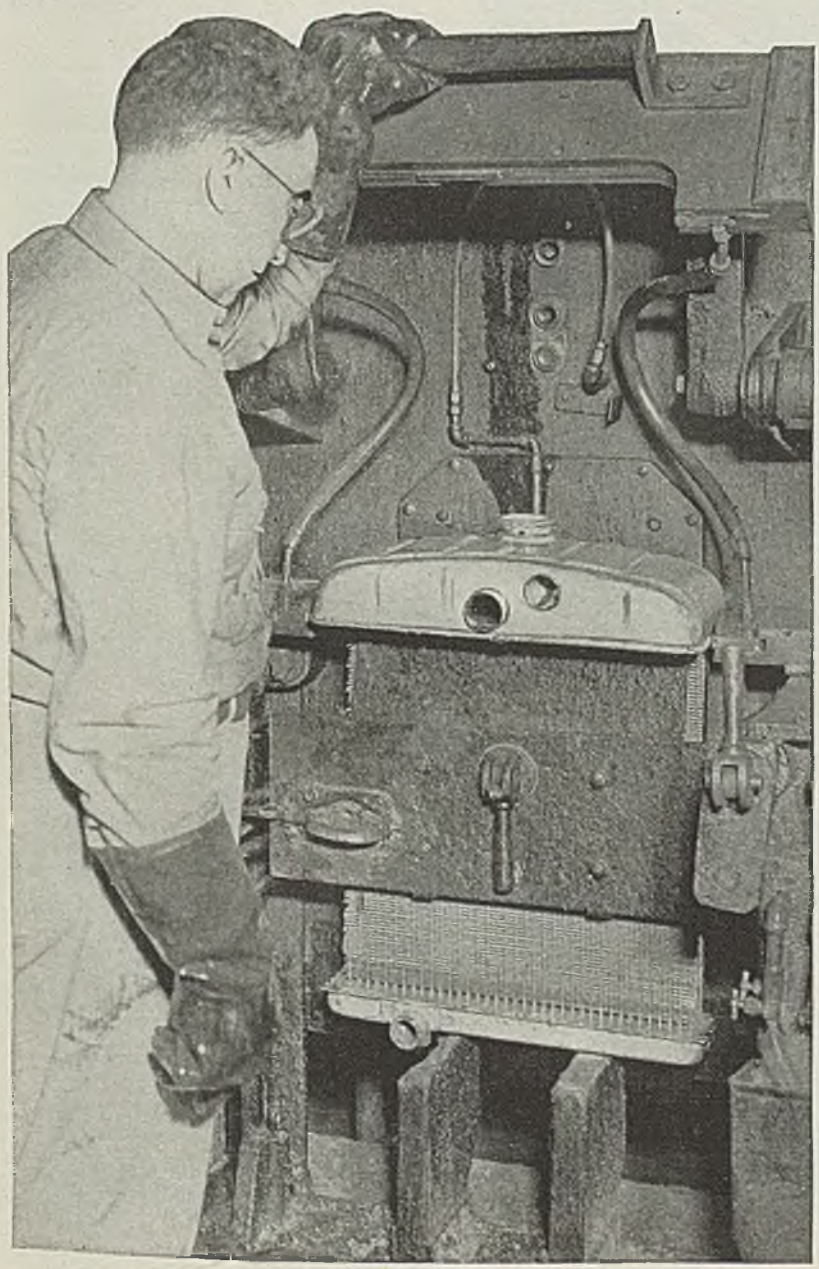
IH cuts soldering cost 58% with TOCCO Induction Heating



INTERNATIONAL HARVESTER COMPANY, world-famous builder of farm implements and automotive equipment, reports the following benefits from TOCCO Induction Soldering of radiator tanks to core:

CUTS COST 9¢ EACH

Former hand method cost 16.3¢ each for medium size radiator. TOCCO soldering costs 6.85¢ each, saving 58% on this operation.

IMPROVES QUALITY

TOCCO's automatically controlled heat melts uniform solder ring at 400° F . . . makes every joint perfect. Eliminates rejects. Improves service in field.

IMPROVES WORKING CONDITIONS

Operator simply loads and unloads fixture. TOCCO eliminates fatigue, heat and fumes.

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Future Supplies

(*Concluded from Page 90*)

taxable reserves in the Lake Superior region is 1,200,000,000 tons. Rich deposits are being depleted rapidly and that remaining will be harder and slower to get out. Another 30 to 50 per cent of taxable reserves is available in lower grade ore.

Foreign ore offers possibilities, but there is some question as to whether it could be depended upon. Considering transportation and docks for handling, it would probably be high in cost. Furthermore, in event of war the flow might be cut off. Ore pockets are distributed over the United States but these cannot be mined at what would be considered a reasonable price.

Altogether, Mr. Hewitt estimated that total ore potential in the United States aggregates 4,800,000,000 tons. By readjusting the sights because of Lake Superior deposits not fully charted, it is likely that high-grade reserves in the district will total approximately 1,600,000,000 tons.

Lake Superior Taconite Available

Optimism for the future must therefore take into consideration the concentrating of Lake Superior taconite which is available in unestimated quantity. To concentrate may cost as much as $15 to $20 a ton. Mr. Hewitt warned that we must not continue to exhaust high-grade iron ore at the rate in the past, and then be forced to depend upon concentrates. Instead, the country must begin to balance consumption of the two. This necessity is now being recognized and many companies already are studying taconite concentrates for blast furnace use.

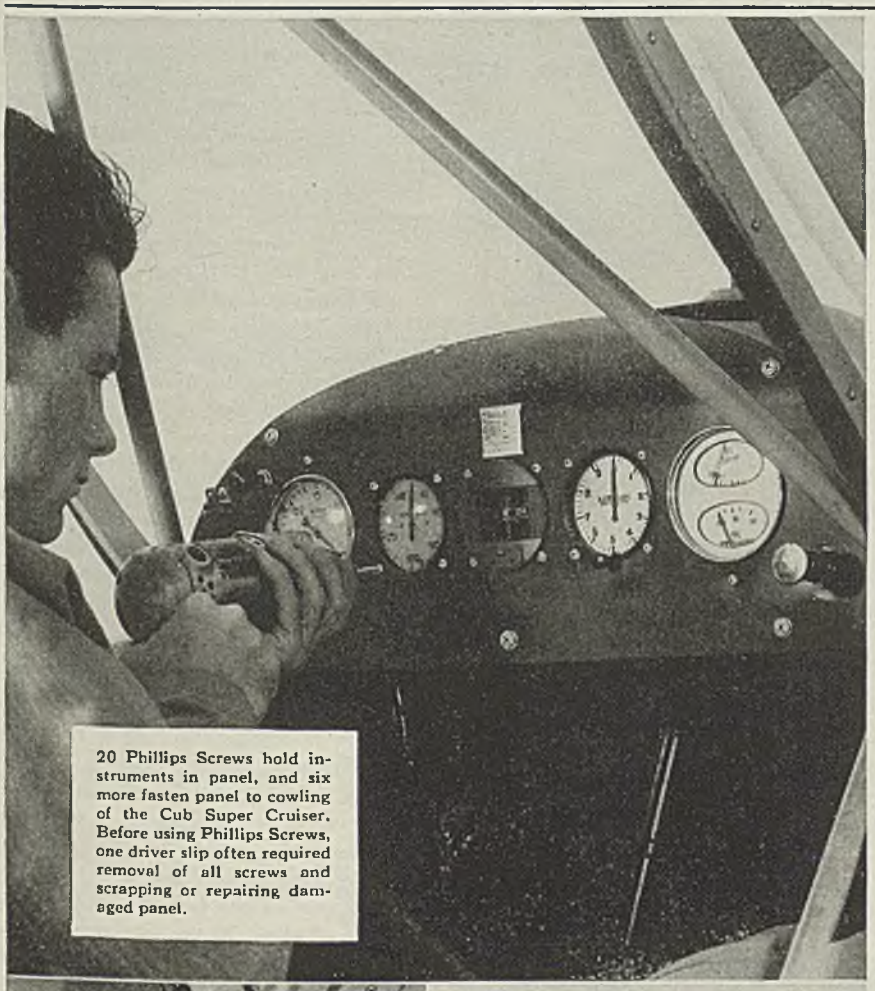
In discussion which followed, Mr. Hewitt received general commendation for his effort in assembling iron ore information from many sources and providing an interpretation and conclusion of great significance to the iron and steel industry.

Good sinter is an aid in good blast furnace operation, stated T. Plante, superintendent of blast furnaces, coke works and docks, Jones & Laughlin Steel Corp., Cleveland, in presenting a paper titled "Good Sinter and Its Production." This company's first investigational work was in connection with the flue dust, but later some ore fines were included.

The speaker said that research so far reveals soft sinter to have high reducibility. Further study is expected to confirm this conclusion and possibly reveal some new factors. Sinter plant objective, therefore, is to produce consistently a uniform, soft, friable sinter.

"DRIVE TWICE AS FAST"

—Phillips Screws help Piper build 1100 Cubs a month!



20 Phillips Screws hold instruments in panel, and six more fasten panel to cowling of the Cub Super Cruiser. Before using Phillips Screws, one driver slip often required removal of all screws and scrapping or repairing damaged panel.

Fastenings near fabric covering—no place for driver slips—no slips with Phillips Screws.

The 20,000th Piper Cub, completed June 1946. Phillips Screws speeded this big production!

"We started using Phillips Screws back in 1938, when . . . and because . . . we were getting set for large scale production," declared Piper's Assistant Chief Inspector to the James O. Peck Co. investigator, studying assembly savings with Phillips Screws in well-known plants. "Today we're shipping our 20,000th Piper Cub. That proves how much faster Phillips Screws are to drive.

"IDEALLY SUITED TO POWER DRIVING, which we needed for high production. Unlike slotted screws, Phillips Screws hold the driver bit in place without a guide or other support, automatically center themselves in the screw holes and catch the thread quicker. Phillips Screws are easily twice as fast to drive.

"TAKES LESS TIME TO MAKE SKILLED ASSEMBLERS. It takes a man much less time to become familiar with and do a good job of driving Phillips Screws. Since the Cub is fabric covered, any driver slips would cost us expensive, undesirable patching, doping and repainting . . . up to $1.00 a slip. Same thing on the instrument panel where a single driver slip would cost up to $3.50. If we were using slotted screws, assemblers would have to go much slower, especially at the learning stage, to avoid such damage.

"WE GET A BETTER INSPECTION. Don't have to watch out for burred heads as we used to do with slotted screws. Fabric tears and instrument panel scratches are out. And the Phillips Recessed Head certainly makes a more attractive, workmanlike job wherever screw heads are exposed."

GOOD IDEAS FOR YOUR ASSEMBLY LINE in this independently made report of Piper's assembly savings with Phillips Screws. Similar studies . . . covering metal, wood and plastic products . . . available to you without cost or obligation. Use the coupon TODAY!

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The H. M. Harper Co.
International Screw Co.
Lamson & Sessions Co.

26 SOURCES

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National Lock Co.
National Screw & Mfg. Co.
New England Screw Co.
Parker-Kalon Corporation
Pawtucket Screw Co.
Pheoll Manufacturing Co.
Reading Screw Co.
Russell Burdsall & Ward Bolt & Nut Co.
Scovill Manufacturing Co.
Shakeproof Inc.
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2300 Industrial Trust Bldg., Providence, R. I.

Send me reports on Assembly Savings with Phillips Screws.

Name.....

Company.....

Address.....

.....

Hot Dip Galvanizing

(*Continued from Page* 116)

bath so that when placed therein it can be jammed crosswise in the kettle. They are so constructed as to sink about 2 in. below the surface of the zinc when in the operating position.

When molten zinc is exposed to the air, oxides naturally form because of the action of the air on the zinc. These oxides, until lately, were the second largest residuum loss in the galvanizing operation. When the suface of the zinc is permitted to remain exposed, these oxides progressively grow until large quantities are piled on the surface of the zinc. Finally they are removed, usually at drossing time, only to prepare the way for a new accumulation.

Investigation of this matter resulted in the perfection of material which, when placed on the surface of the zinc forms a perfect seal between the surface of the zinc and the air. The use of this material prevents the formation of any oxides whatever on the surface of such portions of the zinc as may be covered. Metal may be passed through it or wire may be threaded through it without in any way disturbing the continuity of the cover. Details of this important development are presented later.

Cover Blankets Heat in Kettle

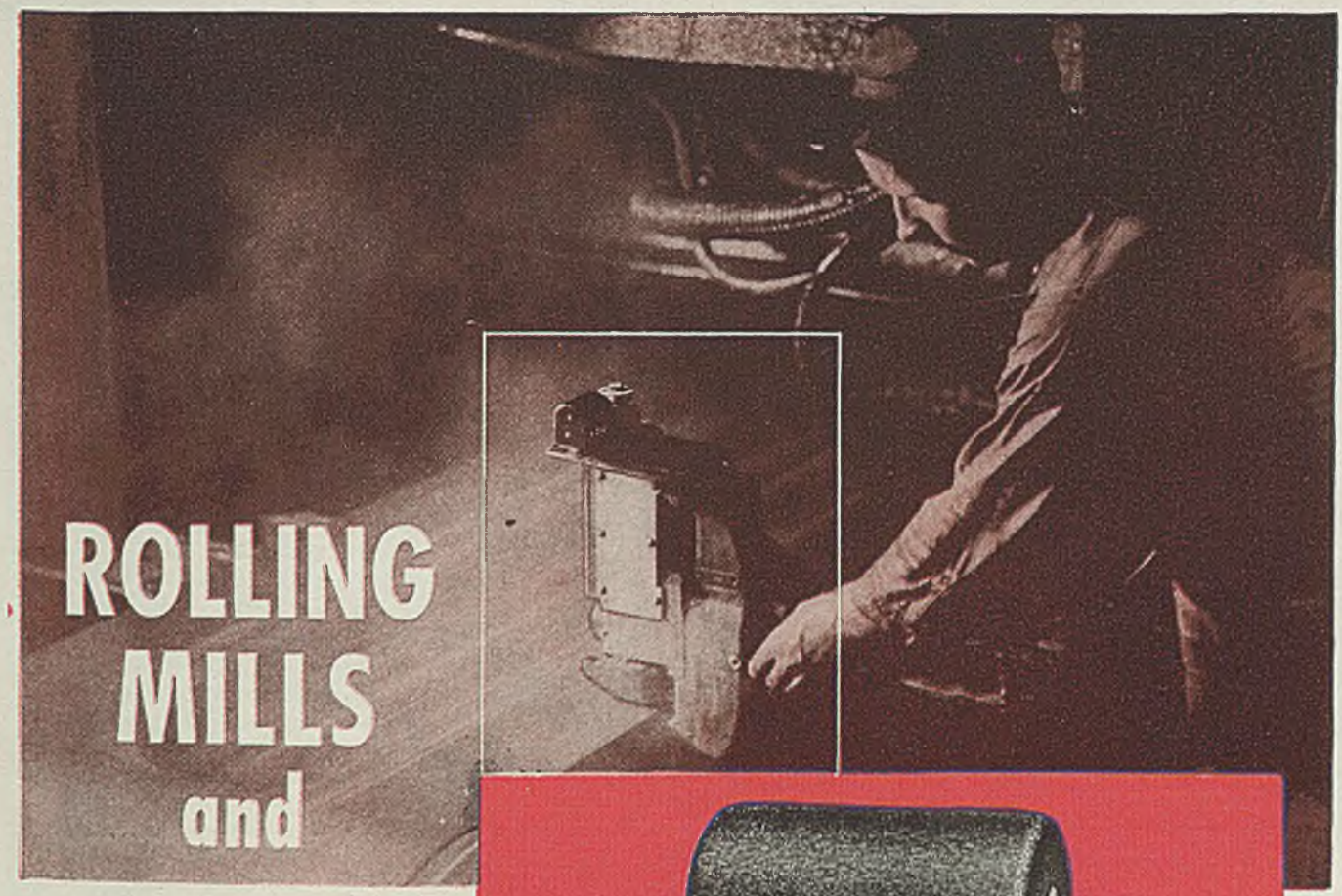
Another feature of this cover is its ability to blanket the heat in the kettle and prevent excess radiation. By reducing the heat loss from radiation, less heat need be applied; if less heat is applied, this means less dross, longer kettle life and less fuel.

Because of the fact that these oxides, while of about 70 per cent zinc content, bring little money from buyers of such materials this blanket is meeting with signal recognition in the wire field, where oxide and heat losses have been heavy.

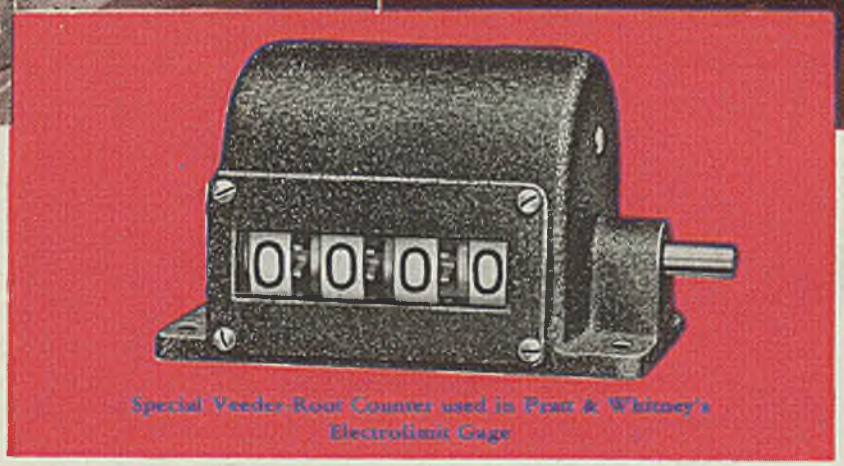
For many years the outgo end of the kettle and beyond the last mentioned dam was covered with granular charcoal. In the case of the so-called "charcoal-wiped" or "vertically-drawn" wire, this bed of charcoal is contained in a box in order to increase and maintain its depth. In the case of asbestos and pigtail-wiped wire, the charcoal was piled up to the entrance of the wipe.

Charcoal, however, deteriorated rapidly and so was discontinued in favor of a harder grade of specially saturated carbon.

The method of controlling the submersion of continuously galvanized wire also varies with the type of wipe. Asbestos-wiped wire is held submerged by two sinker bars, covered with Stellite to resist wear. This covering material also resists the attack of the zinc on the sinker



ROLLING MILLS and Hundreds of Other Products



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bar. In some cases the use of softer material has been retained because the grooves formed, act as a guide. Many operators, however, prefer to groove the Stellite to maintain uniform separation of the wire. These sinker bars are placed in both ends of the bath in such a manner as to offer a gradual entrance and exit of the wire and to avoid too sharp angles.

In the case of charcoal or vertical-drawn wire, the second or exit sinker is replaced with a roller sinker. The latter is so designed that no revolving bearings are required to operate under the zinc, thus avoiding rapid wear. Refacing of this roller is required only at infrequent intervals. Any sinker roller so designed as to operate the bearings beneath the zinc, causes a vibration which is quickly transmitted to the wire as it leaves the zinc. Any vibration at this point is apt to roughen the coat and this is not permissible.

In order to further eliminate the possibility of vibration the high roller over which the wire passes after it leaves the zinc, is never attached to the building girders, but rather to a firm foundation in the floor or to the kettle sides. These high rollers are usually 10 to 12 ft above the kettle, depending somewhat on the type of operation and the speed of travel.

Asbestos Compression Wipes

Wiping by asbestos compression wipes is effected by three methods. *Lever* type; by this control the asbestos pads through which the wire passes are held together by a series of counter-weights which theoretically exert a given pressure on the pads. This type of wipe is more commonly used where heavier coatings of this grade are desired. *Screw* type; by this control the wire may be wiped to a high degree of coating thinness and is usually employed only on lighter grades of coat. *Bobbin* type; this control is used generally on smaller gages of "tight-wiped" wire.

Any of these types of asbestos wipes leaves much to be desired. In the first place, on any standard operation, a set of asbestos wipes requires the constant attention of two operators and the result achieved is dependent entirely upon the expertness and care of these wipe operators. Because the human element plays so large a part at this point in the operation, research is underway in the laboratories with the hope of developing a thoroughly mechanical type of wipe which will control itself and eliminate manual attention at this point of the process.

Vertical-wiped wire passes from the high rollers directly to the takeup frames; asbestos-wiped wire does or does not,

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according to the type of finish that is desired.

Asbestos-wiped wire is made in three finishes, namely dull, satin and silver bright. These finishes are obtained mainly in the following manner. *Dull-finished* wire passes directly from the asbestos wipes to the takeup frame. This technique permits the wire while in transit to oxidize from the heat of the wire and results in a dull finish. *Satin-finished* wire is quenched with water 8 or 10 ft from the asbestos wipes. The effect of this quench is to stop the dulling or oxidizing of the wire at a given point in its travel. This results in a brilliance according to the nearness of the quench to the wipe. *Silver-bright* wire is obtained only if the water quench is within 6 in. of the wipe. This quench should effect only a setting of the zinc and the wire must not leave this quenching or setting operation cold. In other words the coating must be set while still in a molten state within 6 in. from the wipe and must emerge from the water at a sufficient temperature to evaporate or dry the wire quickly. Fig. 35 shows a standard water quench.

Distance Affects Preese Test

The distance of the water from the wipe affects materially the Preese test. In other words, a silver-bright under normal conditions, will yield one Preese dip less than the same wire if permitted to oxidize by the dull-finish method. This is because the alloy structure in the coat is thinner in the quickly quenched wire.

The method of making up the wire pads is important in this operation. In the first place a good grade of asbestos cord should be used, such as No. 4280. Less expensive grades can be used, however, such as No. 195 or No. 4195. These are formed into pads by hand, approximately the width of the wipe holder. They are then dipped in melted vaseline and semidried on the side of the kettle. Ordinarily the bottom wipe is renewed after the passing of three or four joints, but the top wipe is changed after each joint.

The bobbin wipe, Fig. 37, is used generally on fine wire, and in some cases heavier. The wire is strung through the metal holder; the hard wood bobbin sets in the holders over the wire which centers itself in the beveled portion at the top of the slot. Fine asbestos cord then is wedged into the slot at the top, wrapped around the wire and the remaining end also wedged in the slot. As the wire passes through the asbestos, it pulls the wipe into the bevel resulting in a tight and remarkably uniform coat round the wire.

(To be continued)

YEARS OF EXPERIENCE ARE BUILT INTO THIS LOCOMOTIVE

Each passing year brings improvements in design, construction and material used in Whitcomb locomotives. Suggestions from a user may lead to better visibility or a more convenient arrangement of controls and less fatigue for the operator. A new metal is born, and if it meets our requirements more accurately it is immediately designed into the next job. Constantly, our Engineering and Research Departments are striving to produce locomotives that will move more tons, in less time at lower costs per mile.

Typical of the results from these far reaching policies is the 65-ton Diesel electric illustrated. Pound for pound there is more locomotive built into this Whitcomb work horse than in many others, without the Whitcomb name plate, that are tons heavier. Ask about its remarkable tractive effort performance in speed ranges up to 40 MPH.

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BLW THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

Modern Gear Inspection

(*Concluded from Page 84*)

of displacement of the tooth face in face width of gear measured. Space between individual vertical lines on chart represents 0.0002-in. movement of the measuring pointer.

Another Michigan machine, (Fig. 1) for quickly and accurately checking lead in gears in production is useful in shops employing large numbers of gear shaving machines, to faciliate setting the crossed-axis angle on the shaving machine. Machine employs a master lead equipped with three or four starts equally spaced about its periphery. An indicator is placed in contact with one of the gear tooth surfaces and the gear is guided past the indicator by a master lead. Both gear and master gear are mounted on a single spindle. Without changing the position of the gear on the spindle, three or four teeth can be checked, depending on the number of starts on the master.

Failure Due to Binding

If size of gears varies materially, they will not mate on the proper center distance, or the gears might bind in operation due to heat expansion. Failure due to binding may also result if the gears are extremely eccentric, although eccentricity is usually objectionable only from the noise standpoint.

A testing machine has been developed at Michigan which is useful for checking gear size over rolls, eccentricity over a pin, and parallelism of spur gear teeth. In addition, all pertinent elements affected when sharpening a hob or milling cutter can be inspected on this machine. The machine resembles bench centers with several attachments which can be mounted on an auxiliary table. The table is capable of being moved accurately parallel and at right angles to the line of centers.

Combined effect of all gear errors will show up in a test run on a speeder designed to duplicate as nearly as possible actual operating conditions. One type of speeder which was developed to meet virtually every demand for running two mating gears, is equipped with a drive mechanism which may be applied to either spindle while a brake load is applied to the spindle holding the mating gear. However, with each spindle turning in the same direction, the driving and braking action may be reversed to simulate the action of a car transmission under drive and coast conditions. Four spindle speeds are provided ranging from 580 to 1740 rpm. A larger speeder of the same basic design provides a range of speeds from 580 to 1800 rpm and will take gears of a maximum diameter of 13 in.

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The Business Trend

Industrial Tempo Again Equals Postwar High

INDUSTRIAL ACTIVITY continues at a high level after equaling in the week ended Oct. 19 the postwar high mark of 154 per cent (preliminary) of the 1936-1939 average on STEEL's industrial production index. This represented a 1-point rise over the preceding week, and marked the sixth consecutive week that there has been only a slight deviation in the rate of activity.

Production is still being limited by insufficient supplies of materials and components, and in many cases by shortages of skilled labor.

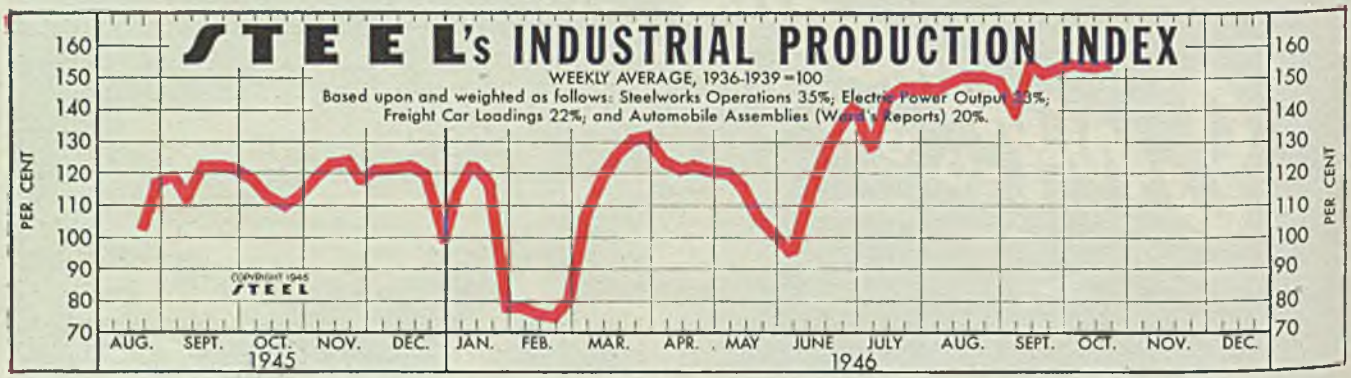
ELECTRIC POWER—In some areas, an insufficiency of electric power may soon become a new handicap to high industrial production. Consumption of electricity is at a high level, and with the days getting shorter the rate of power usage is expected to be consistently upward into the winter. Capacity of many utility companies now is only slightly in excess of peak demand, and doubt exists as to the ability of some companies to take care of the anticipated heavy December demands for electric power. Strikes in plants producing equipment for electric systems have hampered the electric utility industry in making additions to generating facilities. Capacity of generating stations at last report totaled 50,180,000 kilowatts, only 78,000 kilowatts above the 50,102,000 kilowatts capacity at the end of 1945. To have an adequate margin of safety between capacity and demand, the industry should have at least a million kilowatts more generating capacity in place for the winter than it now has. Meanwhile, electric power industry representatives are discussing possible means of easing the burden on generating facilities, and a plea may be made for consumers to economize on the use of electricity.

STEEL—Production of steel ingots continues at a high rate of approximately 90 per cent of capacity, yet the clamor for steel, particularly sheets and strip, is universal.

AUTOMOBILES—The automobile industry is one in which sheet steel remains as the most critically short item. Only twice has the postwar output of autos exceeded 90,000 a week. In the week ended Oct. 19, production totaled 89,687 passenger cars, trucks and busses.

COAL—Production of 12,200,000 tons of bituminous coal in the week ended Oct. 12, helped bring the 1946 cumulative output to within 8.7 per cent of the aggregate production for the corresponding period in 1945.

CONSTRUCTION—Further slackening in the rate of contemplated building expenditures brought the September volume to the lowest level since last November, Dun & Bradstreet Inc. reported. Estimated cost of permits granted for new buildings and for alterations and repairs in 215 cities dropped 13.3 per cent to $176,492,394, from $203,580,309 in August. During the first nine months of 1946, permits for construction estimated to cost $2,079,055,672 were issued in the 215 cities. This was close to three times the volume in the corresponding period of 1945, and was the highest for that period since 1929.



The Index (see chart above): Latest Week (preliminary) 154 Previous Week 153 Month Ago 151

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)§	90.5	90	90	65
Electric Power Distributed (million kilowatt hours)	4,540	4,495	4,507	3,915
Bituminous Coal Production (daily av.—1000 tons)	2,033	2,020	2,115	1,037
Petroleum Production (daily av.—1000 bbls.)	4,733	4,737	4,775	4,237
Construction Volume (ENR—Unit $1,000,000)	$108.2	$81.9	$116.8	$73.1
Automobile and Truck Output (Ward's—number units)	89,687	86,330	80,972	13,750

*Dates on request. §1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	905†	899	899	773
Business Failures (Dun & Bradstreet, number)	23	25	19	15
Money in Circulation (in millions of dollars)‡	$28,579	$28,608	$28,453	$27,952
Department Store Sales (change from like wk. a yr. ago)†	+15%	+15%	+37%	+11%

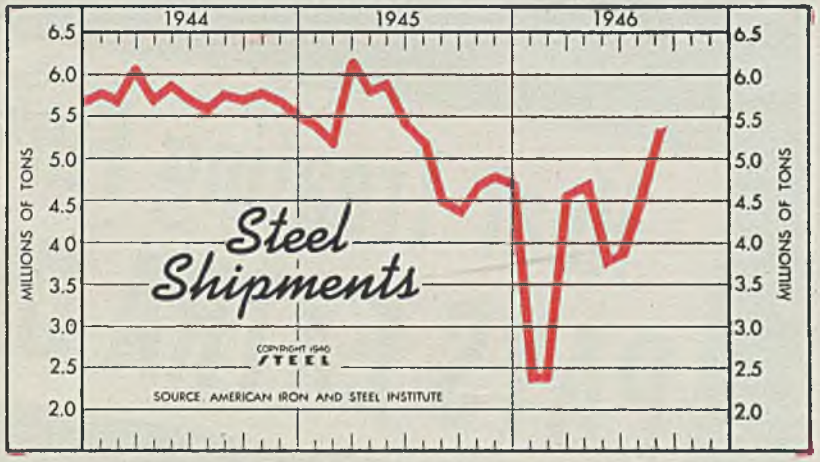
†Preliminary. ‡Federal Reserve Board.

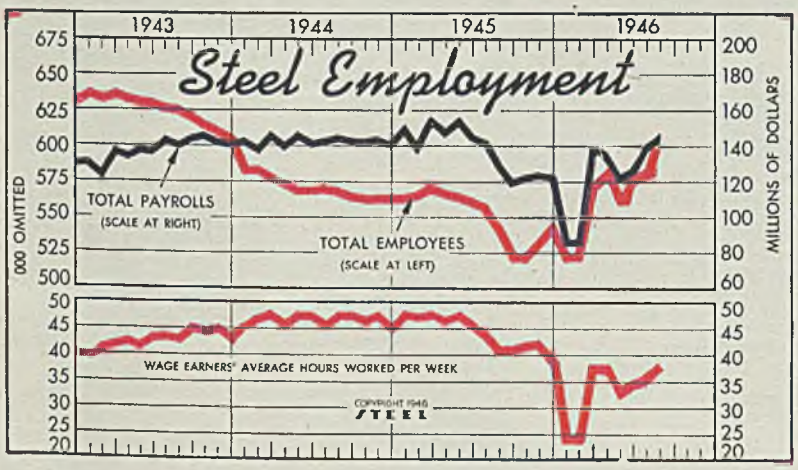
Steel Shipments

(Net Tons)

	1946	1945	1944
Jan.	2,391,850°	5,435,647	5,767,687
Feb.	2,391,849°	5,184,498	5,700,673
Mar.	4,644,988	6,179,452	6,146,595
Apr.	4,698,081	5,769,786	5,744,177
May	3,906,064	5,938,055	5,859,786
June	3,966,628	5,437,206	5,703,314
July	4,639,610	5,214,074	5,597,631
Aug.	5,406,470	4,512,637	5,837,328
Sept.	.....	4,391,143	5,743,437
Oct.	.....	4,660,237	5,752,147
Nov.	.....	4,779,628	5,686,527
Dec.	.....	4,729,561	5,458,133

° Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,783,699 tons.





Steel Employment

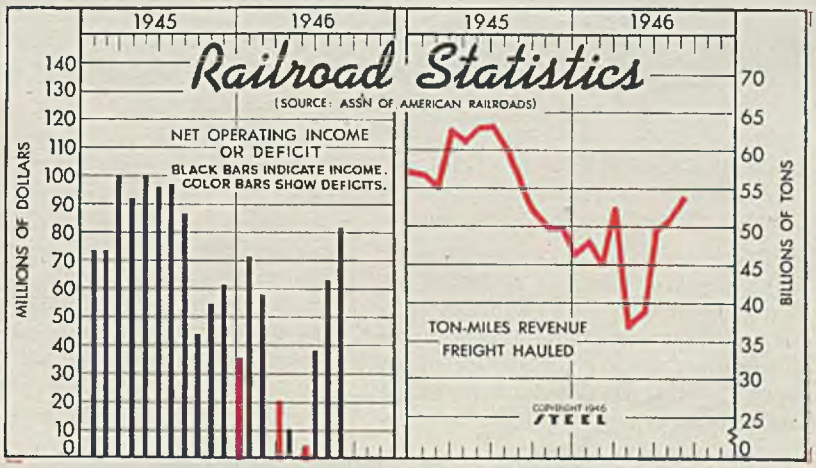
	—Employees † (000 omitted)—			—Total Payrolls (Unit—$1,000,000)—		
	1946	1945	1944 †	1946	1945	1944
Jan. °	522	564	583	$84.9	$150.3	$141.8
Feb. °	522	566	583	84.9	138.4	137.6
Mar.	570	570	578	138.8	155.0	145.3
April	582	567	573	134.3	147.0	138.9
May	563	565	569	121.4	154.0	145.4
June	578	562	570	125.6	144.1	140.5
July	595	557	571	138.0	141.0	141.8
Aug.	596	543	569	145.2	128.1	143.9
Sept.	....	521	565	....	119.1	142.2
Oct.	....	522	564	....	121.3	141.7
Nov.	....	533	564	....	122.8	143.1
Dec.	....	545	564	....	122.5	139.9

† Monthly average. ° Figures for January and February, 1946, are merely averages derived from a report that combined those two strike-affected months.

Statistics of Class I Railroads

	Net Operating Income —millions—			Ton-Miles Revenue Freight —billions—		
	1946	1945	1944	1946	1945	1944
Jan.	$70.8	$73.0	$84.9	48.2	56.8	60.5
Feb.	57.8	73.2	84.5	45.1	55.3	59.3
Mar.	°20.5	99.9	92.5	52.8	62.9	62.7
Apr.	10.1	91.9	87.7	37.0	61.6	60.4
May	° 4.8	99.9	98.5	39.0	63.4	64.0
June	38.1	96.1	99.8	50.0	63.6	62.0
July	62.8	97.1	98.6	51.5	60.5	62.8
Aug.	81.7	86.7	101.4	54.0	56.4	64.5
Sept.	...	44.0	89.1	...	52.2	61.0
Oct.	...	54.4	97.3	...	50.0	63.5
Nov.	...	61.3	91.6	...	50.0	59.4
Dec.	...	°36.9	69.8	...	46.5	57.3
Ave.	...	$70.0	$91.3	...	56.5	61.5

° Deficit.



FINANCE

	Latest Period°	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$11,468	$11,862	$14,061	$10,072
Federal Gross Debt (billions)	$263.7	$263.7	$265.5	$262.1
Bond Volume, NYSE (millions)	$27.3	$27.6	$38.8	$39.3
Stocks Sales, NYSE (thousands)	7,839	7,911	10,688	9,168
Loans and Investments (billions)†	$58.2	$58.1	$59.2	$60.9
United States Gov't. Obligations Held (millions)†	$39,187	$39,088	$40,595	$45,108

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$64.45	$64.45	$64.45	$58.27
All Commodities†	126.0	125.1	121.7	105.3
Industrial Raw Materials†	146.3	144.5	138.4	116.6
Manufactured Products†	118.6	118.1	115.9	101.9

†Bureau of Labor Statistics Index, 1926 = 100.

Heat Treating Furnace PAYS EXTRA DIVIDENDS

Operating records prove that the installation of a CARBOFRAX silicon carbide hearth in the furnace pictured has been an unusually sound investment.

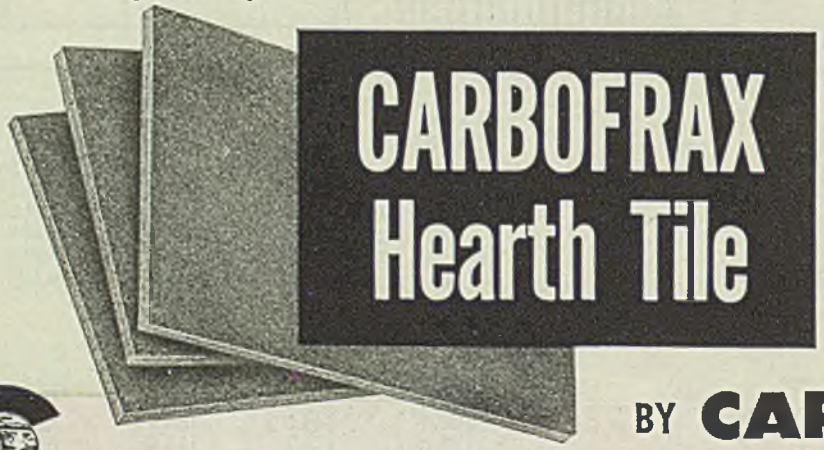
Production capacity has increased fourfold since substituting a CARBOFRAX hearth for fireclay. Oil consumption has been cut materially. Temperatures throughout work chamber are much more uniform. To this has been added considerable savings resulting from reduced maintenance and virtual elimination of furnace outages for repairs.

Hearth life has been increased by approximately 3½ times. And this has been accomplished under tough conditions of operation. Working temperatures range from 1200° to 1850° F. The pans often carry net loads exceeding 600 lbs. each. They are run into this 20′ long furnace by means of a dolly.

Here are the reasons for these results.

With a thermal conductivity 11 to 12 times greater than ordinary refractories, a CARBOFRAX hearth transmits heat faster—more evenly to the work. The temperature gradient through the floor is cut which lowers the operating heating head. Thus, it can be maintained with less fuel for equal rates of production. And high hot strength plus excellent resistance to mechanical abrasion and cracking assures freedom from repeated repairs and replacements.

This performance record is only one of innumerable case histories pointing to vastly improved furnace efficiency and resultant savings effected by CARBOFRAX hearths. You, too, can enjoy these benefits. One of the best and easiest ways to get the complete story is to discuss your particular operations with one of our technicians. Write today to Dept. J-106, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

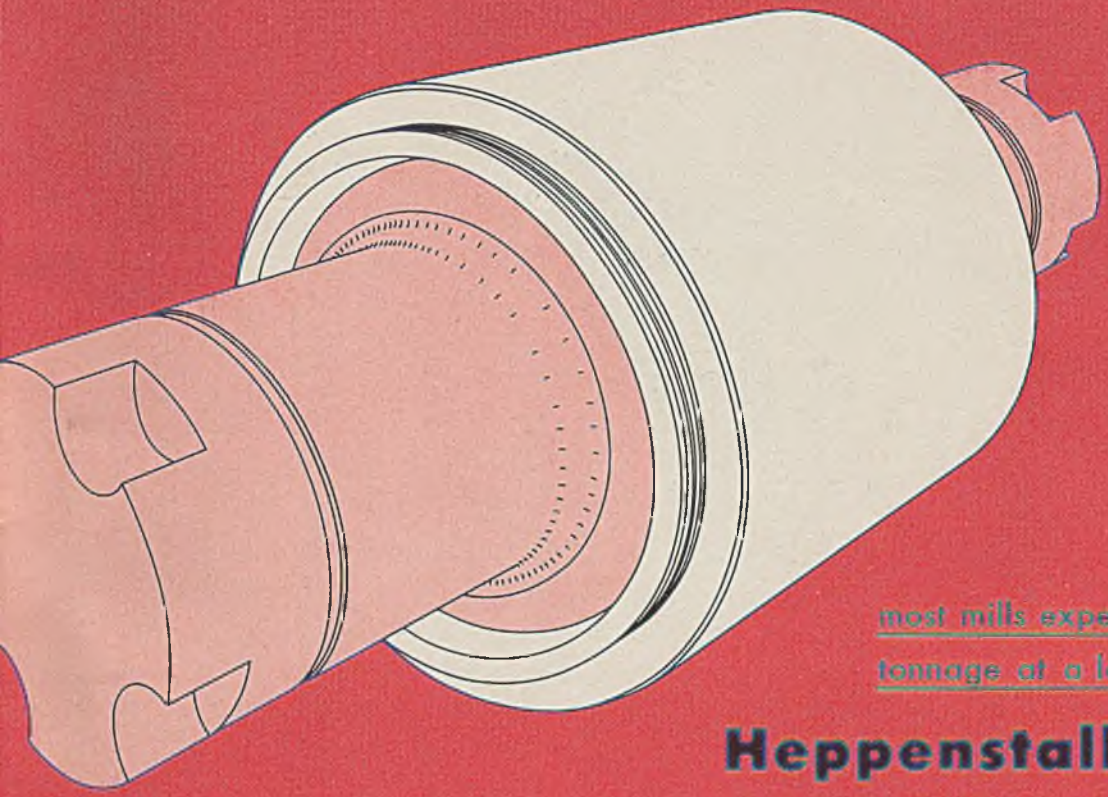


CARBOFRAX Hearth Tile

BY **CARBORUNDUM**
TRADE MARK

"Carborundum" and "Carbofrax" are registered trademarks which indicate manufacture by The Carborundum Company

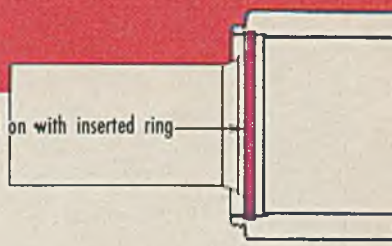
There's a sound reason why



most mills expect and get greater tonnage at a lower cost with . . .

Heppenstall Sleeves

for back-up rolls

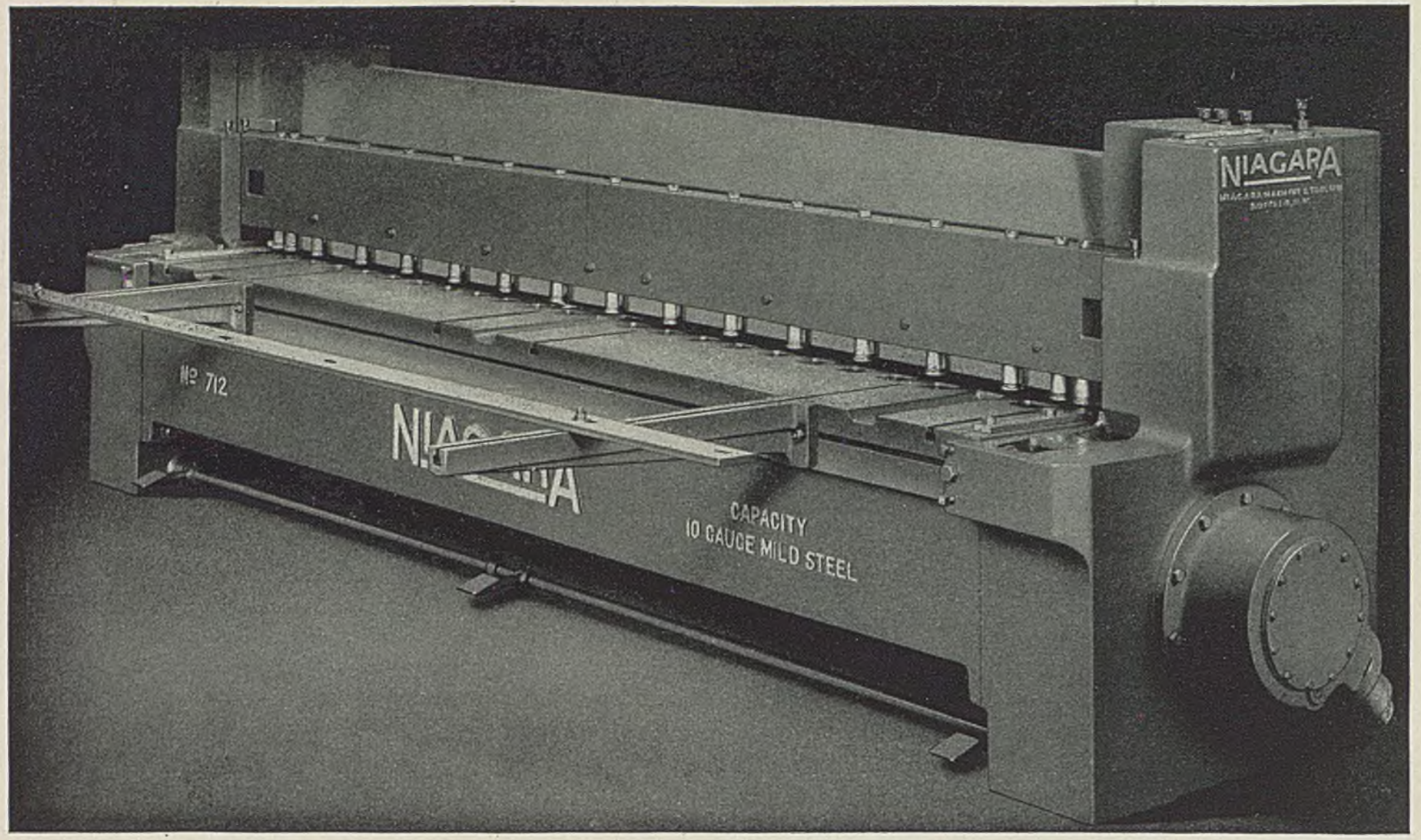


They can't slip — they're locked on with inserted ring

Heppenstall back-up roll sleeves have 3 important, proved advantages over a solid roll: (1) They last much longer; (2) They cost less; (3) They eliminate the expense of scrapping a worn roll . . . Being a relatively small mass of metal with no necessity for the usual compromise between strength of necks and hardness of surface, these sleeves permit the incorporation of all Heppenstall's skill in metallurgy, forging and heat treating . . . and they can be furnished in any workable degree of hardness desired. Write for the complete story. Address Heppenstall Co., Pittsburgh, Pa.

Heppenstall

the most dependable name in forgings



More production per man-hour is being obtained in plants using Niagara Power Squaring Shears. Convenient operation, quick, accurate setting of ball bearing, self-measuring parallel back gage, full visibility of cutting line, instant-acting Niagara sleeve clutch and complete accessibility at rear are some of their modern features. Built in a complete range of capacities and sizes. Niagara Machine & Tool Works, Buffalo 11, N. Y. District Offices: Detroit, Cleveland, New York.

Shear knives available for cutting alloy and special steels. Let us know what you desire to cut. Prompt delivery on spare knives for Niagara Squaring Shears. Also factory regrinding service by the same skilled men who grind new Niagara Knives.

Coal Strike Would Cut Steel Production Promptly

Fuel reserves small and coke already short . . . Decontrol of steel still uncertain . . . Mills not yet clear on first quarter quotas

ANOTHER coal strike this year, as now threatened, would cause curtailment in steel production within a week, for while coal output over the past few months has been substantial, a considerable tonnage has been moving abroad and steel producers generally have not been able to build normal inventory since the 59-day suspension last spring. Some steel mills, unable to operate at even normal capacity, due to shortage of scrap and pig iron, are in somewhat better position than others as to coal, but few, if any, would not start reducing output promptly in the event of a general walkout at the soft coal mines, especially with winter near at hand.

A coal strike would further aggravate an already tight situation in metallurgical coke, on which sellers recently have begun to prorate shipments among their customers for the second time this year. Because of coke shortage some foundries are substituting anthracite in egg and broken sizes, with good success, it is said. In fact, well within the memory of some fuel sellers some larger foundries in eastern Pennsylvania at one time used anthracite to the exclusion of coke.

Meanwhile, prospects of general decontrol of the steel industry continue interesting but uncertain. Many steel interests expect lifting of price ceilings by the end of the year or earlier, but so shifting is the attitude of the federal administration on various aspects of decontrol that firm conclusions at this time are difficult to draw. Possibility of early action, however, has tended to ease steel demand somewhat and is definitely retarding movement of scrap in some quarters.

Nevertheless, while there is slight easing in pressure for steel for this and other reasons, the situation in light flat-rolled products continues particularly acute. There still is far more demand for sheets and strip than mills can handle and so difficult is the task of formulating schedules that producers do not yet know where they stand for first quarter.

Some mills now are taking a little new tonnage for forward positions and before this week is over some producers are hopeful of setting up quotas for first quarter. However, they are far from sure they will not have to revise them later. Some producers believe they may have five to six weeks capacity available for new carbon sheet tonnage in first quarter, but this would appear to be more than average.

Shape producers, barring at least one important interest, have set up quotas for the first three months of 1947 and have little capacity left, notwithstanding a further drop in new structural activity because of CPA restrictions and sharply advancing building costs.

Limit of 45 days for scrap inventory of all grades but cast and 30 days for the latter has been imposed by CPA, with regulations on dealers and brokers to insure against hoarding. This action is to aid in spreading available tonnage as widely as possible. Scarcity has not been relieved to any appreciable degree and steelmakers are using up reserves in many instances.

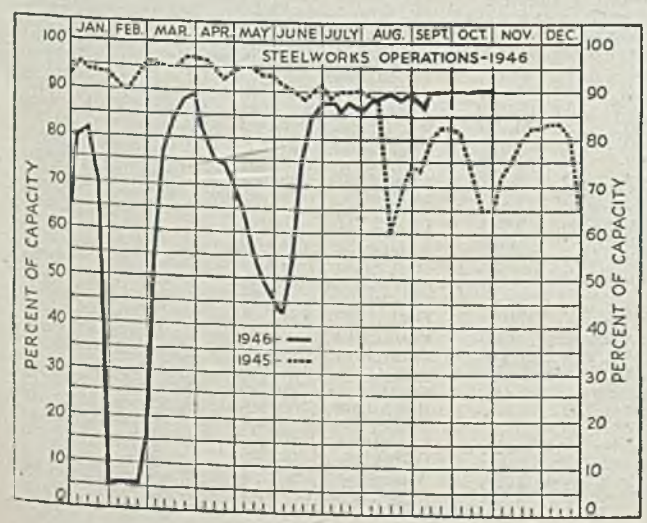
Steel production last week declined ½-point, bringing the estimated national rate to 90 per cent of capacity. The principal factor in the decline was a drop of 23½ points in the Cleveland area, due to a strike at Republic Steel Corp.'s plant which put out all open hearths. This loss was nearly offset by some increases in other districts. Detroit advanced 13 points to 92, Wheeling 4½ points to 93½, Chicago 1½ points to 91½ and St. Louis 10 points to 61. Cleveland declined 23½ points to 66, Pittsburgh 1 point to 96½, Buffalo 2 points to 88½ and New England 1 point to 89. Other rates were unchanged, as follows: Youngstown 91, eastern Pennsylvania 78, Cincinnati 84, Birmingham 99 and West Coast 84.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 26	Change	Same Week 1945	Same Week 1944
Pittsburgh	96.5	— 1	49.5	92
Chicago	91.5	+ 1.5	72	98.5
Eastern Pa.	78	None	71	94.5
Youngstown	91	None	45	88
Wheeling	93.5	+ 4.5	80.5	97
Cleveland	66	—23.5	81	95.5
Buffalo	88.5	— 2	69.5	80
Birmingham	99	None	95	90
New England	89	— 1	80	83
Cincinnati	84	None	71	84
St. Louis	61	+10	68	75
Detroit	92	+13	88	86
Estimated national rate	90	— 0.5	65	96.5

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.



COMPOSITE MARKET AVERAGES

	Oct. 26	Oct. 19	Oct. 12	One Month Ago Sept., 1946	Three Months Ago July, 1946	One Year Ago Oct., 1945	Five Years Ago Oct., 1941
Finished Steel	$64.45	$64.45	$64.45	$64.45	$64.45	$58.27	$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	27.50	27.50	27.50	27.50	27.50	24.19	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES •

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	Oct. 26, 1946	Sept., 1946	July, 1946	Oct., 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.86	2.86	2.57
Steel bars, Chicago	2.50	2.50	2.50	2.25
Shapes, Pittsburgh	2.35	2.35	2.35	2.10
Shapes, Philadelphia	2.48	2.48	2.48	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.558	2.558	2.558	2.30
Plates, Chicago	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh	3.75	3.75	3.75	2.90
Tin plate, per base box, Pittsburgh	$5.25	$5.25	$5.25	$5.00

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$38.00	$38.00	$38.00	$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.30c	2.30c	2.30c	2.15c

Pig Iron

	Oct. 26, 1946	Sept., 1946	*July, 1946	Oct., 1945
Bessemer del. Pittsburgh	$29.77	$29.77	$27.69	$28.35
Basic, Valley	28.00	28.00	26.00	24.65
Basic, eastern del. Philadelphia	29.93	29.93	27.93	26.53
No. 2 fdry., del. Pgh. N. & S. sides	29.27	29.27	27.19	25.85
No. 2 foundry, Chicago	28.50	28.50	26.50	25.19
Southern No. 2, Birmingham	24.88	24.88	22.88	21.57
Southern No. 2, del. Cincinnati	28.94	28.94	26.94	25.50
No. 2 fdry., del. Philadelphia	30.43	30.43	28.43	27.03
Malleable, Valley	28.50	28.50	26.50	25.15
Malleable, Chicago	28.50	28.50	26.50	25.19
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. McKees Rocks, Pa.	28.61	28.61	28.61	25.49
Ferromanganese, fob cars, Pittsburgh	140.00	140.00	140.00	140.26

Scrap

Heavy melting steel, No.1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	25.00	23.75	20.00	20.00

Coke

Connellsville, furnace ovens	$8.75	$8.75	$8.75	$7.50
Connellsville, foundry ovens	9.50	9.50	9.50	8.25
Chicago, by-product fdry., del.	15.10	15.10	15.10	13.75

* $2 higher on bessemer, basic, foundry and malleable on adjustable pricing contracts.

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, $33, fob mill; forging quality, $38, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, Coatesville, uncrop, $48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41.50; Duluth (bill.), $41; Pac. ports (bill.), $51.50. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co., $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49.50; Duluth, billets, $49; forging billets fob Pac., ports, $59.50.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 fob Toronto, O.; Geneva Steel Co., $64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $58.43; del. Detroit $60.93; del. eastern Mich. $61.93.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon, sheet bars, $39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—⅜ in. inclusive, per 100 lb, $2.30. Do., over ⅜—$\frac{47}{64}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.535.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.635c; eastern Mich., 2.685c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports, dock, 2.885c; Pac. ports, dock, 3.185c. (Sheffield Steel Corp. may quote 2.75c, fob St. Louis; Joslyn Mfg. & Supply Co., 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.056c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.108	4300	$1.839
2300	1.839	4600	1.298
2500	2.759	4800	2.326
3000	0.541	5100	0.379
3100	0.920	5130 or 5152	0.494
3200	1.461	6120 or 6152	1.028
3400	3.462	6145 or 6150	1.298
4000	0.487	8612	0.703
4100 (.15-.25 Mo)	0.757	8720	0.757
(.20-.30 Mo)	0.812	9830	1.407

* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.76c; eastern Mich., 3.79c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo, 2.535c; Gulf ports, dock, 2.735c; Pacific ports, dock, 2.785c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo, del., 2.535c; Gulf ports, dock, 2.735c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.56c; eastern Mich., del., 2.61c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 3.01c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 3.00c on hot carbon sheets, Sparrows Point, Md.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.41c; eastern Mich., del., 3.46c; New York, del., 3.615c; Phila., del., 3.635c; Pacific ports, 3.96c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.635c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.635c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to lengths 9.00c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.335c; eastern Mich., 3.385c; Pacific ports, 3.885c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.935c; eastern Mich., 3.985c; Pacific ports, 4.485c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.685c	4.00c
Armature	4.25c	5.035c	4.35c
Electrical	4.75c	5.535c	4.85c
Motor	5.425c	6.21c	5.525c
Dynamo	6.125c	6.91c	6.225c
Transformer			
72	6.625c	7.41c	.....
65	7.625c	8.41c	.....
58	8.125c	8.91c	.....
52	8.925c	9.71c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.585c; eastern Mich., del., 2.635c; Pacific ports, 3.135c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.485c; eastern Mich., del., 2.535c; Pacific ports, 3.035c. (Superior Steel Corp. may quote 3.20c, Pitts.)

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.185c; eastern Mich., del., 3.235c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.335c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.835c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point, $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets: 20 x 28 in., coating I. C. 8-lb $12.50; 15-lb $14.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.).

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; Geneva, Utah, 2.65c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, del., 2.74c; Boston, del., 2.86c; Pacific ports, 3.085c; Gulf ports, 2.885c.

(Granite City Steel Co. may quote carbon plates 2.65c fob DPC mill; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.435c; Gulf ports, 4.135c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.308c; Pacific ports, 4.525c.

Clad Steel Plates: Coatesville, 10% cladding: nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.035c; Gulf ports, 2.735c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c, Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.235c.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

Wire to Manufacturers in carloads

Bright, basic or bessemer	*$3.05
Spring (except Birmingham)	*$4.00

Wire Products to Trade

Nails and staples

Standard and cement-coated	†$3.75
Galvanized	‡$3.40

Wire, Merchant Quality

Annealed	§$3.50
Galvanized	§$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15½ gage and heavier	72
Barbed wire, 80-rod spool	**79
Barbless wire, twisted	**79
Fence posts	74
Bale ties, single loop	72½

*Add $0.10 for Worcester, $0.05 for Duluth and $0.535 for Pacific ports.

†Add $0.30 for Worcester, $0.535 for Pacific ports. Nichols Wire & Steel may quote $4.25: Pittsburgh Steel Co., $4.10.

‡Add $0.535 for Pacific ports.

§Add $0.10 for Worcester; $0.735 Pacific ports.

**Pittsburgh Steel Co. may quote 89.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Welded

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	53	30	½	21	0½
¼ & ⅜	56	37½	¾	27	7
½	60½	48	1-1¼	31	13
¾	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Elec. Weld— Hot Rolled	Cold Rolled
1"	13	....	$9.90	$9.36	$9.65
1¼"	13	....	11.73	9.63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15.06	18.03
2¼"	12	17.07	20.28	16.57	19.83
2½"	12	18.70	22.21	18.11	21.68
2¾"	12	19.82	23.54	19.17	22.95
3"	12	20.79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38.68	31.32	37.52
4½"	9	43.16	51.29	....	....
5"	9	49.96	59.36	....	....
6"	7	76.71	91.14	....	....

Pipe, Cast Iron: Class B, 6-in. and over, $60 per net ton, Birmingham; $65, Burlington, N. J.; $62.80, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton. $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates $51 net ton, base, Standard spikes, 3.65c.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅝ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-in. and smaller	..	64
½-in. and smaller	62	..
½-in.-1-in.	..	60
⅝-in.-1-in.	59	..
1⅛-in.-1½-in.	57	58
1⅝-in. and larger	56	..

Additional discount of 10 for full kegs.

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset 1-in. and smaller	71 off
Headless, ¼-in. and larger	60 off
No. 10 and smaller	70 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural	4.75c
⅞-inch and under	*65-5 off

*Plus 12 per cent increase on base prices, effective July 26.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	....	72.49c
1.5	4	1	8.5	58.43c
..	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

Stainless Steels

Base, Cents per lb

CHROMIUM NICKEL STEELS

	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.59
312	38.95	43.28	53.02	....	....
*316	43.28	47.61	51.94	43.28	51.94
§321	31.38	36.79	44.36	31.65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35

STRAIGHT CHROMIUM STEEL

403	23.93	26.51	31.92	22.99	29.21
**410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
‡‡430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.19	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)

(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	....	19.48	20.56	....	....
410	....	17.31	18.39	....	....
430	....	17.85	18.94	....	....
446	....	19.48	20.56	....	....

* With 2-3% molybdenum. § With titanium. † With columbium. ** Plus machining agent. †† High carbon. ‡‡ Free machining.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*$8.75
Connellsville, foundry	9.25- 9.75
New River, foundry	10.25-10.50
Wise county, foundry	9.00- 9.50
Wise county, furnace	8.50- 9.00

By-Product Foundry

Kearney, N. J., ovens	14.40
Chicago, outside delivered	14.35
Chicago, delivered	15.10
Terre Haute, delivered	14.85
Milwaukee, ovens	15.10
New England, delivered	16.00
St. Louis, delivered	†15.10
Birmingham, delivered	12.25
Indianapolis, delivered	14.85
Cincinnati, delivered	14.60
Cleveland, delivered	14.56
Buffalo delivered	14.75
Detroit, delivered	15.10
Philadelphia, delivered	14.68

* Operators of hand-drawn ovens using trucked coal may charge $9.35; retroactive to May 17, 1946, on adjustable pricing.

† 15.68 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	22.00c
Industrial xylol	22.00c
Per pound fob works	
Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c
Eastern plants, per pound	
Naphthalene flakes, balls, bbl, to jobbers, "household use"	9.00c
Per ton, bulk, fob plants	
Sulphate of ammonia	$30.00

WAREHOUSE STEEL PRICES

Base delivered prices, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold finished bars	Cold-rolled strip
Boston	4.356[1]	4.203[1]	4.203[1]	6.039[1]	4.050[1]	5.548[1]	4.418[1]	5.725[14]	5.031[14]	4.656[21]	4.965
New York	4.134[1]	4.038[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.838[14]	4.584[21]	5.075
Jersey City	4.155[1]	4.018[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.890[14]	4.605[21]	5.075
Philadelphia	4.114[1]	3.937[1]	3.875[1]	5.564[1]	3.774[1]	4.664[1]	4.554[1]	5.499[18]	5.139[28]	4.564[21]	5.064
Baltimore	4.093[1]	4.05[1]	3.865[1]	5.543[1]	3.64[1]	4.293[1]	4.193[1]	5.365[17]	5.118[30]	4.543[21]	.....
Washington	4.232[1]	4.22[1]	4.067[1]	5.632[1]	3.842[1]	4.432[1]	4.332[1]	5.667[17]	5.007[24]	4.532[21]	.....
Norfolk, Va.	4.377[1]	4.303[1]	4.262[1]	5.777[1]	4.037[1]	4.927[1]	4.477[1]	5.862[17]	4.552[24]	4.677[21]	.....
Bethlehem, Pa.*	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60[1]	3.65[1]	3.92[1]	5.55[1]	3.575[1]	4.21[1]	4.11[1]	5.20[15]	4.625[16]	4.20[21]	4.96
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[15]	4.525[16]	4.10[21]	4.60
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.575[1]	3.95[1]	3.850[1]	5.327[13]	4.625[24]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[24]	4.10[21]	4.80
Cleveland (city)	3.60[1]	3.88[1]	3.65[1]	5.48[1]	3.575[1]	3.95[1]	3.850[1]	5.347[13]	4.625[24]	4.20[21]	4.70
Cleveland (country)	3.50[1]	.....	3.55[1]	.....	3.475[1]	3.85[1]	3.750[1]	.....	4.525[24]	4.10[21]	4.00
Detroit	3.735[1]	3.987[1]	3.935[1]	5.607[1]	3.710[1]	4.085[1]	3.985[1]	5.526[15]	4.760[24]	4.25[13]	4.985
Omaha (city, del.)	4.32[1]	4.37[1]	4.37[1]	5.97[1]	4.045[1]	4.52[1]	4.42[1]	6.00[15]	5.72[24]	4.945[21]	.....
Omaha (country)	4.22[1]	4.27[1]	4.27[1]	5.87[1]	3.945[1]	4.42[1]	4.32[1]	5.90[13]	.....	.....	.....
Cincinnati	3.902[1]	3.983[1]	3.952[1]	5.583[1]	3.671[1]	4.046[1]	3.946[1]	5.296[15]	4.271[24]	4.602[21]	.....
Youngstown*	.....	.....	.....	.....	.....	.....	.....	4.85[13]	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.475[2]	3.85[1]	3.750[1]	5.10[16]	.....	.....	.....
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[1]	3.475[1]	3.95[1]	3.850[1]	†5.40[15]	4.425[24]	4.20[21]	4.90
Milwaukee	3.908[1]	3.958[1]	3.958[1]	5.558[1]	3.633[1]	4.108[1]	4.008[1]	†5.558[15]	4.583[24]	4.358[21]	5.058
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.743[1]	4.118[1]	4.018[1]	5.368[15]	4.793[24]	4.43[21]	5.060
St. Paul	4.092[3]	4.142[3]	4.142[3]	5.742[3]	3.817[3]	4.292[3]	4.192[3]	5.666[15]	4.767[24]	4.852[21]	5.398
St. Louis	3.918[1]	3.968[1]	3.968[1]	5.568[1]	3.643[1]	4.118[1]	4.018[1]	5.622[16]	4.593[24]	4.522[21]	5.222
Memphis, Tenn.	4.296[1]	4.346[1]	4.346[1]	6.071[1]	4.221[1]	4.596[1]	4.496[1]	5.746[15]	.....	4.821[21]	.....
Birmingham	3.75[1]	3.80[1]	3.80[1]	6.153[1]	3.675[1]	4.05[1]	4.05[1]	5.20[15]	5.077[24]	4.99[21]	5.465
New Orleans (city)	4.358[1]	4.408[1]	4.408[1]	6.329[1]	4.283[1]	4.658[1]	.....	5.808[15]	5.304[24]	5.079[21]	.....
Houston, Tex.	4.00[3]	4.50[1]	4.50[1]	5.75[3]	3.988[3]	4.668[3]	4.563[9]	5.763[24]	5.819[10]	4.10[21]	.....
Los Angeles	4.65[4]	4.70[4]	5.80[4]	7.05[4]	4.95[4]	5.30[6]	5.200[4]	6.55[13]	6.60[6]	6.105[21]	5.868
San Francisco	4.235[7]	4.185[7]	4.185[7]	5.885[7]	4.16[7]	5.885[1]	4.535[1]	6.385[13]	6.91[15]	5.783[21]	7.588
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.875[27]	6.65[27]	5.000[27]	6.20[15]	6.825[18]	5.983[15]	.....
Tacoma, Wash.	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[13]	6.55[15]	6.23[21]	.....
Seattle	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[15]	6.23[21]	.....

*Basing point cities with quotations representing mill prices, plus warehouse spread; †open market price.

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; [28]—1000 to 1999 pounds; [30]—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	$5.45
Mesabi nonbessemer	5.05
High phosphorus	5.05
Mesabi bessemer	5.20
Old range nonbessemer	5.30

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, cif Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68%	13.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50–8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1	$43.50

less $7 freight allowance.

Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Designation	Chemical Composition Limits, Per Cent					
	Carbon	Mn	Si	Cr	Ni	Mo
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30

Basic open-hearth Electric furnace

Bars per 100 lb	Billets per GT	Bars per 100 lb	Billets per GT
$0.812	$16.230	$1.353	$27.050
.812	16.230	1.353	27.050
.866	17.312	1.407	28.132
.743	14.066	1.244	24.886
1.298	25.968	1.677	$3.543
1.298	25.968	1.677	$3.543

Extras are in addition to a base price of 2.921c. per pound on finished products and $58.43 per gross ton on semi-finished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

PIG IRON

Maximum prices per gross ton fixed by OPA schedule No. 10, last amended July 27, 1946; $2 increase may be charged on adjustable pricing contracts made between May 29 and July 27. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$29.50	$29.00	$30.50	$30.00
Newark, N. J., del.	31.20	30.70	32.20	31.70
Brooklyn, N. Y., del.	32.28	....	....	32.78
Birdsboro, Pa., base	29.50	29.00	30.50	30.00
Birmingham, base	24.88	23.50	29.50	....
Baltimore, del.	30.22	....	....	....
Boston, del.	29.68	....	....	....
Chicago, del.	28.72	....	....	....
Cincinnati, del.	28.94	28.06	....	....
Cleveland, del.	28.62	27.74	....	....
Newark, N. J.	30.82	....	....	....
Philadelphia, del.	30.05	29.55	....	....
St. Louis, del.	28.62	29.54	....	....
Buffalo, base	28.50	27.50	29.50	29.00
Boston, del.	30.06	29.56	31.06	30.56
Rochester, del.	30.03	....	31.03	30.53
Syracuse, del.	30.58	....	31.58	31.08
Chicago, base	28.50	28.00	29.00	28.50
Milwaukee, del.	29.73	29.23	30.23	29.73
Muskegon, Mich., del.	32.05	....	....	32.05
Cleveland, base	28.50	28.00	29.00	28.50
Akron, Canton, del.	30.04	29.54	30.54	30.04
Detroit, base	28.50	28.00	29.00	28.50
Saginaw, Mich., del.	30.81	30.31	31.31	30.81
Duluth, base	29.00	28.50	29.50	29.00
St. Paul, del.	31.13	30.63	31.63	31.13
Erie, Pa., base	28.50	28.00	29.50	29.00
Everett, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.06	29.56	31.06	30.56
Granite City, Ill., base	28.50	28.00	29.00	28.50
St. Louis, del.	29.00	28.50	....	29.00
Hamilton, O., base	28.50	28.00	....	28.50
Cincinnati, del.	29.68	29.18	....	29.68
Neville Island, Pa., base	28.50	28.00	29.00	28.50
*Pittsburgh, del., N.&S. sides	29.27	28.77	29.77	29.27
Provo, Utah, base	26.80	26.00	....	....
Sharpsville, Pa., base	28.50	28.00	29.00	28.50
Sparrows Point, base	29.50	29.00	....	....
Baltimore, del.	30.60	....	....	....
Steelton, Pa., base	....	29.00	....	....
Swedeland, Pa., base	29.50	29.00	30.50	30.00
Philadelphia, del.	30.43	29.93	....	30.93
Toledo, O., base	28.50	28.00	29.00	28.50
Youngstown, O., base	28.50	28.00	29.00	28.50
Mansfield, O., del.	30.66	30.16	31.16	30.66

High Silicon, Silvery

6.00-6.50 per cent (base).....$34.00
6.51-7.00..$35.00 9.01- 9.50. 40.00
7.01-7.50.. 36.00 9.51-10.00. 41.00
7.51-8.00.. 37.00 10.01-10.50. 42.00
8.01-8.50.. 38.00 10.51-11.00. 43.00
8.51-9.00.. 39.00 11.01-11.50. 44.00

Fob Jackson county, O., per gross ton. Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01-14.50%, $48, Jackson, O.; $51.25 Keokuk, Iowa; $49.25 Niagara Falls, N. Y. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn. $33.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $28.00
Valley base 28.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $34.00 base; $35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $31.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge net to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

* To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.24, Oakmont, Verona; $1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote $2 a ton higher for foundry and basic pig iron on the Birmingham base.

Refractories

Per 1000, fob shipping point
Net prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $81.00

High Heat Duty

Pa., Ill., Md., Mo., Ky. 65.00
Ala., Ga. 65.00
N. J. 79.00

Intermediate Heat Duty

Ohio 57.00
Pa., Ill., Md., Mo., Ky. 59.00
Ala., Ga. 51.00
N. J. 62.00

Low Heat Duty

Pa., Md., Ohio 51.00

Malleable Bung Brick

All bases 75.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press 42.00
Wire Cut 40.00

Silica Brick

Pennsylvania 65.00
Joliet, E. Chicago 74.00
Birmingham, Ala. 65.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.
Bulk 22.00
Bags 26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.
Chrome brick 54.00
Chem. bonded chrome 54.00
Magnesite brick 78.00
Chem. bonded magnesite 65.00

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective CaF² content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

Open Market Prices of Leading Ferroalloy Products

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone; Special, 21c; regular, 20.50c; medium, 14.50c; central zone: special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.04% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0665c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.26c.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

Ferrovanadium: V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb. contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 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.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices up 10 cents.

Ferrochrome: Contract, lump, packed; high carbon, eastern zone, c.l. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; high carbon, high nitrogen, add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l., and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points. **Low carbon, high nitrogen:** Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C about 5-7%): Contract, lump packed, eastern zone, freight allowed, c.l. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, high carbon (Cr 60-65%, Si, Mn and C 4-6% each): Contract, lump, packed, eastern zone, freight allowed, c.l. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.05c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S.M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.15c ton lots 21.00c, less ton lots 22.00c eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.20c.

Ferrochrome Briquets: Containing exactly 2 lb. Cr, packed eastern zone, c.l. 9.50c, ton lots 9.80c less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 2c for smaller lots. Deduct 0.80c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

Chromium Metal: 97% min chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c, central 81c and 82.60c; western 82.25c and 84.75c; fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract ton lots or more $1.35, less, $1.60, pound of metal; $1.36 and $1.61

central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, carlot, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese, containing exactly 2 lb Mn and about ½ lb Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon,** weighing about 5 lb and containing exactly 2 lb Si, or about 2½ lb and containing exactly 1 lb Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more; Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.89, less $2.01, eastern; freight allowed; $1.903 and $2.023, central, $1.935 and $2.055 western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, $1.90, 1 ton to 8 tons, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

Silvaz Alloy: (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up 0.25c.

SMZ Alloy: (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c, central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

CMSZ Alloy 4: (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

CMSZ Alloy 5: (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Zirconium Alloy: 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up $5 per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, less-ton lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 97%, $2.50-$2.60; freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% NA_2O; or air dried, 83-85% V_2O_5 and 5.15% NA_2O, $1.10 per lb contained V_2O_5, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, delivered at consumer's plant except where noted. For complete OPA price schedule refer to MPR-4

OPEN HEARTH AND BLAST FURNACE GRADES

	—Heavy Melting—			—Bundles—						
	No. 1	No. 2	No. 1 Busheling	No. 1	No. 2	No. 3	Machine Shop Turnings	Mixed Borings, Turnings	Short Shovel Turnings	Cast Iron Borings
†New York	15.33	15.33	15.33		15.33	13.33	10.33	10.33	12.33	
Philadelphia	18.75	18.75	18.75	18.75	18.75	16.75	13.75	13.75	15.75	14.75
*Boston	14.06	14.06	14.06	14.06	14.06	....	9.06	9.06	11.06	
Cleveland	19.50	19.50	19.50	19.50	19.50	....	14.50	14.50	16.50	13.50–14.00
Pittsburgh	20.00	20.00	20.00	20.00	20.00	18.00	15.00	15.00	17.00	16.00
Valley	20.00	....	....	20.00	....	....	15.00	....	17.00	16.00
Mansfield	....	....	....	....	....	....	15.00	....	....	14.75
Chicago	18.75	18.75	18.75	18.75	18.75	16.75	13.75	13.75	15.75	15.25
Buffalo	19.25	19.25	19.25	19.25	19.25	....	14.25	14.25	16.25	13.32
†Detroit	17.32	....	17.32	17.32	17.32	15.32	12.32	12.32	14.32	
St. Louis	17.50	....	....	....	....	....	10.50	....	12.50	
Cincinnati	19.50	19.50	....	19.50	19.50	....	10.50–11.00	10.50–11.00	12.50–13.00	11.50–12.00
Birmingham	17.00	17.00	17.00	....	17.00	15.00	....	....	12.00	13.00
San Francisco	17.00	17.00	17.00	17.00	17.00	9.00	7.00	....	....	....
Seattle	14.50	14.50	....	....	....	....	....	....	....	....
Los Angeles	14.00	13.00	....	12.00	12.00	....	5.50	5.50	....	....

ELECTRIC FURNACE, FOUNDRY AND SPECIAL GRADES

	Bar Crops and Plate	Cast Steel	Punchings and Plate Scrap	Electric Furnace Bundles	Heavy Turnings	Alloy Free Turnings	Cut Structural and Plate Scrap 1 ft and under	Cut Structural and Plate Scrap 2 ft and under	No 1 Chemical Cast Iron Borings	Tin Can Bundles
Philadelphia	21.25	21.25	21.25	19.75	18.25	....	21.25		*16.51	....
†New York	....	....	17.83	16.33	....	....	17.83	17.33	14.33	....
*Boston	....	....	....	....	....	....	....	....	13.31	....
Cleveland	22.00	....	22.00	20.50	....	....	....	....	....	16.00
Pittsburgh	22.50	22.50	22.50	21.00	19.50	18.00	22.50	22.00	19.00	....
Chicago	....	....	21.25	....	....	....	....	....	....	....
†Detroit	....	....	19.82	18.32	....	....	....	....	....	....
Birmingham	15.50	....	....	....	....	....	19.00	18.50	....	14.50
San Francisco	15.50	15.50	....	....	....	7.00	18.00	17.50	....	....

STEEL GRADES OF RAILROAD ORIGIN

	No. 1 Heavy Melting R.R. Steel	Railroad Malleable	Axles	Rails — Rerolling	Rails — Random Lengths	Rails — Cut 3-ft and under	Cut 18-in. and under	Railroad Specialties	Uncut Tires	Angles, Splice Bars
Pittsburgh	21.00	22.00	26.00	23.50	21.50	23.50	24.75	24.50	23.50	23.50
Valley	21.00	....	....	....	....	....	....	....	....	....
†Chicago	19.75	22.00	....	22.25	20.25	22.25	23.50	22.75	21.00	22.25
St. Louis	....	22.00	24.50	21.00	19.00	21.50	....	....	....	21.00
Cincinnati	....	....	....	....	20.50–21.00	....	....	....	....	....
Birmingham	....	....	24.00	20.50	18.50	....	....	....	20.50	20.50
San Francisco	....	....	24.00	....	18.50	....	....	....	....	....
Seattle	14.50	....	....	....	....	....	....	....	....	....

CAST IRON GRADES

	No. 1 Cupola Cast	Charging Box Cast	Heavy Breakable Cast	Stove Plate	Unstripped Motor Blocks	Malleable	Brake Shoes	Clean Auto Cast	No. 1 Wheels	Burnt Cast
†New York	25.00	21.00	20.00	23.00	20.00	24.00		27.00	22.00	....
*Philadelphia	25.00	21.00	20.00		20.00	24.00	17.75	27.00		17.75
*Boston	25.00		20.00	23.00	....	....	....	27.00	22.00	....
Buffalo	25.00	21.00	20.00	23.00	20.00	24.00	17.75	27.00		17.75
Cleveland	25.00		20.00	....	....	....	....	....	22.00	....
*Pittsburgh	25.00	21.00	20.00	23.00	20.00	24.00	17.75	27.00	....	....
Los Angeles	25.00	....	....	....	....	....	....	....	....	....
*Chicago	25.00	....	....	....	....	24.00	....	....	....	....
†Detroit	25.00		20.00	....	....	....	....	27.00		17.75
*St. Louis	25.00	21.00	20.00	23.00	....	....	17.75	27.00	22.00	....
Cincinnati	25.00	....	20.00	23.00	....	....	....	....	....	....
Birmingham	25.00	....	20.00	23.00	20.00	....	17.75	....	22.00	....
*Seattle	25.00	....	....	....	....	....	....	....	....	....

* Fob shipping point; † fob tracks; ‡ dealers buying prices.

LOGEMANN

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In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

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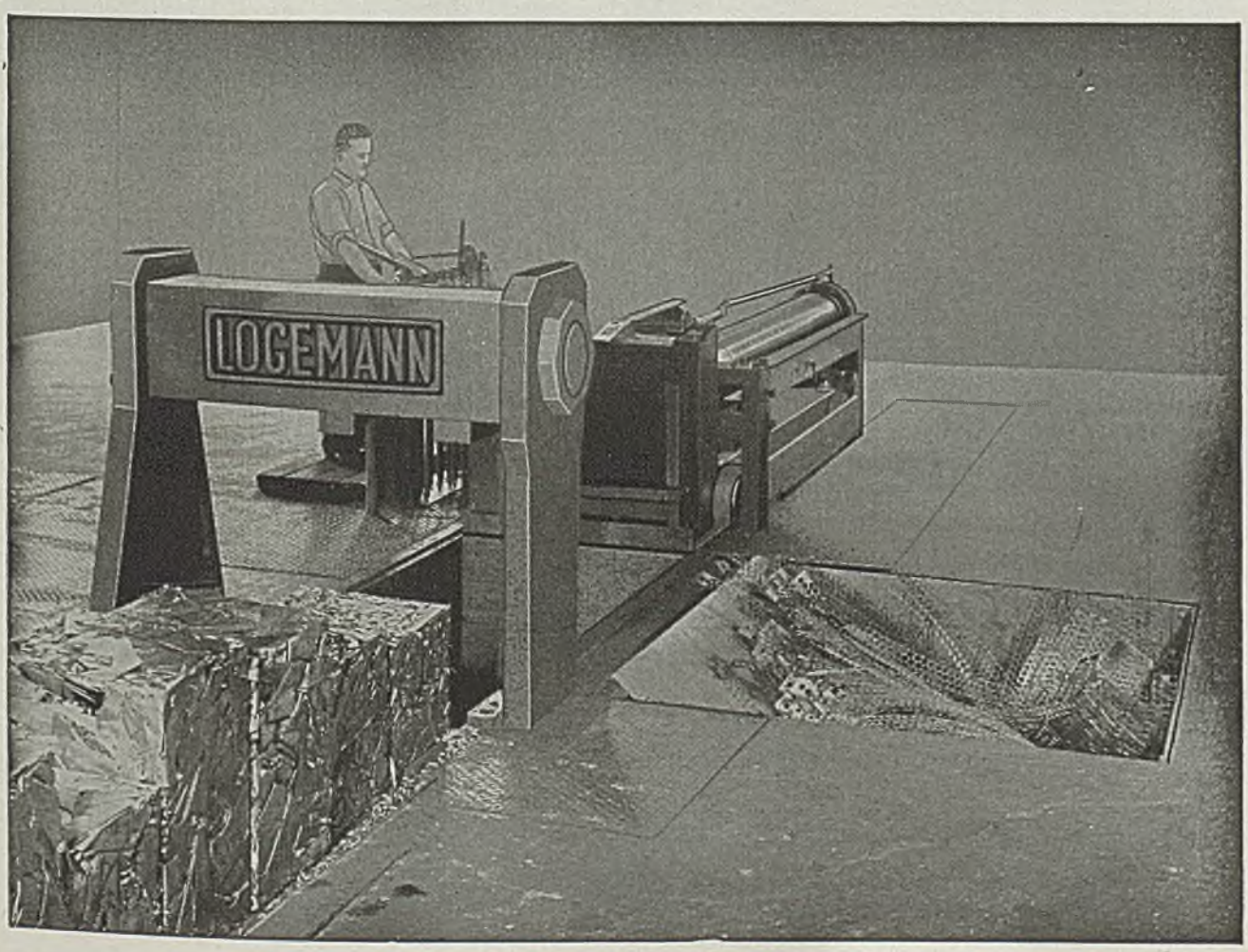

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 15.50c; 88-10-2 (No. 215) 18.75c; 80-10-10 (No. 305) 18.25c; No. 1 yellow (No. 405) 12.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 9.25c, select 9.35c, brass special 9.50c, intermediate 9.75c, E. St. Louis: high grade 10.25c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 8.10c, chemical 8.20c, corroding, 8.20c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland - Akron - Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston - Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 14.50c; No. 12 foundry alloy (No. 2 grade) 14.12½c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 15.25c; grade 2 (92-95%) 13.75c; grade 3 (90-92%) 13.50c; grade 4 (85-90%) 13.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 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% max. 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 fob 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.; 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%, fob 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.

Mercury: Open market, spot, New York, $96-$99 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.30.

Cobalt: 97-99%, $1.50 lb, for 550 lb (bbl.); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y. 90.12½c per ounce.

Platinum: $73.50 per ounce.

Palladium: $24 per troy ounce.

Iridium: $125 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 28.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

Rods: Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

Seamless Tubing: Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

Copper Wire: Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c, New York, 10.00c Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

Zinc Products: Sheet fob mill, 14.15c, 36,000 lb and over deduct 7%, Ribbon and strip 13.25c; 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 12.00c; 1-3 tons 13.00c; 500-2000 lb 13.50c; 100-500 lb 14.00c; under 100 lb 15.00c. 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 lb to 1 ton 17.75c; under 400 lb 18.25c.

Copper Anodes: In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

Copper Carbonate: 52-54% metallic Cu, 250 lb barrels 20.50c.

Copper Cyanide: 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

Sodium Cyanide: 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

Nickel Anodes: 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

Nickel Chloride: 100-lb kegs or 275-lb bbls 18.00c lb, del.

Tin Anodes: 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb bbls 39.00c fob Grasselli, N. J.; 100-lb kegs 39.50c.

Sodium Stannate: 100 or 300-lb drums 36.50c, del.; ton lots 35.50c.

Zinc Cyanide: 100-lb kegs or bbls 33.00c fob Niagara Falls.

Scrap Metals

Brass Mill Allowances: Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red Brass			
85%	10.875	10.625	10.125
80%	10.875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Muntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	.....
Phos. br., A, B, 5%	12.750	12.500	11.900
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lb of one group and ½c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper and copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-lined brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

Aluminum Scrap: Price fob 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 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

Lead Scrap: Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

Zinc Scrap: New clippings 8.00c, old zinc 6.50c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 5.70c, radiator grilles 5.70c, add ½c for 20,000 lb or more. Unsweated zinc dross, die cast slab 6.55c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ½c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 23.00c; 90-98% nickel, 23.00c 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; solder sheet 18.00c.

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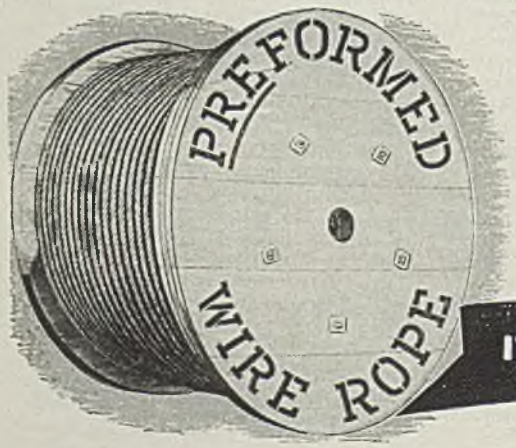

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IT HANDLES EASIER—LASTS LONGER

Sheets, Strip . . .

Carryover will absorb most first quarter output; quotas being set on limited basis as rated orders press

Sheet & Strip Prices, Page 140

New York—Sheet producers are accepting an increasing volume of sheet tonnage for shipment after this year. Before the end of this week at least two or three mills are planning to set up some quotas for first quarter, although they are so heavily overbooked at present that it appears that quotas will be small. In other words, there will be a heavy volume of tonnage originally promised for this year which will be carried over. The situation in cold-rolled sheets is tighter than in hot-rolled sheets, and in galvanized the situation is particularly bad. Housing requirements are taking practically all the galvanized sheets in the current quarter, it is said.

Boston—Flat-rolled carryovers will drastically limit new volume and quotas for first quarter and sheet steel users are making further readjustments in fabricating schedules. Mills are making practically no progress against backlogs, although most have not been accepting firm orders and large tonnages are awaiting to be submitted for scheduling. Although some have apparently overestimated requirements especially in view of revised production programs, users are not getting enough steel at the new levels. There are scattered cancellations and deferments, indicating duplicate buying, in one case involving more than 300 tons, and unbalance in overall inventory in other instances, mainly the latter. Outstanding cancellations are on light-gage carbon sheets. With the exception of stainless most special grades are nearly as tight as carbon.

Tight as are sheets, cold strip is even worse. Going back to hot-rolled, notably in low-carbon, rerollers of narrow cold stock are operating on a hand-to-mouth basis, although one producer is in the throes of a long strike. As loaded as sheet mills are currently, the picture could change materially should consumers in the automotive and several larger industries defer on deliveries to present levels of consumption. More flat-rolled steel is going to most automobile plants and suppliers than is now being consumed, which has been the case for some time.

Pittsburgh — Despite rumors to the contrary, most steel producers expect CPA to continue priority assistance through remainder of this year at least for veterans housing program and small companies that can prove inability to obtain steel sufficient to sustain operations even on limited basis. There is some prospect priorities might be extended to freight car builders and important reconversion industries on West Coast, although the logic that such action would only take away badly needed steel from other important industries may prevail. Present volume of rated tonnage is not excessive in relation to overall finished steel output, but the difficulty arises from fact nearly 90 per cent of priority orders represent galvanized and light gage hot-rolled sheets. However, some interests expect to have very few openings in first-quarter production program for scheduling new orders. Stainless steel producers are booked well into first quarter on polished sheets. Rising production costs for galvanized sheets without compensating price relief likely will result in curtailed production.

Cleveland — "Wildcat" strike at Republic Steel Corp.'s Corrigan-McKinney plant here last week caused a daily loss of about 4200 tons of steel and constituted a threat to operations of the finishing mills. If the strike is continued, sheet and strip mill operations will be reduced later this week. Loss of tonnage would have an adverse effect on November and December shipments to customers who do not have rated orders in the books. Producers here are still annoyed by receipt of rated orders from new customers, some of whom are located outside the area usually served.

Chicago — While steelmakers do not rule out possibility of some decontrol of steel products soon, there is much doubt that it would apply to sheets and strip because of the extreme tightness which exists. Only one mill is accepting business for 1947, but the others are under pressure to announce their quotas and intentions. Consumers need this information to set up production schedules for next year. While approximate quotas have been worked out by mills, the yearend carryover, which will depend upon fourth quarter production, cannot be reliably estimated.

Cincinnati—Sheet mills are receiving a steady flow of rated orders, further tightening the supply, especially in galvanized and cold-rolled. Although allotments for the quarter to other consumers were considered conservative tonnage, with check on expansion plans in most cases, considerable of this tonnage may be carried over into the new year.

St. Louis—Sheet production has increased, following a drop due to lack of steel. Deliveries continue eight to nine months behind schedule on sheets, plates and tin mill products. Completion of a new cold-rolling mill is expected about April 1 which will increase output of sheets substantially. This project is now threatened by delay as a result of the strike at plant of Allis-Chalmers Mfg. Co. There is no abatement of demand. Books for 1947 will not be opened until the middle of first quarter.

Tin Plate . . .

Tin Plate Prices, Page 141

Pittsburgh—Inadequate power and other production difficulties have forced a moderate reduction in tin plate output of one interest here in recent weeks. All producers report the box car shortage is growing more acute, causing serious shipping delays. A fourth-quarter tin mill products load of 900,000 tons was originally discussed, but this figure was revised to about 850,000 tons to take care of shutdowns and other production problems expected this quarter. Production set-backs last quarter resulted in a carryover tonnage of 80,000 tons, compared with 30,000 tons from second quarter.

Cleveland — Due to shortage of freight cars in which to ship material to ports, Civilian Production Administration has authorized producers to defer rolling of tin plate for export. This ruling also applies to other steel products. This will enable steelmakers to divert the export steel into domestic channels, which generally will be applied against heavy order backlogs.

Steel Bars . . .

Mills selective in booking bar orders, some limiting to regular customers; most producers sold far ahead

Bar Prices, Page 140

Pittsburgh — Considerable headway against carryover tonnage is indicated for this quarter, particularly in sizes over 2-in. However, most sellers believe carryover tonnage in small sizes will absorb most of January output. Automotive parts suppliers are accepting all tonnage scheduled despite reports that in some instances their production schedules have been temporarily cut back by automobile builders. Shipments to farm implement companies have eased following large volume delivered under directives in third quarter. Alloy bar production is less than half of war peak rate, and despite 27-day power strike here, which shut down electric furnaces, mill deliveries generally are available within six weeks on most specifications.

Philadelphia — Bar producers are still booking tonnage for first quarter but are able to take only a little in smaller sizes of hot carbon steel. Schedules also are tightening appreciably on smaller sizes of cold alloy bars. In hot alloy bars, however, the situation continues easy, with some mills still taking tonnage for shipment before the end of this year.

New York—Carbon bar sellers are proceeding cautiously in booking orders for first quarter. Some leading producers are accepting orders only from regular customers and on the basis of prewar specifications. Cold-drawn alloy bar producers are also moving cautiously, and especially in the smaller sizes, ⅝ inches and smaller, for which there is an especially good demand. Most of these mills are placing district offices on a quota basis and leaving it up to these offices to make the allocations. Thus this procedure varies, at least in some cases, from that for the handling of hot carbon bars, as indicated above, where the distribution is confined strictly to old customers and on a prewar basis.

Some producers of hot carbon bars are covered for first quarter on small specifications, with considerable tonnage on order for shipment later. Mills generally are substantially behind on current commitments.

The situation in cold-drawn carbon bars for first quarter is fairly easy, with most sellers able to make promises for that period regardless of the size of the specification. Hot alloy bars are readily available in all sizes, with certain mills still able to promise deliveries before the end of this year.

Boston—There is continued easing in carbon bars over one-inch, notably, as the size supply in smaller diameters is tight as ever. Inability of consumers to get rods has added to the load in small-sized bars. Hot-rolled alloy bars over 1⅛-inch are open for December delivery, but going into smaller sizes of cold-drawn alloys first quarter schedules are

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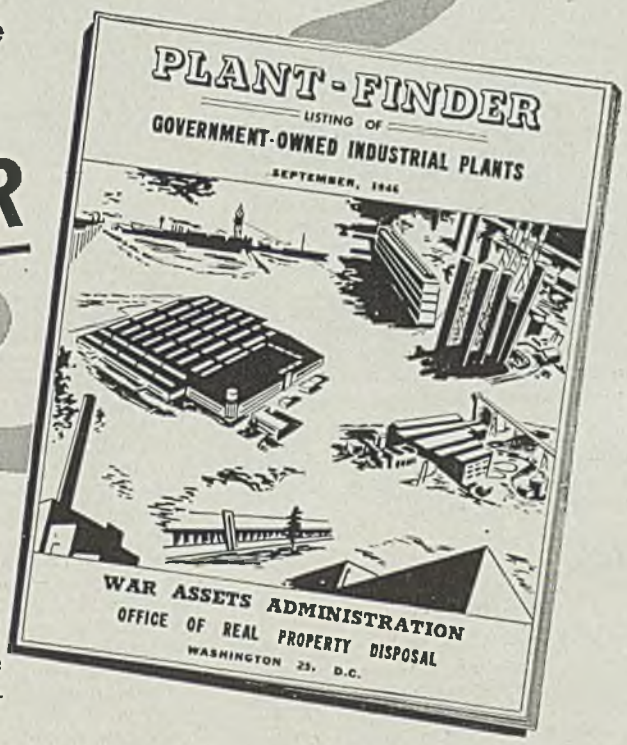

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filling, with some sizes under quotas. While there are some openings for carbon cold-drawn in second quarter, capacity is rapidly filling for that period. Some mills are out on turned, polished and ground rounds, with others in March.

Cleveland — Republic Steel Corp.'s bar mills here continued to operate at virtual capacity last week, but officials of the company were uncertain how long the present rate can be maintained in view of a wildcat strike at its Corrigan-McKinney plant. This strike, which began Oct. 21, forced a shutdown of all open hearths and represented a loss of some 4200 tons of steel daily. If the strike is continued, finishing mills will be forced to curtail operations later this week with bar mills scheduled to be the first affected.

Chicago — Demand for carbon bars exceeds demand by a substantial margin, and except for one district producer orders for 1947 are not being accepted. It had been expected that all mills would have opened books by this time, but delays have been encountered until year-end inventories can be appraised. This depends upon production and shipments in fourth quarter. In most cases, 1947 quotas have been worked out, but may have to be altered in light of carryover tonnage.

St. Louis—Production of merchant bars continues at high level but insufficient to keep abreast of demand. Raw materials are scarce but not yet hampering output. Uncertainty of new steps to be taken by the government to aid housing is interfering with planning of schedules. Small bars are in greatest demand and capacity is booked through first quarter and beyond.

Wire . . .

Wire Prices, Page 141

New York—When price controls go off wire, adjustments upward on low margin or profitless items may be expected. This will be notably the case with some low-carbon lines on which production is small. Users of low-carbon wire are especially pinched, but production should rise with a price advance. Rod producers are short of raw materials for steel, aggravating an already serious situation with nonintegrated wire drawers. Most rod producers are striving to meet current obligations, but are restricting forward commitments. Heavier production of nails, approaching 70,000 tons this month, is another drain on semifinished.

Boston—Pressure on wire mills is unabated and increasing in some directions. Depending on product and grade, backlogs extend into second quarter on some items; on the other hand, a few products are relatively easy, stainless welding wire for one. Leading consumer of stainless in the East has a better than normal inventory, but is pressed for carbon grades; rope wire deliveries are not far extended. Music wire is more extended, reflecting demand for springs, at a time some mills are not getting estimated production on this grade. Automotive industry is clamoring for wire, including valve spring stock, but holding parts suppliers strictly to specifications on wire. In scattered instances wire fabricators accept off-specifications to get material, but few supplying automobile components are able to do this.

Steel Plates . . .

Some mills covered for first half next year with much inquiry for that period; light-gage inquiry leads

Plate Prices, Page 141

Philadelphia — District plate mills are making little headway against arrearages because of inability to obtain sufficient scrap and pig iron to operate at even normal capacity. There is less new demand but still enough to increase backlogs under present operating conditions. Some producers are booked for a year ahead on the basis of present production but are taking some additional tonnage for second quarter on the possibility that operating conditions will improve.

New York—While there is less pressure for plates than for sheets and strip, producers of the heavier flat-rolled material are still far behind on schedules and many are practically covered for first half. Only one mill so far is reported to have accepted any tonnage for third quarter, 1947, however. Special demand continues for light-gage plate, ⅜ and ¼-inch material, coming out from a diversity of sources. Substantial lists are before the market from railroad equipment builders for delivery in first half.

Boston — Impact of removal of controls will be heavier on plate prices than on most other steel products. Four Pennsylvania mills normally supplying substantial tonnage in this area are permitted premiums, up to $6 a ton in one case. In an open market and an approach to normal distribution, doubt exists as to the ability of these mills to command premium prices or willingness of plate fabricators to pay. Consumer inventories are low or out of balance and mill production hampered by shortages in primary steelmaking materials. Demand for tank steel in lighter gages holds at high level while shops with large tonnage contracts have difficulty in placing all steel required. Bids on hull plates for the Navy this month named February for delivery, price adjustment clauses included.

Seattle—Plates continue in strong demand and shops are as busy as the situation will permit. Many important projects will be up as soon as materials are available. Chicago Bridge & Iron Co. has been awarded two 80,000-barrel steel storage tanks for the Texas Co. at 3640 N.W. St. Helens Rd., Portland, Oreg., where retaining walls and other facilities will be installed. Tonnages are unstated. Thompson Pipe & Steel Co., Denver, has been awarded 27,500 feet of 24-inch steel water pipe for Helena, Mont. Ritzville, Wash., has awarded a steel water tank to H. D. Fowler Co., Seattle, for Pittsburgh-Des Moines Steel Co. involving 110 tons.

Tubular Goods . . .

Tubular Goods Prices, Page 141

Boston—Wrought pipe deliveries are more extended, nine months for direct shipments, with skelp supply low following loss of a month's production due to the power strike at Pittsburgh. While some merchant steel pipe mills are sold up on direct shipments through next year for this area, others have some openings which they are reluctant to fill so far ahead, although books are being opened. As a result several large tonnages overhang the market, seeking space on equipment late next year and even into 1948. E. B. Badger & Sons Co., Cambridge, Mass., engineers, need 2500 tons for a refinery at Tulsa, Okla., and an approximately large tonnage for a second at Baytown, Tex. Part of the latter may be filled from surplus, which is reported to be substantial in the Southwest. Contractors and other buyers are frequently forced to fill requirements from several warehouses and distributor stocks are kept down. One mill opening books for next year will take no direct shipment orders through jobbers.

Industrial fabricators of tubing, furniture and the like are buyers of electric welded tubing instead of the usual lighter-walled bedstead stock, although higher in price. This is partially offset by fabricating economies, less grinding and better surface finishing.

Cast pipe buying by utilities for delivery in third and fourth quarters next year is active and demand continues strong in other directions beyond seasonal normal. With double shifts one large eastern producer is making progress against backlogs, largely rated tonnage, commanding a better supply of pig iron.

Cleveland — Pipe producers are distributing their output to jobbers on a quota basis and are allowing a 45-day lead time. Allocations generally are complete for January shipments. Some producers have allocated their entire 1947 tonnage that will be available for direct shipment to consumers and, hence, are virtually out of the market so far as new business is concerned.

Seattle—Cast iron pipe contracts are being awarded on an if and when basis. Many projects are being postponed because of uncertainty. Several thousand tons of materials are aboard ships tied up by the seamen's strike. Inquiry is fairly strong but agencies are hamstrung by existing conditions. Tacoma opened bids last week for 1900 tons involved in four local improvements and has called bids Nov. 1 for an additional tonnage. West Slope district, Portland, Oreg., has called bids Nov. 12 for 6000 feet of 12-inch class 250 cast iron pipe, fittings and pumps and bids will be received Nov. 4 by Oak Grove, Oreg., for 24,000 feet of 16-inch steel pipe, 3400 feet of 12-inch and 45,000 feet of 6-inch cast iron pipe, and two 200,000 gallon steel water tanks, tonnage unstated.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 141

New York—Bolt and nut makers find demand as heavy as at any time during the war. Particularly heavy are requirements for bolts ranging from ¼ to ½-inch in diameter, with demand widely diversified. Heavy structural items are under relatively less pressure, although fabricators' inventories are said to be low. Most producers are confronted by heavy export demand, which in the main they are having to sidestep because of domestic needs. Backlogs average around 16 weeks, it is estimated.

Structural Shapes . . .

Structural Shape Prices, Page 141

Pittsburgh—Shortage of structurals has delayed completion of many expansion programs. Mills are hopeful of substantially reducing carryover tonnage on standard shapes before close of year, but there is little prospect of accomplishing this on wide flange beams. Largest construction recently approved by CPA involves $470,000 for expansion of Pittsburgh Plate Glass Co.'s production facilities at Creighton, Pa. Approval also has been granted for a $255,000 program at American Rolling Mill Co.'s Butler, Pa., plant for the construction of two new mill buildings. Construction has recently started on a $10 million expansion and improvement program at this plant aimed at increasing ingot capacity from 591,000 to 750,000 tons annually.

New York—Following placing of several sizable jobs recently, the local structural market is rather quiet. Considerable work is under contemplation but CPA limitations and the upward trend in costs are causing many builders to move slowly. Meanwhile work already begun is proceeding slowly, due to rail congestion resulting from the ocean shipping tie-up and the trucking situation, which, however, is now beginning to loosen up. Shape mills generally have substantial commitments running well into next year.

Boston—Construction of a telephone building at Malden, Mass., has been authorized and for the first time in months nonhousing authorizations exceeded denials the second week in October, $1,168,726 against $122,807. New structural inquiry is ebbing, hampered by a myriad of adverse factors, not the least of which are mounting costs. Most highway bridge programs are well behind schedule.

Seattle—Public Roads Administration, Portland, Oreg., has awarded the Clackamas river bridge, Oregon, to Tom Lillebo, Reedsport, Oreg., at $118,130, of which $43,000 is the cost of steel. Bureau of Reclamation, Denver, has called bids for screw-lift vertical gates and gate lifts for the Fallon, Mont., project and will open bids Nov. 20 for two motor-driven radial gates, air compressor and propeller fans for the Cascade dam project at Boise, Idaho.

Iron Ore . . .

Iron Ore Prices, Page 142

Consumption of Lake Superior iron ore in September totaled 6,380,155 gross tons, compared with 6,738,409 tons in August and with 5,817,017 tons in September, 1945, according to the Lake Superior Iron Ore Association, Cleveland.

Cumulative consumption for the year to Oct. 1 totaled 41,820,885 tons, compared with 58,271,871 tons in the comparable period last year.

Stocks on hand at furnaces and Lake Erie docks Oct. 1 totaled 37,572,950 tons, compared with 34,066,987 tons a month earlier and 39,549,055 tons a year ago. As of Oct. 1 166 of the 195 blast furnaces depending principally on Lake Superior ore were in blast, the same as at Sept. 1, compared with 148 stacks active Oct. 1, 1945.

Pig Iron . . .

Consumers without preference for housing cramped for material; melt improving slightly in some areas

Pig Iron Prices, Page 143

Pittsburgh—Sharp upturn in pig iron consumption occurred last week with all foundries resuming normal operations following cessation of the electric power strike. Despite restricted production schedules during the 27-day power strike, most foundries were unable to increase pig iron inventories for the local merchant producer shipped to customers outside this immediate area that were badly in need of iron and built up its own stock somewhat. Even foundries on the preferred list that were shut down did not receive their previously scheduled allotment. Inadequate coke and iron ore supplies are major retarding factors in bringing idle high cost furnaces into operation.

Boston—With additional ore in sight supplementing the approximately 80,000 tons on hand Mystic furnace will resume blast on foundry iron as scheduled about Nov. 15 and by the first of the year should be contributing substantially toward relieving critical shortages among New England consumers. Distribution of output for the first six weeks will be a major problem and initial shipments will go to foundries supplying castings to industries threatened by curtailments or production stoppages by lack of molded products. Such an industry is the typewriter industry, badly in need of castings and confronted by temporary release of hundreds of employes, Mystic has not been taking firm orders and delivery schedules will also probably be affected by rated volume, although certifications against prospective Mystic tonnage have been slow to develop.

Shippers into New England territory may also apply for ceiling price adjustments on directed emergency shipments of merchant iron. While applications for adjusted prices pend producers may sell on open billing. Adjusted ceilings will include total costs plus average freights. Freight absorption has been a growing factor in deliveries to this area, notably during the two years no iron has been produced at Everett, while during that period the basing point was maintained, net under Buffalo price. A shipper from that territory to Boston has been absorbing $4.45 per ton, Worcester and Providence $3.49 and Springfield $2.36. Meanwhile, foundry and steelworks stocks are low, with melt curtailed and mixtures high in scrap ratio. Rated volume for November will approximate that of this month and not much easing in overall supply is likely before December.

New York—Pig iron melt in this district will probably be a shade heavier this month than last, due to the improved trucking situation. However, most foundries in this district are not engaged in certified work for the housing program, with a result that they not only are unable to produce in anything like sufficient volume to meet requirements of miscellaneous orders on hand, but are not faring quite as well with respect to distribution by pig iron producers as

they did a month ago. However, all sellers are trying to give regular customers at least some tonnage regardless of whether they have certified work or not. At the same time foundries engaged in the housing program are being allocated somewhat more iron than in September. November allocations for the housing program are now being set up. Oct. 25 was the theoretical deadline for specifications.

Cincinnati—Some slowing in shipments of pig iron, to nonpriority melters, was reported in prospect, meaning allotments for the month may not be fulfilled promptly. Iron is already in short supply, and any lag in delivery would trim the melt immediately. Coke supplies are tight, but so far adequate to old customers. Inquiries to district ovens are more numerous.

Cleveland—Republic Steel Corp. has leased the 800-ton government-owned blast furnace at Gadsden, Ala., from the War Assets Administration and started production last week. Rated capacity is 20,000 tons of pig iron per month. Under Housing Expediter Wilson W. Wyatt's premium payment plan Republic will receive an incentive payment of $12 a ton on its entire shipments of foundry and malleable grades from this plant. All current production will be channeled into manufacture of critically needed housing items. The Gadsden plant's output will mean an increase of more than 20 per cent in the southern area's shipments of foundry and malleable iron.

Foundries in the Cleveland district are receiving larger shipments and are increasing melt steadily, although scrap and pattern grades of lumber are still critical items. One foundry has increased its labor force by 550 men since V-J Day but has difficulty finding 250 additional workers to bring operations up to desired levels. Unfilled orders have been reduced and in several instances delivery is being promised in 30 days on new business compared with 90 days a few weeks ago. Deliveries now are being made close to schedule.

Buffalo — Foundries became more desperate during the week as one of the top merchant iron producers was forced to reduce output because of inadequate coke supplies. Melters were cutting operations to four or five days a week. Sellers were urging foundries not to operate six days a week. Some foundries have acceded to the request. Others, however, with large order backlogs, are reluctant to reduce their work week. Another boatload of iron arrived from the upper lakes for a local ingot producer which had a furnace shut down unexpectedly for repairs. This was the fourth boatload to arrive under an inter-company plants set-up.

Philadelphia — Foundries engaged in certified work for the housing program are receiving full allotments of pig iron, but those not so engaged have considerable difficulty operating on even a reduced basis. Virtually all the latter are receiving some iron but in quantities far short of needs. Adding to difficulties also is scarcity of coke, with some using anthracite coal as a substitute. This scarcity is ascribed particularly to greatly increased requirements of foundries doing rated work, who are being supplied with adequate coke as well as pig iron. Basic consumers are feeling the squeeze created by abnormal production of foundry iron at some furnaces. How-

ever, one district furnace is switching from foundry to basic this week, for a short run.

Chicago — Foundries continue to operate on meager inventories of raw materials, principally pig iron and coke scrap. Total iron supply remains steady and so far little gain has been made through additional blast furnaces coming in under the housing subsidy program. Priorities granted under the housing program are causing some dislocation in distribution of iron. Foundry coke supply is short.

Scrap . . .

Limit put on inventories by CPA to prevent hoarding; supply little improved and upgrading is widespread

Scrap Prices, Page 144

Pittsburgh—Scrap supply has not improved, with most dealers refusing to collect unprepared material, while direct shipments of industrial scrap are still relatively light. It is questionable how much longer steel production can be sustained at present high levels, while the outlook for the winter months is particularly grave. One large interest reports incoming scrap is less than 30 per cent of that being consumed. Electric furnace output is expected to be reduced soon and open-hearth production already has been curtailed at some plants. Upgrading continues on a wide scale, but even this practice is not bringing out adequate tonnage. Higher scrap prices are held necessary to encourage collection of scrap from remote areas and make it worth while for dealers to process material. Most trade interests believe the return of the peddler to the scrap trade is of major importance in remedying present inadequate supply. Prior to the war scrap collected by peddlers represented nearly 25 per cent of scrap purchased.

New York—Scrap is moving at a somewhat better rate, but considerable is said to be upgraded material, providing sellers with a premium. Were it not for these premiums the flow would be sharply curtailed, as is demonstrated in the case of consumers who are refusing to take upgraded material.

The local regional office of the War Assets Administration is opening bids Oct. 28 on 6832 tons of steel scrap, including approximately 4600 tons of "pot shell units of fabricated steel".

Cincinnati—Iron and steel scrap supplies continue critically short, and most melters are close to a day-by-day basis. Even those with heaviest inventories are far short of normal tonnage for this season. Brokers and dealers fear the pinch will become progressively worse as collections, because of winter weather, fall off. Low tonnage of production scrap is one of the major disappointing factors.

St. Louis—Scrap shipments here continue 60 per cent or more under normal, with railroad metal comprising the only substantial movement. Mill reserves have dropped below the 30-day mark but there is no distress yet. Foundries, however, are extremely short of cast, many working on a two or three-day margin. Dealers at collection points are reputed

to be holding back considerable tonnage in an apparent hope for decontrol. A hedge against OPA's possible demise was made here last week in a deal for railroad scrap, with the contract providing for price renegotiation in the event of any OPA change before shipment. In contrast to recent weeks, little scrap now is reported bypassing this district for the Chicago market.

Seattle—The scrap situation is no better. It is strictly a sellers' market and owners of scrap are holding their accumulations. Yards are not interested in processing materials under present ceilings and are awaiting a revision of prices. Meanwhile mills are cutting deeply into inventories, hoping there will be a change for the better before they are forced to close. A recent survey discloses that present supplies will probably carry mills to the end of the year but after that no one will predict.

Youngstown—Scrap shortage has become more acute and threatens steel production unless relief is given. Mills now are depleting inventories at a time when winter stocks should be built. Large receipts of landing mat tonnage being shipped here for scrap have been greatly reduced.

Boston—Shipments of both steel and foundry scrap are light from yards and industrial tonnage continues subnormal. Uncertainty of decontrol of prices is holding back some tonnage. If prices go off advances are expected but accumulated scrap will come into the market in volume to be confronted by probable car shortage. Cast scrap is being picked up in truck lots at prices reported over ceiling and supply of low phos material has slackened. The Everett furnace, resuming next month, will need blast furnace grades, an increase in the overall demand.

Philadelphia — Movement of steel scrap is off somewhat in this district, with possibility of price decontrol in the near future as one retarding factor. Were it not for premiums obtained through upgrading of material this movement would be far lighter. At least one large eastern Pennsylvania consumer still refuses to accept upgrading material and his position is becoming particularly difficult. Cast grades, on which price increases were granted late last summer, are also being subjectd to upgrading and there still is general shortage, for basically the supply is light at best and foundry requirements have seldom, if ever, been larger.

Chicago — Within the past few days scrap flow has suffered from the government's accelerated decontrol program. There is no assurance whatever that scrap will be given early decontrol, nevertheless it is obvious that producers of scrap are watching and waiting, for lifting without a doubt will result in a price rise. CPA's inventory control program does not appear impressive for the limitations imposed lack meaning at this time. Any steel plant would be glad to possess 45 days' supply, and a foundry would be flattered to have 30 days' of cast scrap. Inventories currently are measured in only a few days, and continuity of operations is dependent upon new shipments. For every grade of scrap, demand exceeds supply by a wide margin.

Detroit — Decontrol of scrap prices is regarded in some quarters as the possible forerunner of a runaway market for a short period, but at least it may

have the moral effect of making honest men out of buyers and sellers once more. The fact that inventories are so low and that much scrap is being channeled to specific melters will tend to make it difficult to accumulate stocks for speculation. One large yard here, for example, has at the most no more than 500 tons of prepared and unprepared material, as against a normal stock of 6000 to 8000 tons. A local mystery is what is happening to all the production scrap from General Motors divisions which have had no important lists out for the past two months. Reports are heard of small foundries offering as much as $40 per ton for cupola cast material, but few dealers could supply it at any price.

Limit Put on Scrap Stocks

Following closely the scrap restriction plan approved by the Scrap Industry Advisory Committee, CPA has issued an order limiting scrap inventories by consumers to 45 days for all but cast grades and to 30 days on the latter.

Scrap dealers and brokers under the new plan may not accept scrap in any month which they do not expect to ship in the following two months. Effective Jan. 5, 1947, and on the fifth of each succeeding month dealers and brokers must report to CPA when shipments in the two preceding months have been less than tonnage received in the third preceding month. The order also directs that where a person or company maintains more than one operating unit and keeps separate inventory records for each unit, the limitations apply independently to each unit.

Bureau Reports on Scrap And Pig Iron Consumption

Consumption of ferrous scrap and pig iron in July was 15 per cent greater than in June, a report just released by the U. S. Bureau of Mines indicates.

July scrap consumption totaled 3,997,000 tons, compared with 3,763,000 tons in June, while pig iron consumption in July was 4,071,000 tons, compared with 3,235,000 tons in June. The July consumption of ferrous scrap and pig iron was the greatest since the corresponding month in 1945.

Consumers' scrap stocks at the end of July were 3,268,000 tons, lowest for the year. Likewise, pig iron stocks, which totaled 723,000 tons at the end of July, were the lowest for any month-end in 1946.

Warehouse . . .

Warehouse Prices, Page 142

Chicago—Warehouse stocks continue short and unbalanced. Chief shortages exist in sheets and strip, bars, galvanized sheets, light structurals, plates and tin plate. Some of the sheet and strip shortage arises from the fact that warehouses formerly were able to get from mills irregular and odd lots of mill runs, but these have been almost completely cut off with consumers willing to take everything mills can ship.

Pittsburgh—Steel distributors' stocks of cold-finished bars, alloys, plates and carbon bars 2-in. and over are in fair shape. However, inventories of other steel items are far from adequate. On some items, such as galvanized sheets, small size bars, some wire items, most structurals and light gage hot and cold-rolled sheets, warehouse stocks are inadequate to meet even essential needs of customers despite careful allocation. Some reduction in mill shipments for warehouse account is expected by distributors this quarter. However, producers state they expect at least to match third quarter shipments.

St. Louis—Warehouse steel inventories are declining steadily. There was a net loss in September of at least 15 per cent and October and November are likely to show no improvement. Shipments to warehouses average four months behind orders. Some mills are urging warehouses to cancel back orders so they can become current, and a few warehouses are doing so reluctantly. Sheets continue in tightest supply, with light plates and small structurals scarce. Demand continues on the upgrade, much of it from new consumers with no standing with mills. Most of them are seeking Washington priorities, with scant success unless their product concerns housing. Even producers of agricultural equipment are faring badly on priorities.

New York—Warehouse steel distribution is badly disrupted by the trucking strike. Outgoing shipments are most restricted and in spots jobbers are building up on some items, although mill

deliveries are trailing last quarter, notably in sheets. Some distributing plants are practically closed. Alloy stocks are generally well balanced, including polished stainless sheets. Additional polishing equipment is closing the gap in that grade. Fabricators of light novelty goods for the Christmas trade, usually buying from warehouse, are in need of steel.

Boston—Better than 60 per cent of demand on warehouses is for steel products on which supply is smallest, flat-rolled, plates, structural and small carbon bars. Inventories are sufficient in alloys and generally on cold-drawn carbon bars over one-inch. Demand for warehouse steel is heavy, many consumers being unable to get wanted delivery from mills, turning to distributors. Warehouses are receiving less steel this quarter thus far and the total without the directive will be below that of the third.

Canada . . .

Toronto, Ont. — Canadian industrial activities continue seriously hampered due to steel shortage and there has been only minor improvement in manufacturing enterprises since the end of the steel strike. Local mill representatives state that a new outpouring of inquiries and orders is appearing but most new business is being accepted on an if and when delivery basis. Steel producers also are holding to the policy of making price known at time of shipment. As far as steel sheets and strip are concerned, mills are out of the market and are not taking additional orders. It is pointed out that mills are fully booked on sheets and strip to the end of first quarter with carryover from earlier quarters this year. Sheets, both black and galvanized, are in serious short supply and practically all lines of manufacture are held down due to shortages. No sheets or strip were produced during the strike and it is only within the past few days that sheet mills resumed operations.

Plate mills also are solidly booked to the end of the year and producers are not accepting additional commitments. Plate demand is heavy, most consumers are operating on restricted schedules and a large amount of export business for cars and locomotives has had to be abandoned.

Producers report only small surplus capacity of steel bars for last quarter and this surplus is in smaller size. The Steel Co. of Canada is making some deliveries of bars, but none has been reported from Algoma Steel or Dominion Steel & Coal. Ontario mills have backlogs on bars sufficient to keep some units in operation well into first quarter.

Nails and wire have long passed the critical stage. Building operations have been seriously hampered by nail shortage and a couple of months ago the government seized available supplies for food packers. While some nails have been appearing, imported from the United States, they also are in short supply and consumers have been paying up to $13 per 100-pound keg, against the normal domestic price of $5 a keg. Some aluminum nails have been available recently at $65 per 100-pound keg through retailers.

Pig iron supply is critical, with no iron being received from leading Canadian producers although Canadian Furnace Co., Port Colborne, continues to make deliveries and imports from the United Staates are gaining in volume. Melting operations by a number of foundries have been seriously reduced due to pig iron and scrap shortages.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

17,000 tons, generator assembly building for General Electric Co., Schenectady, N. Y., to American Bridge Co., Pittsburgh; Stone & Webster Engineering Corp., Boston, engineer-contractor.

3900 tons, 10-million cubic foot gas holder for Philadelphia Electric Co., Chester, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

1500 tons, exchange building, San Francisco, for Pacific Telephone & Telegraph Co., to American Bridge Co., Pittsburgh.

900 tons, plant, Chicago, for Sprague Warner, Division of Consolidated Grocers Corp., to Joseph T. Ryerson & Son Inc., Chicago.

815 tons, Mercy Hospital addition, Buffalo, to Bethlehem Steel Co., Bethlehem, Pa.

645 tons, Memorial stadium, Omaha, to American Bridge Co., Pittsburgh.

570 tons, foundry building for General Electric Co., Everett, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

460 tons, Millard Hospital addition, Buffalo, to Bethlehem Steel Co., Bethlehem Pa., through Metzger Construction Co., Buffalo, general contractor.

400 tons, beam span, Dallas, Tex., for state highway department, to Virginia Bridge Co., Roanoke, Va.

325 tons, factory building, E. F. Drew Co.,

Boonton, N. J., to Schacht Steel Construction Inc., New York.

250 tons, John Hancock Homes, Brookline, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

175 tons, addition, Chicago, for White Cap Co., to Joseph T. Ryerson & Son Inc., Chicago; Campbell-Lowrie-Lautermilch Corp., Chicago, contractor.

125 tons, laboratory for Sharpless Corp., Bridgeport, Pa., to Cantley & Co., Philadelphia.

STRUCTURAL STEEL PENDING

1200 tons, building, Beloit, for Fairbanks, Morse & Co.

300 tons, du Pont plant at Carneys Point, Pa.

275 tons, du Pont addition to paint factory, San Francisco.

225 tons, shop building, Boston & Maine railroad, Somerville, Mass.

130 tons, building, Chicago, for American Sanitary Rag Co.

100 tons, sheet metal shop, Chicago, for A. Mathis & Sons; L. B. Strandberg & Son, Chicago, contractor.

100 tons, crane runway, Chicago, for Cuneo Press Inc.

100 tons, addition, New England Baptist hospital, Boston.

Unstated, $3 million addition to electrochemical plant of E. I. du Pont de Nemours & Co., Niagara Falls, N. Y.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3500 tons, generator assembly plant for General Electric Co., Schenectady, N. Y.; to American Bridge Co., Pittsburgh; Stone & Webster Engineering Corp., Boston, engineer-contractor.

Unstated, Public Roads bridge, Clackamas river, Oregon, to Tom Lillebo, Reedsport, Oreg.; $43,000 steel involved.

REINFORCING BARS PENDING

700 tons, veterans hospital, Sioux Falls, S. D., for Veterans Administration; Morrison Knudson & Sons, Boise, Idaho, low on general contract; bids rejected.

Unstated, veterans hospital, Fargo, N. D., for Veterans Administration; bids Nov. 20.

Unstated, grain elevators for Endicott Elevator Co. and Wheat Growers of Endicott, Endicott, Wash.; expenditure of $150,000 and $122,680 respectively approved by CPA.

Unstated, 189-foot bridge and four smaller concrete spans in Sherman county, Oregon; bids to state highway commission, Portland, Oct. 28-29.

PLATES . . .

PLATES PLACED

500 tons or more, two 80,000-barrel steel storage tanks for Texas Co., Portland, Oreg., to Chicago Bridge & Iron Co., Chicago.

500 tons or more, 27,500 feet 24-inch water pipe for Helena, Mont., to Thompson Pipe & Steel Co., Denver, low at $107,978.

110 tons, million-gallon tank for Ritzville, Wash., to H. D. Fowler, Seattle, for Pittsburgh-Des Moines Steel Co.

PLATES PENDING

Unstated, 24,000 feet 16-inch steel water pipe, also two steel water tanks, for Oak Grove, Oreg.; bids Nov. 4; H. L. Gilbert, Portland, engineer.

Unstated, elevated steel water tank, ¼-million gallons, alternate ½-million gals., for Wapato, Wash.; bids Nov. 18 to Mrs. F. M. Rouleau, city clerk; G. D. Hall, Yakima, engineer.

PIPE . . .

CAST IRON PIPE PLACED

500 tons, or 1947 contract, Fitchburg, Mass., 6 to 24-inch pipe, to U. S. Pipe & Foundry Co., Burlington, N. J.

200 tons, 16 and 24-inch, Hartford, Conn., to U. S. Pipe & Foundry Co., Burlington, N. J.

200 tons, 12 and 16-inch, Hartford, Conn., to R. D. Wood Co., Philadelphia.

100 tons, 24-inch, Springfield, Mass., to U. S. Pipe & Foundry Co., Burlington, N. J.

CAST IRON PIPE PENDING

1900 tons, four local improvements, Tacoma, Wash., bids in.

1200 tons, including 1000 tons of 12-inch and 200 tons of 36-inch, for Metropolitan District Commission, Boston; contractor's letting.

250 tons or more, 6000 feet 12-inch Class 250 cast iron pipe, for West Slope district, 9205 S. W. Canyon Rd., Portland, Oreg.; Cunningham and Associates, Portland, engineers.

170 tons, mainly 12-inch, Salem, Mass.

Unstated, 3400 feet 12-inch, 45,000 feet 6-inch cast iron pipe, also two steel tanks, Oak Grove, Oreg.; H. L. Gilbert, Portland, engineer; bids Nov. 4.

STEEL PIPE PENDING

155 tons, 50,000 feet of 2-inch, 20,000 feet of 2½-inch and 775 feet of 5-inch, standard steel pipe, Chicago, for Bureau of Electricity, Department of Streets and Electricity; bids Oct. 28.

RAILS, CARS . . .

RAILROAD CARS PLACED

Lehigh & Hudson River, 20 seventy-ton covered hopper cars, to Harlan & Hollingsworth Corp., Wilmington, Del.

New York City Board of Transportation, 200 trolley coaches, to St. Louis Car Co., St. Louis.

Northern Refrigerator Line, 50 seventy-ton refrigerator cars, to Despatch Shops Inc., East Rochester, N. Y.

Pennsylvania Railroad, 408 bulk containers of 8 tons capacity each, placed; designed for the movement of lime, silica sand and other constituents of steel, they will be mounted in batteries of 12 in specially equipped gondola cars for handling within steel mills by cranes.

Shaker Heights, O., 25 trolley cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Missouri Pacific, 2200 freight cars and eight stream-lined passenger cars: approval granted by Federal district court, St. Louis, to make purchase; also one diesel-electric locomotive.

LOCOMOTIVES PLACED

Southern Pacific, twenty 6000-horsepower diesel-electric engines, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Missouri Pacific, one diesel-electric locomotive; purchase authorized by Federal district court, St. Louis, in addition to considerable car equipment.

Pennsylvania Railroad, three diesel-electric switch engines of about 660 horsepower; bids to be opened Oct. 30.

RAILS PLACED

Baltimore & Ohio, 80,200 tons of rail and 35,000 tons of accessories, placed; Bethlehem Steel Co., Bethlehem, Pa., 28,500 tons of 131-pound rail and 11,500 tons of 112-pound rail; Carnegie-Illinois Steel Co., Pittsburgh, 27,600 tons of 131-pound and 11,600 tons of 112-pound rail; and Inland Steel Co., Chicago, 1000 tons of 112-pound rail; track accessories were placed with various manufacturers.

RAILS PENDING

Pennsylvania Railroad, crossing frogs and structural steel, contract 48-1946; bids opened Oct. 24.

High Operating Rate Seen Easing Shortage of Steel

(*Concluded from Page 49*)

able items such as railroad equipment, etc., naturally has accumulated and will be pressing on the steel market for a much longer period than would have been the case had the war not prevented maintenance of capital facilities on a large scale.

Correction of the steel price situation which has served to discourage production of certain high cost products is expected within the near future. Restoration of normal profit margins to these items will result in improvement of supply conditions in this area of production.

That the shortages of steel reported by some consuming industries should shortly be made up if steel producers are able to continue producing at present peacetime recordbreaking rates, is the opinion expressed by Walter S. Tower, president, American Iron & Steel Institute.

Strikes in steel plants, coal mines and in other industries, and shortages of raw materials, have prevented more than 12 million tons of finished steel from reaching the market this year, he said.

"The month-long steel strike in January-February of this year resulted in a loss of more than 6 million tons of finished steel." said Mr. Tower. "Hardly had the mills got back into stride when the nationwide coal strike caused a direct loss of over 3,500,000 tons more of finished steel.

"Since then production has continued to be hampered by a series of small strikes as well as by shortage of scrap and other raw materials.

"All of these had added up to an overall loss of over 12 million tons of finished steel. That is enough steel for 900,000 automobiles and 70,000 farm tractors, plus the steel for 570,000 washing machines, 1,144,000 kitchen stoves, and 1,416,000 refrigerators, plus the steel for seven billion tin cans. In addition, there still would remain more than 9 million tons of steel for other purposes.

"Those items of 'lost production' represent approximately 2½ months output at the August rate for cans, tractors and washing machines and up to more than 6 months output for refrigerators.

"Right now, however, steel production is greater than in any peacetime period in history," Mr. Tower said. "If the mills can continue to produce without interruption the backlog of unfilled orders should soon get back to normal."

CONSTRUCTION AND ENTERPRISE

ALABAMA

DECATUR, ALA.—Wolverine Tube Division of Calumet & Hecla Consolidated Copper Co., 1411 Central St., Detroit, has let contract to Foster & Creighton Co., American National Bank Bldg., Nashville, Tenn., for a copper tube manufacturing plant, estimated to cost $12 million.

GADSDEN, ALA.—Goodyear Tire & Rubber Co., A. C. Michaels, plant manager, plans a $650,000 expansion program to increase production of neolite heels and soles.

CALIFORNIA

BURBANK, CALIF.—Pacific Airmotive Corp. has building permit for warehouse 200 x 280 feet, costing $93,000, and storage building 30 x 202 feet, costing $18,000, both at 2940 Hollywood Way.

GLENDALE, CALIF.—Radford Iron Works, 1845 Victory Blvd., has building permit for a plant addition costing about $5000.

LOS ANGELES—Frank A. Reed, 1610 North Western Ave., has permit for erection of 40 x 60-foot machine shop at 1049 Riverside Dr., to cost about $7500.

LOS ANGELES—Joseph T. Ryerson & Son Inc., 816 West Fifth St., has building permit for a crane runway at 4318 East Bandini Blvd., to cost about $28,000.

LOS ANGELES—Western Stamping Co. Inc., 6219 South Western Ave., has permit for erection of machine shop addition 39 x 108 feet, to cost about $22,000.

LOS ANGELES—California Gasket & Washer Co. has been incorporated with $75,000 capital, represented by Flanagan & Thomas, 453 South Spring St.

LOS ANGELES—Steel Products Supply Co. Inc. has been incorporated with 2500 shares no par value, represented by Joseph H. Dasteel, 9538 Brighton Way, Beverly Hills, Calif.

LOS ANGELES—J. A. Monax, 757 Towne Ave., has building permit for a machine shop structure at 3535 East Power St., East Los Angeles, covering 3200 square feet of floor space, to cost about $15,000.

POMONA, CALIF.—B. E. Maschio has building permit for a machine and welding shop at 1084 East Second St., steel construction, 48 x 50 feet, to cost about $9700.

SAN DIEGO, CALIF.—Associated Pipe & Supply Co. has been organized by R. T. MacKenzie and H. A. D. MacKenzie and has established operations at 1018 West Washington Ave.

VERNON, CALIF.—Kinney Iron Works Inc. has building permit for a coke oven at 2525 East 49th St., to cost $13,933.

VERNON, CALIF.—General Motors Corp., Frigidaire division, has building permit for office and warehouse building at Loomis Blvd and Alcoa Ave., to cost about $175,000.

VERNON, CALIF.—C. B. S. Steel & Forge Co. has building permit for a craneway roof and plant addition at 3321 East Slauson Ave., to cost about $17,000.

VERNON, CALIF.—Bethlehem Pacific Coast Steel Co. has building permit for five industrial buildings at 6023 Alcoa Ave., to cost about $300,000.

ILLINOIS

CHICAGO—Sprague Iron Works, 4418 West Addison St., has let contract to Carl Wanen, 5377 Bowmanville St., for a one-story 132 x 180-foot plant addition, to cost about $55,000. J. M. Weidenfeller, 1100 North Dearborn St., is architect.

OTTAWA, ILL.—Union Carbide & Carbon

Corp., New York, has let contract for manufacturing plant for Bakelite Corp., a subsidiary, at Ottawa, including main building covering 135,000 square feet for production of vinylite plastic film, pressing unit for plastic rigid sheets, warehouses and offices. Contract has been awarded to F. H. McGraw & Co., Hartford, Conn. Giffels & Vallet Inc., Detroit, is engineer.

ROBINSON, ILL.—Ohio Oil Co. will let contracts soon for a $2 million refinery addition and storage facilities, increasing storage facilities to 51,500,000 gallons.

MICHIGAN

BERKLEY, MICH.—Industrial Enterprises Inc., 3750 West Eleven Mile Rd., has been incorporated with $50,000 capital to do general manufacturing and tool and die work, by Lyle W. Blanchard, 3658 Cumberland Ave.

CENTERLINE, MICH.—Model Broach Co., 24630 Mound Rd., has been incorporated with $50,000 capital to manufacture broaches, cutting and forming tools and machinery, by Fred Holas, 21173 Randall Ave., Farmington, Mich.

DEARBORN, MICH.—Abdite Gauge Co., 5405 Oakman Blvd., has been incorporated with $250,000 capital to manufacture dies, tools, gages and fixtures, by Alfred J. Morency, 22434 Edison Ave.

DETROIT—Whitman & Barnes, 2108 West Fort St., plan a brick, steel and concrete plant building, to cost about $1,500,000.

DETROIT—Lansing Smelting Co. Inc., Dime Bldg., has been incorporated with $50,000 capital to manufacture metal products, by W. E. Garrigan, 501 East Grand River Ave., East Lansing, Mich.

EAST DETROIT, MICH.—Cooney Industries Inc., 17245 East Ten Mile Rd., has been incorporated with $115,000 capital to manufacture and install conveyor systems, by Albert E. Cooney, 110 Merriweather Rd., Grosse Pointe Farms, Mich.

FERNDALE, MICH.—Aircraft Precision Products Inc., 1300 East Nine Mile Rd., has been incorporated with $50,000 capital to manufacture aircraft engine parts, by Bryce C. Clemens, R.F.D. No. 1, Walled Lake, Mich.

MONTAGUE, MICH.—Arrow Foundry Co. has been incorporated with 10,000 shares no par value to manufacture castings, by Walter M. Klaus, Ferry St.

MUSKEGON, MICH.—Wiener Metal Processing Corp., 1352 Division St., has been incorporated with $100,000 capital to operate a foundry and machine shop, by Paul M. Wiener, 1001 West Summitt Ave., Roosevelt Park, Mich.

MISSOURI

FAYETTE, MO.—City has voted $100,000 in bonds for a municipal light and power plant and water works improvements. Frank Beard, Kahoka, Mo., is consulting engineer.

MALDEN, MO.—Russell & Axon, 6635 Delmar Blvd., St. Louis, consulting engineers, will prepare plans for municipal water works and electrical plant expansions for which $200,000 in bonds were voted recently. Bidding dates have not been determined.

ST. LOUIS—Joseph Bettendorf, 6000 Chippewa St., has let contract to I. E. Millstone Construction Co., 4343 Clayton Ave., for a one-story 180 x 240-foot industrial warehouse building at 5200 Manchester Ave.

ST. LOUIS—Bemis Bros. Bag Co., 408 Pine St., St. Louis, has let contract to Gamble Construction Co., 620 Chestnut St., for a one-story 113 x 116-foot bag plant addition at 1058 South Vandeventer Ave.

NEW YORK

NEW YORK—Eastern Brass & Copper Co., 515 Greenwich St., has plans for a heat treatment building, warehouse and office building, to cost about $100,000 at Bronx Park Ave. and 180th St. Horace Ginsberg, 205 East 42nd St., is architect.

OHIO

CLEVELAND—Crest Fabricating Corp., recently formed to fabricate metals, Walter T. Oden, 4206 Bailey Ave., secretary, plans a plant on Bosworth Rd.

CLEVELAND—Cleveland Steel Specialty Co., 3765 East 91st St., Donald B. Ewing, president, has been incorporated from a partnership and plans expansion of plant when materials are available.

CONNEAUT, O.—Conneaut Foundry & Machinery Co. has been incorporated with $75,000 capital by Claude A. Schmidle, 2560 Milford Rd., Cleveland, and will build a plant on Maple Ave., Conneaut, to manufacture water heating units and other metal products.

YOUNGSTOWN—W. T. Pettit & Sons Co., 129 South Center St., has been formed to manufacture sheet metal and wire products, such as garbage cans and paper burners. New equipment is being installed. W. T. Pettit Sr. is president and treasurer.

OREGON

EUGENE, OREG.—City is having survey made by Stevens & Koon, Portland, Oreg., for a proposed filtration plant costing $1,300,000, including $600,000 for 42 to 45-inch steel supply pipe. Main contracts will be let early in 1947.

PORTLAND, OREG.—Louis Schwab has awarded contract for erection of a machine shop at 3026 NE Skidmore St., to cost about $23,000.

RHODE ISLAND

CRANSTON, R. I.—Narragansett Brewing Co., New Depot Ave., has plans in preparation for a one-story 50 x 155-foot boiler plant, to cost about $150,000.

PROVIDENCE, R. I.—Pilling Chain Co., 140 Benedict St., will take bids Nov. 1 for a two-story plant addition, to cost about $65,000. L. A. Gardiner, 612 Union Trust Bldg., is architect.

TEXAS

EUREKA, TEX.—Parkersburg Rig & Reel Co., A. Sidney Knowles, president, plans to treble size of newly acquired Nowery J. Smith plant at cost of about $2 million for production of heaviest type of oil and gas equipment, including heaters, treaters, metal tanks and separators.

HOUSTON, TEX.—Crane Co., 2205 McKinney St., plans a manufacturing and warehouse addition, to cost about $225,000. Lamar O. Cato, 2103 Crawford St., is architect.

WASHINGTON

BELLINGHAM, WASH.—City council has accepted plans by General Engineering Co., Seattle, for proposed $365,000 disposal system, subject to approval by voters.

EATONVILLE, WASH.—City has called bids for Nov. 1 for water system improvements, including 1770 feet of pipe, pumps, filter and 300,000-gallon concrete reservoir. J. W. Carey, Seattle, is engineer.

LONGVIEW, WASH.—Pacific Paperboard Co. has CPA approval for addition to pulp mill to house three pulp grinders and electrical equipment, doubling plant capacity.

PULLMAN, WASH.—City has included in 1947 budget provision of $200,000 for proposed disposal plant.

WEST VIRGINIA

PARKERSBURG, W. VA.—American Cyanamid Co., 30 Rockefeller Plaza, New York, has let contract to Turner Construction Co., 420 Lexington Ave., New York, for a manufacturing plant, power plant and warehouse, to cost about $3,500,000; and to Rust Engineering Co., Clark Bldg., Pittsburgh, for chemical equipment to cost about $2 million.

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15,000 pcs.	6"	.074"	35"	Welded	SAE 1010
60,000 ft.	2-9/16"	20 Ga.	12' Random	Welded	SAE 1010
55,000 ft.	⅜"	12 Ga.	15' Random	C.D. Seamless	SAE 1035
10,000 ft.	1¾"	9 Ga.	11' Random	Stainless	Type 304
1,000 ft.	2¼"	½"	11' Random	Stainless	Type 430
1,600 ft.	4½"	9/16"	20' Random	H.R. Seamless	SAE 1020
20,000 ft.	4¾"	16 Ga.	18'2" long	Welded	SAE 1010
15,000 ft.	8"	14 Ga.	20'0" long	Welded	SAE 1010
1,500 ft.	8"	½"	13' Random	C.D. Seamless	SAE 1030
1,500 ft.	6¾"	12 Ga.	13' Random	C.D. Seamless	SAE 1030
20,000 ft.	2¼"	14 Ga.	15' Random	C.D. Seamless	SAE 1015
15,000 ft.	¾"	11 Ga.	20' Random	C.D. Seamless	SAE 1075
2,000 ft.	3¾"	½"	15' Random	H.R. Seamless	SAE 1015
1,500 ft.	4-1/16"	¾"	20' Random	H.R. Seamless	SAE 1015
3,500 ft.	4¼"	13/32"	20' Random	H.R. Seamless	SAE 1015

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Moly.	.12

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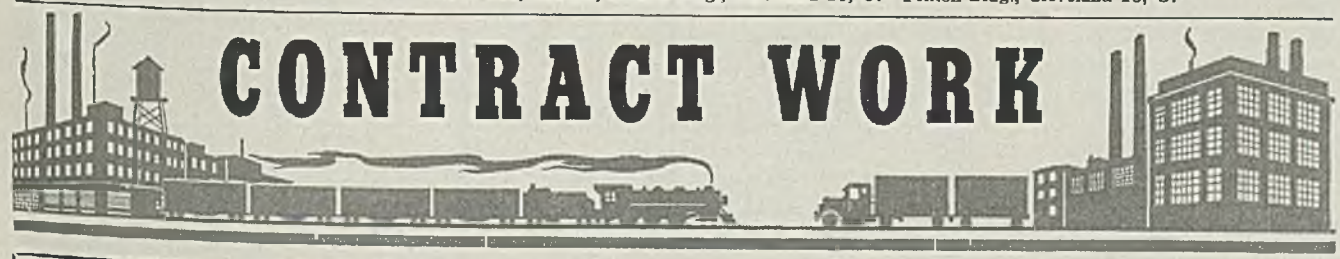

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