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STEEL

The Magazine of Metalworking and Metalproducing

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JULY 29, 1946

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Brazilian Steel Plant Increases Capacity

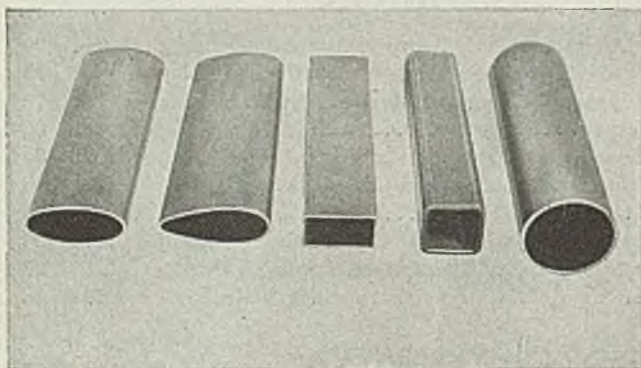
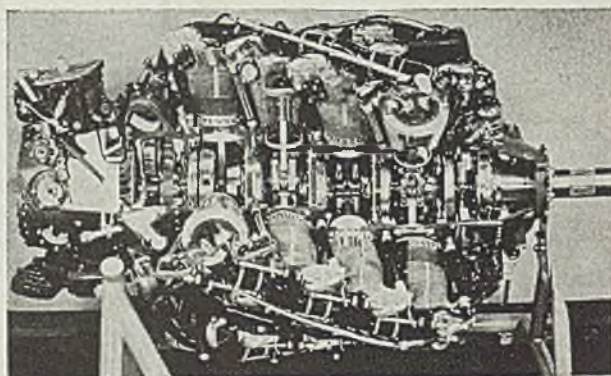
TRIPLE EXAMPLES of improved performance with TRIPLE ALLOY STEELS...

NICKEL, CHROMIUM, MOLYBDENUM

(A) CARBURIZING GRADES

Helps Aero Engine Deliver World-Record Power

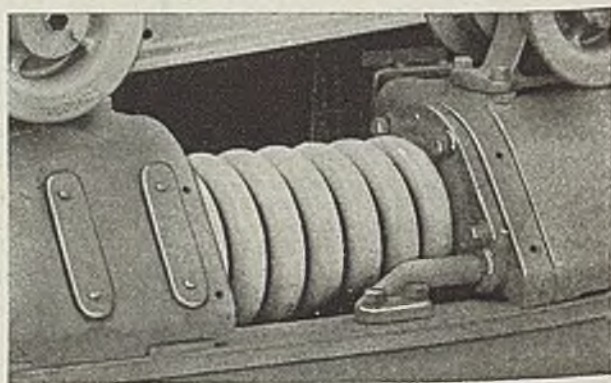
Utilizing Nickel - chromium - molybdenum triple - alloy steels wherever alloy steels are needed ... this 3405 pound Pratt & Whitney "Wasp Major" aircraft engine delivers over 3650 horsepower. Among the highly stressed parts of triple-alloy steels are gears, piston pins and knuckle pins of 9315 and 4320 type steels. Excellent carburizing properties help make these types especially good for case-hardened parts subject to heavy duty service.



(B) MEDIUM CARBON GRADE

Promotes Reliability in Aircraft Tubing

Triple-alloy steel of the 8630 type is ideal for air frames and other aircraft tubing applications where a high strength/weight ratio is vital. Excellent welding and forming characteristics help assure improved response to fabricating operations. The photograph shows a few of many shapes available from Summerill Tubing Company.



(C) HIGH CARBON GRADE

Doubles Impact Resistance in Tractor Springs

Adoption of "8655" triple-alloy steel for tractor coil springs varying from $\frac{3}{4}$ " to $1\frac{3}{4}$ " in diameter, enabled Caterpillar Tractor Co. to raise impact requirements from a minimum of 10 foot pounds (Charpy double width bar) to 20 foot pounds. Exceeding this higher figure without difficulty, this triple-alloy steel provides not only high elastic strength but improved resistance to shock and fatigue failures.

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World Accord and Industry

VIEWS

the NEWS

Returning from a trip of more than 40,000 miles which afforded unusual opportunities for observing the conditions under which industry in Europe and Asia is struggling, this writer finds the workshop of America operating at a postwar peak in production but threatened on all sides by new outbreaks of the troubles that have plagued it since V-J Day.

Here at home industry is hampered by confusing and uncertain government policies and restrictions, shortages of materials and unstable labor relations. In the metal-working industries the most disconcerting current problems are those involved in price control, wages and working conditions and material supply. In the steel producing industry the most immediate threat is an acute shortage of scrap.

These difficulties on the domestic scene have their counterparts in the Far East and in Europe. In Japan, Manchuria, Korea, China, Germany, Austria, France, Belgium and other countries in Asia and Europe industries either are idle or are languishing at a low rate of operations because of government restrictions, shortages of food and fuel, labor unrest, inadequate transportation, maldistribution of materials and manpower and in some cases feuds between governments and between factions within governments.

However, there is one great difference between the problems confronted by American industry and those faced by industry in Europe and Asia. Here industrial management is dealing with one government. In Europe and Asia industry is subject to regulations issued not by one government but by several. Many of industry's problems abroad can be resolved only by complicated negotiations at the highest diplomatic levels.

The point can be illustrated by the present scrap situation. Our mills need scrap from Europe and Asia. Little military scrap is available, but in one spot in Europe there are at least 250,000 tons of scrap in a small area all within crane reach of railroad tracks. This scrap cannot be made available until long drawn out agreements have been reached by the representatives of at least four nations. If this and other non-military scrap were not thus enmeshed in diplomatic routine, it is quite possible that private companies long since would have collected, prepared and marketed it.

One of the great current needs of the world is to increase the rate of industrial production, yet tens of thousands of plants are idle or nearly so awaiting decisions that must be made at international diplomatic levels. Accord between nations is the world's No. 1 problem today. Lack of it is hampering industry seriously.

STEEL =

July 29, 1946

PROMISE FOR FUTURE: Gratifying gains in industrial production are reported all along the line as industry recovers from the effects of early-year labor troubles.

Significantly, in this connection, all four basic barometers in STEEL'S index of industrial production, steel operations, electric power production, automobile manufacture and freight carloadings, currently top the 1936-1939 weekly averages for the first time since V-J Day. And with no major work stoppages current in the basic industries, manufacturing operations have burgeoned markedly.

This is all to the good. Certainly it warrants the

view that, after months of futile fumbling and fumbling, industry at last is on the way to normal peacetime activity. However, it still is too early to let our optimism run riot, for many obstacles remain to be surmounted before industry can be said to have cleared the postwar adjustment hurdle.

Not the least of these obstacles concerns raw material supply. There just isn't enough of everything to go around. In steel, for example, a particularly acute situation exists, especially in the flat-rolled products, with producers committed for virtually every pound of metal they can produce.

In view of this, it is clear conditions do not justify

(OVER)

an excess of optimism for the near future. Some encouragement is to be had, however, from the fact that despite the handicaps of short supply and unprofitable price levels, industry has been able to achieve a level of operations which compares favorably with that of the best pre-war years. This, by itself, hints of what industry can, and will do, once supply and demand come into better balance than at present.

—pp. 44, 122

LOOKING AHEAD: So much importance is ascribed to the necessity for expanding our foreign trade in support of continued high postwar industrial activity and a stable world economy, more than casual interest attaches to data on iron and steel exports from this country during the war years, 1941-44, just released by the United States Department of Commerce.

These data, withheld throughout the war for security reasons, show that in the four years we exported the huge total of 27,611,000 tons, an annual average of 6,902,000 tons. The import of this contribution to our Allies' war effort becomes clear when the annual average for the period is contrasted with our record peacetime exports of 3,892,000 tons in 1937.

Pending restoration of Europe's war-damaged steel industry, world demand is gravitating to this country. We cannot afford to ignore this business. If our present strong position in the world market is to be maintained long after the present supply emergency has passed, we must look ahead and build good will now. Perhaps this explains the Civilian Production Administration's move last week granting priorities assistance on urgent export requirements for general steel products.

—pp. 48, 49

FLOATING BILLY: Important improvements in grinding and polishing operations have resulted from the time and effort engineers expended in exploring the possibilities of the abrasive belt. Some improvements, in form of special machines, achieve astounding results.

In working hand-in-glove with machinery manufacturers and industrial users, for example, engineers of Minnesota Mining & Mfg. Co. finally hit upon novel and successful method of polishing wide stainless steel sheets involving the use of abrasive belts 40 to 50 in. wide.

Feature that led to the successful application of the wide belts was the use of a floating billy which applies uniform pressure across the entire width of the stainless sheet. The arrangement not only keeps the stainless steel sheet flat, but it also serves to keep the temperature even throughout the entire area of the metal.

—p. 78

SIGNS OF THE TIMES: Developments in labor circles are being watched closely for a clew to the future (p.41) as the unions launch program aimed at fighting inflation. Threat of strikes and wave of new wage demands implied unless price rise is halted. . . . First union agreement covering wages and working conditions of mine supervisory employees was signed recently (p. 43) by Adm. B. C. Moreell, government coal mines administrator. The action, covering 136 workers at four Jones & Laughlin Steel Corp. mines, is significant in light of the fact the industry for years has resisted attempts to force it to deal with supervisory workers through unions. . . . Marked trend throughout the country toward expanded special tooling programs (p.43) is reported by the National Tool & Die Manufacturers Association. Trend arises largely from need for cutting labor costs and is particularly noticeable in the case of specially built machines. . . . Systematic store-room planning leads to improved inventory control (p.76) ensuring prompt delivery of proper materials to machines, avoiding waste, confusion and production delays. . . . Machine tool shipments during June rose \$2 million above those in May (p.46), being exceeded by only one other month in 1946, January, when the total was \$30,263,000. . . . While down markedly from wartime, airplane manufacturers are doing a heavy volume of business compared with prewar. Unfilled orders for planes and other products totaling \$1,105,594,953 were held by manufacturers of complete aircraft (p.47) as of May 31. Of the total \$1,036,285,614 was for airplanes, \$21,537,442 for plane conversions and \$47,771,897 for modification work, aircraft products and non-aircraft products. . . . High resistance to chemical corrosion of such reagents as mineral and organic acids, alkali and acid solutions is incorporated in four nickel-base alloys now finding wide use in industry (p.70). . . . Scrap shortage is becoming increasingly acute threatening a shutdown of steelmaking furnaces unless quickly relieved. Government control authority, in move to correct supply situation (p.49), is enlisting services of many industrial leaders who spearheaded the wartime salvage drives to help carry out a 10-point salvage program recently initiated. . . . Labor shortages are retarding British production (p.54), the foundry industry, for instance, operating currently at only two-thirds of capacity. . . . Hearing of outstanding interest to West Coast industry (p.62) gets under way July 31 in San Francisco when the Pacific Freight Tariff Bureau will take up the plea of the United States Steel Corp. for a reduction in freight rates on steel moving from Geneva, Utah.

E. L. Shaner
EDITOR-IN-CHIEF



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STEEL



A wage policy for CIO unions when the government price control outlook is clarified may grow out of a recent meeting in Washington of these CIO leaders. Seated, left to right: James B. Carey, CIO secretary-treasurer; Philip Murray, CIO president; and Jacob Potosky who succeeds the late Sidney Hillman as president of the Amalgamated Clothing Workers of America. Standing, left to right, are: L. S. Buckmaster, Albert Fitzgerald, and Emil Rieve, all CIO vice presidents. NEA photo

Threat of New Labor Crisis Sensed

Management watching union moves in anti-inflation battle as Congress passes denatured price control extender. Wave of wage demands anticipated in event present steps to combat price spiral fail. Second management-labor conference urged

By WILLIAM M. ROONEY
News & Market Editor, STEEL

IS ANOTHER labor crisis building up to explode with atomic bomb force just when industrial production will have attained the virility denied it by strikes and supply shortages since the end of the war last August?

That's a difficult question to answer. On the surface the current labor situation is the most placid it has been for months, with no major stoppages in basic industries and only a few isolated strikes of importance in manufacturing industry. Nevertheless, management is apprehen-

sive of impending trouble, with some labor union spokesmen hinting of new wage demands regardless of existing contracts should living costs continue to rise.

Momentarily the unions appear to be biding their time, concentrating their efforts on moves to encourage buyer strikes. Last week the Congress of Industrial Organizations made public a 5-point program drawn up by its Cost-of-Living Committee for the guidance of constituent unions in combating inflation.

This program seems tame, wholly lacking threat of work stoppages. However, observers see in it the opening gun in a

drive to maintain the wage advantages won earlier in the year; a drive which could easily develop into a wave of strikes should less aggressive moves fail of the unions' objective.

That the explosiveness of the situation is sensed widely is indicated by a letter to President Truman, just made public, in which a group of economists, engineers and educators urge the summoning of a new labor-management conference in an effort to head off what they consider an approaching industrial crisis because of the "unsound trend" of labor, management and government policies.

The letter declared that now that the first phase of postwar adjustment between labor and management had ended, some way must be found to interrupt the "slugging-it-out" method of making adjustments.

The conditions for success in the large-

scale field of mass production it was said, called for:

"1. Wages must be increased progressively with increase in production.

"2. The consumer must share in prosperity with lower prices.

"3. There must be clear-cut rules of the game scrupulously obeyed.

"4. There must be well-ried team-play between labor, management and other economic groups."

Indications are labor leaders will move slowly in any action they take in their fight to hold wage gains. For one thing the prolonged strikes which brought the workers sharp wage increases at the same time were costly to the individual workers and consequently the workers in general are in no mood to lose more time. Astute union leaders, conscious of this, therefore, can be expected to make sure of their ground before they call their followers out on strike.

Unauthorized Walkouts Possible

Still, this does not obviate the possibility of so-called unauthorized walkouts, which can be just as serious a check on production. Even during the present relatively peaceful period of labor relations, such wildcat stoppages are being experienced right along. Only last week steel-making at the Midland works of the Crucible Steel Co. of America at Midland, Pa., was halted by a work stoppage resulting from a controversy over vacations for ex-servicemen. Some 2000 veterans are employed in the plant. When the company declined to accede to a union request that vacation pay allowance in excess of the terms of the union agreement be paid some 300 of these veterans who had not worked 60 per cent of the pay periods during the year, a walkout resulted. An official of the union claimed the strike was unauthorized, but it forced almost complete shutdown of the works, Crucible's largest.

Whether revived government price control will help avert serious labor disturbances in the immediate future is questionable. The revised law meets some of union labor's demands but it falls far short of overall goals. As passed by Congress it provides: Extension of OPA to June 30, 1947; continuation of rent control; creation of 3-man board of decontrol with final authority over gradual removal of price restrictions; freedom from control of meat, dairy products, grains, petroleum, cottonseed and soy beans until Aug. 20 when controls will be restored automatically unless the decontrol board rules otherwise; decontrol of poultry, eggs and tobacco after Aug. 20 unless the board requires controls to be restored before that date; transfer from OPA to the secretary of agriculture



Plans and policy for the future were discussed by this newly created executive board of the CIO-Political Action Committee in a meeting at Washington recently. Left to right are: William Pollock, secretary-treasurer of the Textile Workers Union of America; Jack Kroll, former assistant chairman of the Political Action Committee, now chairman; David J. McDonald, secretary-treasurer, United Steelworkers of America; and George F. Addes, secretary-treasurer, United Electrical, Radio & Machine Workers of America. NEA photo

of authority to determine continuation of controls over food commodities; continuation of subsidies on a reduced basis until April 1, with payment decided by the decontrol board.

Regardless of the extension of government price control most observers are of the opinion the price line cannot be held. While industrial materials and products will be immediately restored to control once the law is passed, it is pointed out that even before OPA expired June 30 many of these products had been scheduled for upward adjustment, and expectations are these adjustments will be carried through by OPA, though action on some of them may be delayed for a time.

As a general thing, price ceilings except on products specifically decontrolled are likely to be re-established at the June 30 level.

Expectations are that the OPA will go to work immediately upon a long list of products for which ceiling raises had been under consideration when the agency expired June 30. This list includes:

Vacuum cleaners, 15 per cent; metal household furniture, 14 per cent; dry batteries, 8 per cent; shovels, 14 per cent; Portland cement, bags, 5 cents per barrel; cast iron ware, 5 per cent; mason's tools, 10 per cent.

Another proposed order would increase the base price of pig iron to stimulate

production of castings for farm machinery and home construction. This would be somewhat under \$2.50 per ton.

Already reported prepared are orders suspending price ceilings on a long list of capital goods; a few minor building materials; metallic arsenic and arsenic trioxide; bismuth metal and alloys; cadmium metal, oxide and sulphide, minor metals and nonmetallic minerals; cotter pins; ice cream cans; locking devices for barrels and containers, solid steel rivets, and track bolts.

From this it can be seen that even on hard goods restoration of price controls will not necessarily mean continuance of price levels in effect prior to June 30. As a matter of fact, whatever return is made to pre-June 30 levels will be temporary in most cases since under the reviver legislation OPA has from 30 to 60 days to apply new pricing standards, which standards, it is said, will necessitate higher prices on a large number of products.

The unions will view with concern any break in the price line since each rise will cut down the wage advantages won during the spring. However, it is possible revived government control will slow down the price spiral sufficiently to permit production to catch up with demand in many directions before the situation becomes so serious as to foment a wave of wage demands. Only time will tell.

Lower Costs Are Sought Through Special Tooling

Marked trend noted towards use of specially built machines, tool and die manufacturers are told at Boston meeting

MARKED trend throughout the country toward expanded special tooling programs was reported to the directors of the National Tool & Die Manufacturers Association by President Richard F. Moore, at a 2-day meeting at the Sheraton Hotel, Boston, July 19 and 20.

This trend arises largely from the need for cutting labor costs, and is particularly noticeable in the case of specially built machines, said Mr. Moore, who is also president of the Moore Special Tool Co. Inc., Bridgeport, Conn.

By installing one special-purpose machine to perform a number of operations previously done on separate machine tools, the manufacturer can replace the several employees formerly needed, by a single man. More complex special tooling is also being utilized to slash labor costs through use of one progressive or compound die in the place of several simple dies.

Excellent results from the apprenticeship training program of the NTDMA were reported to the board by Willis Ehrhardt, partner, Ehrhardt Tool & Machine Co., St. Louis, vice president of the association and chairman of its Fact-Finding Committee.

Announcement was made by George S. Eaton, executive secretary, that arrangements are under way for the association's annual membership meeting, which will be held at the Congress Hotel, Chicago, Oct. 23-26.

On Friday evening at the Sheraton, 250 tool and die manufacturers and guests attended a dinner meeting at which Einar Johnson, partner in the Boston Tool & Die Co., and president, Eastern Massachusetts Tool & Die Manufacturers Association, acted as master of ceremonies.

First Union Agreement for Coal Mine Supervisors Won

First union agreement in the bituminous coal industry covering pay and working conditions for mine supervisory workers was signed on July 17 by Vice Adm. Ben C. Moreell, government ad-

ministrator of coal mines.

The agreement with John L. Lewis' United Mine Workers applies to 136 supervisory workers at four western Pennsylvania bituminous mines of the Jones & Laughlin Steel Corp., Pittsburgh. The case has been regarded as a test over the long-controverted issue of unionizing mine foremen. Admiral Moreell signed the agreement as operator of bituminous mines under a government seizure order in effect the last two months.

For years the coal industry has resisted attempts to force it to deal with supervisory workers through a union. The industry contended that supervisors are part of management and cannot act on both sides of the bargaining table.

Under the government-union agreement the Jones & Laughlin supervisory

workers affected were given wage increases of \$1.85 per day plus overtime after 40 hours. These terms are retroactive to May 22, 1946.

MEETINGS....

Aug. 22-24, Society of Automotive Engineers: National West Coast transportation and maintenance meeting, New Washington Hotel, Seattle. John A. C. Warner, 29 West 39th St., New York 18, secretary and general manager.

Sept. 9-13, American Chemical Society: National Chemical Exposition, Coliseum, Chicago, sponsored by the Chicago section, ACS. Show headquarters are at 1513 South Wabash Ave., Chicago 5.

Sept. 12-14, National Association of Foremen: Annual convention, Forest Park Hotel, St. Louis. Association headquarters are at 11 W. Monument Bldg., Dayton 2, O.

Sept. 16-20, Instrument Society of America: National Instrumentation Conference and exhibit, William Penn Hotel, Pittsburgh. Richard Rimbach, Pittsburgh, secretary.

Present, Past and Pending

■ CARNEGIE PURCHASE OF STEEL PLANTS APPROVED

WASHINGTON—Sale of the former government-owned steel facilities at Homestead, Duquesne and Braddock, Pa., to Carnegie-Illinois Steel Corp. for \$65,013,200 was approved last week by the Justice Department.

■ LEAD SUPPLIES TO REMAIN LOW IN AUGUST

WASHINGTON—Total lead available for August delivery is estimated at 17,512 tons, including 11,200 tons of imported metal, Civilian Production Administration said last week. Outstanding August demand amounts to 66,500 tons.

■ CONSTRUCTION AWARDS ESTABLISH NEW ALL-TIME HIGH

NEW YORK—Construction awards east of the Rocky Mountains totaled nearly \$4 billion in the first six months of this year, a new high, F. W. Dodge Corp. reported last week.

■ BATTERY OF COKE OVENS AT CLAIRTON PLANT REBUILT

CLAIRTON, PA.—Battery No. 22 at the Clairton by-product coke plant of Carnegie-Illinois Steel Corp. has been rebuilt with total carbonizing capacity of 2500 tons of coal a day. Rebuilding of battery No. 21 will commence immediately.

■ UNEMPLOYMENT COMPENSATION DENIED TO STEEL FOREMEN

CHICAGO—Indiana State Employment Security Division has denied unemployment compensation to 84 foremen of the Gary Works, Carnegie-Illinois Steel Corp., who refused to stay on the job during the steel strike early this year.

■ \$4 MILLION WORTH OF SURPLUS MACHINE TOOLS OFFERED

ELMIRA, N. Y.—More than \$4 million worth of government surplus machine tools and industrial equipment is being sold to commercial, nonpriority buyers at Bendix Aviation Corp.'s Eclipse Division here.

■ FINISHED PRODUCT INVENTORIES FOUND BELOW NORMAL

WASHINGTON—A nation-wide check on inventories of finished products by the Civilian Production Administration indicates that inventories are about average or below normal.

■ COLUMBIA STEEL'S EXPANSION PROCEEDING ON SCHEDULE

SAN FRANCISCO—Construction of Columbia Steel Co.'s \$25 million cold-reduction steel sheet and tin plate mill at Pittsburg, Calif., is proceeding on schedule.

■ MAKE RICH FIND OF TANTALITE IN CANADA

EDMONTON, ALTA.—Mining men returning from the north reported that 46 miles east of Yellowknife they made one of the world's richest and largest finds of tantalite.

■ ZINC, ANTIMONY MUST BE LICENSED FOR EXPORT

WASHINGTON—All grades of zinc in slabs, pigs or blocks, also antimony ores and concentrates, have been added, effective immediately, to the Positive List of the Office of International Trade, and now require individual licenses for export.

■ STOCKPILING OF STRATEGIC MATERIALS TO CONTINUE

WASHINGTON—Government stockpiling of strategic and critical materials will be continued under a bill signed last week by President Truman. Stockpiled on June 30 were: Copper, 323,000 net tons; zinc, 222,000 net tons; antimony, 5300 net tons; aluminum, 321,500 pounds; lead, 41,000 net tons; tin, 49,000 long tons; silver, 374,667 troy ounces.

Consumers Press for Steel Supplies

Metalworking firms, encouraged by rising output, confident of making substantial headway against order backlogs in last half of year

By J. C. SULLIVAN
Pittsburgh Editor, STEEL

PITTSBURGH

PROJECTED requirements for finished and semifinished steel products through the remainder of this year are expected to exceed substantially available supply, but barring strikes and unforeseen work stoppages the steel production outlook is more promising than at any time to date this year, and there is some indication of a let-up in present frenzied steel demand by the first quarter next year.

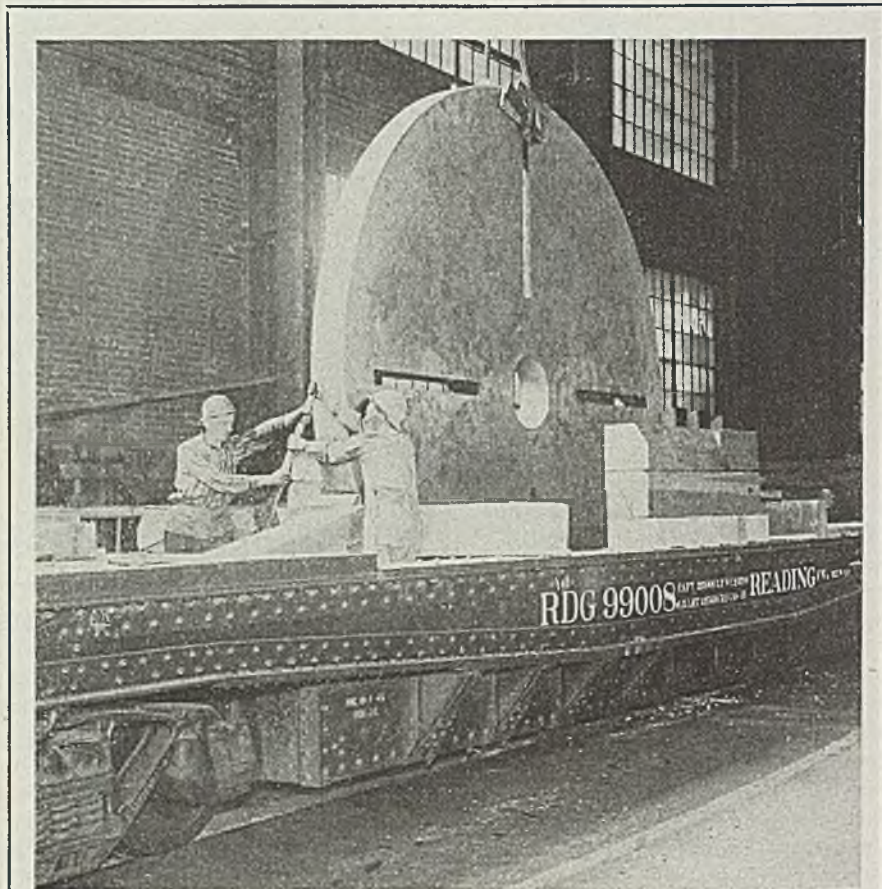
On the basis of improved steel supply outlook most metalworking companies are confident that some headway will be made in the immediate future against the abnormally large order backlogs accumulated since V-J Day. Intermittent fabricating operations throughout the first half year have in most instances resulted in topheavy order backlogs representing 6 to 9 months output at present levels.

A survey of metalworking companies in the Pittsburgh district, representing a cross section of fabricating activity, indicates that the majority of plants are operating between 70 and 80 per cent of capacity. Except in a few instances, production schedules are slightly better than 4 to 8 weeks ago when operations averaged closer to the 60 per cent level, with some companies down as low as 25 per cent of capacity.

Fourth Quarter Prospects Bright

Most firms surveyed expect only a slight improvement in production schedules this quarter, but are optimistic over fourth quarter prospects in view of the indicated improved supply of steel and components during the closing three months. Apparently inventories of metalworking companies reached a low point during the last half of May and early June. Although their steel stock position since has improved only slightly the downward trend in production schedules has been reversed with production outlook through the rest of this year more promising.

Unbalanced steel stocks and supply of components forced many companies to schedule vacation periods earlier this year in the hope of augmenting inventories of



LOG GRINDER: This large chipper disc for breaking logs into chips in Pacific Coast pulp mills is one of four completed recently at the Bethlehem, Pa., plant of Bethlehem Steel Co. The discs are 175 in. in diameter, 10 in. thick, and weigh more than 32 tons each. One disc, already in operation, is capable of reducing a log, 24 ft long and 4 ft in diameter, into chips of $\frac{3}{4}$ in. or under in less than half a minute

those items that were depleted and thereby making possible more efficient and balanced operations. As a result a few companies have been able to increase production to 80 per cent and higher, but in some instances this pace cannot be maintained throughout the rest of this quarter unless a larger tonnage of steel is received from the mills than is now indicated. Even among those companies whose average production schedules are relatively high some departments either are completely idle or on sharply reduced schedules because of unbalanced steel stocks or components.

Two railroad car shops shut down for 6 weeks in an effort to accumulate supplies of plates, shapes, carbon bars, steel car wheels, braking equipment, lumber and most railroad specialty items, have resumed partial operations and are hopeful of steadily increasing production schedules.

The few stamping companies in this district are back on prewar 40-hour week schedules. However, output is not being pushed because of the general scarcity of most flat-rolled steel items, with the result operations range between 75 and 85 per cent of capacity. Most companies in this category state current production schedules are slightly better than a month ago.

Some improvement in operations also is reported by forge shops and cold-finished bar and tubing manufacturers, but the increase has been negligible to date. These interests note some increase in mill shipments, although on the basis of indicated steel allotments over coming months there is little prospect normal operations can be attained until fourth quarter at the earliest. Current operations range between 70 and 80 per cent of capacity for these interests.

Manufacturers of metal fasteners here

have been particularly hard hit by the shortages of steel, coil wire and nut flats in particular. These companies believe steel supply will gradually improve throughout the last half, but do not anticipate much relief from the current shortage until late this quarter at the earliest. Depleted inventories forced most of these concerns to shut down for a two weeks vacation period somewhat earlier than usual this year, and since resuming operations they have not been able to step up production schedules past the 75 per cent mark. Operations of companies in this group average about 70 per cent.

Structural fabricators have near record order backlogs and most promising potential business in years, but work on projects is delayed due to shortage of most structural items, particularly wide flange sections. Critical structural supply position of some fabricators is illustrated by the statement of one interest that his monthly mill allotment for third quarter would sustain production at about 10 per cent of capacity. This company currently is relying heavily on warehouses for its steel needs, and has been forced to turn down many jobs because of inadequate steel inventories which have retarded operations to 25 per cent of capacity.

Most structural fabricators, however, are somewhat better off in regard to inventories, with operations averaging about 70 per cent. Due to limited operations in face of extremely heavy demand most structural fabricators are booked 6 to 9 months ahead and are forced to pass up much attractive new business. Shortage of skilled help in the shops also is a factor limiting operations.

CPA's pig iron certification program, applying on August and September production, is expected to result in a more critical pig iron shortage among many foundries in this district. The certified tonnage under this program is expected to absorb more than half of the projected capacity output of the lone merchant pig iron producer here. Indicated pig iron shortage throughout the remainder of this quarter, for other than the veterans housing and farm implement programs, may adversely affect production schedules of steel roll and heavy steel mill equipment manufacturers who currently are operating at approximate capacity.

Builders of materials handling equipment and industrial furnaces also report normal operations, and on the basis of future mill delivery promises these companies expect to be operating well above prewar normal by early fourth quarter. Present production schedules are estimated at between 80 and 90 per cent of capacity.

Small Assures Steel Producers No Overall Allocation Planned

Civilian production chief says continuation of uptrend in ingot output will go long way towards easing distribution problems and limiting government controls. Seeks to prevent geographical dislocation of shipments

NO OVERALL allocation of steel supply is contemplated by the government, representatives of leading steel producing companies have been told by John D. Small, administrator, Civilian Production Administration.

At a meeting with the steel men in New York, Administrator Small cited sharp gains in production since the end of the coal and steel strikes, and declared continuation of a climb in ingot production above the current rate (just under 90 per cent) would go a long way to ease steel distribution problems and limit government controls.

Current limited priorities assistance

established by CPA to relieve individual hardship cases and to eliminate bottlenecks in the Veterans' Housing Program must be continued through the fourth quarter, Mr. Small said.

In view of the unsettled situation on price controls, the production chief stated it was difficult to discuss in specific detail some of the steel production problems which are related to price. He emphasized, however, that regardless of what action is finally taken on price control, a means must be found to prevent geographical dislocation in the production and distribution of steel products which are in critically short supply.

Entire Government Stockpile of Copper May Be Released to Veterans' Housing Program

CIVILIAN Production Administration is considering recommending that the entire government stockpile of copper be utilized over the next 90 days to further the veterans emergency housing program.

Government-owned copper stocks totalled approximately 300,000 tons at the end of June, 1946, compared with around 500,000 tons at the beginning of the year. Work-stoppages and decreased imports contributed largely to the 200,000 ton decrease.

Emphasizing that the veterans housing program had top priorities on materials, CPA officials told members of the Brass Mill Industry Advisory Committee that products for this program must be provided even if other orders had to be relegated to later deliveries.

June brass mill production rose to 200,000,000 pounds, CPA said, the largest

peacetime production in the history of the brass industry. Despite this sizable gain, CPA pointed out that all of the production increases will be absorbed by the new housing demands now materializing.

Reviewing the copper supply situation, CPA representatives reported production of domestic refined copper amounted to only 202,000 tons for the first six months of 1946, while foreign imports were 128,000 tons or a total of 330,000 tons. Consumption for the six months' period was approximately 532,000 tons, bringing about approximately a 200,000 ton drain on stocks held by the Office of Metals Reserve. Demand for the last half of 1946 is estimated by CPA's Copper Division at 600,000 to 660,000 tons compared with an estimated 345,000 ton supply, indicating a 255,000 ton or greater deficit.

Scrap Men Get Behind New Salvage Drive

SEEKING to clarify the confused situation in the iron and steel scrap market arising from the unprecedented consumption of metallics during the war and aggravated recently by expiration of OPA without the return of a bona fide free market, the Institute of Scrap Iron & Steel, Washington, last week issued a statement of policy for members of the ferrous scrap industry.

The Institute endorses all efforts to increase the flow of scrap and backs the new salvage drive just launched by the Civilian Production Administration.

Officers and directors of the organization are pledged to urge all dealers to continue to move scrap expeditiously to consumers so that no obstacle to full production of new steel and castings may be raised.

Government Tool Disposal Plans Pushed Actively

Machinery advisory group told more than \$233 million worth sold. Rebuilding of equipment before exporting urged

WASHINGTON

MOST government-owned machine tools have been either declared surplus or placed in War Assets Administration warehouses, Henry W. Cornell, director of Sales Group II of WAA, reported last week at a meeting of the Metalworking Machinery & Equipment Industry Advisory Committee.

Mr. Cornell further said that according to the latest statistics more than \$233 million worth, in acquisition cost, has been sold. Of this amount \$82 million worth has been sold by approved machine tool dealers.

The committee recommended that surplus machine tools be rebuilt before being placed in the export market in order to maintain the high standard of American equipment.

Another recommendation was that machine tools in long supply and adaptable to school use be placed in a nominal price category so that educational institutions with limited budgets may have an opportunity to bring up to date their machine shops.

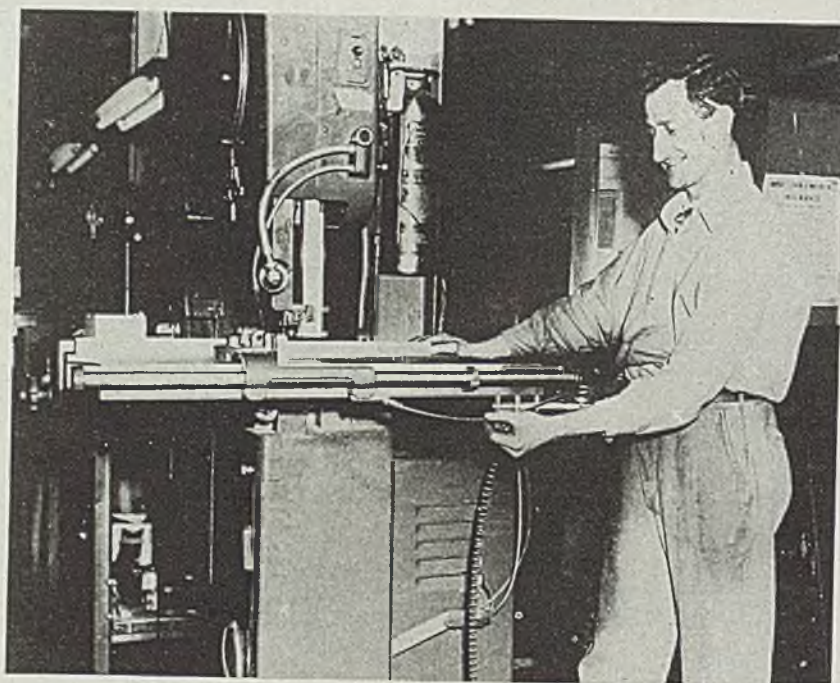
Mr. Cornell, who conducted the meeting, also pointed out that WAA is considering a revision of the regulation governing disposal of machine tools to permit some flexibility in the Clayton formula covering the sale of attachments on standard machine tools.

In an effort to speed disposals, the War Assets Administration has authorized owning agencies to make direct sales of special aeronautical tooling to war contractors.

The special order (No. 17), authorizing direct sales by the owning agencies, also provides that contractors in possession may retain special tooling for their own use, but not for resale provided persons other than the contractors in possession are not licensed to use the tooling. Sales will be negotiated at prices which are considered fair value.

June Machine Tool Shipments Rise \$2 Million Over May

Machine tool shipments in June rose \$2 million above those of May, the June



SAFETY FIRST: For suggesting that the control pulley on this Do-All machine be moved from top to side to eliminate hazardous reaching across the machine, John Brophy (above), machinist at the Dobbs Ferry, N. Y., plant of North American Philips Co. Inc., won a company award

shipments totaling \$28,580,000, compared with \$26,580,000 in May, according to the National Machine Tool Builders' Association, Cleveland. The June shipments were exceeded by only one other 1946 month, January, when the total was \$30,263,000.

New orders in June totaled \$28,490,893, compared with \$28,497,922 in May, while cancellations of orders in June amounted to only \$1,632,568, compared with \$3,231,856 in May. Backlog of unfilled orders rose in June to \$183,456,967, highest for any 1946 month. Backlog in May was \$182,888,583.

Foreign shipments in June amounted to \$6,318,921, compared with \$6,767,698 the previous month. New foreign orders rose from \$6,342,374 in May to \$9,328,147 in June; cancellations of foreign orders in June dropped to \$373,793, lowest this year; and total unfilled foreign orders rose in June to \$54,460,975, highest for any month in 1946.

Considerable Surplus Machinery Being Moved at Pittsburgh

Pittsburgh—In the machine tool market in this district, disposition of government-owned surpluses is of considerable importance. During the last half of June, approved dealers certified by the War Assets Administration completed sales in the amount of \$129,522,26, representing 42 per cent of the total machinery and

industrial equipment sold through the Pittsburgh branch of WAA's Cleveland regional district. Acquisition cost to the government was \$271,505.40. Delivery promises on regular sales are being slowly extended on account of manufacturers' shortages of castings, copper tubing and other components.

Special Machine Tool Demand Remains Active at Cincinnati

Cincinnati—Ordering of special machine tools continues in good volume, and a good proportion of buyers demand expedited delivery. New business in the smaller, standard tools is less active, some of the demand undoubtedly diverted to surplus property offerings.

Expect Exports to Balance Gaps In Domestic Market Demand

New York—Demand for export, notably France and Britain, will go far toward balancing any lags in domestic orders. Current shipments abroad are close to 25 per cent of the total. Total tool shipments are slightly higher and in some instances machine builders are producing more tools than they are booking, although shortages of materials, notably motors and castings, tend to narrow the margin. For industry as whole, with cancellations about complete, unfilled orders July 1 were

slightly heavier than June 1. Orders are steady but at reduced volume booked earlier this year.

Low Output Delays Buying of Machine Tools by Auto Makers

Cleveland — Unfilled orders for machine tools, on a dollar basis, have increased for four consecutive months, although there has been only a comparatively slight change on a unit basis. Buying interest is being held down by uncertainty over the future of price control and by the delay of automobile manufacturers in preparing for introduction of new models. It was pointed out that production has not been sufficiently large for the automotive industry to write off their tooling costs on the present models. New purchases will not be authorized, it is believed, until these costs can be more fully covered.

Geier Retires as Chairman of Cincinnati Milling Machine

Cincinnati — Cincinnati Milling Machine Co. has announced retirement of Philip O. Geier as chairman of the board and treasurer. He will continue as a director. He has been with the company since 1904, as salesman, purchasing agent and treasurer.

Ferris M. Angevin, secretary since 1932, was named to the vacancy as treasurer, and Millard Romaine, assistant to the president, takes his place as secretary.

CPA Charged with Actions Injurious to Small Firms

Civilian Production Administration was charged last week with three actions allegedly injurious to small independents in steel warehousing, steel drum manufacture, and in small plants using plastic molding powders, in a complaint filed with the House of Representatives by the House Small Business Committee.

Civilian Production Administration actions do the following, said the committee: Permit steel mills, under direction 12 to M-21, to fill their own warehouses at the expense of independent warehousemen; under the same direction, steel companies owning steel drum plants favor their own manufacture by steel allotments.

Under direction 17 to priorities regulation 28, the CPA was charged by the committee with denying priorities assistance to small plants needing plastic molding powders, in effect leaving small operators to shift for themselves.

Unfilled Orders Exceeding \$1 Billion Held By Aircraft Manufacturers at End of May

UNFILLED orders for planes and other products totaling \$1,105,594,953 were held by manufacturers of complete aircraft at the end of May, the Bureau of the Census and the Civil Aeronautics Administration reported last week.

Of the total, \$1,036,285,614 was for airplanes, \$21,537,442 for plane conversions and \$47,771,897 was for modification work, aircraft products and non-aircraft products.

Plane manufacturers shipped 3198 planes valued at \$44,024,286 in May. This was an increase of 33 per cent over the 2402 aircraft shipped in April, but was a 1 per cent decrease from the \$44,557,353 value of April shipments. U. S. military customers received planes valued at \$19,875,535 during May, while shipments to all other customers totaled \$24,148,751.

Backlog of unfilled military orders was reported at \$45,714,093 and for other customers at \$390,571,522.

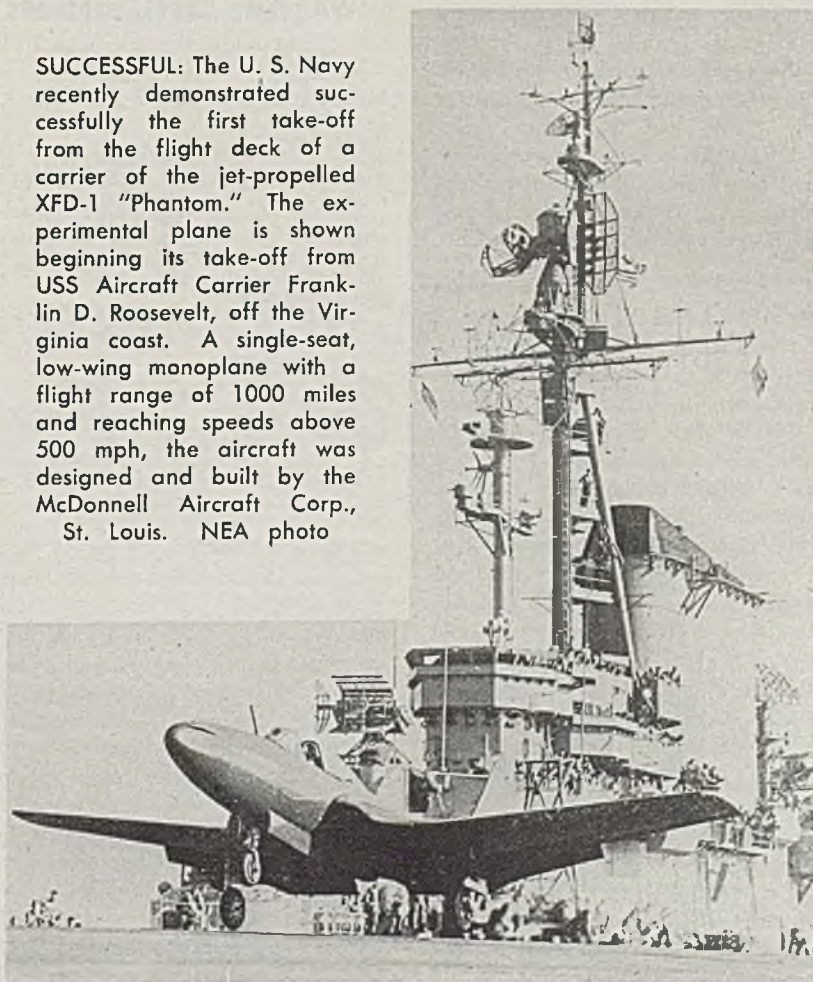
Manufacturers delivered \$4,997,911 of converted craft during the month and had a backlog of conversions amounting to \$21,537,442 on May 31.

Military aircraft acceptances totaled 637 during the first six months of 1946, according to the Aircraft Industries Association. Of the total, 90 were bombers, 488 fighters, and 59 of other types.

Beech Aircraft Corp. has received an order for spare parts from the Navy amounting to between \$10 million and \$12 million. Deliveries will start in November and are scheduled to run over a two year period. The spares are for Beechcraft twin-engine training and transport planes. The Navy recently acquired 250 Beechcrafts from the Army in addition to a substantial number purchased by the Navy during the war.

Engineers of Douglas Aircraft Corp. are reported to have worked out a method of utilizing jet engines to speed up transport airplanes to 500 miles an hour.

SUCCESSFUL: The U. S. Navy recently demonstrated successfully the first take-off from the flight deck of a carrier of the jet-propelled XFD-1 "Phantom." The experimental plane is shown beginning its take-off from USS Aircraft Carrier Franklin D. Roosevelt, off the Virginia coast. A single-seat, low-wing monoplane with a flight range of 1000 miles and reaching speeds above 500 mph, the aircraft was designed and built by the McDonnell Aircraft Corp., St. Louis. NEA photo



Iron and Steel Exports Maintained High Yearly Average in War Years

Rise to 6,902,000-ton average in 1941-44 period, compared with peacetime peak of 3,892,000 in 1937, revealed by government as it resumes publication of detailed statistics. All-time record of 8,717,000 tons was reached in 1940

EXPORTS of iron and steel products during the war years, 1941-1944, totaled 27,611,000 short tons, or an annual average of 6,902,000 tons. This average compared with 3,892,000 tons in 1937, the record prewar year, and 8,717,000 tons in 1940, the peak wartime high which was established before the entry of this country into the war and before the initiation of the lend-lease program.

A fairly steady rise was recorded in exports during the 1935-1939 period when an annual average of 2,308,000 tons was recorded. The record high of 1940 was 24 per cent greater than the top figure reached in World War I. Exports of scrap, however, showed a sharp decline during the war years due to governmental restrictions.

The detailed statistics of United States exports of iron and steel mill products for the war years, 1941-44, are a continuation of a series prepared by the Bureau of Foreign and Domestic Commerce through 1940, and interrupted thereafter by restrictive measures on the release of export data. The report was prepared by B. R. Butler and Jacob Levin of the bureau's Metals & Minerals Unit.

United Kingdom Was Chief Market

Our chief market in the 1940-44 period was the United Kingdom, which received more than 38 per cent of the total. Exports to the United Kingdom and Canada alone constituted about 55 per cent of the aggregate.

Several substantial shifts to countries of destination were made during the wartime period. The ten countries that were consistently high for 1937, 1940 and 1944 (the last year for which detailed figures have been compiled) are the United Kingdom, Canada, Union of South Africa and the following Latin American countries: Argentina, Brazil, Chile, Colombia, Cuba, Mexico and Venezuela. Of these three years, 1940 showed the widest distribution of large exports, with 23 countries receiving 50,000 tons or more, and accounting for 91 per cent of total exports that year.

The 3,913,908 tons which went to the United Kingdom in 1940 was by far the largest quantity to any country in the three years selected. The United King-

dom, which was exceeded only by Japan and Canada in 1937, was again in first place in 1944. Canada was third largest in 1937 but was second in 1940 and 1944.

In 1937 Japan received 985,210 tons of iron and steel products from this country and was the highest for that year. By 1940 the quantity dropped to less than half and by 1944 to nothing. On the other hand, Russia, with slightly more than 100,000 tons in 1937 and about one-third of that amount in 1940, had risen to 885,243 tons in 1944 and was third in order of magnitude.

For the four years beginning in 1941, aggregate exports were divided almost equally between lend-lease and cash shipments. Country-wise, however, there

WARTIME STEEL EXPORTS

(In thousands of short tons)

Product	1941	1942	1943	1944
Pig iron	578	111	144	162
Ferroalloys	24	22	47	9
Ingot, blooms, etc.	2,314	2,196	2,064	1,107
Bars and rods	775	782	805	775
Plates	405	441	730	331
Skelp	162	171	116	158
Sheets	624	911	777	895
Strip	179	222	200	212
Tin plate,terne plate	398	665	444	489
Structural I & S shapes	412	270	293	300
Rails	170	256	312	317
Railway track materials	32	56	97	135
Tubular products ..	512	531	567	614
Wire and products ..	404	449	371	373
Castings, forgings ..	135	162	223	175
Total	7,124	7,245	7,190	6,052

was quite a variation, the report pointed out. The United Kingdom was the principal beneficiary of lend-lease, receiving over half of the total exports in that category. On the other hand, Canada remained almost entirely on a cash basis throughout the period, and was the recipient of nearly one-third of the total steel exported under cash payment arrangements. Russia was the second most important beneficiary under lend-lease while the other large beneficiaries were in the British Empire group of nations.

While lend-lease shipments to Canada, United Kingdom, Russia, Iraq, India, Australia, Iran, New Zealand, Egypt,

Union of South Africa constituted almost one-half of all exports in the four-year period, similar exports to all the other countries of the world amounted to only about 2.5 per cent of the grand total.

From the standpoint of type of product exported during the war period the most significant development was the increase in shipments of semifinished steel forms. While during the 1935-39 period those products constituted less than 8 per cent of the total shipped, for the five years ensuing they totaled nearly 30 per cent of the aggregate amount. This development, the report said, was a direct result of the war, bringing exports of semifinished steel for rolling and finishing abroad. One effect of this is the subsequent loss of home scrap to this country.

Less spectacular relative increases occurred in the exports of bars and rods which rose from 8 per cent to 12 per cent of the total in the two five-year periods. Other categories either only managed to hold their own or actually showed decreases in relative importance. Flat products dropped from 31 per cent to 23 per cent, pig iron from 14 per cent to 4 per cent, and tin plate and terne plate from 12 to 7 per cent.

The most significant development in this country's exports of iron and steel scrap was the sharp drop during the war years. In the prewar years 1935-39, they were so high that they actually exceeded, in tonnage, the total exports of all iron and steel mill products. From 1940 onward precipitous drops in scrap exports brought the level in 1943 to its lowest point in more than 20 years, and to a quantity only 1.2 per cent as large as exports in the high year of 1937.

The decreased level of scrap exports which followed the enactment of two laws restricting the activity of exporters reached a low point in 1943 at only 54,894 short tons. This was the lowest figure since 1921, and was in sharp contrast to the 4,583,700 tons of 1937.

Nonhousing Construction Uses Few Critical Items

Dollar value of critical materials going into commercial and industrial construction amounts to only 3 per cent of total costs, according to the Civilian Production Administration which made a survey to determine the effect of nonhousing construction on materials supply. The balance was divided 55 per cent to labor, and 42 per cent to other materials which are in relatively good supply. Critically short materials include, in part, bathtubs, radiation, cast iron soil pipe and warm air furnaces.

CPA Priority Aid Is Extended to Steel Exports

Assistance is established for 70,000 tons of general steel products in addition to tin plate quotas

PRIORITIES aid to meet limited and urgent export requirements for general steel products was established last week by the Civilian Production Administration. Formerly such priority assistance was limited to tin plates only.

This priority assistance will be effective on September deliveries and will be limited to a monthly total of 70,000 tons on general steel products, in addition to the present tin plate quotas. The tin plate quota on which priority assistance was previously granted was established at 112,000 tons for the third quarter.

Priorities aid is further limited through a provision in the amended direction 10 of order M-21 which states that no steel producer is required to accept CXS (certified rated orders) for any steel product in excess of 2 per cent of his expected monthly shipments of that product.

Applications for priorities assistance on export orders are made to the Office of International Trade, Department of Commerce. The "CXS" symbol on an order presented to a steel mill means that the OIT has certified that such an order is entitled to priority assistance and the steel mill is required to accept it as a rated order, subject to the above-mentioned 2 per cent limitation.

Industrial Salvage Groups To Be Reactivated by CPA

Civilian Production Administration plans to enlist the service of most of the 860 industrial leaders who spearheaded the salvage drives during the war years to help carry out the government's recently announced iron and steel scrap salvage program.

This action on the industrial front follows the recently announced program by the Office of War Mobilization & Reconversion which set up a 10-point plan to speed the flow of scrap from federal agencies to the steel mills.

The CPA salvage campaign will be "sparked" by Edward W. Greb, former deputy chief of the Industrial Salvage Branch of the War Production Board's

Salvage Division. Mr. Greb will be aided by L. D. Green, representing the scrap committee of the American Iron & Steel Institute, and Edwin C. Barringer, president and secretary, Institute of Scrap Iron & Steel Inc.

Continental Steel Corp.'s Net Profit Shows Increase

Net profit of \$380,152 for the second quarter of 1946 has been reported by Continental Steel Corp., Kokomo, Ind. For the corresponding quarter of 1945 the net profit was \$208,672.

Net earnings for the first half of 1946 total \$391,114, compared with \$360,564 in the corresponding period of last year.

Rotary Electric Steel Co. Net Profit Shows Increase

Rotary Electric Steel Co., Detroit, has reported its net profit for the first half of 1946 was \$283,520, a \$24,800 increase over the corresponding period of 1945. An item listed for 1946 but not for the first half of 1945 was strike expense, which amounted to \$79,446.

Consolidated Net Profit Of Acme Steel Co. Rises

Consolidated net profit of Acme Steel Co., Chicago, for the second quarter of 1946 rose to \$1,029,665, compared with \$600,520 for the corresponding period of last year. Federal income taxes decreased, the provision for such in the

second quarter of 1946 being \$631,085, compared with \$2,201,502 for the second quarter of 1945.

Increases Shown in Net Income of M. A. Hanna Co.

Net profit of the M. A. Hanna Co., Cleveland, for the second quarter and the first half of 1946 exceeded that for the corresponding periods of last year.

For the second quarter of 1946 net profit was \$1,210,922, compared with \$1,152,056 for the second quarter of 1945. Net profit for the first half of 1946 totaled \$2,231,393, compared with \$1,999,053 in the corresponding period of last year.

Copperweld Steel Reports Decline in Net Earnings

Copperweld Steel Co., Glassport, Pa., reports for the first six months of 1946 net income of \$50,540 after crediting to income \$110,531, representing one-half of reserves charged against operations in prior years and after provision of \$43,237 for federal and state income taxes. The first six months of 1945 showed a net income of \$475,959 after provision of \$307,647 for federal and state income and excess profits taxes.

Woodward Iron Co. Earnings Increase in First Half

Woodward Iron Co., Woodward, Ala., had a net profit of \$476,805 in the first half of 1946. In the corresponding period of last year the net profit was \$394,629.

GOVERNMENT CONTROL DIGEST

CIVILIAN PRODUCTION ADMINISTRATION

Imports: Materials shipped in bond to the United States for transshipment to another country have been removed from import control. The removal order affects such materials as lead and tin but will have no effect on the domestic supplies of these metals. The relaxed order does not apply if the material is processed or manufactured in bond in this country for re-export. Pig lead which is made into storage battery plates for re-export, for instance, is still subject to import controls. (M-63; CPA-LD-150)

Construction: CPA Administrator Small has ordered that every favorable consideration be given to applications from educational institutions for "CC" priorities ratings needed to complete construction or expansion of facilities indispensable to the Veterans' Educational Program. An authorization to do nonhousing building under VHP-1, the construction control order, must be applied for separately. Such an authorization from CPA does not carry a preference rating with it. Authorization for housing projects, however, carry "HH" preference ratings. The only preference rating given for non-housing is the "CC" rating, which is granted sparingly in cases of urgent need, where assistance is required for procurement of a few bottleneck items. If dormitories and other college housing are solely for veterans, applications for preference ratings for scarce building materials

named on schedule A of priorities regulation 33 (HH ratings) are handled by the Federal Housing Administration. CPA is called on only if the materials needed are those on which the HH ratings do not apply. (VHP-1; CPA-479)

Steel Exports: Priorities aid is established to meet urgent export requirements for general steel products, effective on September deliveries. Formerly such aid was limited to tin plate only. Assistance will be limited to a monthly total of 70,000 tons on general steel products, in addition to present tin plate quotas of 112,000 tons for the third quarter. No steel producer is required to accept CXS orders for any steel product in excess of 2 per cent of his expected monthly shipments of that product. Applications for priorities assistance are made to the Office of International Trade, Department of Commerce. (M-21; CPA-LD-163)

Inventory Limit: Manufacturers' inventories on 18 finished products, including furniture, domestic mechanical refrigerators, washing machines, electric ranges and domestic sewing machines and vacuum cleaners, as well as some scarce building materials and photographic equipment, have been limited to assure a steady and rapid flow of new production to the consumer. Last date for compliance with the regulation is Aug. 15, 1946. Also tightened are inventory controls on manufacturers' stocks of 27 materials and components. (PR-32; CPA-480)

Windows of Washington

Renegotiation of War Department contracts for fiscal years 1942-3-4 nears completion. Refunds of \$6,471,680,000 determined as of June 30, 1946. Income and excess profits taxes would have recovered 70 per cent of sum refunded

RENEGOTIATION of contracts assigned to the War Department for the 1942, 1943 and 1944 fiscal years has been substantially completed, and it is expected most of the War Department cases for subsequent fiscal periods will be completed by November, 1946.

In the renegotiation cases completed by the War Department Price Adjustment Board as of June 30, 1946, refunds of \$6,471,680,000 had been determined. As of that date the Navy and Treasury Departments, Reconstruction Finance Corp., Maritime Commission and War Shipping Administration had completed renegotiation cases involving refunds of \$3,165,191,000. Total of refunds determined was therefore \$9,636,871,000 as of June 30.

According to best available estimates, federal income and excess profits taxes would have recovered approximately 70 per cent of excessive profits determined through statutory renegotiation, leaving an estimated net recovery from renegotiation conducted by the War Department of \$1,941,504,000 and from all Departments \$2,891,061,000.

In addition, the Office of the Chief of Finance of the War Department reports contract price reductions in War Department contracts in the amount of \$3,257,952,000, and similar adjustments by other departments are known to be large.

The renegotiation recoveries are after allowances of deduction for amortization of war facilities under certificates of necessity except to the extent that the refunds may be modified through the renegotiation rebate on recomputed amortization.

An important utilization of the renegotiation activity has been in connection with the termination of war contracts. In the administration of the Renegotiation Act, a policy was adopted to consider in a renegotiation the situation resulting from the use of the so-called "no cost" settlement of contract termination claims. Through the "no cost" termination claim settlement procedure, contractors in a great number of cases have waived their claims to compensation on account of the termination of their war contracts and have been al-

lowed appropriate credit therefore in renegotiation. This method has obviated the necessity of making individual settlements in tens of thousands of such claims and has saved the government and contractors untold accounting work and administrative detail.

As of June 30, 1946, renegotiation of 1942 assignments to the War Department was 99.9 per cent completed, assignments for 1943 were 99.91 per cent completed, those for 1944 were 98.5 per cent completed. Of the 60,175 assignments completed for these three years 41,482 were cancelled or cleared as having no excessive profits. Voluntary refund agreements have been entered into in 17,982 or 96.20 per cent of the 18,693 assignments in which excessive profits were found. The remaining 711 assignments have resulted in unilateral determinations.

The accomplishments of renegotiation from April 28, 1942, the date of the enactment of the first renegotiation statute, through December 31, 1945, were achieved at an estimated expense to the War Department of \$22,581,000. This is thirty-eight one hundredths of one per cent (0.38 per cent) of the gross recoveries of excessive profits for that period or one and twenty-seven one hundredths of one per cent (1.27 per cent) of the net recoveries after deduction of estimated taxes. Estimated expenses through Dec. 31, 1945, of the renegotiation activity of all departments, including the War Department, aggregated \$29,772,000 which is 0.34 per cent of the total gross recoveries or 1.13 per cent of the total net recoveries for that period.

Overseas Scrap

Although Reconversion Director John Steelman's scrap directive of July 15 called on the War Department to instruct Army commanders overseas to speed up the return of military scrap wherever possible, the chances of getting any large quantity of military scrap from overseas is considered by well informed authorities as remote.

Most of the scrap held by our Army in Italy was returned to the United States last year or early this year. The scrap held by our forces in France was turned over to the French at the time we released the German prisoners of war who had been slated to prepare and handle this scrap for shipment to the United States. Part of the scrap held by us in the American-occupied zone of Germany was released to German steelmakers last year for the production of badly needed



SALARIES TALK: Legislation providing for \$5000 annual pay increases for members of the federal judiciary brought prompt resignations from two Democratic House members to accept jobs on the bench. They are Rep. John W. Murphy of Pennsylvania who will become a judge in the middle district of that state and Rep. Luther Johnson who will join the United States Tax Court in Washington. Shown in photo, left to right: Rep. John W. McCormack, Massachusetts; Representative Murphy; Attorney General Tom C. Clark; Rep. Sam Rayburn, speaker of the House; and Representative Johnson. NEA photo

roofing sheets, and considerable scrap from this zone has been shipped over by the Army as ballast. As a result, there appears to be comparatively little military scrap still available in Europe.

A large tonnage of steel is said to be represented in idle military equipment in the hands of our Army—as in tanks, jeeps and guns—but so far conditions in Europe apparently have not become sufficiently stable to warrant declaration of this military equipment as surplus property available for disposal.

As to scrap in the Pacific, by far the greater part of the tonnage is in Japan and authorities expect it will remain there for use by the Japanese iron and steel industry. General MacArthur has had a lot of trouble getting the Japanese economy back into working shape and one of his troubles has been inability to get much iron and steel production. So far pig iron and ingot production in Japan has not gotten beyond 3 per cent of capacity. One of the difficulties is due to lack of ships to bring in iron ore from abroad. In view of this situation it is not regarded as likely that any great quantities of scrap will be shipped to the United States from Japan.

Battle scrap is to be found on all the Pacific islands on which our forces fought, but altogether the total is not great. Furthermore, shortage of help and the difficulty of loading scrap from these islands on ships lying offshore are bad handicaps. And, since the recent sale of Pearl Harbor scrap to an Oakland dealer there is very little scrap left in Hawaii.

Army officers familiar with the movement say it costs at least \$25 on the average per ton to bring in scrap from overseas.

Hail British Loan

Approval of the British loan agreement represents the most important move since the war to put our future foreign trade on a sound basis, in the opinion of administration leaders.

Under the agreement Britain will not discriminate against United States products in any of her controls on im-

ports. In consequence of the \$3,750,000,000 loan, Britain will pay in dollars for goods purchased from the United States or, if payment is made in pounds, American sellers readily will be able to convert sterling into dollars. Within a year, unless the United States agrees to an extension, Britain is to remove all restrictions on converting pounds into dollars in ordinary business deals, thus eliminating restrictions employed to strengthen Britain's dollar position during the war. Furthermore, the agreement provides that Great Britain will dissolve her sterling area dollar pool, an arrangement which during the war and since has placed difficulties in the way of American exporters.

Britain under the agreement also will support the United States move for a world trade organization, as a part of the United Nations setup, to reduce trade barriers and eliminate discriminations.

Informed quarters in Washington do not expect any great rush of British purchases in the United States to develop as a result of the loan. Rather, they believe, there will rather quickly develop an orderly, controlled program to buy goods falling into two classes: 1—Consumer goods badly needed to prevent a sharp decline in Britain's continued low standard of living, and 2—machinery, machine tools and other capital goods required to rehabilitate Britain's industries or place them in more efficient condition.

U. S. To Buy Luxury Liners

Bids will be opened by U. S. Maritime Commission Sept. 20 for two new luxury liners "larger and faster than any ever built in this country." They will be 912-foot express passenger vessels with deadweight tonnage of 12,500 and with speed of 30 knots, to be used in the trans-Pacific trade. They are scheduled to make the trip from the West Coast to Japan in eight days.

Known as "Great Circle" liners, and described by the commission as "epochal," they will be streamlined to an unusual de-

gree and will make more extensive use of aluminum than ever before attempted. Almost all the superstructure, starting from a point one-third aft of the bow, will be mainly of the light metal, of which 770 tons per ship will be required. Use of aluminum, the commission states, will increase stability of the vessels, permitting a beam of only 86 feet and making for greater speed with less horsepower.

Another innovation will be a circular marine veranda on the teardrop-shaped sun deck. This play spot, 72 feet in diameter and 55 feet above ocean surface, will be complete with bandstand, dance floor, cocktail lounge and bar, and will have an unobstructed view of the blue water ahead across the enclosed bow section machinery. Main deck will have a fully equipped theater accommodating 304 persons.

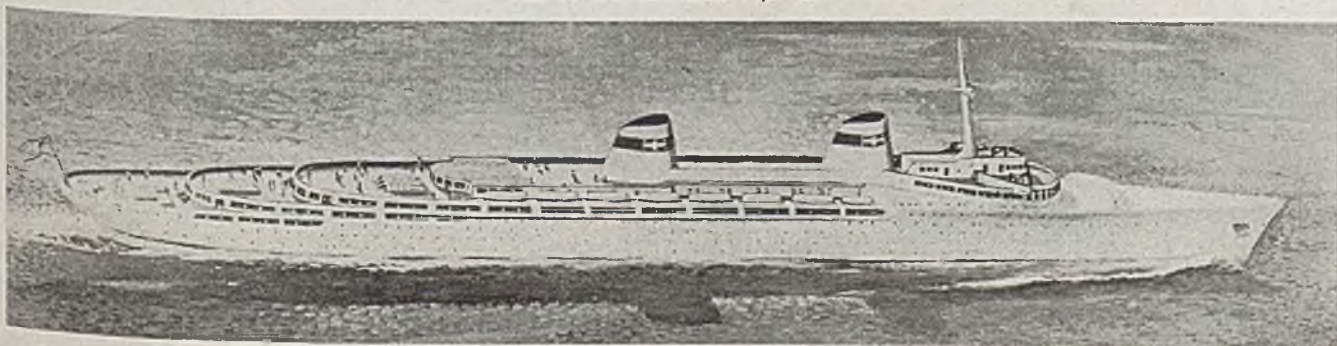
Believing that passengers can be attracted at three fare levels despite the increasing trend in recent years to level incomes through the operation of the federal income tax system, the vessels will have three swimming pools; "one pool is provided for each class of passengers so there will not exist the necessity for limitation of usage of this luxurious liner." Other features include large open deck space on the promenade deck, a shopping arcade and complete service facilities. Each ship will accommodate 1378 passengers—475 first class, 207 tourist and 696 third class. There will be four dining rooms served from three galleys. All passenger quarters will be air-conditioned. The crew of each will number 590 officers and men.

Delivery of the ships is expected by March of 1949.

Price Index Moves Up

Sharp increases in prices on consumers goods since the suspension of the OPA are reflected in the weekly price index of the Bureau of Labor Statistics. The index for July 11 was 233.1, compared with 216.4 as of July 3 and 199.4 as of June 28. The price index embraces 28 commodities which enter directly into the cost of living, and is figured on the basis of 100 for August of 1939.

Wash drawing of new type luxury vessel to be operated in trans-Pacific trade. Maritime Commission will open bids on two such craft Sept. 20



A new Milling

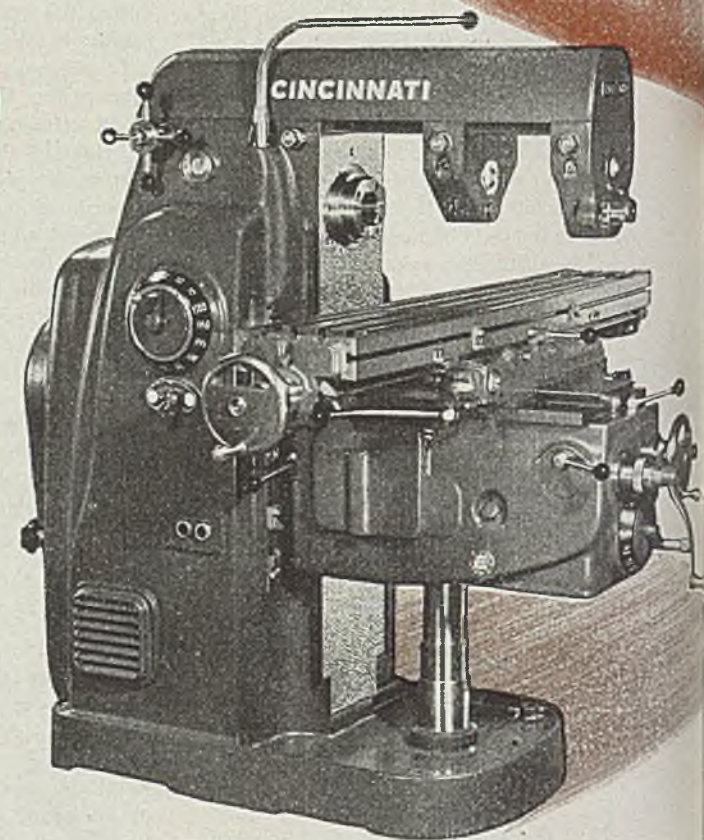
THE NO. 2 MI

The development and building of machines that will handle machining operations to better advantage always has been the paramount aim of Cincinnati Milling. And while this end result is necessary to offset rising costs, the machine tool itself must have more than features of rapid output; it must also gain operator acceptance. The new CINCINNATI No. 2 MI Milling Machines fulfill both of these requirements. They offer many new features for today's production, and they have features of safety and dependability which quickly win operator acceptance. If you would keep abreast of the accelerating business tempo, investigate the possibilities offered by the new CINCINNATI No. 2 MI. These new machines are available in Plain, Universal and Vertical styles. Complete engineering specifications may be obtained by writing for catalog M-1429-1.

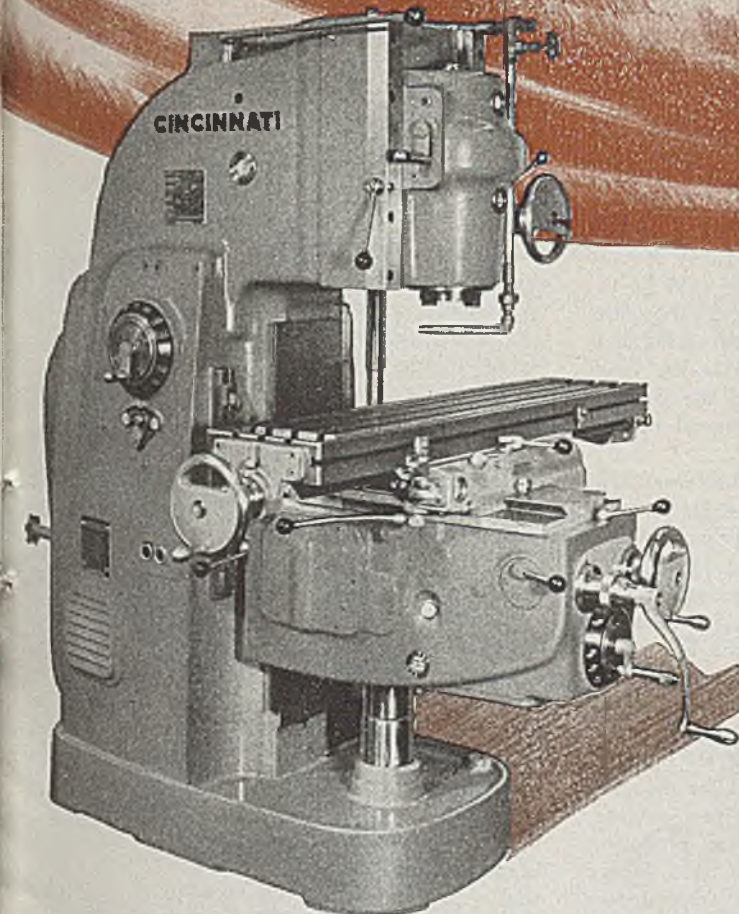


THE CINCINNATI

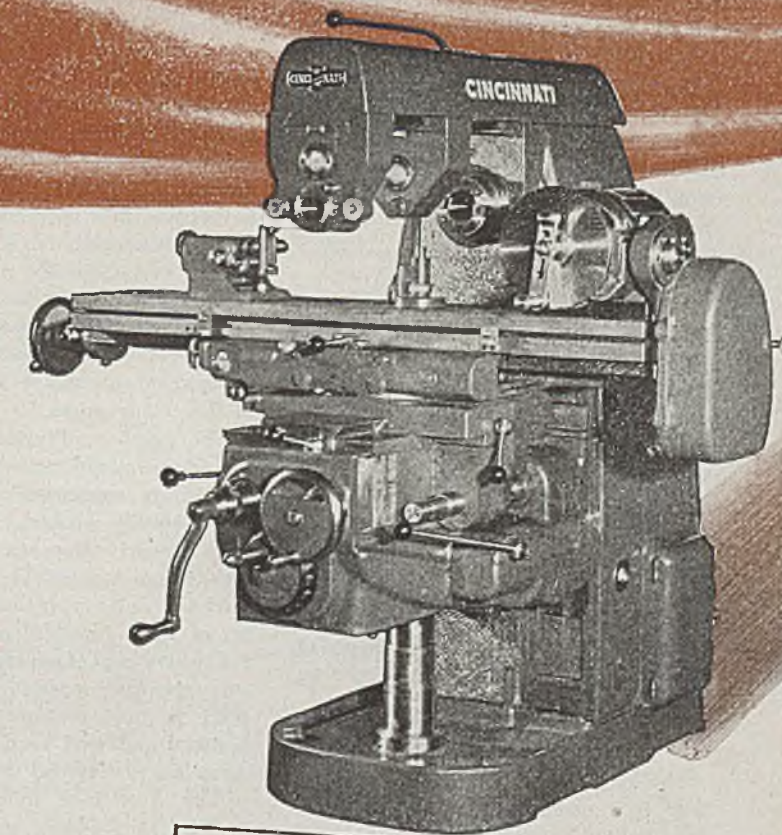
MILLING MACHINES



**CINCINNATI
No. 2 MI Plain
Milling Machine**



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Labor Shortage Retards British Output

Foundry industry operating at only two-thirds of capacity. Tin plate output 30 per cent of 1938 level. Steelmakers concerned over absorbing higher freight rates. Demand for all rolled products heavy

BIRMINGHAM, ENG.

ONE OF the chief difficulties confronting British industry is manpower scarcity. Despite releases from the service there still are many complaints in every industrial area of the country that expansion is being held up and delivery of urgently needed goods delayed.

Nowhere is this difficulty more conspicuous than in the iron founding trade and the position was set out recently by the Minister of Supply answering questions in the House of Commons. The present capacity in the foundry industry is 3,500,000 tons a year, compared with 3,400,000 tons in 1939 and 3,200,000 in 1943. Owing to shortage of labor, however, actual production is at the rate of 2,300,000 tons a year, but the Ministers of Supply and Labor are doing everything possible to increase the labor force.

Demand for light castings far exceeds the supply, due to the push by local authorities in towns and counties in endeavoring to relieve the serious housing shortage. Another aspect of this difficulty is the fact that many other building programs for manufacturing and trade are being held up and may be postponed for a long period because of the priority given to housing.

Tin Plate Output Low

The relatively low production of tin plate is a matter of disappointment to industrialists. Latest figures of production show that in May exports only reached 30 per cent of the 1938 average which at that time was not regarded as anything like the peak. Production has only been increased a little above the wartime level and it is still some 60 per cent below the prewar peak. Home supplies of tin plate are at about wartime level, which was restricted to essential needs, and new home demands arising from reconversion are, in general, not being satisfied. Supplies released from direct munitions production and any increase of supply are made available for export. But the direction of exports is chiefly decided by the needs of countries packing foods for this country and of the armed forces abroad, their priorities being assessed by the Ministry of Food. Under such conditions, the rebuilding of the export trade constitutes an

almost impossible task. There are a number of old type mills that could be reopened if labor were available.

Recent increases in prices have been authorized by the Ministry of Supply, including a rise of 15s a ton in Staffordshire low phosphorus pig iron and 16s a ton for the lighter gages of galvanized sheets. There has been no general increase in prices, however, and steel manufacturers are anxious to know how they are to be compensated for the heavy burden of increased railway rates which have come into operation. Every ton of rail-borne minerals has to be paid for at higher cost and the higher transport charges have also to be paid on finished products. Some producers take the view however that the mood of the present government is against a general raising of the ceiling prices.

The question of price, however, is a secondary consideration as far as the market is concerned. Steelworks continue heavily booked. Plate and sheet mills have backlogs to the extent that new orders are not likely to be scheduled for delivery before the first quarter of 1947. In addition to steel houses, for which manufacturers are bound to give priority on certain classes of steel, there is great pressure for shipbuilding material and steel required for the construction of railroad cars and wagons.

The steel tube mills are producing for the shipbuilding trade on a bigger scale than for many years. Some opportunity for the development of export

trade in light sections and bars has been given by the decision of the Board of Trade to sanction an increase in steel bar exports provided the additional material is rolled from discard or old material. On the other side of the picture, the urgency of home requirements will probably cut down the tonnage of plates and sheets available for export.

Although the latest figures of coal production show some improvement the position is still serious and in the next month or two—the holiday season—further increases are unlikely, with the consequent result that industrial users will start the winter with depleted stocks. The electricity supply companies are concerned at the seriousness of the situation and have issued a statement in which they say that while consumption of electricity continues to rise, coal stocks, which ought to be increasing to meet the winter need, stand at barely a fortnight's supply over the country as a whole, and in many places they are below this dangerous level.

Between now and next April the gas and electricity industries will together require over three million tons more than were delivered in the comparable period of last year. It is expected that on Oct. 31 stocks will amount to only four weeks' supply. Even to obtain this the industry would have to receive between now and October about 800,000 tons more coal than were delivered last summer. Electricity undertakings will need an extra 50,000 tons every winter week to keep them going.

Low quality coal is creating difficulties, and it is estimated that the industry is having to use about 2 million tons more each year than would be necessary if the coal was of prewar quality.

Foreign Notes

Bolivia's probable postwar imports will be largely for railroads, petroleum, mining, roads and transportation industries and for hydroelectric power development, cement manufacture and related activity, according to consular reports. The value of projects extending through 1948 is expected to exceed \$24 million, which represents about 12 per cent of all programs anticipated, or about \$201,800,000 overall.

Textile machinery from the United States is reported to be in demand for expansion and modernization of Chilean

industry, advices from that country indicate. During the first quarter of this year, American-made textile machinery was imported in small quantity, and 12 silk looms were reported en route from Switzerland. Chilean authorities are said to be considering establishing standards for imported machinery, which will be the basis for import authorizations.

Brazilian imports of railway equipment last year were predominantly from the United States, according to consular reports from Rio de Janeiro. Of 9089 metric tons of locomotives and acces-

sories which were imported, 8898 represented equipment from the United States. Railway car parts totaled 12,776 tons including 11,483 from the U. S.

Exports from the United Kingdom of nonelectrical prime movers totaled 2000 tons for the first two months of 1946, according to the Department of Commerce, based on official British figures. Monthly average exports of these machines in 1945 were 900 tons. Other machinery exports totaled 19,900 tons in January and 22,900 tons in February. Textile machinery exports were 3800 tons in January and 3000 tons in February.

Farm machinery sales in Canada are said to be in an active state by American consular officers at Winnipeg. A recent sale of 69 farm tractors and other power farm equipment in Saskatchewan was attended by buyers, some of whom came

300 miles to attend the sale. During 1945, 18,608 tractors were sold in Canada.

Municipal officials of Santiago, Chile, are reported planning to spend \$4 million for purchase of new street transportation equipment. The purchases contemplated include 160 busses, spare parts and equipment, and 100 trolley busses.

Peru is depending on the United States for a large part of its electrical goods, according to 1944 figures just released, which are the latest guide to foreign trade trends in that country. The United States was first in importance as the source of these supplies, with Argentina second, and Switzerland third.

British exports of machine tools in January and February of this year amounted to 1200 tons and 1700 tons, respectively, official British statistics have revealed.

Finland and Sweden are reported to have negotiated an exchange whereby Finland expects to obtain a total of 65,000 tons of iron ore from Sweden this summer in exchange for Finnish pig iron.

United States continued during the past two years as a major source of iron and steel manufactures imported into Brazil, American consular advices reveal. Total imports, with the United States shipments, in 1945 are respectively

as follows: Iron bars and rods, 4600 metric tons, from the U. S., 4565; iron strips, 923 and 903 tons; iron sheets and plates, 11,027 and 10,997 tons; steel bars and rods, 27,539 and 26,639 tons; steel strips, 10,006 and 9704 tons; steel sheets and plates, 39,190 and 28,752 tons; angles and tees, 12,268 and 9175 tons; tin plate sheets, 52,174 and 51,823 tons; light and heavy rails, 83,976 and 82,573 tons; pipe, except flexible, 24,817 and 23,758 tons.

Iraq To Get Transportation Equipment from British

Machinery and equipment needed to develop transportation and communications in Iraq are expected to be obtained in England or from surplus material of British military authorities in Iraq. Contracts for bridges, a railroad extension and workshops, airways, and railroad equipment already have been let to British firms.

Australia Adjusts Machine Tool Industry to Peacetime

Efforts are being made to convert to a peacetime basis the Australian machine tool industry, which during the war had a phenomenal growth.

From 10 firms in business in 1941 the number grew to 200 at the peak of war production, employing 12,000 persons and producing 14,000 machines yearly.

United Kingdom's Steel Output Increasing

Steel production in the United Kingdom during the second quarter of 1946 was at the rate of 13,111,000 tons a year. This is an increase over the figure of 12,617,000 tons for the first quarter of 1946 and compares with 11,814,000 tons in the second quarter of 1945.

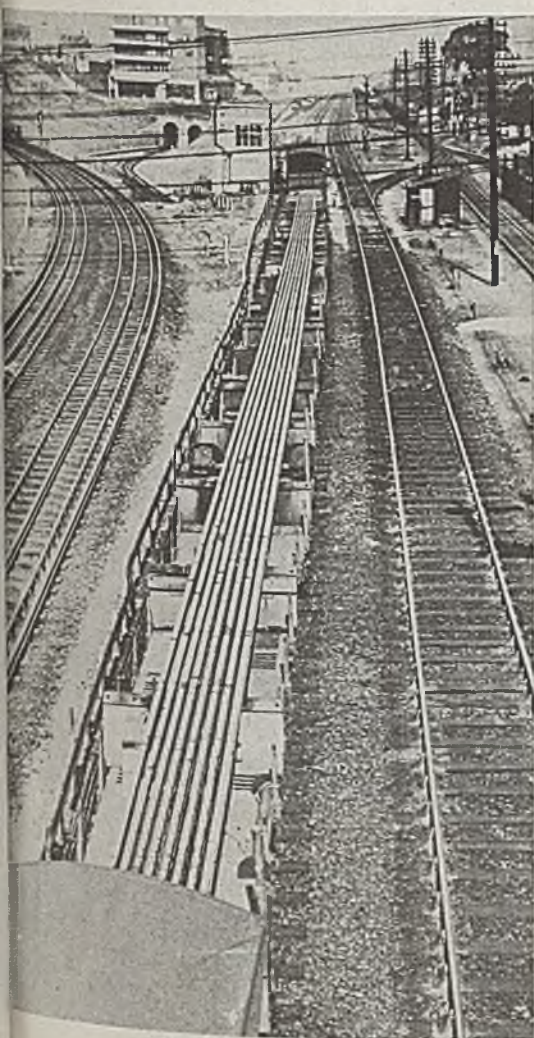
Production during June was curtailed by the Whitsun holiday whereas in June, 1945, there were no public holidays.

Pig iron output during the second quarter was at the rate of 7,827,000 tons a year compared with 6,894,000 tons in the corresponding period of 1945. June production was at the rate of 7,879,000 tons a year compared with 6,916,000 tons a year ago. Pig iron output is not significantly affected by public holidays.

Following table shows the June production and previous figures:

Steel Ingots and Castings (in tons)				
1945				
	Weekly Average	Annual Rate	1946 Weekly Average	Annual Rate
1st Quarter	233,200	12,126,000	242,600	12,617,000
April	236,600	12,302,000	252,100	13,111,000
May	210,800	10,962,000	261,900	13,619,000
June	238,300	12,392,000	239,900	12,475,000
2nd Quarter	227,200	11,814,000	252,100	13,111,000

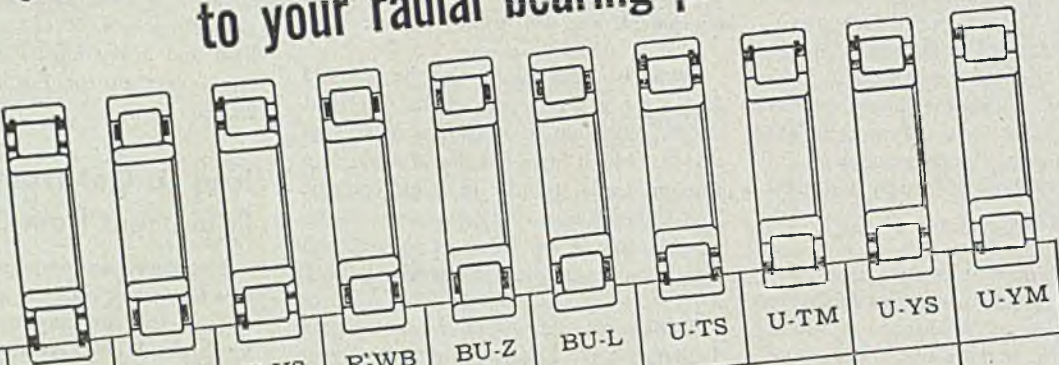
Pig Iron (in tons)				
1945				
	Weekly Average	Annual Rate	1946 Weekly Average	Annual Rate
1st Quarter	134,500	6,992,000	145,500	7,566,000
April	137,600	7,154,000	148,700	7,732,000
May	128,200	6,668,000	151,200	7,860,000
June	133,000	6,916,000	151,500	7,879,000
2nd Quarter	132,600	6,894,000	150,500	7,827,000



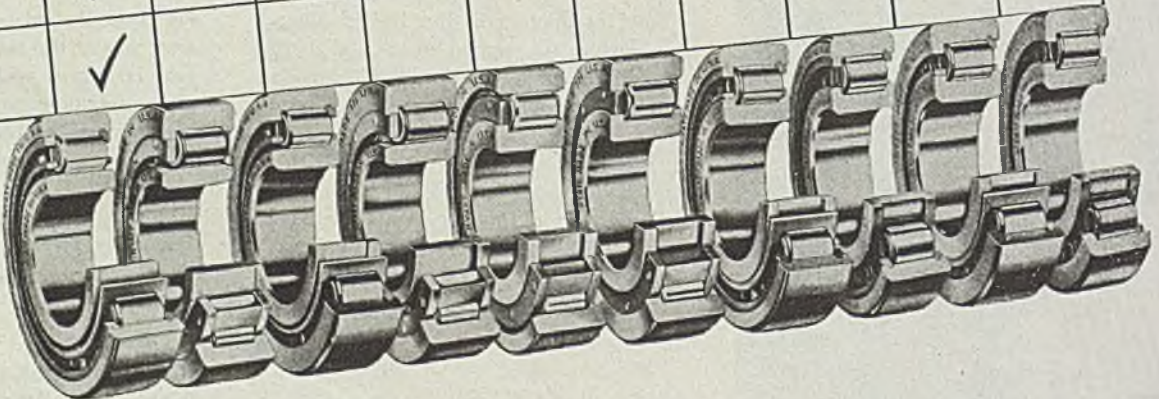
Three hundred foot lengths of rail welded at the London passenger transport depot are conveyed eight at a time on a special railway train to Park Royal where they will be installed on the Great Western Railway. NEA photo

Hyatt has the Answers

to your radial bearing problems



SERIES	A-TS	A-WB	R-YS	R-WB	BU-Z	BU-L	U-TS	U-TM	U-YS	U-YM
1000		✓		✓	✓	✓		✓	✓	✓
1200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5000		✓			✓					
5200	✓	✓			✓		✓	✓		
5300	✓	✓			✓		✓	✓		
6200	✓									



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(including dimensions and load ratings) is in the new 88-page Hy-Load Catalog, just off the press. A complete engineering guide to radial bearing selection and use. Write now for a free copy, without obligation.

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION

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Auto makers incur considerable cost in going to great lengths to overcome shortages of materials. Additional appointments to Ford Motor staff create stir in automotive circles. Britain celebrates Golden Jubilee of its motor industry

DETROIT

SUPERHUMAN efforts are required to keep automobile assembly lines moving these days, and if ever anyone battled to avoid shutdowns, the industry and its purchasing and follow-up personnel are in there pitching day and night. One of the first shortages to crop up was bumpers and there are many new cars being driven around now with strange assortments of wood, channel iron and other makeshift bumpers. One company figures it has cost \$20 per car to install wood plank bumpers. Cases have been reported where cars were shipped without any bumpers and dealers have charged buyers for installing the temporary wood pieces, this would appear about as fine a way of incurring customers' ill-will as could be imagined.

The entire bumper supply situation has been tangled for months and probably will require several more months to iron out fully. Principal difficulty has been strikes at manufacturers' plants which now are settled and production is moving ahead after a fashion. Attempts to place bumper business elsewhere have not met with much success. One spring manufacturer was approached with a request to furnish 100,000 bumpers for an independent passenger car builder, but could not even consider taking the business. In another case, a car manufacturer spent three months building bumper dies to turn over to a new source for production. Again, thousands of dollars have been spent tooling up to produce special brackets to hold 2 x 4 wood pieces, and Hudson even resorted to the purchase of some war surplus armor plate, which was annealed, sheared, drilled and furnished as a standby protection. Another company estimates it is short 20,000 bumpers as a result of the three-month suppliers' strike.

Other Shortages Cause Headaches

A few other sob stories on shortages as furnished by the Automobile Manufacturers Association may be of interest—

One producer (Packard), having exhausted its stockpile of pig iron for the foundry and being unable to obtain sufficient tonnage from nearby sources, set the wires buzzing and finally located some material in Utah. A \$15 per ton premium in the form of extra freight added better than 50 per cent to the cost

of this item. (It is reported other melters have even gone as far as Mexico to obtain pig iron. One ton of pig iron is sufficient to cover castings requirements for about seven average passenger cars, so you can figure what the freight premium per car amounts to).

Air freight service was established to keep front wheel spindles flowing to an assembly plant from a small Leroy, N. Y., manufacturer, brought into production when shortages hit other sources of supply.

Copper for the rolling mills of one company had to be shipped in from Chile, when American sources were throttled by strike.

No steel rims are being received from one important supplier because of a

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January	121,861	524,073
February	83,841	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,321
June	214,511*	546,278
Week ended:		
July 6	45,175*	96,457
July 13	74,015*	114,318
July 20	78,995*	109,912
July 27	80,000*	105,635

*Preliminary.

strike, with the result several assembly lines currently are slowing.

One manufacturer with long-standing orders for front fenders received 1900 less than ordered in July, and will be short 760 in August.

Shortage of corn starch is worrying foundries which use the material in core binders. Urea resin may be a possible answer.

With cotton fabric in limited supply, one manufacturer has turned to artificial leather for upholstery—more expensive yet acceptable to many buyers.

Organization of a central foundry division has been announced by General

Motors, for the stated purpose of providing additional foundry services to any GM division requiring them. S. W. Healy, formerly works manager of the Saginaw Malleable Iron Division, has been appointed general manager of the new activity, with headquarters at Lockport, N. Y. The foundry division will be included in the general engine group activities under jurisdiction of R. K. Evans, vice president.

Initial operations will be at Lockport, where the foundry of Harrison Radiator Division has been taken over. The plant is a relatively small unit which hitherto has provided requirements in radiator inlet and outlet fittings, now changed to steel stampings after perfection of a new design and attachment method which would avoid rusting of the joints. The plant has two cupolas of 4 tons each per hour capacity, and during the war also made some brass and aluminum castings. Equipment for the latter production is being removed, and production shortly will be started on gray iron shock absorber castings, later to be machined by Allison.

New Personnel at Ford

Appointment of Harold T. Youngren as director of engineering at Ford created a real stir in automotive circles where it was being figured the major personnel changes had been just about completed at the Rouge plant. Youngren is about the best known transmission expert in the field today and can be calculated to bring a lot of drive to Ford's efforts to perfect and place in production an automatic transmission. It will be recalled some months ago reports were current that Detroit Gear Division of Borg-Warner here was tooling up to build a new Ford transmission of simplified design. As far as is known this project is continuing and with Youngren, former director of engineering development at Borg-Warner, now coming to Ford, the device may see somewhat earlier fruition. No announcement was made of course, but observers here are guessing the new engineer's salary may run well into six figures. He first joined General Motors in 1929 as assistant chief engineer of Buick, after spending a time as consulting engineer for Studebaker at South Bend. Only 54, he has at one time or another been associated in an engineering capacity with Allis-Chalmers, Westinghouse Electric, Falls Motor Co., Harley-Davidson Motor, Curtiss Airplane & Motor Corp., and Pierce-Arrow.

Coincident with the appointment of

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INJURED VETS WIN AWARDS: Three war veterans are \$1000 richer as a result of winning awards in the special model car design competition for hospitalized servicemen sponsored by the Fisher Body Craftsman's Guild. Here Thomas Archer, left, vice president of General Motors and president of the Craftsman's Guild, looks over the winning models with W. S. McLean, guild secretary

Youngren, R. H. McCarroll, until recently executive engineer, has been named director of chemical and metallurgical engineering and research, doubtless a post more to his liking, since he has always been perhaps more interested in long-range engineering study and research than in mechanical engineering or production research. McCarroll has been directing the planning of the new Ford engineering center, and presumably may continue in this capacity, freeing Mr. Youngren for concentration on more immediate problems.

Lewis D. Crusoe Joins Ford

Selection of Lewis D. Crusoe, an expert cost accountant and for many years comptroller for the Fisher Body Division of GM, as a member of the Ford executive staff was not so much of a surprise, since for the past eight months he has been administrative assistant to E. R. Breech at Bendix Aviation. After early experience in lumber and logging, Crusoe joined Fisher Body as a time-keeper in the days when automobile bodies were primarily the products of skilled woodcraftsmen. He eventually became chief cost accountant and established the cost system for all Fisher Body plants in the country. Fifteen years ago

he was named divisional comptroller and assisted in the conversion from wood to all-steel bodies. During the war he negotiated war contracts and handled Fisher Body pricing with the government. He left Fisher Body along with his brother Claude, who was general purchasing agent, at about the time the Fisher brothers severed their connection with the body subsidiary. Claude Crusoe is now purchasing director for Willys-Overland in Toledo.

Only last week, two more appointments came along—Haro'd Joy, a Dodge veteran of 27 years, to be assistant purchasing agent, and John Wallace, Packard traffic manager, to be director of traffic. Beyond any question, Ford has done more in recent months to bolster and expand administrative ranks than any other company in the business. Many will say it was high time for the changes, but that is another story.

British Celebrate Jubilee

"Vital to the life of the nation" is the slogan the British are using to commemorate the Golden Jubilee of that country's motor industry, which began July 18 and will continue through Nov. 20. The opening day was marked by

ceremonies dedicating the new headquarters of the society of motor manufacturers and traders in the former town house of Baron Lionel de Rothschild at 148 Piccadilly in London. A pageant portraying 50 years of the automotive industry in Britain by means of scale models of motor vehicles built from 1896 on, animated displays and a documentary film are now being shown in London and later will be taken on tour. Last Friday there was a jubilee banquet at the Dorchester Hotel on Park Lane and the following day the London Cavalcade of 450 motor vehicles toured the metropolis, while the King and Queen looked on. American manufacturers planning to visit Britain this summer are invited to participate in the festivities.

Stout Works on Housing

The energetic W. B. Stout, who flits about from one new idea to the next with all the grace of a humming bird, has now moved from airplanes to automobiles to low-cost housing for GI's. Currently he is displaying models of a new small house of the prefabricated type built on a tubular steel framework. In the home, 70 per cent of the wood, from flooring up, has been eliminated, none of the walls being load-bearing. The entire roof weight is carried by the tubular framework and supporting columns outside the walls. The inventor estimates the dwelling will cost the owner at least \$1000 less than a similar conventional design. Stout Houses Inc. has been organized to produce the structures.

Hudson Output Rising

Hudson Motor Car Co. states scheduled output now is up to 720 cars a day, with peak capacity of 960 expected to be reached this fall. Employment at present is around 17,000, and may be boosted another 5500. Possibility is seen of another Hudson assembly plant coming into operation outside Detroit. The company manufactures 67 per cent of the entire car in its own plants. A smaller and lighter model is on drawing boards, and will be held until the lower-cost car market looks ripe.

Car Sales Figures Resumed

Resumption of compilation of monthly factory sales figures on motor cars and trucks by the Bureau of the Census and its regular release by the AMA shows June totals of 141,090 passenger cars (33.6 per cent of the 1941 total) and 60,812 trucks (60 per cent of June, 1941). Sales for the first six months of the year were 640,624 passenger cars and 837,484 trucks.

DUO-THERM

May 17, 1945

Mr. George A. Tinnerman
Tinnerman Products, Inc.
2038-2046 Fulton Road
Cleveland 13, Ohio

Dear George:

Speed Nuts are faster to apply and don't require a wrench. They can generally be locked adjacent to a flange so they cannot turn. This means they can be installed in places hard to get to with a wrench. I asked the Service Department if they liked Speed Nuts and why, and was advised that Speed Nuts were a tremendous aid in replacing and servicing of parts. We have approximately 600,000 units in the field so that servicing is materially simplified by the use of the easily removed Speed Nut as compared to a rusted bolt and nut that may have to be chiselled or sawed off.

DUOTHERM DIVISION
Motor Wheel Corp.

D. F. Jones
Chief Engineer

LF Jones/bl



Let Duo-Therm's Chief Engineer, D. F. Jones, tell you what he thinks. His letter above leaves no doubt about the advantages of SPEED NUTS in the manufacture and servicing of hundreds of thousands of fuel oil heaters by the

TINNERMAN PRODUCTS, INC. • 2039 FULTON ROAD, CLEVELAND 13, OHIO

In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aerocessories, Ltd., London

In France: Aerocessories Simmonds, S. A., Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

Speed Nuts

PATENTED

* Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS

Let SPEED NUT USERS

tell you why

They Changed to SPEED NUTS

No. 2 in a series, "The Customer Talks"

ASSEMBLY ADVANTAGES

Applied faster

Will not "freeze" to threads

Will not "clog" with paint

Reduce assembly costs

Eliminate lock washers

Eliminate handling of material

Perform multiple functions

Weigh less

Prevent vibration loosening

Protect fragile materials
against damage

Duo-Therm Division of Motor Wheel Corporation.

SPEED NUTS help keep down the costs on Duo-Therm's modernized assembly lines. And the ease with which SPEED NUTS are removed greatly speeds up servicing their units in the field.

Why postpone the improvement of your product assembly? Eliminate waste motions, unnecessary parts and useless weight by changing to SPEED NUTS. Send your complete assembly details when writing for samples as SPEED NUTS are made in over 3,000 shapes and sizes.

Production of Electric Power Equipment Rises

Westinghouse Steam Division plant's 1946 business will exceed that of normal years by at least \$2 million

STEAM TURBINES to produce 591,000 kilowatts of electricity will be shipped from the Westinghouse Steam Division plant in Philadelphia, according to D. W. R. Morgan, general manager. In addition, the division will produce nearly half a million turbine horsepower to drive ships of the Navy and Merchant Marine.

To complete this 1946 production schedule, employment at the Steam Division has increased 60 per cent above normal prewar levels. Total employment, including 1100 workers of the two-year-old Aviation Gas Turbine Division, organized by Westinghouse to design and produce jet and gas turbine engines for aircraft drive, will be 6600.

In dollar volume, business this year will run from \$16 million to \$18 million compared to \$10 million to \$14 million in normal years. For 1947 the plant schedule calls for land turbines capable of generating 1,319,000 kilowatts, nearly 500,000 kilowatts higher than ever before, in addition to the manufacture of auxiliary land turbines to meet various factory power needs. Marine commitments add 42,000 kilowatts of electric generating capacity and 12,000 horsepower for ship propulsion to the 1947 production schedule.

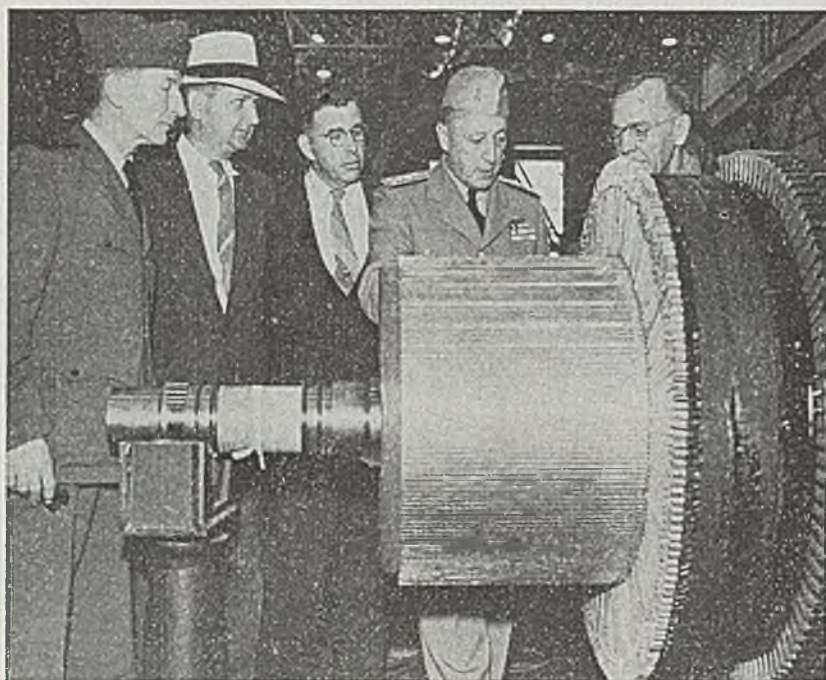
The 1948 schedule calls for turbines generating 995,000 kilowatts and other power drives of 22,000 horsepower.

During the past five years the South Philadelphia Works turned out 18 million horsepower of propulsion and generating equipment for the Navy, which included main propulsion turbines for 224 combat ships. In addition, much auxiliary equipment was produced.

Air Reduction Sales Co. Buys Government Plant

Air Reduction Sales Co., New York, has purchased from the War Assets Administration an acetylene plant the former operated in Portland, Ore. Sale price was \$130,300. The site, plant and equipment represented a government investment of \$176,694.

Air Reduction plans to continue acetylene production at the plant.



POSTWAR INSPECTION: Vice Adm. Charles A. Lockwood, in charge of submarine operations in the Pacific during the war, visits the General Electric shop at Schenectady that built propulsion motors and generators for many of his pigboats. Shown with Admiral Lockwood discussing a rotor detail with one of the shop's workmen are, left to right: Capt. J. S. Evans, inspector of machinery; H. P. Bish, GE Federal & Marine Divisions; and L. T. Stafford, Motor & Generator Manufacturing Division

BRIEFS

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

Commercial Iron Works, Portland, Ore., has been offered for sale. The properties, which are available separately, include a shipyard with deep water facilities and a completely equipped foundry and machine shop. The property management firm of Norris, Beggs & Simpson, Portland, is handling the sale.

Cessna Aircraft Co., Wichita, Kans., plans to reopen its plant at Hutchinson, Kans., in order to increase its capacity for personal planes. Operations are scheduled to begin on Sept. 1.

Tennessee Coal, Iron & Railroad Co., Birmingham, has established a district office at 409 West Adams St., Jacksonville, Fla., to serve Florida and southern Georgia. Robert P. McGregor is manager.

Ekco Products Co., Chicago, has acquired Murdock Metal Products Inc., formerly M. & M. Mfg. Co., Chicago, manufacturer of metal specialties in the

kitchen field. Murdock Metal will be operated as a subsidiary.

Brainard Steel Corp., Warren, O., has opened a sales office at 206 Marion Bldg., Cleveland. Frank E. Houck has been appointed district sales manager.

Eureka Iron Works, Newburgh, N. Y., a newly established division of Eureka Shipbuilding Corp., will engage in fabrication and erection of all types of steel construction.

International Harvester Co., Chicago, has plans for increasing operations at its Rock Falls, Ill., plant by transferring its complete disk harrow production from other plants to Rock Falls. The cost of plant modifications will be approximately \$725,000.

Peter A. Frasse & Co. Inc., New York, has opened a new steel warehouse at 157 Richmond Ave., Syracuse, N. Y. The warehouse will be a distribution point

for mechanical steels to central New York state. William E. Karnuth is district sales manager in charge.

Curtiss-Wright Corp., New York, has purchased Victor Animatograph Corp., Davenport, Iowa, which will continue production of equipment for the motion picture industry.

B. F. Goodrich Co., Akron, has published a 28-page booklet describing its complete line of industrial rubber products.

Ralph M. Simon Steel Products Mfg. Co., Los Angeles, has plans to build a \$30,000 factory building at 126th St. and Yukon Ave., Los Angeles.

Building Hardware Division, Harvey Machine Co., Los Angeles, will construct a one-story factory at Vernon, Calif. The building will contain 20,000 square feet of floor space.

Lamp Department, Cleveland, General Electric Co., has announced a complete line of fluorescent lamps in the new 4500-white color.

Electrical Products Co., Los Angeles, has announced plans to construct a new factory and office building in Los Angeles. Cost of the building will be \$300,000.

American Cladmetals Co., Pittsburgh, newly organized, has acquired a plant in Rosslyn Farms, Pa., formerly owned by Bethlehem Steel Co., and will produce clad copper and fabricate part of the plant's estimated production of 4 million pounds per year into cooking utensils.

Hungerford Research Corp., Murray Hill, N. J., has merged with Hungerford Plastics Corp., that city, and will continue operations under the latter company's name.

Metal Products Division, Ryan Aeronautical Co., San Diego, Calif., has begun to manufacture high quality durable alloy metal casket shells to sell to casket manufacturers and finishers.

Sanimetal Tile Corp., Washington, N. J., has changed its name to Vikon Tile Corp.

Inland Steel Co., Chicago, plans to close its Cincinnati sales office on Aug. 15. Counties in northwestern Ohio formerly handled by this office will be transferred to the company's Detroit office. The remainder of the territory including Cincinnati, Dayton and Colum-

bus, O., will be transferred to the Indianapolis office.

Agerstrand Corp., Muskegon, Mich., is erecting a foundry for its own needs. Cost is estimated at \$50,000.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has appointed Joseph T. Ryerson & Son Inc., Chicago, as distributor for its welded boiler tubes.

Automatic Transportation Co., Chicago, is expanding its export program by appointing independent sales representatives in nearly 40 countries.

A. S. Ahlowahia & Co., Ludhiana, India, is interested in buying iron and steel scrap in this country as well as galvanized pipe and wire, rolling machinery, and machinery for making bolts, nuts, rivets and wire nails.

Delta Mfg. Co., Milwaukee, until recently a subsidiary of Rockwell Mfg. Co., Pittsburgh, has been made a division of the Rockwell company and designated Delta Mfg. Division.

Organic Coatings Division, United Chromium Inc., New York, has opened its new lacquer plant in Carteret, N. J.

Pemco Corp., Baltimore, has completed construction of its new plant built for the production of glass and ceramic colors.

American Well Works, Aurora, Ill., has bought Atlas Foundry, Chicago, and will operate it as a division.

Holub Industries Inc., Sycamore, Ill., recently organized, has begun the manufacture of electric blowers, industrial vacuum cleaners, voltage testers, wire connectors, and other electrical and mechanical products.

A. M. Castle & Co., Chicago, will begin construction soon of a warehouse and office building in North Kansas City, Mo.

New Firm Formed To Sell War-Developed Products

Formation of a company to develop and market outstanding products of war-born research has been announced by Jess W. Sweetser, president of the new company, Sweetser Corp., with offices at 41 East 42nd St., New York 17.

The company plans to speed up the development of commercial uses of these products and will market them through established outlets.

Officers of the company in addition to Mr. Sweetser are: H. LeRoy Whitney,

chairman of the board; Dudley P. Felt, executive vice president; Hunt T. Dickinson, vice president and treasurer; and M. Mercedes Young, secretary.

H. K. Porter Buys American Spiral Spring & Mfg. Co.

H. K. Porter Co. Inc., Pittsburgh, has purchased American Spiral Spring & Mfg. Co., Pittsburgh. The acquisition, together with the Porter Ft. Pitt Spring plant, will be operated as American-Ft. Pitt Spring Division.

Porter's capacity for production of springs is materially increased by the addition, and according to T. M. Evans, president of Porter, substantial operating economies will be provided by the joint operation of the two spring plants.

Alcoa Plans To Build, Buy Two Facilities in Midwest

Expansion plans which include construction of a new plant at Des Plaines, Ill., and purchase of a factory at Richmond, Ind., have been announced by officials of Aluminum Co. of America, Pittsburgh. The plant to be built in Des Plaines will include manufacturing, service and office buildings and will have floor space of approximately 190,000 square feet. The facility will be used to manufacture aluminum die castings.

Negotiation are under way for purchase from the government of the plant in Richmond which was operated during the war by Perfect Circle Co., Hagerstown, Ind. It will be used as the headquarters and main works of Aluminum Seal Co., New Kensington, Pa., a wholly owned Alcoa subsidiary. The building contains approximately 255,000 square feet of floor space and is adaptable to the manufacture of seals and closures for medical and food containers and other types of packages. Perfect Circle will continue to occupy about one-third of the plant under lease arrangement with the War Assets Administration.

New Simplified Practice List Applies To Valves

Copies of Simplified Practice Recommendation R183-46 applying to gate, globe, angle and check valves made of brass and bronze are available from the Superintendent of Documents, Government Printing Office, Washington 25. For each of these kinds and types of valves the recommendation gives a simplified list of sizes and corresponding service ratings. The recommendation will be effective from Sept. 1, 1946.

Freight Rate Reduction Plea of Geneva Steel To Be Considered

Hearing scheduled for July 31 by Pacific Freight Tariff Bureau to take testimony on request for \$8 per ton rate on finished steel products to West Coast points. Little opposition is expected from the railroads

SAN FRANCISCO

HEARING of important interest to West Coast industry in general and to Geneva Steel Co. in particular will be held in San Francisco July 31. It will be the meeting of the Pacific Freight Tariff Bureau, which will take testimony for and against Geneva's request for an \$8 a ton freight rate on finished steel products from the plant near Provo, Utah, to West Coast points.

It is the opinion here that Geneva's future success as a continuing and profitable steel-producing enterprise will hinge to an important degree on a reduction in rates to \$8. During the lengthy period when disposal of the plant was considerably in doubt, final discussion on whether or not Geneva could become a major steel producing unit usually centered on the question of freight rates. The fact that U. S. Steel Corp. has moved so quickly following purchase of Geneva to bring about this reduction also is evidence of the importance the corporation attaches to the matter.

Chances Favorable for \$8 Rate

Although comment on prospects for an \$8 rate are highly unofficial, it is believed widely that chances are favorable for granting of such a rate.

For one thing a precedent for that tariff was established in wartime. Before the war rail rate on finished steel from Utah to the West Coast was \$12 a ton; that also is the present tariff. However, during the war, when Geneva was operated for the government, rates were cut to \$8 a ton on government shipments from the mill to shipyards on the California coast and to \$9.50 a ton from Geneva to Portland, Oreg.

The present request is for a straight \$8 rate from Geneva to all West Coast points from San Diego to Seattle.

The important factor in this proposed reduction for Geneva, of course, is a competitive one. If the rate is maintained at \$12 a ton, shipments must compete with the same type steel shipped by boat from the East Coast through the Panama Canal to the West Coast at tariffs ranging from \$8 to \$14 a ton, but averaging about \$11 a ton, or less than the present tariff from Utah. A large

part of this competition presumably would come from Bethlehem Steel Co.

During most of the time when the future of Geneva was under discussion, talk of prospective post-war rail rates usually hit much lower than the \$8 figure, never higher than \$6.50 a ton. U. S. Steel itself estimated at one time that the tariff should be set at \$5.31 a ton. Therefore, the present request of \$8 was something of a surprise. However, it has been pointed out that by making a moderate request, Geneva is much more likely to attain its figure, than if a sharply lower request had been made. If the latter course had been followed, objections by the railroads involved would have been sharper, and opposition by Bethlehem possibly would have been keener than it is likely to be in either case when the tariff bureau meets July 31.

As a matter of fact, it is understood that Utah railroads which will originate the Geneva traffic are not planning to oppose the move at all. One of the major carriers involved is the Union Pacific. Although that railroad has made no comment, officially or otherwise, on the Geneva proposal, the remarks of Ambrose J. Seitz, vice president in charge

of Union Pacific traffic, is believed to be significant. Mr. Seitz said recently:

"In the interest of this territory (Utah) and traffic development, I feel free to state that all of the carriers are anxious and willing to enter into rate negotiations with the owners of Geneva. Union Pacific, and for that matter any other railroad, has as its primary objective the development of traffic. That is a mutually beneficial undertaking as between industry and the railroads because commerce is vital to the operation and growth of the railroad."

The present proposal to reduce rates applies only to finished steel products. Later, when additions and improvements are made to the Geneva plant, lower rates will be sought on unfinished products, chiefly on hot-rolled coils which will be shipped from the Utah mill to the new rolling mill Columbia plans to build on San Francisco Bay for production of tin plate and narrow gage products.

The railroads also have put into effect a low export rate of \$5.20 a ton on structural steel and plates to be shipped from Geneva to West Coast ports for export.

At present there is every indication that considerable backing will be given to U. S. Steel's case at the July 31 hearing. Gov. Hebert B. Maw of Utah plans to represent the state in person as head of a delegation of Utah businessmen and industrial leaders. Strong backing to the proposal also is being given by the steel committee of the Western States Council. West Coast steel fabricating companies are expected to be represented at



LUXURY BUS: This 60-foot articulated bus, featuring aluminum and magnesium, was built for Sante Fe Trail Transportation Co. by Permanente Metals Corp. It will be tested by the Sante Fe company and may be placed in regular service on the line

the meeting as well as other interests.

Meantime, the Geneva plant is getting into production according to schedule and every prospect now is that the mill will begin volume shipments in September, if not sooner. September was the announced goal at the time the plant was purchased from the government.

On July 22 another open hearth started melting, and further increases in operation are expected soon. More than 1250 men now are on the plant's payroll, compared with a handful of maintenance employees in the coke ovens and furnaces since the mill was closed last fall.

New Type Light Weight Motor Coach Being Tested

A new type motor coach was demonstrated last week at the Los Altos, Calif., magnesium plant of Permanente Metals Co. by Henry Kaiser and Joseph Frazer, of Kaiser-Frazer Corp. It is a magnesium-aluminum bus of articulated construction. Because of trailertype body, the bus has a seating capacity for 63 passengers with seats arranged at normal distances apart, or 40 passengers in "luxury" type coaches which provide extra space between the seats.

The Kaiser bus has a weight of 28,000 pounds empty and 34,000 pounds loaded, and an overall length of 60 feet. The power unit is a Cummins diesel making 275 horsepower. The body is constructed of 60 per cent magnesium and 40 per cent aluminum.

The present bus is a "hand-made" job designed as an experimental model made for Santa Fe Trail Transportation Co., motor bus subsidiary of the Atchison, Topeka & Santa Fe Railway. The "pilot" model was built at a cost of \$150,000; no figure has been announced for regular models. Santa Fe Trailways will test the new model for one month of hard highway driving. If tests are satisfactory, it will order 15 more of the coaches.

Employment Gains Expected By California Agencies

Shipments of goods and materials from eastern manufacturing centers will gradually swell, with the result that employment in California will continue to rise, according to a report by the Industrial Relations, Employment and Reconstruction departments made public in Los Angeles last week.

Nevertheless unemployment in California is greater than in the nation as a whole, the report disclosed. Personal readjustments are regarded as a basic factor, however, rather than a serious lack of industrial job opportunities.

Case Histories Support Charges Of Job Placement Inefficiency

California Manufacturers' Association, continuing attack on USES, alleges abuse of government authority in making job referrals. Points out thousands of jobs go begging while unemployment compensation roll mounts

LOS ANGELES

"WHILE thousands of already existing jobs go begging, the United States Employment Service tries to cover its inefficiency by seeking publicity and pleading for 'organized community activity' to develop new job opportunities.

"Second, it alibis its inefficiency by alleging that employers 'want a \$20,000-a-year-man for a \$1200 job,' knowing full well that the average factory worker in California earns more than \$50 per week.

"Both the USES and the California Employment Stabilization Commission appear to have failed in their responsibilities so that thousands can loll on the dole."

These charges were made last week in the third of a series of letters from the California Manufacturers' Association signed by Alvin E. Hewitt, executive vice president.

The association makes use of the case history method in citing instances of alleged abuse of governmental authority in directing veterans and others to "get on the dole" rather than to hunt jobs in industries hungry for workers.

Under the heading, "How veterans who honestly want jobs are discouraged by USES," the letter gives the experience of a Navy lieutenant as related to an investigator for the association, as follows:

"After waiting for an interview I was sent to a man who knew very little about the work in which I was interested. This man spent the better part of 15 minutes looking up a code symbol to classify my request.

"Then he made two statements. First, he said my best bet was to go out looking for a job myself. Second, he suggested I apply for unemployment insurance. After leaving the interview I felt my afternoon was entirely wasted."

Another case history described in the letter was based on the reported experience of an ex-Army fighter pilot, who said:

"As I stepped to the window to receive an application blank I was given instructions for filling it out and at the same time told that I should start figuring on filing for unemployment insurance.

"Altogether I wasted two days during which I could have been searching for my

own type of work. Finally the USES advised me to do just that! They seemed decidedly confused and unsure of themselves."

Still another case history is that of a bookkeeper-secretary, according to the letter, which details the case thus:

"This woman has been earning \$200 or more a month for several years. For 10 consecutive weeks up to July 3 she has drawn unemployment compensation and in that time the USES has given her but one job referral. This was for a \$150-a-month job in a grocery store which she declined as not suitable."

"Yet," the Hewitt letter comments, "during the same 10 weeks, 1350 advertisements for bookkeepers or stenographers, or combinations of the two, appeared in just one newspaper covering her city. It would appear that this woman is not 'involuntarily' unemployed even if the USES and the stabilization commission by arbitrary 'interpretation' say that a person cannot go to work for less wage than the immediate past salary rate."

Another case was that of a woman film extra earning \$300 a year, the letter stated. This qualifies her for benefits, which she receives, although her husband supports her.

"Under the law," it is pointed out, "this woman could get \$16 a week for 10 weeks—or \$163. It would take the year-around taxes from six average manufacturing wage earners getting \$50 a week to pay for just one such woman's 'racket'."

The association's letter of criticism is addressed to Raymond Krah, local USES director; James G. Bryant, chairman, California Employment Stabilization Commission; Fay Hunter, regional USES director, San Francisco; and Peter D. Kristick, Bay City manager of the USES.

Western Pipe & Steel Co. Enters Low Bid for Pipe

Western Pipe & Steel Co., San Francisco, made a low bid of \$1,208,000 for 9600 feet of steel pipe 12 feet in diameter on a contract being awarded by the Bureau of Reclamation for the Grand Coulee dam project in the Pacific Northwest.

Men of Industry



JOHN R. CRAIG

John R. Craig, recently released from the Navy, has been appointed assistant to the vice president in charge of sales, Taylor-Wharton Iron & Steel Co., Easton, Pa.



WILLIAM RODDER

tendent of No. 1 foundry by his former assistant, Gustave Hintz, who became associated with Allis-Chalmers' old Reliance works in 1912. Both Mr. Lebesch and Mr. Hintz are members of the American Foundrymen's Association.

William Rodder has been appointed director of engineering, Aetna-Standard Engineering Co., Youngstown, O. He has been with the company's engineering department 17 years, and was chief engineer for the last eight years. Perry Snyder succeeds Mr. Rodder as chief engineer. Mr. Snyder has been division engineer, Brier Hill Works, Youngstown Sheet & Tube Co., Youngstown.

George S. Cole Jr., factory manager, Brown-Lipe-Chapin Division of General Motors, Syracuse, N. Y., has been placed in charge of G. M.'s new Elyria, O., plant.

Harold R. Dinges has been named district sales manager of one of the new southern sales areas, Mathieson Alkali Works, New York. He will have headquarters in Charlotte, N. C., and will supervise company sales activities in Virginia, North and South Carolina and parts of West Virginia and Tennessee. Mr. Dinges joined Mathieson in 1941, and was a member of the sales development department until his present appointment. O. J. Theobald Jr., a sales representative with the company since 1932, has been named to assist Mr. Dinges. Fred O. Tilson has been appointed district sales manager of the organization's second newly defined southern area. He will have headquarters in Chattanooga, Tenn., and will supervise sales activities in parts of Tennessee, Alabama and



D. A. CAMERON

Georgia. Mr. Tilson has represented the company in varied sales capacities since he joined it in 1925. William H. Eastburn has been named district sales manager of the newly defined New England sales area, and will have headquarters in Providence, R. I. He has been a member of the firm's sales staff since 1932.

D. A. Cameron has been appointed assistant general sales manager, Parker Appliance Co., Cleveland. He joined the company in 1941, and, during his first three years of service was district manager in Dayton, O. He came to Cleveland in 1944 to assume administrative direction of all the company's branch offices. J. E. Murphy has been named manager of distributor sales for the Parker company. He joined the firm in 1943, as sales representative in the Dallas, Tex., territory.

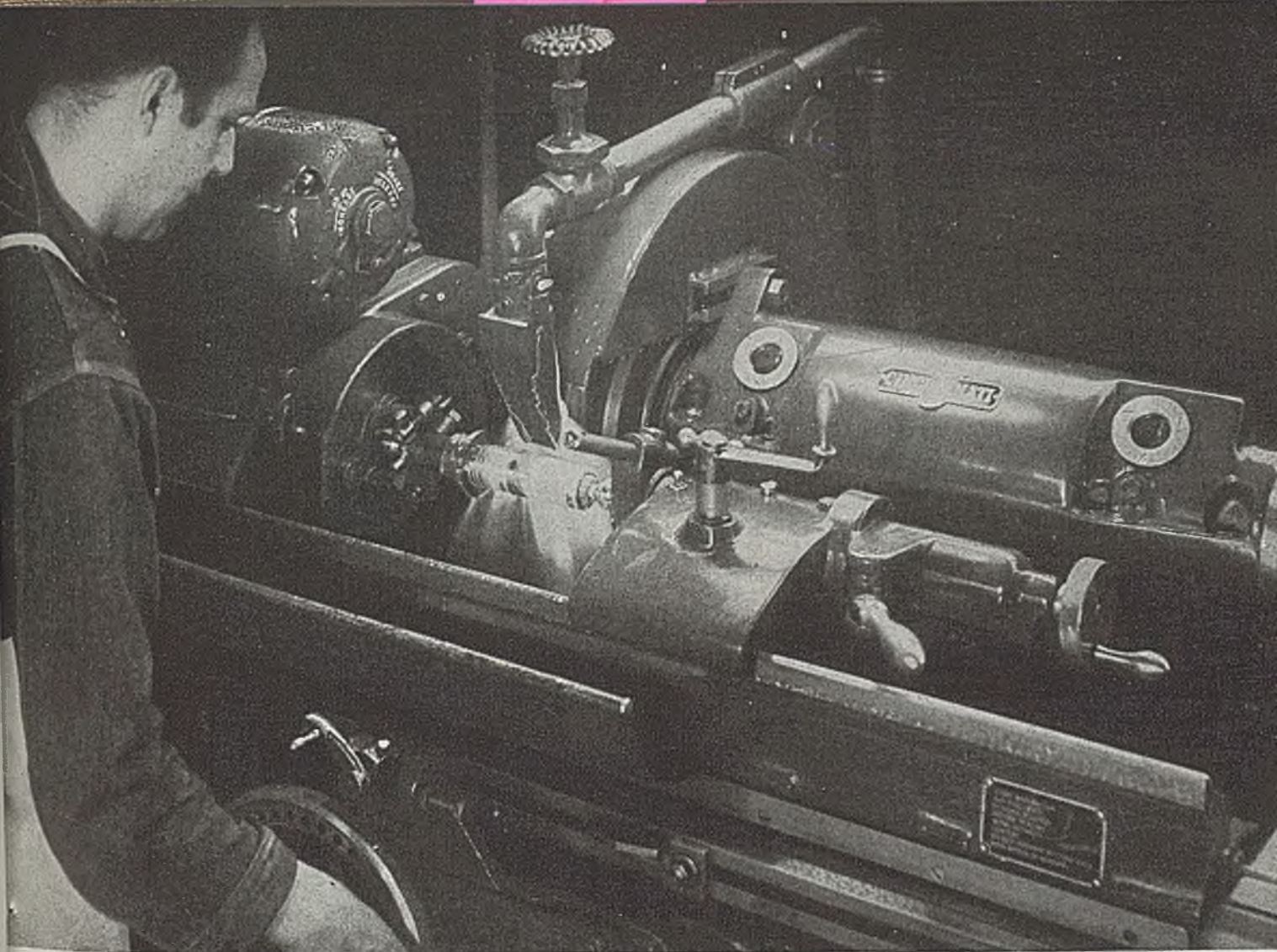
J. F. Sequin has been appointed representative in Texas and Oklahoma for Paisely Products Inc., Chicago. He will have headquarters in Dallas, Tex.

William B. Guernsey has been appointed assistant to vice president, American Bridge Co., Pittsburgh, subsidiary of United States Steel Corp. Craig T. Clapp has been appointed marine department contracting manager, succeeding Mr. Guernsey. Mr. Guernsey joined the company in 1925, and was contracting manager of the marine department since 1941. Mr. Clapp began with American Bridge in 1937 at the Ambridge, Pa., plant. He had been assistant contracting manager of the marine department since 1943.

Dwight L. Davidson has been ap-

R. L. Hess Jr. has been named secretary, Rust Engineering Co., Pittsburgh. He will also direct the activities of the company's legal department. Mr. Hess, who had been serving as assistant secretary and assistant treasurer of the organization, succeeds the late Ralph Bayard Baldrige in his new position. Mr. Hess joined Rust's legal department in 1937, and in 1941 became assistant secretary and assistant treasurer. Dickson C. Shaw III, an attorney in the company's legal department, has been named to succeed Mr. Hess as assistant secretary. Mr. Hess continues as assistant treasurer.

Anthony Lebesch has been promoted from superintendent, No. 1 gray iron foundry, Allis-Chalmers Mfg. Co., Milwaukee, to assistant general superintendent of the firm's No. 1 and No. 2 brass foundries and pattern shops. Mr. Lebesch joined the company in 1924. He has been succeeded as superin-



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Provides Outstanding Cooling, High Accuracy, Fine Finish

In every shop, a careful study of every factor influencing cutting or grinding efficiency will pay important dividends.

Here, for example, is a typical case in which the use of Sunoco Emulsifying Cutting Oil on a grinding-operation pays-off in fast production, high finish, great accuracy.

Operation: A short-traverse job, grinding cast-iron sleeve.

Material: Cast Iron.

Stock Removal: .014 inch.

Machine: Cincinnati 10 x 36 Plain Hydraulic Grinding-Machine.

Lubricant: 1 part Sunoco to 40 parts Water.

Sunoco makes possible faster metal-removal without increasing wheel-wear. Sunoco rapidly dissipates heat and helps prevent the loading or burning of wheels. Even at high surface-speeds, close tolerances and mirror-finishes are easily maintained.

For tough problems, involving petroleum products, for smooth cutting and grinding schedules, call the Sun Cutting Oil Engineer near you, today

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**INDUSTRIAL
PRODUCTS**

pointed wire and wire accounts supervisor, American Steel & Wire Co., Cleveland, subsidiary of United States Steel Corp. Mr. Davidson joined the company in 1941 as staff auditor in the Cleveland office. In 1942 he became senior auditor and held this position until his present appointment.

—o—
Dr. Edgar C. Bain, vice president in charge of metallurgy and research, Carnegie-Illinois Steel Corp., Pittsburgh, has been awarded the Albert Sauveur Achievement Award for 1946, by American Society for Metals, Cleveland. Award of the scroll and plaque will be made on Nov. 21 at the annual banquet of the society, held as part of the National Metal Congress and Exposition, at Atlantic City, N. J. Dr. Bain is a past president and past director of American Society for Metals, and was formerly chairman of the New York chapter of the society.

—o—
Clarence H. Harlan, contracting engineer, Fabricated Steel Construction Division, Bethlehem Steel Co., Bethlehem, Pa., retired recently. He had been associated with Bethlehem and McClintic-Marshall Corp., which it absorbed in 1931, for 40 years, and had been located in the Chicago district more than 20 years.

—o—
Appointment of an advisory group to the Gray Iron Division, American Foundrymen's Association, Chicago, is announced by T. E. Eagan, chief metallurgist, Cooper-Bessemer Corp., Grove City, Pa., chairman. Members of the new committee are as follows: A. L. Boegehold, head, metallurgical department, Research Laboratories Division, General Motors Corp., Detroit, and recently nominated president, American Society for Metals, Cleveland (STEEL, July 1, p. 94); John Bolton, metallurgist, Lunkensheimer Co., Cincinnati; H. Bornstein,

director, testing and research laboratories, Deere & Co., Moline, Ill.; V. A. Crosby, metallurgical engineer, Climax Molybdenum Co., New York; R. F. Harrington, assistant works manager, Hunt-Spiller Mfg. Corp., Boston; Max Kuniansky, vice president and general manager, Lynchburg Foundry Co., Lynchburg, Va.; C. H. Lorig, metallurgist Battelle Memorial Institute, Columbus, O.; J. T. MacKenzie, metallurgist, American Cast Iron Pipe Co., Birmingham; G. P. Phillips, chief metallurgist, automotive foundries, International Harvester Co., Chicago; F. G. Sefing, research metallurgist, International Nickel Co. Inc., New York; and E. K. Smith, consulting metallurgist, Beverly Hills, Calif.

—o—
Bernard J. Meldrum, for 10 years associated with the central engineering department, Chrysler Corp., Detroit, has been appointed chief engineer of the Dodge Division, succeeding George B. Allen, who has been transferred to the general experimental staff of the Engineering Division. John E. Brennan and Jerry M. Gruitch have been assigned as engineers on Mr. Meldrum's staff. Edward H. Stilwill has been appointed chief contact metallurgist for Dodge and will direct metallurgical contact work for ferrous metals purchasing and processing at the Dodge main, Dodge forge and Newcastle, Ind., plants. He has been active in metallurgical work for Dodge and Chrysler since 1918.

—o—
Jesse J. Shuman, inspecting engineer, Jones & Laughlin Steel Corp., Pittsburgh, has retired after 46 years with the corporation, and 56 years in the steel business.

—o—
Robert W. Ward has been elected a vice president, American Car & Foundry Co., New York, and placed in charge of manufacturing. Mr. Ward was district

manager of the company's Huntington, W. Va., plant. W. E. Lunger, who was general superintendent of the Huntington plant, succeeds Mr. Ward as district manager. Harold L. Kennedy has been appointed sales agent for the company in the Washington, D. C., sales office. He had been Washington district sales manager, Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.

—o—
George L. Bauer has been appointed eastern division manager, Industrial Division, Chicago, Kerkling & Co.

—o—
Howard D. Herbert has joined the Restfoam sales department, Hewitt Rubber Corp., Buffalo. Mr. Herbert was with Goodyear Tire & Rubber Co. Inc., Akron, for 15 years. He had been manager of Airfoam sales since 1940.

—o—
Allen Chase, James E. Davidson, Duncan Shaw and T. J. Sullivan have been named to the board of directors, National Skyway Freight Corp., Los Angeles.

—o—
Harvey E. Schroeder has been appointed manager of the newly created Pacific Division, Parker Appliance Co., Cleveland. Mr. Schroeder had been district sales manager in Los Angeles for the company, which he joined in 1941. In his new post, Mr. Schroeder succeeds Paul Locklin, who has resigned as manager of Parker's Los Angeles Mfg. Division which, with the company's Pacific sales district, is being combined into a single West Coast organization.

—o—
Henry A. Mullen has been named manager, resistance welding sales, Ampco Metal Inc., Milwaukee, Wis. He had been resistance welding field engineer for the company, stationed in Detroit.

—o—
Eight recent appointments are announced by the Iron & Steel Division, Fontana, Calif., Kaiser Co. Inc. C. H. Lenhart has been appointed assistant general superintendent. Prior to this appointment, Mr. Lenhart was superintendent of the blast furnace department. J. M. Hooper has been appointed assistant general superintendent. Mr. Hooper had been superintendent of the rolling mills department. E. J. Duffy has been promoted from assistant superintendent to superintendent of the blast furnace department. J. E. Macorey has been promoted from assistant superintendent to superintendent, rolling mill department. C. A. Herbert has been appointed superintendent of the tube mill which is now under construction. Mr. Herbert was with Salem Engineering Co., Salem, O. B. A. Shrive has been appointed superintendent of maintenance. He had been



A. L. BOEGEHOLD



JESSE J. SHUMAN

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with Steel Co. of Canada Ltd., Hamilton, Ont. **W. R. Crampton** has been appointed superintendent of yards, roads and transportation. Mr. Crampton recently resigned from the Interstate Commerce Commission. **Robert C. Madden** has been appointed superintendent of metallurgical, inspection and chemical laboratories. He was recently released from the Navy.

E. C. Hummel, vice president and general manager, Utility Electric Steel Foundry, Los Angeles, has been elected president of Alloy Castings Institute, New York. **J. B. Shelby**, assistant vice president, Driver-Harris Co., Harrison, N. J., has been elected vice president of the institute, and **E. A. Schoefer**, executive secretary and treasurer.

Norman H. Keeling has been named sales manager for the Hawaiian Islands, with headquarters in Honolulu, B. F. Goodrich Co., Akron. He had been manager of the company's Washington office for the last several years. Mr. Keeling succeeds **N. F. Weber**, transferred to San Francisco, in charge of the office there, where he replaces **John T. Staker**, who has gone into business for himself. Mr. Keeling has been succeeded at Washington by **Elliott R. McKee**, who represented the company in the Far East for 10 years. **Wilbur J. Bunnell** has been named operations manager for the company in the Philippine Islands, with headquarters in Manila.

William A. Bless, vice president of sales, Consolidated Vultee Aircraft Corp., San Diego, Calif., has been elected to the board of directors of that corporation.

E. J. Towey has been appointed sales manager, Industrial Division, Adel Precision Products Corp., Burbank, Calif. Mr. Towey was executive vice president in charge of sales, engineering, advertising and development of new products, Diamond Iron Works Inc., Minneapolis.

George L. Abbott has been appointed president, treasurer and general manager of the newly formed Warren Belting Co., Inc., Worcester, Mass. Mr. Abbott resigned from Graton & Knight Co., Worcester, where he was vice president and general sales manager since 1939, to take over his new duties.

F. E. Bliven, for a number of years in charge of salvaging activities at the Erie, Pa., works, General Electric Co., Schenectady, N. Y., has been appointed material handling engineer for the company.

Alvin Haas has been appointed vice

president and general manager, American Well Works, Aurora, Ill. He had been general manager, Yates-American Machine Co., Beloit, Wis., for 15 years. **W. N. Remsburg** has been appointed chief engineer of the Sanitary Division of the organization. He has been with American Well Works for the last 12 years. **Gerald E. Hauer**, a sanitary engineer, has been added to Mr. Remsburg's staff. Mr. Hauer was with General Chemical Co., New York.

Forrest W. Morrow has been appointed superintendent, galvanizing department, East Works plant, American Rolling Mill Co., Middletown, O. He succeeds **D. O. Fisher**, retired. Mr. Morrow joined Armco in 1928, and had been assistant superintendent of the galvanizing department since 1945.

Warren H. Williams has been appointed assistant district sales manager, Detroit office, Inland Steel Co., Chicago. Mr. Williams has been with the company since 1937, having been a member of the sales staff of the Detroit office during the entire period.

John E. Lynch, for 14 years manager, Cincinnati sales office, Cincinnati Milling & Grinding Machines Inc., Cincinnati, has been named manager of the company's New York office in the first of several field engineering personnel changes. Others include **Carl M. Beach**, chosen to manage the Detroit office; **E. F. Render**, moved from Syracuse, N. Y., to Detroit; and from the factory, **W. Kent Mathias** to the Syracuse office.

Dr. Willard H. Dow has been awarded the Chemical Industry Medal for 1946 by the American section, Society of Chemical Industry. Dr. Dow was cited

for his "conspicuous services to applied chemistry." He is president and chairman, Dow Chemical Co., Midland, Mich., and president of the Ethyl-Dow Chemical Co. During the war, Dr. Dow served on the chemical advisory committee of the Army and Navy Munitions Board, and on the Chemical Warfare Service Advisory Board. Dr. Dow is a director of the American Chemical Society.

Maj. Gen. Robert M. Littlejohn has been appointed administrator, War Assets Administration, succeeding **Lt. Gen. Edmund B. Gregory** whose health has compelled him to resign.

Dave Bell has been named general manager, National Iron Works, San Diego, Calif. He had been assistant general manager of the organization. **William Zwicker**, who opened the company's Los Angeles office last October, was appointed vice president in charge of sales for the Los Angeles area. **Ted Sanford**, formerly assistant chief engineer, has been named vice president and sales manager.

A. Levinson, president, Steelcraft Mfg. Co., Cincinnati, has been appointed technical advisor on prefabricated steel housing for the Veterans' Emergency Housing Program.

Star Electric Motor Co., Bloomfield, N. J., has terminated its reorganization proceedings and attendant trusteeship and will continue operations under the following officers and executives: President and general manager, **Elvin E. Hallander**; vice president and factory manager, **Franklin R. Carmine**; treasurer, **Donald C. Lillis**; secretary, **Harold Sokobin**; assistant treasurer, **Howard W. Horne**; sales manager, **James M. Adair**; assistant sales manager, **Eugene A. Bacquet**; and purchasing manager, **James C. Carney**.

Marcel C. Boss has formed his own organization under the name of Mabor Co., Rahway, N. J. He had been on the engineering staff of Hanson-Van Winkle-Munning Co., Matawan, N. J. Mr. Boss originally started the Mabor Co. in Paris, in 1930. It was destroyed during the war, however, and has just recently been re-activated in Paris.

Herbert S. Boring has been appointed comptroller, Portsmouth Steel Corp., Portsmouth, O. He was comptroller of Van der Horst Corp. of America, Cleveland.

G. J. Dekker has been elected a vice president of Ohio Chemical & Mfg. Co.



LESLIE B. WORTHINGTON

Who has been elected president, United States Steel Supply Co., Chicago, noted in STEEL, July 22 issue, p. 74.



L. O. McLEAN

Who has been appointed sales manager, General Excavator Co., Marion, O., noted in STEEL, June 24 issue, p. 84.



ROBERT H. OWENS

Elected vice president in charge of engineering and manufacturing, Roots-Connersville Blower Corp., Connersville, Ind., STEEL, June 24, p. 84



WILLIAM E. KNOX

President and general manager, Westinghouse Electric International Co., New York, noted in STEEL, July 15, p. 96.

Cleveland, a subsidiary of Air Reduction Sales Co., New York. Mr. Dekker has been affiliated with Air Reduction since 1919, and became its Detroit district manager in 1940. Stephen H. Newburn succeeds Mr. Dekker as Detroit district manager for Air Reduction Sales Co. Mr. Newburn had been manager of the Cleveland district. He joined the company in 1936. A. C. Brown Jr., recently released from the Army, has been appointed manager of the company's Cleveland district. He originally joined the firm in 1935.

Pem W. Taylor has been appointed sales representative for North Carolina, South Carolina, Georgia, Florida and Alabama, Titan Metal Mfg. Co., Bellefonte, Pa. His offices are in Atlanta.

Roy Blasiola has been named assistant manufacturing manager, Briggs Mfg. Co., Detroit. He had been manager of the company's Eight Mile and Outer Drive plants for the past year, and has been with Briggs since 1923.

Don H. Proctor has been appointed chief sales engineer, Lovejoy Tool Co.

Inc., Springfield, Vt. Mr. Proctor has been with the company 28 years in a manufacturing and selling capacity. A. M. David, West Hartford, Conn., will replace Mr. Proctor as New England district representative for the company, effective Aug. 1.

Dr. Grant R. Fernelius has been appointed manager, Elyria, O., plant, Harshaw Chemical Co., Cleveland. He joined the company in 1941, and had recently been assistant to the vice president in charge of manufacturing. Paul Hines, formerly manager of the Elyria plant, has been named manager of the company's El Segundo, Calif., plant.

E. C. Brehm has been appointed district manager, Pacific coast territory, Carbone Corp., Boonton, N. J. He will have headquarters in San Francisco. R. B. Lamkin will succeed Mr. Brehm as district manager of the company's Chicago office.

Maurice Hooff is general production manager of the new Danville, Ill., plant of the Hyster Co., Portland, Oreg. Operating personnel of the new plant

include Jay Misenhimer, factory manager; Jim Woodley, assistant factory manager; William Morrow, purchasing agent; and Ray Smith, office manager.

H. K. Tryon has been appointed a member of the sales staff of the newly opened Cleveland office, Lukens Steel Co., Coatesville, Pa., and subsidiary, By-Products Steel Corp. Mr. Taylor joined Lukens in 1937, and most recently had been associated with the Coatesville district sales office.

L. K. Kenyon has been appointed Detroit area factory representative, Ahlberg Bearing Co., Chicago. He has been with the company 11 years, and was recently Detroit branch manager. He is succeeded in that capacity by R. E. Iticks, who joined the Ahlberg company in November, 1945, as Detroit salesman.

Donald McKenzie, general sales manager, chemical department, General Electric Co., Schenectady, N. Y., has been appointed Pittsfield, Mass., community chairman, Committee for Economic Development.

OBITUARIES

Leslie B. Davis, for the last 17 years secretary-treasurer, Perfect Circle Co., Hagerstown, Ind., died recently.

Richard B. Jenkins, 46, general manager, Plumbing Ware Division, Briggs Mfg. Co., Detroit, died in that city, July 16.

William Patrick Newman, retired purchasing agent, Robins Conveyors Inc., Passaic, N. J., division of Hewitt-Robins Inc., died July 17. Mr. Newman joined

Robins in 1899, after a brief association with the inventor, Thomas A. Edison. He was purchasing agent for more than 25 years.

Charles Whitall Valentine, 74, former president, Bagley & Sewall Co., Wassertown, N. Y., died at his home in that city, July 22. He was a member of American Society of Mechanical Engineers.

Charles M. Scudder, 56, assistant engineer in charge of drafting and pressure vessels, A. O. Smith Corp., Milwaukee,

died recently in that city. He had been with the corporation eight years.

George Saltonstall Mumford, 79, chairman, Calumet & Hecla Consolidated Copper Co., Boston, died at his home in Chestnut Hill, Mass., July 15.

John Basil Barry, 54, retired vice president, Designers for Industry, Cleveland, died in that city recently.

Fred L. Eberhardt, board chairman, Gould & Eberhardt, Irvington, N. J., died July 18.

CORROSION-RESISTANT ALLOYS

Four metals finding wide use in industries which handle such reactive acids as boiling hydrochloric, sulphuric and hot nitric are described and their range of application indicated. Physical properties of the cobalt-base high temperature alloys were discussed in STEEL May 27, page 88

HIGH RESISTANCE to the chemical corrosion of such reagents as mineral and organic acids, alkali and acid solutions, salts, and wet and dry gases has been successfully incorporated in a series of high strength, nickel-base alloys which can be readily fabricated. Made in four grades of analysis, all but one are amenable to such machining operations as milling, turning, reaming, threading, etc., thus making it possible to fabricate a large variety of equipment from both cast and wrought alloy parts. In addition, the three machinable alloys can be formed cold by such simple operations as shallow dishing without flanging; more severe forming is generally performed after the metal has been heated above its brittle range. The non-machinable alloy can, however, be finished by grinding and it, as in the case of the other three materials, can be successfully welded without undue difficulty.

These alloys, designated as Hastelloy alloys A, B, C, and D, were developed by Haynes Stellite Co., Kokomo, Ind. in conjunction with Union Carbide and Carbon Research Laboratories, Inc., to withstand the strong corrosive conditions encountered in the chemical and process industries. To date these metals have found such varied applications as concentrating equipment, condensers, etching equipment, fractionating columns, furnace parts, kettles, pickling equipment, tubing, valves, and vessels of all kinds in the steel, oil and coal, plastics, rubber, and other industries.

Alloys A and B exhibit strong resistance toward the action of hot and cold hydrochloric acid in all concentrations; alloy C is particularly resistant to wet chlorine gas and sulphurous and phosphoric acids; alloy D is especially adapted for the handling of sulphuric acid in all concentrations at temperatures up to and including the boiling point.

Specific Alloys for Oxidizing or Reducing Media

First of the group, alloy A, is a nickel-molybdenum-iron combination capable of withstanding the action of hydrochloric acid in all concentrations at temperatures up to 158° F with only a slight increase in rate of attack with increasing temperature. It is also resistant to sulphuric acid of any concentration up to a temperature of 150° F and to all concentrations below 50 per cent up to the boiling point. In addition it can be used with acetic, formic, and other organic acids, but not with strong oxidizing agents. Alkalis have practically no corrosive action on this material.

Alloy B contains similar elements as alloy A but has a larger percentage of molybdenum. This material is well suited for equipment handling boiling hydrochloric acid and wet hydrochloric acid gas. It has been found to possess good resistance to phosphoric acid and is less affected by sulphuric acid than alloy A.

For use in the presence of such strong oxidizing agents as nitric acid, it has been found that the nickel-molybdenum-chromium-iron alloy C is most effective. Dilute nitric at temperatures up to 150° F, and nitric of over 40 per cent concentration at room temperatures can be used in contact with it. Free chlorine, aqueous solutions containing chlorine or hypochlorites, and acid solutions of ferric or cupric salts have no deleterious effects on this material. Also, it is highly resistant to acetic, formic, and

sulphurous acids; and has excellent resistance to dry battery mix.

Alloy D is a cast alloy composed of nickel and silicon, with small amounts of other metallic elements, exceptionally resistant to sulphuric acid of all concentrations even up to the boiling point. It has found its widest application in equipment employed in the concentration of sulphuric acid and in large cast equipment where resistance to this acid or sulphuric anhydride is essential. Although this metal can not be used in parts or equipment subjected to strong oxidizing agents, it does possess fair resistance at moderate temperatures to reducing agents such as hydrochloric acid. Acetic or formic acids do not affect it and only slight corrosion results from phosphoric acid.

This group of metals is practically free from corrosion under such conditions as exposure to atmosphere, fresh or salt water, and neutral or alkaline salts. It has been found that alloys A, B, and D can be used wherever oxidizing or reducing flue gases are present, also wherever carbon monoxide, carbon dioxide, and hydrocarbons (at temperatures up to approximately 1470° F) are present. In addition to the penetration test results given in Table I, alloys A, B, and C are highly resistant to such acid chlorides as ammonium or zinc chloride; alloys C and D resist acid sulphates and phosphates.

Other oxidizing agents that can be used in equipment or vessels made of alloy C include such mixtures as nitric and sulphuric; chromic and sulphuric; sulphuric and copper sulphate; sulphuric and dichromates, permanganates or persulphates; and similar reagents. This alloy also has adequate resistance to hypochlorites and other solutions containing free chlorine in appreciable concentrations. However, it may be attacked by these solutions if they are above room temperature, especially those above 105° F.

Physical Properties

Table II summarizes the physical properties of the alloys. Properties of A, B, and C are given for cast metal and for metal rolled and annealed, whereas properties of D are shown for the as-cast form since it is furnished only as castings. In mechanical properties, alloys A and B are comparable in strength and ductility to alloy steels. In addition, both of these metals have good strength high temperatures as shown by short-time tensile tests.

Alloys A and B are austenitic in nature and contain a small proportion of carbides, even when they have been cooled rapidly from a high temperature. They are appreciably hardened by cold-working and acquire an increase in the yield point and ultimate strength and a cor-

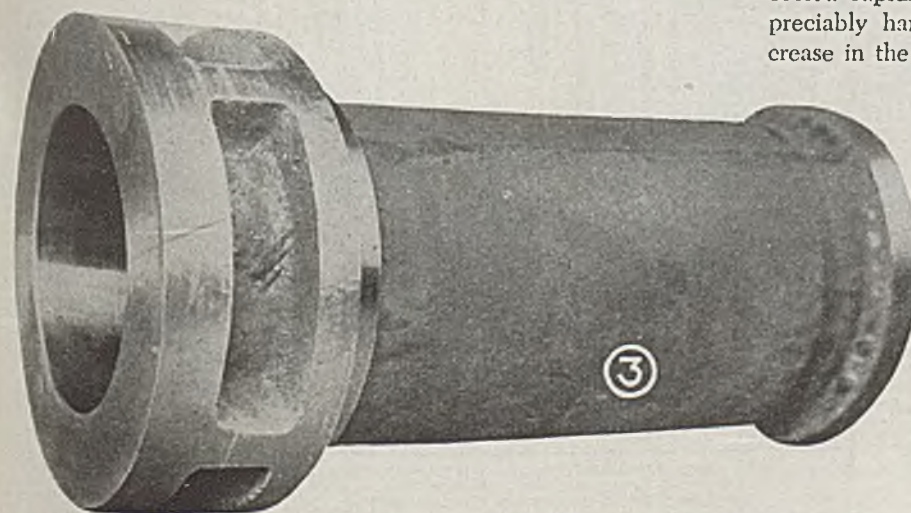
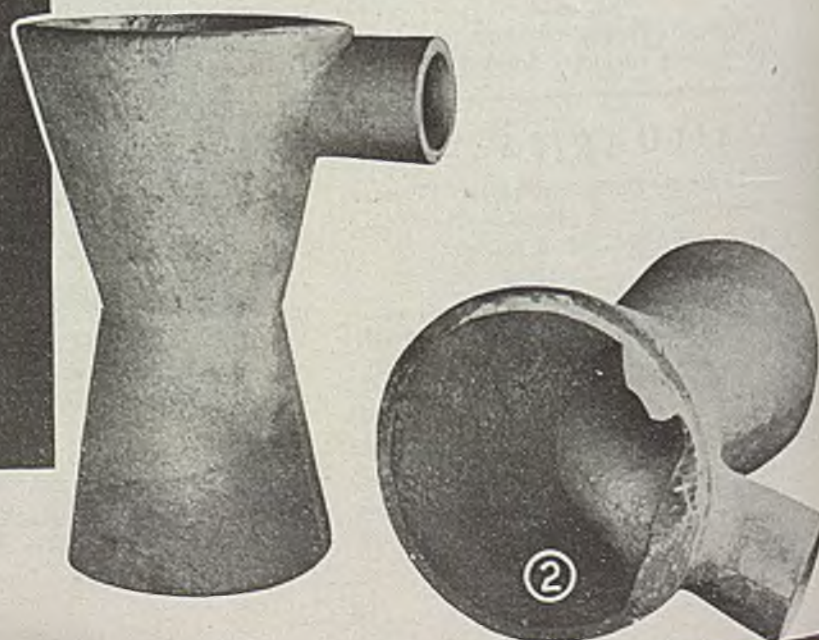
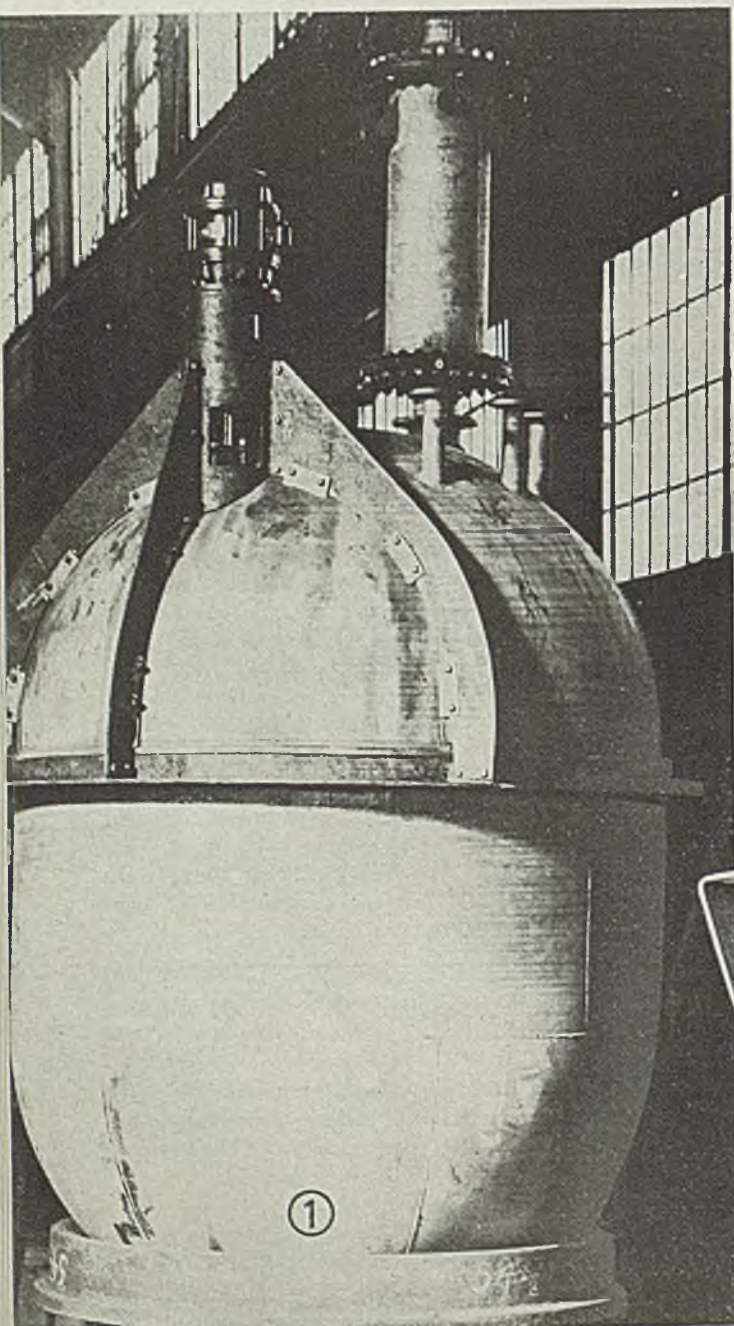


Fig. 1 -- A direct-fired reaction vessel and condenser made of alloy A for handling dilute hydrochloric acid and various salts—chlorides, bromides and fluorides

Fig. 2—Cast alloy A jets for introducing steam to heat and agitate various chemical solutions

Fig. 3—Alloy D ground cylinder liner for a sulphuric acid sludge pump, 10 in. in diameter at large end

responding reduction is ductility after cold working. In cast form, the strength of alloy C is comparable with that of low or medium-carbon cast steel and, although not as ductile as steel, it does possess considerable toughness.

In the form of hot-rolled sheet or plate, it compares favorably with alloy steels in strength and ductility.

Physical properties of alloy D are similar to those of a high-grade gray cast iron. Due to its high silicon content, however, as-cast alloy D has an average hardness of rockwell C 50 to 55 and low impact strength. Its hardness can be reduced and its toughness and impact strength appreciably increased by giving it a toughening anneal at 1925-1950° F for 2 to 4 hours and cooling slowly in furnace. Its hardness gives it good abrasion resistance, and it has been found to be non-galling when used in connection with alloys A, B, or C, or austenitic steels.

Metals A and B are supplied as castings, forgings, hot-

Fig. 4—Valve parts and pipe fittings for service in corrosive acid media



Fig. 5—Hastelloy alloy castings which have been machined to close tolerances. Acme, square, and "V" threads can be machined

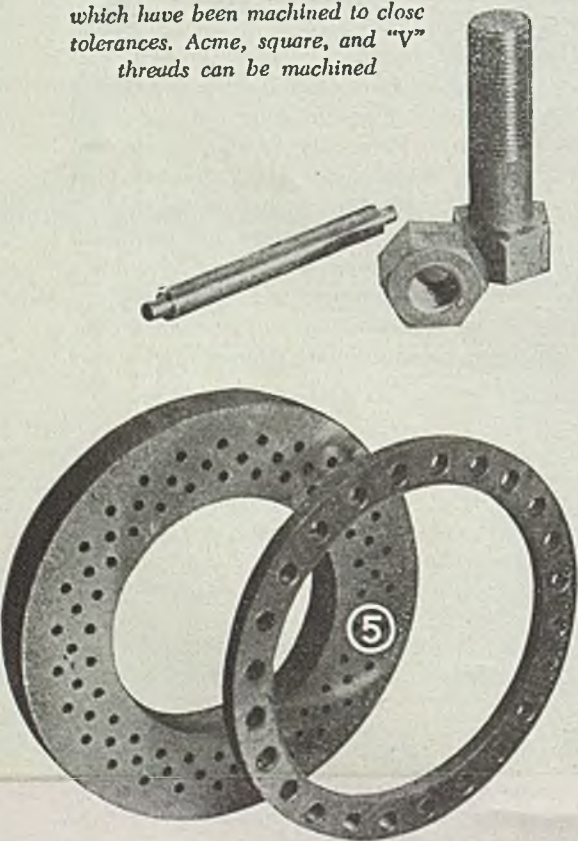


Table II

MECHANICAL PROPERTIES OF HASTELLOY ALLOYS

	Alloy A		Alloy B		Alloy C		Alloy D
	Cast Metal	Rolled Metal Annealed	Cast Metal	Rolled Metal Annealed	Cast Metal	Rolled Metal Annealed	Cast Metal
Ultimate Tensile Strength, psi	69,000-77,500	110,000-120,000	75,000-82,000	130,000-140,000	72,000-80,000	115,000-128,000	36,000-40,500
Yield Point, psi	42,500-45,000	47,000-52,000	55,000-57,000	60,000-65,000	45,000-48,000	55,000-65,000	
Elongation in 2 in., per cent	8-12	40-48	6-9	40-45	10-15	25-50	0
Reduction of Area, per cent	16-18	40-54	10-13	40-45	11-16		0
Hardness, Rockwell	B 85-94	B 94-97	B 92-99	B 96-100	B 89-97	B 84-95	C 50-55
Hardness, Brinell	155-200	200-215	190-230	210-235	175-215	160-210	
Izod Impact Strength, ft.-lb.	25-35	62-77	11-16	68-78	9-14	34-40	
Erichsen Value, depth in mm.		10-11		10-11		8-9	
Short Time Ultimate Tensile Strength, psi at:							
500 deg. C.		90,000		115,000		94,000	
700 deg. C.		55,000		85,000		75,000	
900 deg. C.		40,000		50,000		42,000	
1,000 deg. C.		23,000		25,000		22,000	
Transverse Breaking Test, 1-in. cross section and 12-in. span: load, lb. deflection, in.							5,000 0.070-0.080
Modulus of Rupture, psi							78,000
Modulus of Elasticity, psi	27,000,000		30,750,000		28,500,000		28,850,000

Note: The values given are averages and average ranges obtained with a limited number of specimens. They will serve as a reasonable guide for the engineer or designer planning equipment of Hastelloy alloys.

The figures for cast metal were obtained on specimens in the as-cast condition, except the hardness and impact values for cast alloy C, which represent the hardness and toughness of castings heat-treated to improve machinability. The figures for annealed alloys A and B were obtained on rolled specimens after heating to 1,175 deg. C. (2,150 deg. F.) and rapidly cooling. The figures for annealed alloy C were obtained on rolled sheet specimens after heating to 1,205-1,220 deg. C. (2,200-2,225 deg. F.) and air-cooling.

PENETRATION TEST RESULTS

Acid concentrations percentage by weight. Results expressed as the rate of penetration in inches per month.

Table I

Tests in Wet Chlorine Gas		TESTS IN HYDROCHLORIC ACID																								Tests in Hydrobromic Acid		
Hastelloy Alloy	Saturated Vapor ^a Room Temp.	Hastelloy Alloy	1 per cent			2 per cent			5 per cent			10 per cent			15 per cent			20 per cent			25 per cent			37 per cent (Conc.)			Hastelloy Alloy	48 per cent Boiling Point
			Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point		
C	0.0012 max.	A	0.0033*	0.0074*	0.0069	0.0032°	0.0059*	0.014	0.0023°	0.011°	0.031	0.0012°	0.0070°	0.022	0.0012°	0.013°	0.084	0.00058*	0.0091*	0.079	0.00041°	0.0034*	0.011	0.00033°	0.0029*	0.031	A B	0.0023 0.00094
		B	0.0003°	0.0019°	0.00073	0.00054°	0.0028°	0.00092	0.00074°	0.0027°	0.00097	0.00052°	0.0028°	0.0010	0.00035°	0.0036°	0.0012	0.00030°	0.0029°	0.0019	0.00030°	0.0015°	0.0017	0.00015°	0.0016°	0.0014		
		C	0.000015°	0.00014°	0.00085	0.000012°	0.00016°	0.022	0.00059°	0.013°	0.041	0.0022°	0.028°	0.22	0.0018°	0.019°	0.139	0.0012°	0.0317°	0.36	0.0012°	0.085°	0.61	0.0015°	0.090°	0.273		
		D	0.0019°	0.0053°	0.00084	0.0022°	0.0064°	0.0092	0.0022°	0.013°	0.053	0.0028°	0.021°	0.10	0.0031°	0.041°	0.081	0.0025°	0.037°	0.189	0.0049°	0.037°	0.114	0.012°	0.029°	0.109		

TESTS IN SULPHURIC ACID

Hastelloy Alloy	10 per cent			25 per cent			50 per cent	60 per cent			77 per cent		80 per cent			85 per cent			90 per cent		96 per cent				Evaporated To Fumes
	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	Boiling Point	70 deg. C.	Boiling Point	Room Temp.	70 deg. C.	150 deg. C.	Boiling Point	
A	0.00023	0.0023°	0.003	0.00013	0.001°	0.004	0.022	0.000033	0.001°	0.32	0.001°	0.132	0.000075°	0.0024°	0.110	0.00009°	0.0016°	0.201	0.00074°	0.655	0.000026°	0.00066°	0.03	0.64	
B	0.00015	0.0018°	0.0002	0.00010	0.00078°	0.00015	0.00015	0.00003	0.00018°	0.0031	0.000084°	0.058 -	0.000039°	0.00011°	0.081	0.0001°	0.000068°	0.070	0.000035°	0.084	0.000008°	0.0001°	0.004	0.038	
C	†	0.00032°	0.0042	0.000013	0.00064°	0.0039	0.021	†	0.00096°	0.305	0.00064°	0.093	0.0000054°	0.0025°	0.083	0.000006°	0.00012°	0.180	0.00014°	0.162	†	0.00021°	0.026	0.026	
D	0.00019	0.0015°	0.0011	0.00011	0.0011°	0.00074	0.00089	0.0000074	0.00026°	0.0074	0.0026°	0.015	0.00044°	0.0039°	0.022	0.00019°	0.0039°	0.025	0.0023°	0.073	0.000064°	0.0007°	0.0068	0.035	0.0045

TESTS IN NITRIC ACID

Hastelloy Alloy	10 per cent			20 per cent		30 per cent	40 per cent	50 per cent		60 per cent	70 per cent		
	Room Temp.	70 deg. C.	Boiling Point	70 deg. C.	Boiling Point	70 deg. C.	70 deg. C.	Room Temp.	70 deg. C.	70 deg. C.	Room Temp.	70 deg. C.	Boiling Point
C	0.00096	0.0032°	0.0036	0.0042°	0.015	0.0061°	0.011°	0.00077	0.012°	0.013°	0.00039	0.010°	0.165

Alloys A, B, and D are not recommended for use in nitric acid.

TESTS IN PHOSPHORIC ACID

Hastelloy Alloy	Chemically Pure Acid								Technical Acid							
	10 per cent		30 per cent		50 per cent		85 per cent		10 per cent		30 per cent		50 per cent		85 per cent	
	Room Temp.	Boiling Point	Room Temp.	Boiling Point	Room Temp.	Boiling Point	Room Temp.	Boiling Point	Room Temp.	Boiling Point	Room Temp.	Boiling Point	Room Temp.	Boiling Point	Room Temp.	Boiling Point
A	0.00018	0.0022	0.00011	0.0018	0.000073	0.0027	0.000025	0.068	0.00038	0.00082	0.00048	0.0013	0.00048	0.0027	0.00037	0.0039
B	0.00013	0.00015	0.000074	0.00020	0.000059	0.00014	0.000015	0.00013	0.00029	0.00030	0.00035	0.00093	0.00034	0.0018	0.00025	0.0028
C	0.0000067	0.00012	0.0000032	0.00042	†	0.00025	0.0000064	0.040	0.000019	0.00030	†	0.0011	†	0.0018	†	0.0025
D	0.00012	0.00023	0.000044	0.00044	0.000033	0.0041	0.000022	0.027	0.00037	0.00044	0.00042	0.0011	0.00036	0.0020	0.00024	0.0031

TESTS IN ACETIC ACID

Hastelloy Alloy	10 per cent		99 per cent (Glacial)		Crude
	Room Temp.	Boiling Point	Room Temp.	Boiling Point	70 deg. C.
A	0.00017	0.0002	0.00003	0.0007	0.0017*
C	†	†	†	†	†*
D	0.0003	0.00037	0.000045	0.000037	0.00074*

TESTS IN FORMIC ACID

Hastelloy Alloy	10 per cent	20 per cent	40 per cent	60 per cent	85 per cent (Conc.)
	70 deg. C.	70 deg. C.	70 deg. C.	70 deg. C.	70 deg. C.
A	0.0023*	0.002*	0.0026*	0.0033*	0.003*
C	0.000064*	0.0001*	0.00013*	0.0001*	0.0001*
D	0.0015*	0.0015*	0.0019*	0.0026*	0.0015*

† No measurable penetration.

* Aerated test.

** Sample suspended in sealed bottle over water through which chlorine gas is constantly bubbling.

rolled bars, strip, plate, sheet, rods, wire, and welded tubing; in addition, alloy is available as cast or drawn welding rod. Alloy C is furnished in the form of castings, plate, sheet, welding tubing and cast welding rod. Hastelloy alloy D is supplied only as castings and cast welding rod.

The A, B, and C sheet and plate materials can be sheared hot or cold, but since they are much stiffer and stronger, particularly at elevated temperatures, than ordinary sheet and plate materials, more power is required. A shear which will handle a certain maximum thickness of mild steel plate will handle only about 50 per cent of that thickness in Hastelloy alloy plate. Hastelloy alloys cannot be successfully cut by gas cutting methods, as they possess too much resistance to oxidation. Cutting with a carbon pencil, which merely amounts to melting away the material, can be done; but it is practically impossible to hold a straight or even edge.

These three sheet and plate materials can be formed cold by simple forming operations such as shallow dishing without flanging, or rolling thin sheets into cylindrical shapes. The cold-forming of the alloys will work-harden them but generally not sufficiently to necessitate subsequent heat-treatment for maximum corrosion resistance. Greater power is required for carrying out simple cold-forming operations than is required for mild steel.

More severe forming operations, such as dishing and flanging, rolling heavy plates into small cylindrical shapes, and plain flanging, must generally be performed hot. These alloys possess a brittle range between 1200° and 1900° F, and cracking may occur in this temperature range unless the flow of metal is extremely slow. Hot-forming can be carried out above 1900° F and up to 2150° F for A and B and up to 2200° F for C, as long as the flow of metal is not too rapid. When forming between dies, care must be

TABLE III
RECOMMENDED MACHINING SPEEDS AND FEEDS
(With Haynes Stellite metal-cutting tools)

Type of Cut	Alloy A		Alloy B		Alloy C		Depth of Cut, in.	Feed Per Rev. in.	Depth of Cut, in.
	Surface Speed ft per min.	Feed Per Rev. in.	Surface Speed ft per min.	Feed Per Rev. in.	Surface Speed ft per min.	Feed Per Rev. in.			
Rough-Turn, Face, or Bore	50-60	0.025-0.035	1/16	25-35	0.015-0.030	1/16	30-40	0.020-0.030	1/16
Finish-Turn, Face, or Bore	60-70	0.015-0.020	1/32	30-35	0.008-0.012	1/32	35-50	0.012-0.018	1/32

TABLE IV
GRINDING WHEEL RECOMMENDATIONS FOR GRINDING
ALLOYS A, B, C, AND D

MANUFACTURER	SURFACE-GRINDING		CYLINDRICAL GRINDING	INTERNAL GRINDING	
	Rotary Table, Vert. Spindle Type (Wet)	Reciprocating Table, Hor. Spindle Type (Dry)	(Wet)	(Dry) Under 2 in. Diam.	(Dry) Over 2 in. Diam.
Abrasive Co.	B7 Borolon Silicate N46-GS-A N46-HS-A	B7 Borolon Vitrified N461-J-H9	Borolon Vitrified 46-L-K8	Alloy A: Borolon Vit. 60-K-K9 Alloy B, C, D: SB Borolon Vit. W60-K-HY	B7 Borolon Vitrified N46-J-Hy
Bay State Abrasive Products Co.	H92-46G8-AAA	H92-46H8-AAA	H92-46M5-A6	H92-70K6-A6	H92-46J5-A6
The Carborundum Company	40F1-W-SWB-5 Aloxite Silicate	50-N-200 Aloxite Vitrified	401-M-100 Aloxite Vitrified	603-M-S30 Aloxite Vitrified	50-O-S200 Aloxite Vitrified
Dayton (Simonds Worden White Co.)	846G-1 Vit. D. R. A.	846K-1 Vit. D. R. A.	54N-5 Vit. Al. Ox.	860K-1 Vit. D. R. A.	846K-1 Vit. D. R. A.
Detroit-Star Grinding Wheel Co.	4446-H Staralox Vit.	4446-L Staralox Vit.	46-M Staralox Vit.	4480K Staralox Vit.	4460-K Staralox Vit.
Macklin Co.	2936-2-2 Alum. Res.	2946-J Alum. 401	2946-L Alum. 402	2960-K Alum. 402	2946-J Alum. 402
Norton Co.	3846-G8BE	3846-K5BE	50-M5BE	3860-K	3846-K
Precision Grinding Wheel Co., Inc.	46 H-O	46 L-5	50 N 6	Alloy A: FA 70 M-5	46 K-4
Radiac (A. P. deSanno & Son, Inc.)	9746-FV	9746-JV	9750-M	Alloy A: 9750-L Alloys B, C, D— 9770-J	9746-J
The Safety Grinding Wheel and Mach. Co.	46-7 Rex 46-6- $\frac{1}{4}$ Rex	46 M- $\frac{3}{4}$ Rex	50P- $\frac{1}{4}$ -26 Rex	Alloy A: 60 P-16 Rex Alloy B, C, D: 70 P-16 Rex	
The Sterling Grinding Wheel Co.	N46 FO-X LT N Sterlith	N46 K2 Sterlith Vitrified	N46E-L35-HD N Sterlith Vitrified	Alloy A: N46 K N Sterlith Vit. Alloys B, C, D— N70B-L3 N Sterlith Vit.	N46 J Sterlith Vitrified

taken that the metal is not cooled rapidly into the brittle range by contact with cold dies before forming is completed. For this reason, it is often necessary to reheat several times during particularly severe forming operations. When this is necessary, the material is given a short soak at full annealing temperature to offset any work-hardening which may have occurred during the previous step.

Rolling of these alloy sheets into cylindrical sections in most cases can be performed cold. Approximately twice as much power, however, is required as for rolling the same diameter in mild steel. Simple shapes can be cold-drawn. Drawing, however, work-hardens the alloys and, in performing this work cold, it is often necessary to carry out the operation in several steps, giving a full anneal to restore maximum ductility between the series of drawing operations.

After all forming operations, either hot or cold, material is given a full anneal or stabilizing anneal to impart maximum corrosion resistance to the sheet.

Extensive research on welding methods, together with numerous corrosion tests on welded equipment of Hastelloy alloys, has developed welding procedures so that welds of full corrosion resistance can be made. Alloys A, B, and C can readily be welded by the oxy-acetylene, metallic arc, or atomic hydrogen process. The carbon arc cannot be used because of carbon pickup and consequent lowering of corrosion resistance.

Alloys A, B, and C cast parts are generally welded by the oxy-acetylene process, using a neutral flame and a welding rod of the same composition as the base metal, with the exception that alloy A is welded with alloy B welding rod to give superior corrosion resistance in the welds. An excess acetylene flame is likely to increase the carbon content and impair the corrosion resistance of the weld metal. Therefore, precautions should be taken to maintain a neutral flame to prevent carbon pickup.

Localized preheating is sufficient when welding small castings of alloys A, B, and C; but for large castings, thorough preheating is advisable to prevent heating and cooling strains incidental to the welding operations. Size and shape of part to be welded will determine whether preheating is necessary. No heat-treatment of welding castings is necessary unless they have been preheated for welding and held at red heat for an appreciable period of

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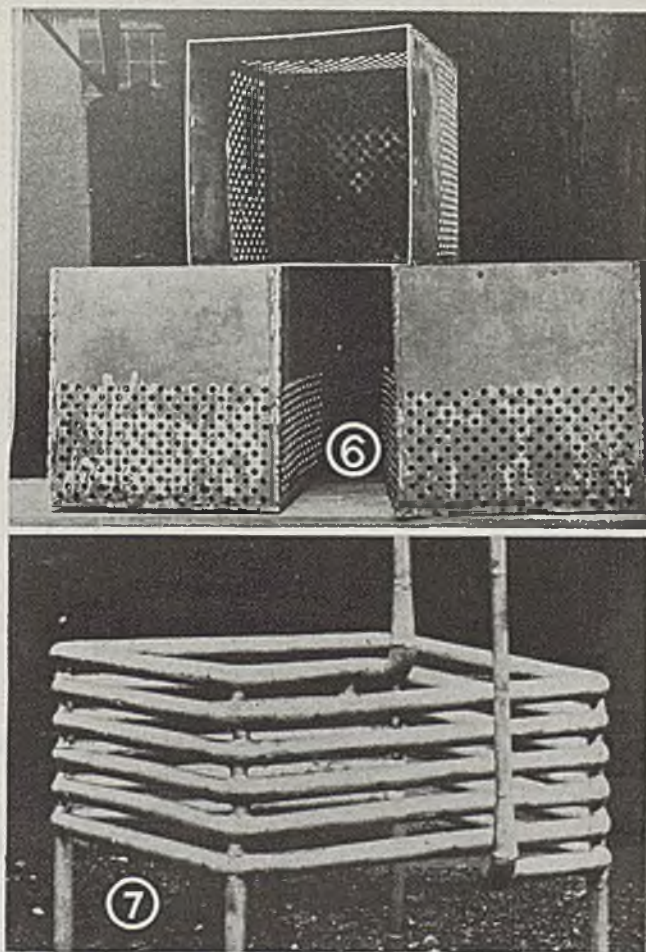
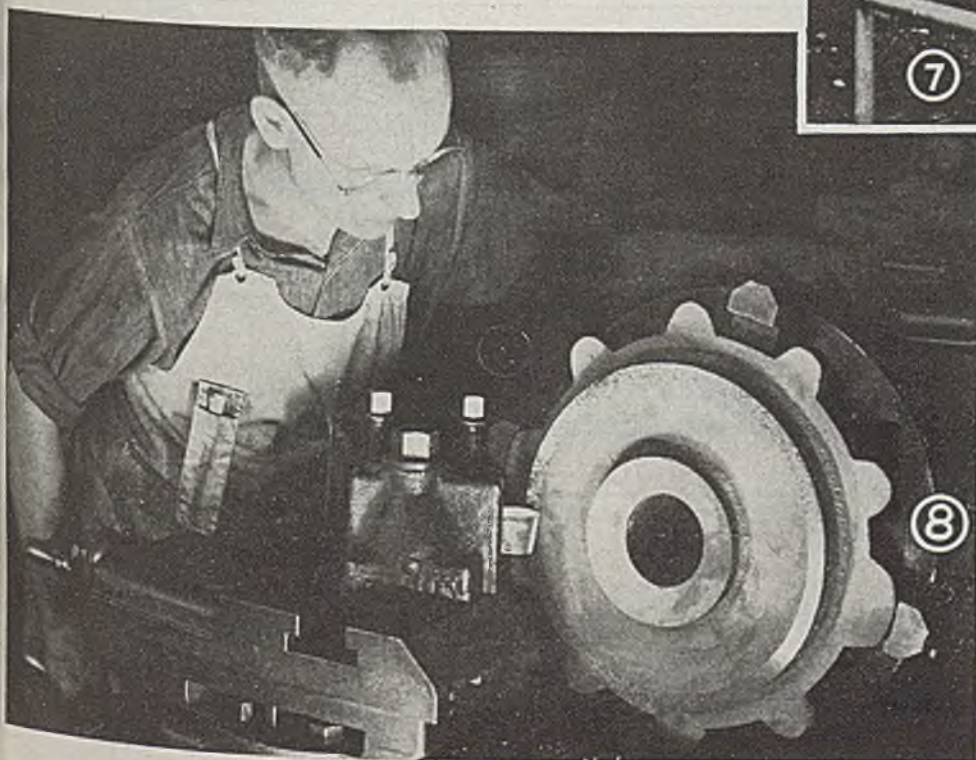


Fig. 6—Perforated baskets for pickling metals in hydrochloric acid formed of 16 B.w.g. alloy A sheet

Fig. 7—Coil of alloy B used for heating solutions containing zinc chloride consists of straight cast pipe and cast 90 degree pipe bends fabricated by welding process

Fig. 8—Machinability of alloys A, B, and C facilitates the manufacture of a wide variety of finished parts





By BENJAMIN MELNITSKY

CONTROL

stores to the shop or outside the shop; knowledge of storage facilities. The four main subdivisions of stores—bar stock, castings and forgings, and finished parts—all provide similar planning problems but with distinct individual differences. In this article each of the three types of stores will be presented separately.

Planning for Bar Stock: In planning for bar stock, several factors must be taken into consideration. Bar stock is difficult and expensive to handle. It should be racked only if it is certain that it will not be required in the shop. Shifting bar stock from rack to rack to make room for new

shipments should be kept to absolute minimum.

Bar stock, especially rounds, should never be left around on the floor of the store. Only when bars are in the rack are they no longer a source of broken feet and split fingers.

Quite often bar

stock is ordered in excessively large amounts. This is especially true when orders are placed directly with mills. Automatic lathes and screw machines consume tremendous quantities of stock. The requirements of these machines plus those of recurring and frequent jobs all demand that stock be ordered in large amounts for long periods of time. Thus, large areas of rack space may be needed at one time, and not at another.

Variety of bar stock stored in most plants is surprisingly large. Not only are there many different types of metals, but each metal may be stocked in several finishes and treatments, and different sizes and shapes. It is not unusual for a storeroom to have stock from 1/32-in. diameter up to 12 in. square. All these must be stored by type of metal and by sizes, with small sizes on top of rack and larger sizes toward the bottom.

It is difficult to estimate in advance the amount of space required to store given quantities of bar stock. Quantity of 10,000 lb of 1 in. diameter stock may mean three racks if the stock is 10 ft long; or it may mean two racks if the stock is 12 ft long; or, as it is often the case, may mean nothing in terms of rack space until such time as the bars are placed in the rack. Yet, if the planner does not know how much space will be required to meet bar stock shipments, he is stymied before he starts.

Ordering period for bar stock is shorter than for any other type of stores. It is quite possible for 10,000 lb of stock to be received the same day as ordered.

With these factors in mind, the planner for bar stock

must know first what is to be received in stores during the planning period. First source of such knowledge lies within the storekeeper himself. Past experience should indicate to him the general nature of receipts. He knows that at certain periods receipts will be especially heavy, and that shop conditions affect receipts in certain ways. Another source of information is his copy of the purchase order on which due-dates are usually listed. By filing purchase orders by due-dates, he can have before him a record of materials to be received the next week or next month.

Of greater value to him is the shortage sheet system which lists not only materials to be received but the ultimate disposition of these materials as well. There are many types of shortage sheet systems. The one described here serves as a typical example. Under this system, purchasing department prepares a list of all shipments that are due during the planning period. It shows quantity of stock to be received, vendor, purchase order number and type of material. List is then sent to the material release department (or to those who are responsible for issuing material requisitions). This department indicates on the sheet how much of the received material will be required immediately and the ultimate disposition of the stock to be received. This sheet then is sent to the storekeeper who uses it as a guide in planning. The storekeeper, with such a record, has a fundamental tool in planning his storeroom.

With the shortage sheet before him, the planner can ascertain, with some degree of accuracy, how much stock he will be asked to deliver during the planning period. Past experience here too is quite valuable because stock issuances often follow more or less definite patterns. It will indicate, for example, that shapers require certain sizes of square stock every other week, or that the automatics require a certain type of round stock every week. Conversations and contacts with shop foremen and office workers can indicate future bar stock need.

Armed with information from these sources, the storekeeper will have a good knowledge of what will be issued from his department during the planning period. Issuances, however, will still be of a variable and not-entirely-foreseeable factor but not a disruptive factor. Variations in issuances above and beyond expectations must be expected, and allowances should be made to absorb relatively wide fluctuations in stock issued.

The storekeeper also must know his racks and storage facilities thoroughly. He must be able to locate needed stock, and to indicate to himself and to others the locations of stock. This can be done by using a system of location symbols. With the use of a simple symbol each rack and each portion of each rack can be found even by a stranger.

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ABRASIVE *Belt* GRINDING

Special machines for use with abrasive belts have contributed important improvements in grinding and polishing operations, increasing production and bettering quality of finish. This is the first of two articles discussing some factors governing development of this method of grinding

AS a manufacturer of coated abrasives, Minnesota Mining & Mfg. Co., St. Paul, was interested in developing and improving machines using its products. Thus company engineers spent much time and effort working with both machinery manufacturers and industrial users. Astounding results were achieved in many instances. Tracing some of these developments will give a more complete picture.

One of the first developments was a wheel, its periphery, composed of rubber, of greater weight than its body. Known as "Quick-as-Wink," it is shown in Fig. 1. At rated speeds of operation, due to centrifugal force, gyroscopic action developed due to the flow of the rubber. By attaching clipped abrasive bands, this wheel proved excellent for grinding and polishing surface imperfections on metals. Due to its balance, it eliminated jump, chatter and work-hardening of the surface, commonly encountered when using a hard wheel. It found ready use for polishing locomotive rods and the nichrome rolls used in glass making, and polishing off surface imperfections of forged pipe used for oil lines, refinishing airplane propeller blades, etc.

One of the next problems to be considered was the polishing of stainless steel. In the early days of stainless steel manufacturing, much of it had to be scrapped because of surface imperfections. Since it was almost impossible to prevent much of the costly chromium content

of the metal from going up the flue when remelting, stainless scrap was worth only about three cents a pound instead of the forty-odd cents demanded for finished stainless steel. It was important, on that basis, to reclaim as much scrap as possible.

One of the earliest developed methods of doing this was to pass stainless steel strips under a series of wheels of the type being discussed. A typical line-up consisted of four 12-in. diameter wheels. The first might use No. 80 grit; the next, No. 100; followed by No. 120 grit dry and another No. 120 grit greased. Arrangements such as this were utilized to reclaim many tons of stainless.

With continued increase of stainless production, the company decided, in 1930, to engineer still faster equipment especially designed for grinding and polishing stainless steel sheet and strip. While it was recognized that the cost of developing such units would be high, it was felt that industry as a whole would benefit.

Stainless Sheet Polisher: First experiments utilized abrasive belts only 6 in. wide. The stainless steel sheet was supported by a table at right angles to the path of the driven abrasive belt. A flat shoe to back up the belt at the point of work contact was employed. However, deep scratches in the finish were traced to the flat shoe, so this was changed to a half-moon shoe which gave better results. Use of a small contact roll instead of a shoe was found to be still better.

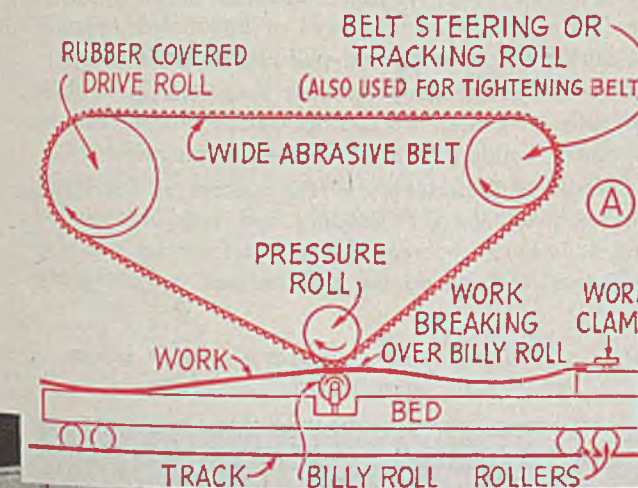


Fig. 1—Removing pits from propeller blades (see right half of blade) with Quick-As-Wink wheel and No. 120 grit abrasive clipped belt. Pits were caused by cinders caught in back-lash of slip-stream produced by whirling propeller blade

Fig. 2—Narrow belt unit developed for grinding and polishing stainless steel

Fig. 3A—Floating billy roll arrangement developed to give uniform pressure across entire width of stainless steel sheets

Fig. 3B—Wide belt abrasive grinder showing how contact is maintained across entire width of sheet

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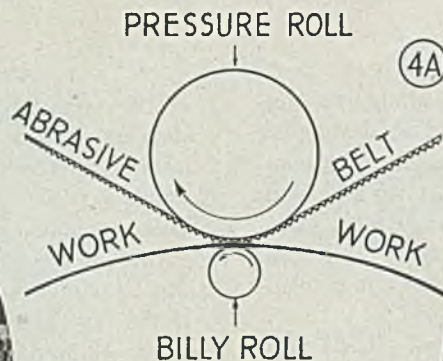
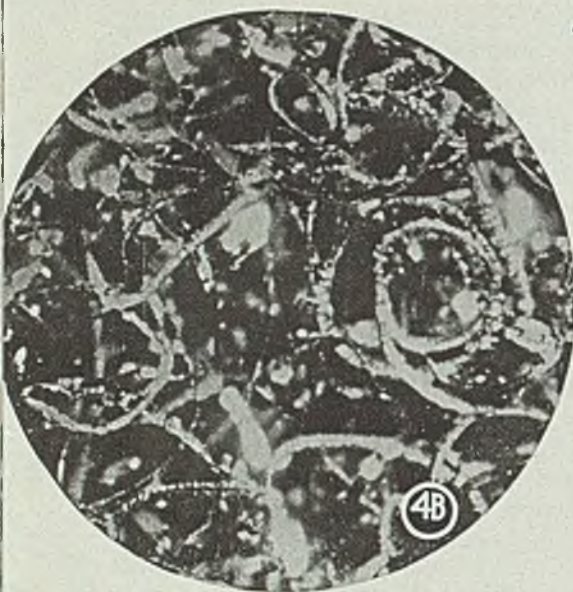


Fig. 4A—Arc contact causes the front edge of the abrasive grain to do the cutting

Fig. 4B — Microphotograph shows that stock removed has same appearance as that removed by any revolving cutter



The final result in the attempt to grind and polish wide sheets with narrow belts was the development of the machine shown in Fig. 2.

It soon became evident that for full scale production and more even finishes, a belt the full width of the sheet was needed. The solution appeared to lie in the use of factory-coated abrasive belts 40 or 50 in. wide although line contact was difficult to maintain.

Since stainless is a poor heat conductor, the next step was to water-cool the table. Basic problem, however, still was that of grinding the full width of the sheet through its entire length with exact grinding pressure regardless of slight variations and undulations existing normally in sheet product.

A new start was made by designing a rounded bed so that the advancing table would bring the sheet to tangential contact at a right angle to the belt grinder. This machine maintained better line contact, and the heat

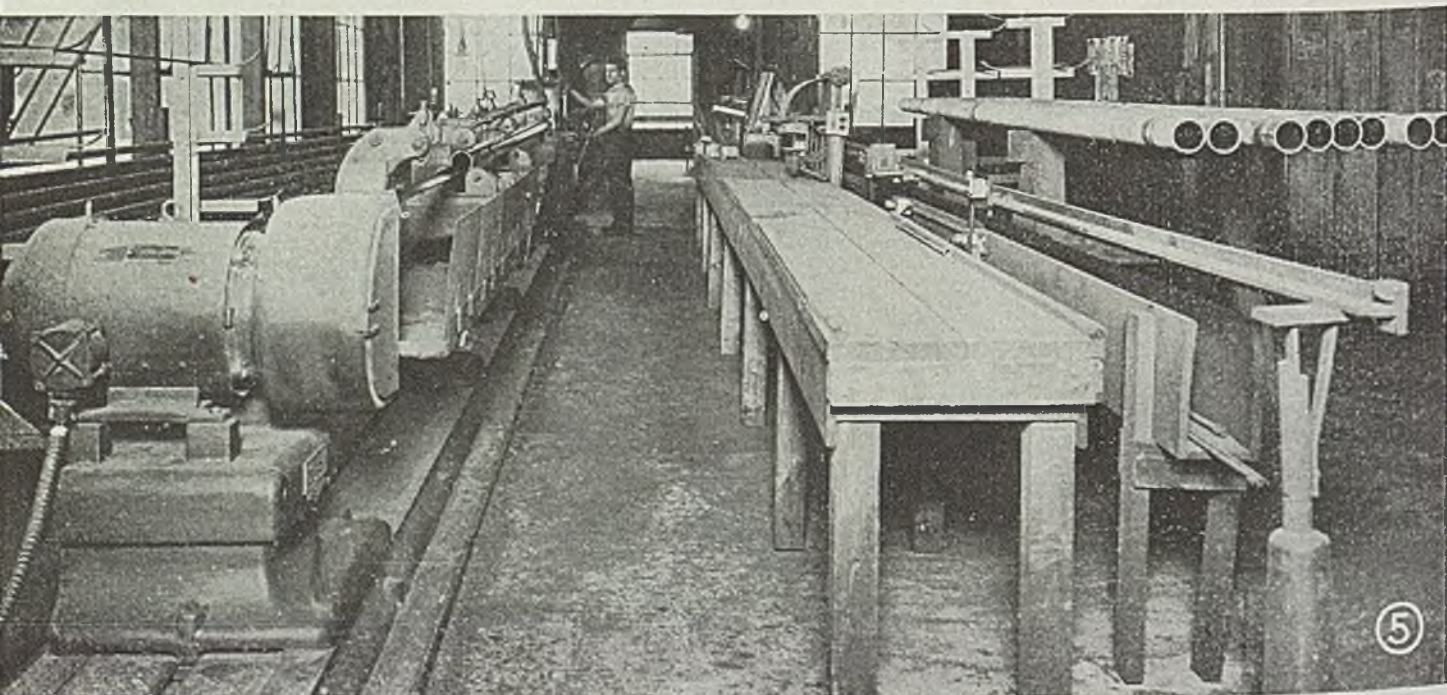
was dissipated by the water cooled table, but it was not completely satisfactory in all respects.

The feature that finally met the full requirement was the use of a floating billy roll (see Fig. 3A and B) which applied uniform pressure across the entire width of sheet (see Fig. 4). This arrangement held the temperature even throughout the entire area of the sheet, keeping it flat during the grinding and polishing operation.

In recent years many different arrangements of these principles have been worked out in conjunction with the machinery builders to meet different requirements.

Contact Is Important: In the process of developing suitable machines for grinding and finishing stainless steel, it became apparent that the soft contact roll originally used to back up the abrasive belt was not giving

Fig. 5—Polishing the inner diameter of tubes with an endless belt



proper support to the abrasive grains of the belt, and inefficient abrasive action was the result.

Hard rolls improved the cutting action, but their lack of flexibility caused excessive belt wear and reproduced machine inequalities in the form of chatter. Intermediate densities resulted in a compromise at best.

Considerable research work was carried on by the company generally in the steel mill themselves, since the contact roll proved to be the heart of any mechanical grinding and polishing method. Comparatively, the contact roll is as important as the work roll of a four high rolling mill.

In the endeavor to find the proper roll construction, many materials such as cloth, cork and grades of rubber were tested.

These tests showed that the best roughing roll was one 6 to 8 in. diameter with a "dual density" rubber covering. Two layers of rubber were applied to the contact roll shaft. Next to the shaft was applied a $\frac{1}{2}$ -in. thick layer of soft rubber (35-40 durometer hardness) over which was applied a $\frac{3}{8}$ -in. thick layer of hard rubber (70-80 durometer hardness). The rolls were dynamically balanced, and the face of the roll ground at the surface speed at which the abrasive belt traveled when in use. This type of construction proved to give highly efficient grinding results and to produce a finish free from chatter. The small diameter of the roll gave a short arc of abrasive contact.

The hard rubber backed up the abrasive mineral, eliminating glazing of the abrasive belt while the softer rubber toward the center acted as a cushion absorbing shock. The soft center also enabled the roll to follow undulations and produce a uniform pattern of grinding.

For finishing, it was found that the best roll was one 10 to 14 in. in diameter with a soft rubber covering approximately $\frac{3}{4}$ -in. thick and a durometer hardness of be-

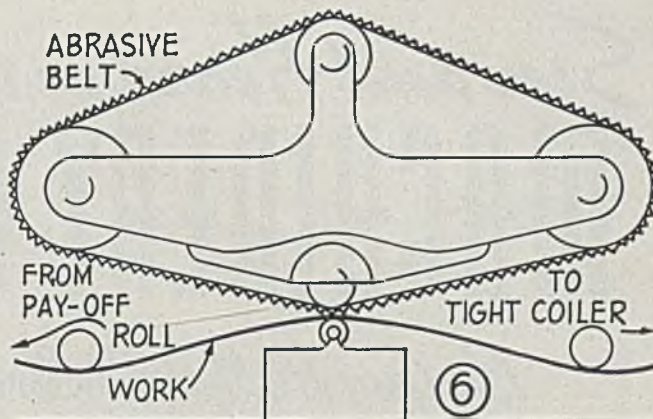


Fig. 6—Wide belt unit used in grinding and polishing continuous strips of stainless steel

tween 20 and 30. This single density larger diameter finishing roll gave the belt the soft action required for polishing operations.

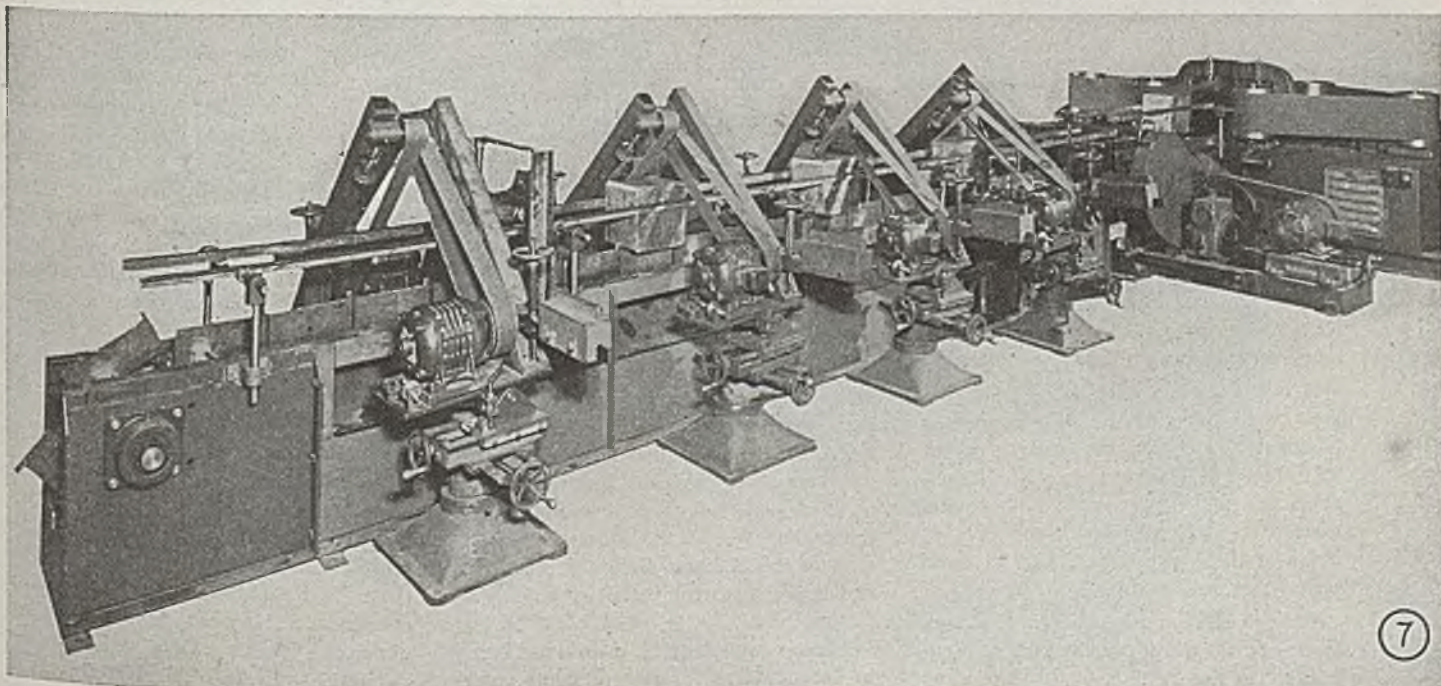
The wide belt grinder and polisher started to supersede the stroke sander in 1933, but it was not until 1936 that the job was completed to general commercial satisfaction. Today belts up to 74 in. widths are used for this work.

Use of these machines has made it possible to produce all standard finishes with uniformity. No attempt will be made to cover the grit sequences followed since they vary, depending on the type of stainless steel to be ground and polished as well as the width and gage. However, the roughing belts are used with oil flushed on the sheet during grinding. Grinding is accomplished with grit Nos. 36, 50, 80, 100 and 120 selected in sequence, depending on the surface condition of the metal.

Finishing is accomplished with abrasive belts used with a heading of grease. Finishing numbers run from 120, 150, 180, 240, 320 and 400 in sequence dependent on

(Please turn to Page 120)

Fig. 7—Special billet grinder used to bevel edges and polish faces of sawed aluminum blocks



Seen and Heard in the MACHINERY FIELD

By Guy Hubbard Machine Tool Editor

NO REPRIEVE: Four silent figures were led down the long corridor into the white-walled chamber. Hushed voices gave final instructions as the four were seated in plain wooden chairs. Spectators gazed intently through a thick plate glass shield as an electrician made final adjustments. Then a switch was thrown—we were on the air!

The four participants in this adventure were Bill Rooney, news and markets editor of *STEEL*, Jack Knox, steel plant editor, Bob Hartford, manager of editorial research, and the writer. The place was radio station WBEN on the 18th floor of Hotel Statler, Buffalo. The time was 6:30 p.m. Thursday, July 18, 1946. The occasion was the Semet-Solvay News Quiz.

Thanks to the high IQ of my companions in this adventure—coupled with the fact that Thursday is the day when various news magazines hit the stands—we made out rather well. Conclusion (and this will be of interest to my friends in the machine tool industry who may be called upon to participate in radio broadcasts): “Microphones don’t bite!”

NO ROYAL ROAD: When one contemplates a large and successful company—especially at a time when business is good—there is some inclination to assume that it must have been born “with a silver spoon in its mouth.” As a matter of fact, many businesses which were born with silver spoons in their mouths have died young. Those which have had to struggle for life in their infancy seem to have done much better.

A few days ago I had occasion to review with some of the officials of the National Acme Co., the early days of that company. Having been with National Acme for many years and having studied its beginnings with the help of many of those who had a part in those early struggles, I know its history.

Back in 1883, the late Edwin C. Henn, then only 20 years old, became a “contractor” in the Pratt & Cady valve shop

in Hartford. In this venture, he became associated with several other young mechanics, including Fred Rand from the Cushman chuck shop and Reinhold Hakevessell from Pratt & Whitney. As an after-hours proposition, they joined a friend named Wittig in manufacturing a bevel protractor.

The famous inventor Christopher Spencer came to Henn, Hakevessell and Rand (who in the meantime had bought out Wittig) and prevailed on them to build for him some “Jumping Jack” screw machines which turned parts from coiled stock by means of revolving tools. That is how the germ of the Acme automatic came to be planted.

Having completed the Spencer assignment, Henn and Hakevessell went to work on a “multiple” of their own design. It was built under incredible difficulties, mostly in a shop in the Boardman Block in Hartford; with the help of money earned on the outside by the principals; and with the help of parts and material salvaged from the Pratt & Whitney scrap pile (with the knowledge and consent of Francis Pratt and Amos Whitney).

This pioneer “multiple”—built in a room with plaster falling off the ceiling and with the help of salvaged parts, by men who were working day and night just to make both ends meet—worked. The next thing, however, was to get the right people interested in it.

Finally Edwin C. Henn journeyed to Cleveland, where he interested his brother Albert W. Henn in the proposition. A. W. put all his savings into it—then to save his investment he had to get into the business himself. After several precarious years in Hartford—marked by such expedients as “borrowing \$5000 for one year at 10 per cent interest, paid in advance”—A. W. finally succeeded in interesting W. D. B. Alexander, president of the National Screw & Tack Co. in Cleveland, to the extent of buying 25 Acmes.

These were set up in “a little red barn” in Cleveland as a screw products enter-

prise called the National Manufacturing Co. The Acme Machine Screw Co., as the Hartford company was christened in 1896, took part payment for the 25 Acmes in National stock. Thus the two ventures were linked together.

In 1901 this “spiritual” connection became a physical connection, with the removal of the Hartford enterprise to Cleveland and the formation there of the National Acme Mfg. Co., now called the National Acme Co. No one in Hartford at that time realized that something of potential importance was slipping away.

This is the 50th anniversary of the corporate founding at Hartford of what eventually became National Acme. It took courage and foresight and hard work to get it started. There have been times when it has taken an equal amount of courage and foresight and hard work to keep it going and to keep it growing. Fred H. Chapin, who has guided the destinies of the company for more than 20 of its 50 years, deserves a heap of credit for the part he has played in keeping it going and keeping it growing.

ON THE LATCHSTRING: Recently I visited some of the machine tool plants in Wisconsin. There I came across an idea which appeals to me not only as good business but also as typical of the friendly spirit of that land of blue lakes and yellow butter. (“Butter”, they solemnly promised me up there, “will return!” If that sounds like General MacArthur, remember that his father came from Wisconsin.)

Getting back to that “idea,” it is a small folder or booklet which is presented to the visitor by the receptionist. (Incidentally, those Wisconsin machine tool builders have a knack for selecting receptionists).

Getting back again to that “idea,” these folders or booklets officially welcome the visitor; they list the names and titles of executives in the company; they show location of plant and transportation facilities by means of maps; they give various other bits of essential information—some of which one hesitates to ask of a receptionist. (Down east, where I come from, many of the capable nurses used to hail from Prince Edward Island. They “took to nursing” just as Wisconsin girls apparently take to “receptioning”).

This item was inspired by a folder and by a booklet, the first having been presented to me by the receptionist at Gisholt Machine Co., the second by the receptionist at Ciddings & Lewis Machine Tool Co. Undoubtedly some other companies already have such “vest pocket directories.” Many others would—in my estimation—do well to adopt this idea.

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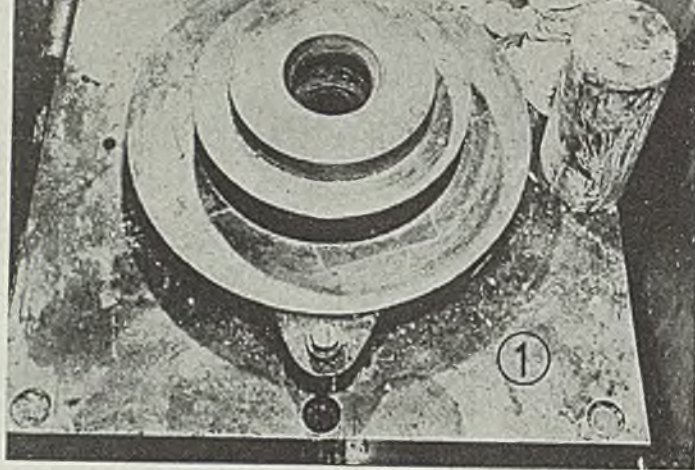
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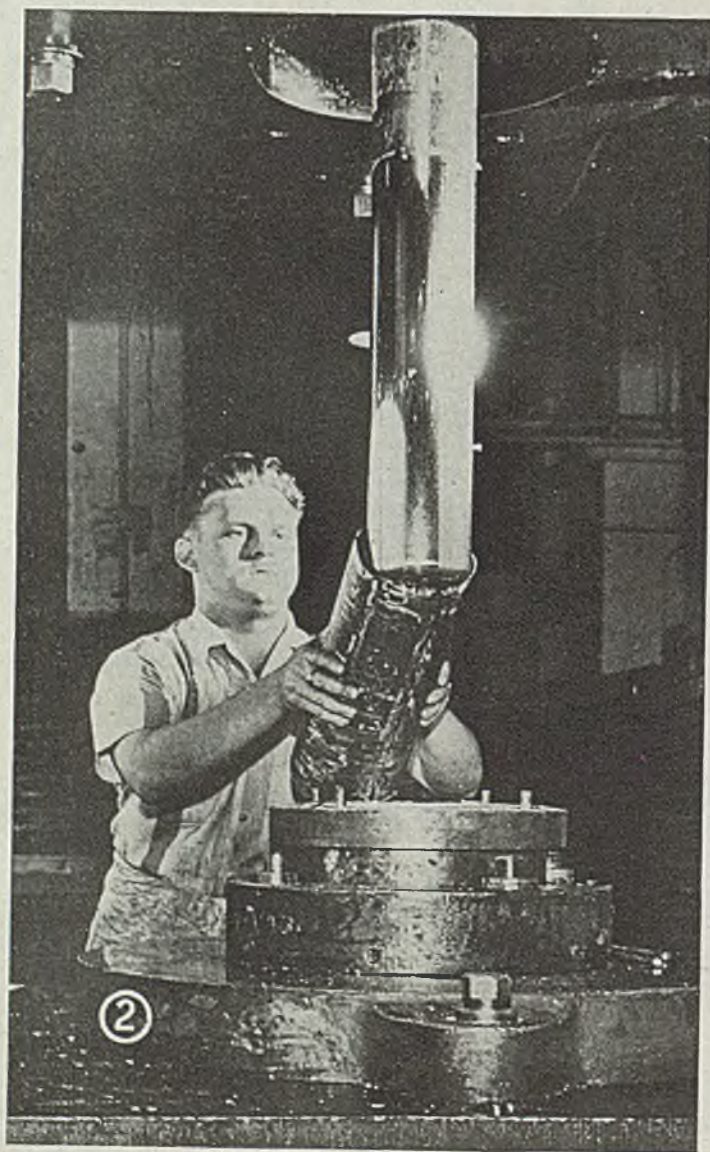
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CARBIDE DRAWING DIES



By DANIEL MAPES
Vice President
Walter Kidde & Co. Inc.
Belleville, N. J.

REDUCTION in scrap amounting to 50 per cent, and a materially improved product due to the elimination of surface defects in finished pressings are some of the advantages attributed to the use of Carboloy cemented carbide dies in deep drawing sheet metal for high pressure gas cylinders at Walter Kidde & Co. Inc., Belleville, N. J. Cylinders are used for fire extinguishers and for storage of commercial gases up to 2000 psi.

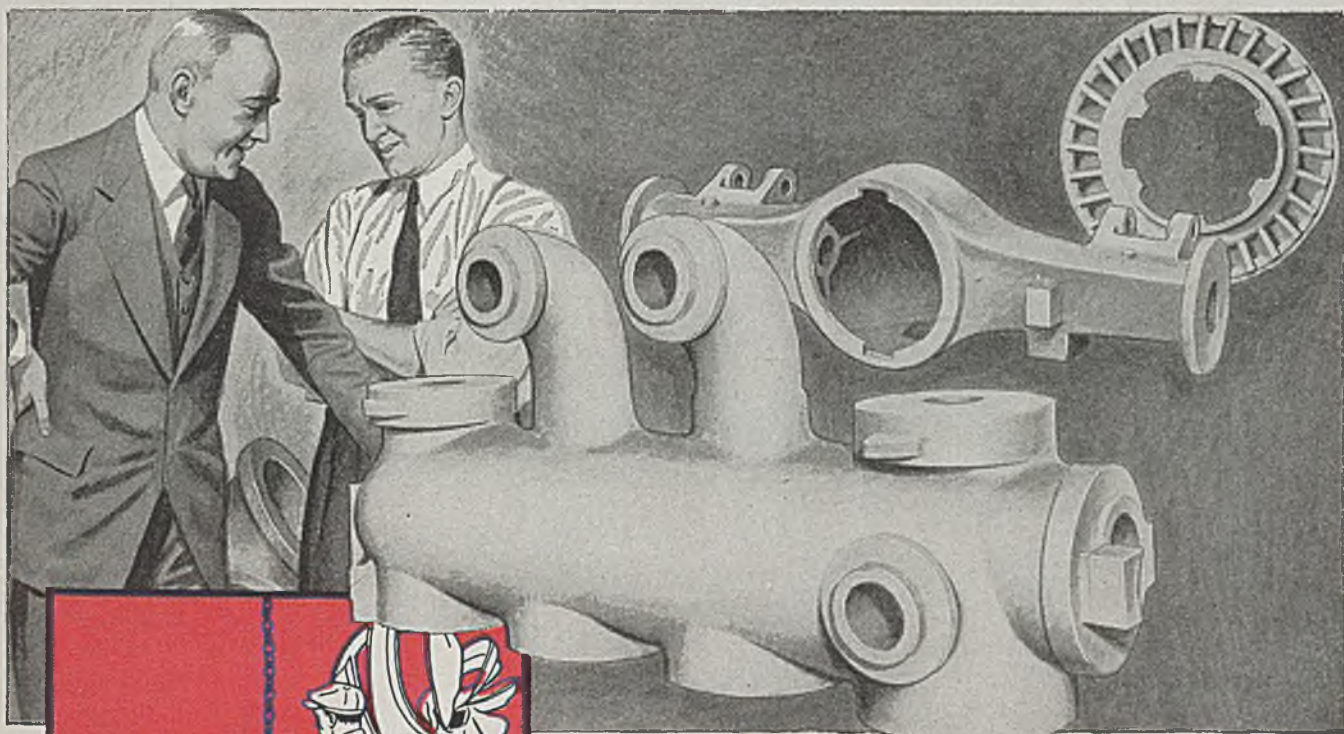
At present, 95 per cent of all our sheet metal drawing—covering a wide range of thicknesses in a variety of metals—is being performed with carbide dies (see Fig. 4) ranging in size from an inside diameter of 2 to 13½-in. Finished containers run from 2 in. in dia by 6½-in. long to 8¾-in. dia by 32 in. long.

The metal stock includes chrome-molybdenum as well as various other types of alloy steels, mild steels, stainless steels and aluminum alloys. It is estimated that more than 4,000,000 distinct drawing operations are performed each year in the manufacture of these products, using steel dies.

When shifting from conventional steel drawing dies to those made from Carboloy die metal neither press operation nor lubrication has to be changed (see Fig. 1). Inasmuch as carbide dies are the exact duplicates of steel dies formerly employed, it would have been unnecessary to change the drawing procedure. The extreme hardness and high resistance to wear of the carbide metal, however, made it possible to take heavier drafts on Carboloy dies than on comparable steel dies without measurably reducing the productive life of the carbide dies. In order to take advantage of the economies derived from a fewer number of drafts,

Fig. 1—In changing to Carboloy dies, it was found unnecessary to modify either press operation or lubrication of work pieces

Fig. 2—Steel punches are used with carbide dies since life of steel punches is sufficient for average production run on a given size container (around 50,000 pieces). When punches are worn, they are re-worked for use in smaller diameter drawing operations



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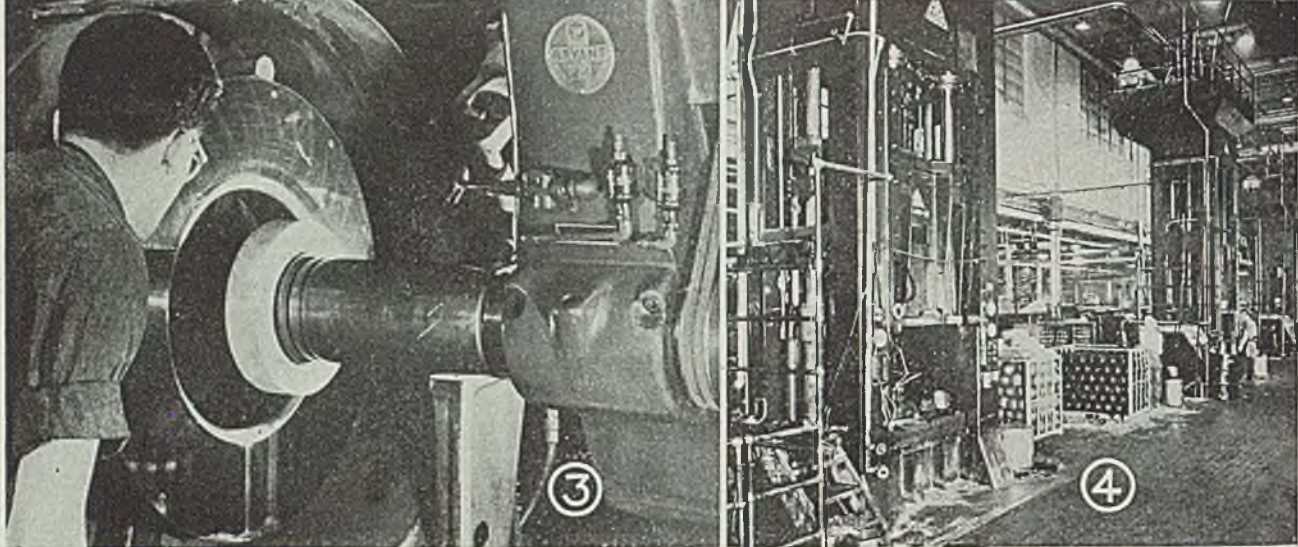


Fig. 3—Carbide dies are reconditioned in much the same way as wire drawing dies, although heavier equipment is used. Here flat steel ring bolted on top of large cupping die is being re-ground to the original specifications

Fig. 4—Hydraulic presses at Walter Kidde & Co. Inc., are used in deep drawing high pressure gas cylinders from chrome-molybdenum and other alloy, mild and stainless steels, and from aluminum alloys

some alteration was made in die size, but not in basic die design.

In addition, the longer life of Carboloy dies made possible further economies. In changing over to carbide dies, the various drawing steps were worked out dimensionally to take advantage of the fact that some of the dies could be used for more than one operation. For instance, a carbide die used for first draw for one size of cylinder, is used also for the third draw in producing another size.

Although some difficulties were anticipated, it was found that the same die setting practice could be used for the carbide dies as for conventional steel dies. As a matter of precaution, however, somewhat more attention is paid to insuring perfect alignment between the die and the punch in order to protect the carbide die.

As shown in Fig. 2, steel punches are used in combination with carbide dies. The reason for this is that the dies tend to wear more rapidly than the punches. Steel punches will stand up for an average of 50,000 drawing operations—about the average production run required. Thus, no particular savings would have accrued from the use of carbide punches at least insofar as down time for maintenance is concerned. When the steel punches wear down, incidentally, they are reconditioned for use in smaller diameter drawing operations.

Extreme hardness and wear-resisting properties of Carboloy dies reduce the need for polishing until after some 10,000 operations. Time required to polish a carbide die is about the same as that needed to polish a steel die.

Despite long life, carbide dies for sheet metal drawing must be polished periodically to obtain maximum service and continued quality of product. To recondition

a carbide die, the ring which eventually forms in the carbide nib is ground out and the entire nib repolished, holding as close as possible to the original specifications. This process, Fig. 3, is much the same as in reconditioning standard Carboloy dies used for wire drawing. Equipment used for polishing the sheet metal drawing dies at Kidde, however, is somewhat heavier than that used to recondition the wire drawing types.

Practice is to predetermine the time interval at the end of which each die should be repolished before the ring has assumed undesirable proportions. This procedure prolonged overall die life greatly.

Long Productive Life

Some idea as to the total productive life of the Carboloy deep drawing dies may be gleaned from the records of one average die. The length of draw for which this particular die was used is 22 in. In the time during which the die was in operation, some 250,000 drawing operations were performed, amounting to a total length of draw of nearly one hundred miles. Yet the total wear on the inside diameter of the die, so far, is only around 0.003-in. Since our dies are serviceable until wear has reached 0.005-in., total productive life on this particular die probably is somewhat in excess of 400,000 pieces, barring unforeseen accidents.

Production increase of between 25 and 30 per cent per day in approved finished pieces was affected by the use of Carboloy sheet metal drawing dies. This was partly due to a decrease of 50 per cent in down time for maintenance, installation, etc. In addition, the use of the Carboloy dies virtually eliminated surface scoring as well as formation of surface cracks in the sheet metal. The longer life

of the Carboloy dies also made it possible to cut inventory of deep drawing dies by 25 to 30 per cent, thereby substantially reducing the total outlay for dies.

—o—

Steel Castings Metallurgy Presented by an Authority

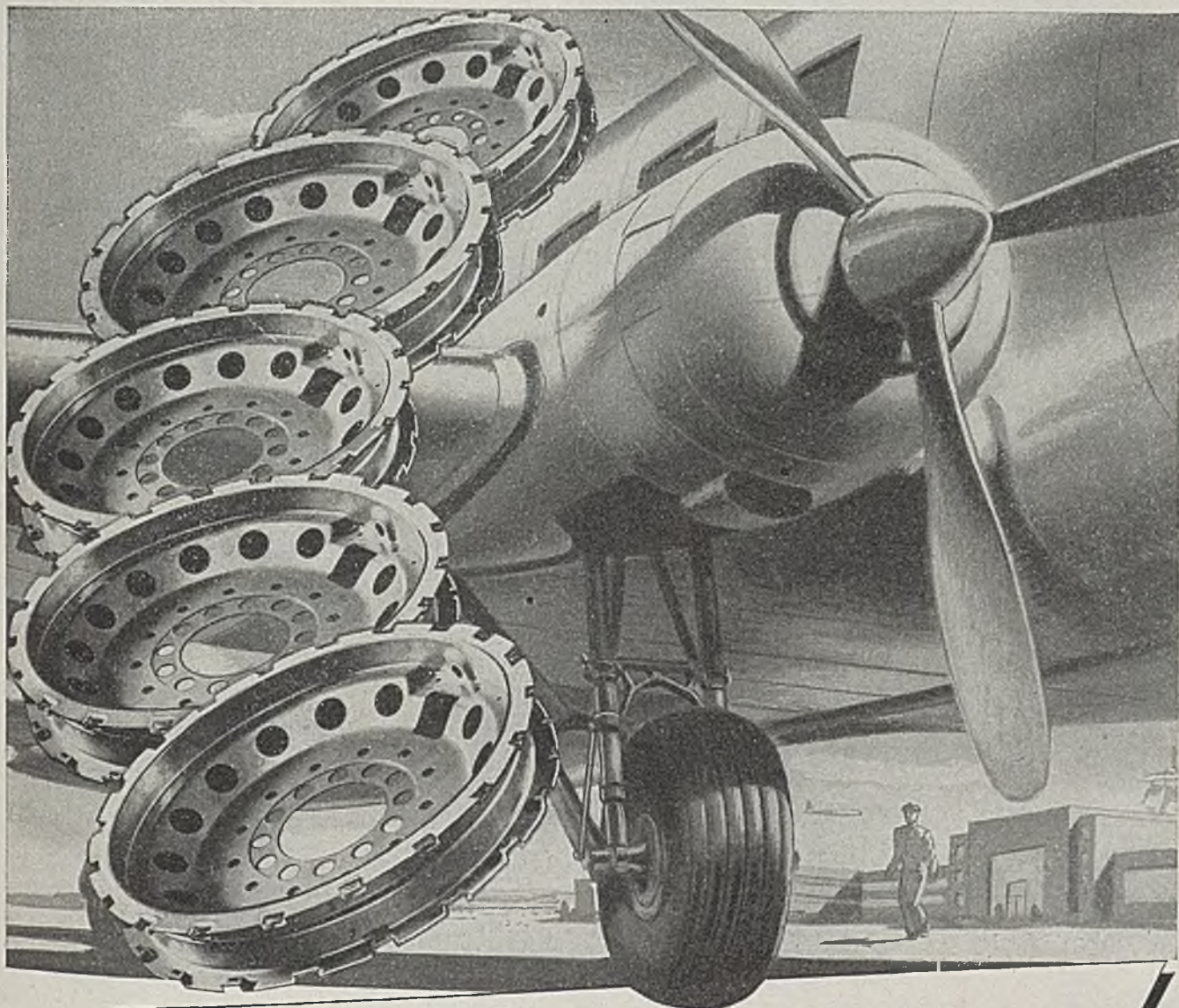
Metallurgy of Steel Castings, by Charles Willers Briggs; cloth, 663 pages 5 3/4 x 8 3/4; published by McGraw-Hill Book Co., 330 West 42nd St., New York, for \$6.50.

A number in the Metallurgical Engineering series, this volume by the technical and research director of the Steel Founders' Society of America has been prepared in response to a need in the steel casting industry for a single source reference, with detailed information on technical and metallurgical control in production of steel castings.

The discussion is designed to meet needs of operating men, workers and apprentices in the industry, casting buyers, design engineers and metallurgists in other industries, as well as by students and technical men.

The point of view is one of technical control of all manufacturing operations for production of steel castings, as quality control of a product cannot be properly formulated without thorough understanding of technical problems encountered.

The volume covers basic and acid practice; gases, deoxidation, porosity and inclusions; tapping and pouring; liquid cast steel; solidification; gates and risers; contraction in the solid state; sands and cores; effect of molten steel on sand and cores; cleaning, chipping and grinding; heat treatment and metallography; welding; inspection and properties.



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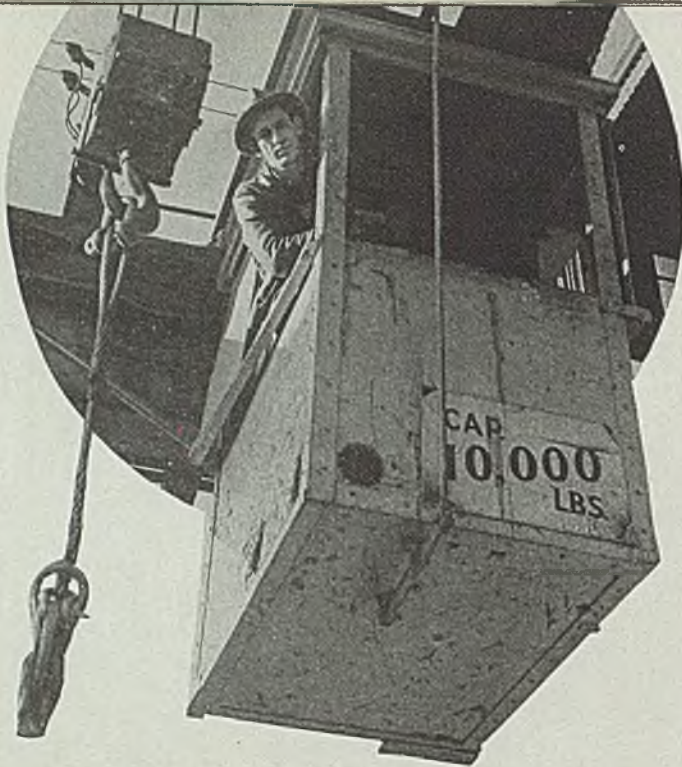
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Safety

A SERIOUS BUSINESS

**For Albina
Shipyard
Crane Operator**



CRANE operator H. L. Pugh of the Albina ship yards at Portland, Ore., believes every crane operator and every member of the ground crew must know hand signals and all variations, not only to protect his own life and job, but the jobs and lives of all men working under the cranes.

Accompanying illustrations show hand signals used by Oregon Shipbuilding Corp., said to be very nearly foolproof, and are suggested as standard procedure for all crane work in the country.

Safety is a serious business, so far as Mr. Pugh is concerned. For example, before he takes his cranes in the morning, he checks every foot of the preformed wire rope and all fastenings before they are used to "swing" loads. In addition, the rope is lubricated before the crane moves out on the track. The latter also is given a trial run before a load is accepted.

According to Mr. Pugh, if even one section of the wire rope shows serious wear, it is changed immediately without using it for "one more load." All cranes at Albina are equipped with preformed wire rope produced by American Chain and Cable Co., broken surfaces of which will not barb to cause hand injuries to workers.

Above—Operator Pugh leaning out of his crane cab looking for a signal from the member of the ground crew. Right—Member of ground crew gives "lower" signal. Note slight variation from drawing of same signal. Crane operators must learn these variations. Photos by Les. T. Ordeman; drawings by Paul Keller, Portland, Ore.



STEEL PLATE FABRICATION

for the Iron & Steel Industry

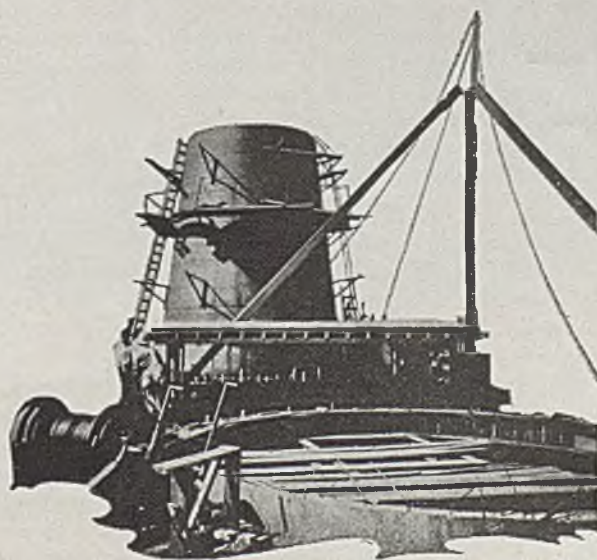
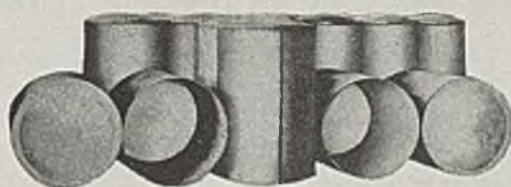
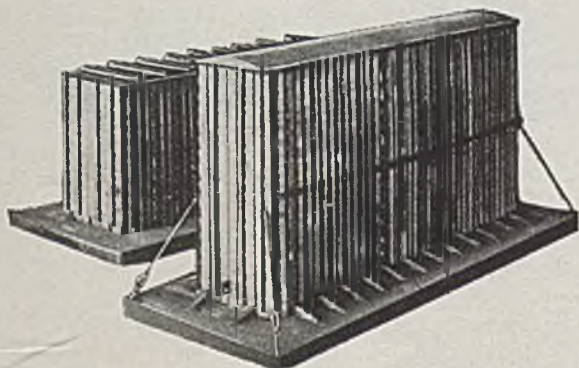
General American Equipment has a long record of satisfactory service to many outstanding steel mills. Much of this equipment was precision fabricated from specifications submitted by steel mill engineers, and some was designed, fabricated and installed by General American to meet performance requirements.

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ENGINEERING NEWS

at a glance

MODERNIZATION of the 65-ft pear-shaped atom smasher at the East Pittsburgh laboratory of Westinghouse Electric Corp., was begun recently in line with the company's broad research program into nuclear physics and problems associated with the conversion of atomic energy into a useful source of power. According to the company, no basic changes are to be made in the atom smasher. Incorporation of contemplated improvements, however, will require about three months.

DURING selective carburizing, various type paints, when applied to a surface, will prevent carburization of low carbon steels, providing the method of application is absolutely correct. According to Lindberg Engineering Co., Chicago, this is practically a laboratory procedure in some instances. The method of applying paint is so critical that should any amount of oil—even the amount released from the hands of the operator—adhere to the part, this portion becomes vulnerable to carburizing gases.

SURFACES of metals can be inspected for scratches and other minute defects in about a minute when using a system developed by Rex D. McDill, Cleveland engineer. The system, dubbed Faxfilm by the inventor, consists of a roll of transparent film, a bottle of solvent, cardboard mounts for the specimens, a moistener for wetting the mount adhesive and a hand magnifier for viewing the film. According to Faxfilm Co., Cleveland, blank film is a strip of clear plastic material 0.0005-in. thick and ¾-in. wide. Solvent is used to soften one side of the film so it penetrates every scratch or other unevenness of the surface being recorded. After film is stripped off, excess solvent evaporates, leaving the embossed details as permanent as the film itself. Film then is mounted on a cardboard mount which enables details of the film to be

projected on a screen. Ordinarily, magnification of 100 diameters on the screen reveals desired details. When etched metal surfaces are to be recorded to reveal grain structure, solvent is applied directly to the specimen.

AT Schenectady, N. Y., General Electric Co., is placing glass on reflectors of floodlights by a spinning-on method which is said to eliminate the need for cumbersome hinged doors and latches. Complex machines and equipment are required for the spinning process. GE engineers state that the aluminum reflector and the clear, flat front glass are placed in the spinning machine where special tools spin the edge of the reflector over the rim of the glass. Upon completion of the operation, the glass and reflector appear as a single, permanent unit. Maintenance of the reflector is no problem. Its lamp socket can be removed easily from the rear.

LIMITED quantities of gas free metals for experimental work are being offered by National Research Corp., Boston. Metals and alloys which lend themselves to vacuum melting are being furnished in ingot form after melting at pressures in the range of 10^{-3} to 10^{-2} mm Hg.

CO-OPERATIVE agreement under which the Bureau of Mines and University of Maryland will prepare a world mineral atlas was announced recently in Washington by Dr. R. R. Sayers, director of the bureau and H. C. Byrd, president of the university. The atlas is being prepared as an aid to postwar stock-taking, and as a guide to future planning for conservation of irreplaceable resources. It will include the location of major mineral deposits, potential reserves, composition and grade of the ore, comparative production and consumption by countries and salient facts on geology, mining and beneficiation, uses, substi-

tutes and world trade with the United States.

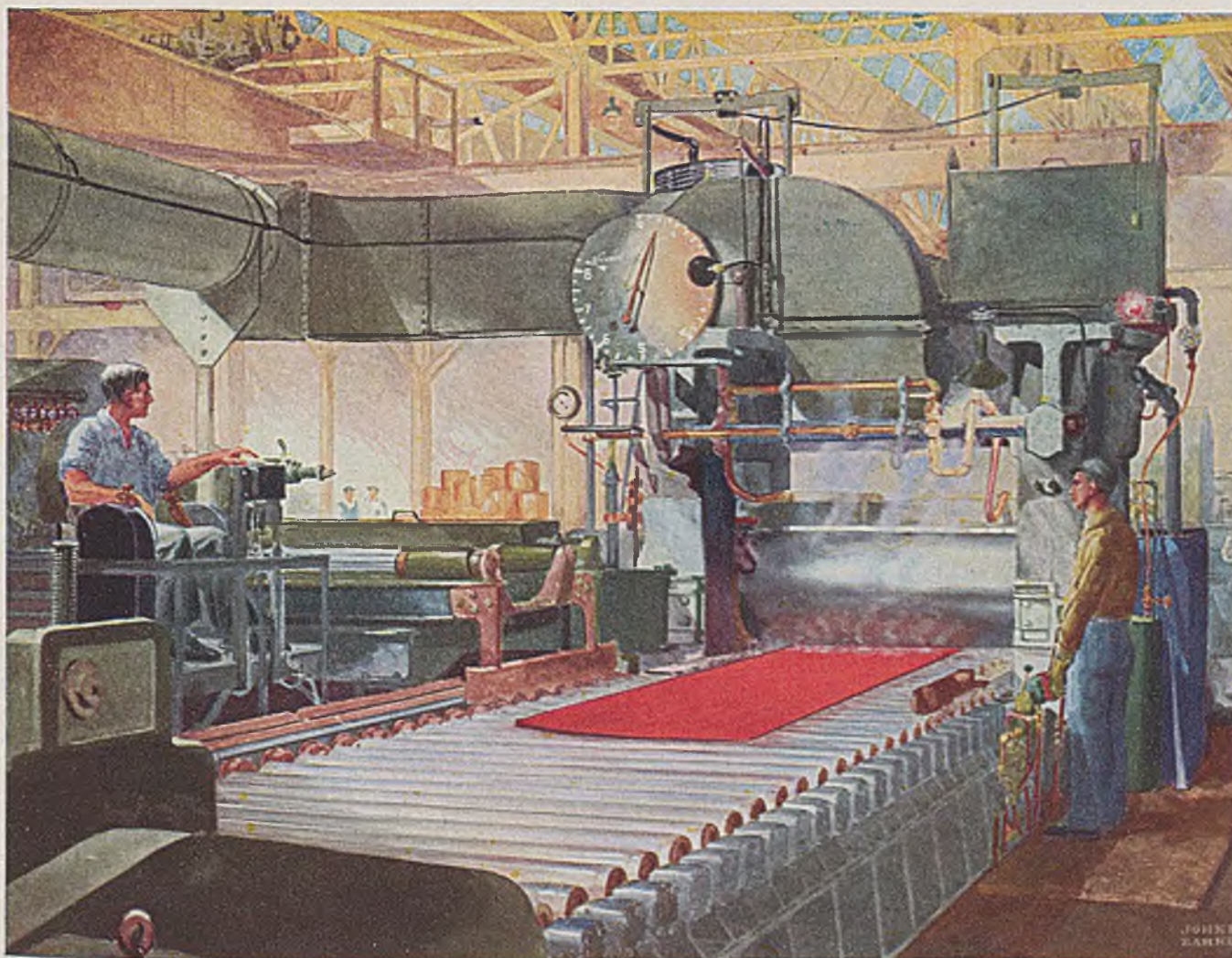
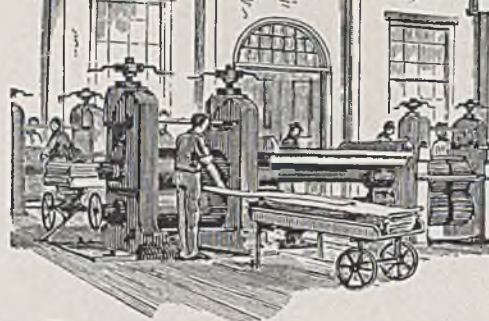
COMBINATION abrasive and plastic binder safety flooring which, during the war, proved invaluable on Navy vessels around gun mounts and on passageways was recently converted to peacetime commercial use by Goodyear Tire & Rubber Co., Akron. According to Otto C. Pahline, manager of the flooring and builders' supply department, the special abrasive aggregate will withstand crush loads in excess of 7000 lb psi.

POWER unit which consists of a 6-hp gasoline engine, automatic clutch and transmission, now being turned out by Salsbury Motors Inc., Pomona, Calif., is reported capable of powering light vehicles or is adaptable for use in many stationary installations. Called the Power Package by the company, the unit automatically gears down the engine for moving heavy loads and speeds up the ratio to do lighter work faster. Pressure oil system operated by a gear oil pump is included in the 56-lb engine.

A SPOT welder is not always a spot welder, according to Sciaky Bros. Inc., Chicago. The company recently discovered a spot welder to be the most efficient machine for hot forging a pulley axle to a trolley frame. In the work, special electrodes were used to upset both ends of the alloy steel axle. Pressure was applied and heat regulated so that only the two ends of the axle were upset over the frame, leaving the wheel free to rotate. Speed of operation, lack of shaft distortion and strong junction of shaft and frame were among advantages found in adopting the welder for this work.

SUCCESSFUL operation of integral wing fuel tanks in aircraft today, is dependent to a large extent on S-1711-R, a Thiokol liquid polymer compound which, pumped into the wing cavity, seals it by forming a rubber "bladder." Originally, in converting wing waste space into integral gasoline tanks, aircraft makers sealed all riveted seams, bolted structure and metal to metal joints of the wing with some type of sealing paste or putty. Strips of rubber and other materials also were inserted between metal to joints. Unfortunately, during the war, a great number of these type tanks developed serious leaks as result of natural vibration and landing and flight loads. Manufactured by Stoner-Mudge Inc., the new material and its process of application represents a joint development of the company, Navy's Bureau of Aeronautics and the Air Technical Service

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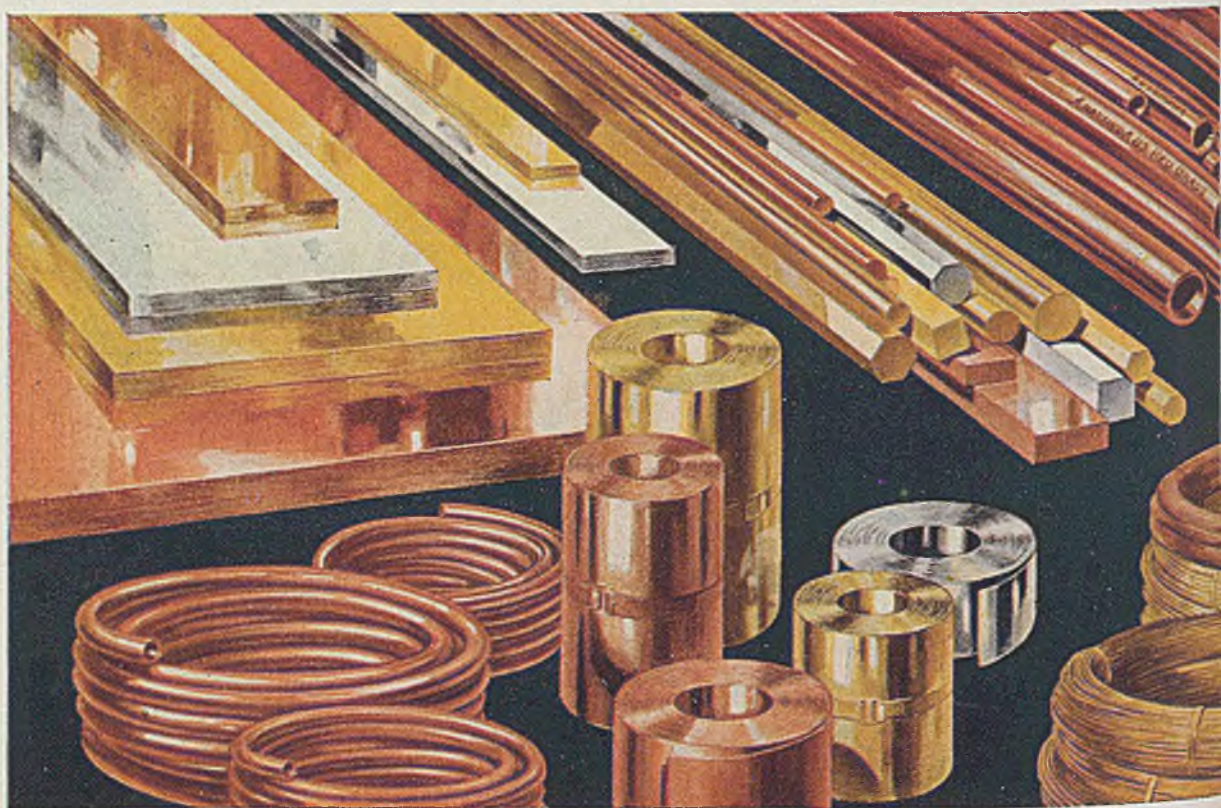
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SHEETS

WIRE

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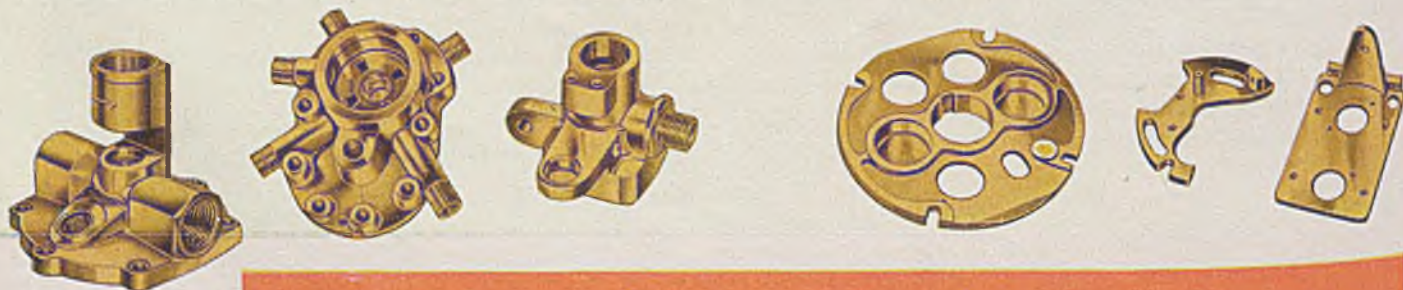
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Command of the Army. In its application, the liquid compound is pumped into the cleaned wing cavity, coating the entire interior. Excess is then pumped out and coat cured by the application of ammonia gas. Latter acts as a polymerizing agent, and causes the liquid rubber to "cure" to a rubber sheet or lining, effectively sealing all structural leaks. "Bladder" formed is resistant to solvent action of aviation gasoline, flexible enough to absorb the flexure of the wing at very low temperatures and adhere to all parts of the interior so collapse under flight conditions is impossible.

RESEARCH program on closed impression die forgings was launched recently by the Drop Forging Association in connection with Lessells and Associates of Boston, the former reports. The program is to include studies of mechanical and metallurgical properties of closed impression die forgings, studies of mechanical and metallurgical properties of other engineering materials, compilation of comparative data obtained on properties of forged and cast materials and special investigations.

BEST results when machining with carbides are generally obtained by cutting dry. Coolants, however, may be needed on certain jobs where it is necessary to maintain a high degree of dimensional accuracy. In latter cases, according to Fred W. Lucht, development engineer of Carboloy Co. Inc., Detroit, it is best to use a solution consisting of one part soluble oil and 30 to 40 parts of water. This variation in proportion of water to oil is made necessary by variations in hardness of water in various parts of the country. Also when using this solution, a copious flow of the liquid should be directed toward the cut underneath the tool, or at the cut from the side of the tool where it won't be interrupted by the chip flow.

SUBSTITUTION of thermoplastic for metal tubing in aircraft is seriously limited by the effect of temperature variations on thermoplastics, according to an Army Air Corps technical report released by the Department of Commerce, Washington. The report presents results of wartime tests on various types of semiflexible and rigid thermoplastic tubing over a temperature range of 158 to minus 67° F. Tests of the tubings were made over such a wide temperature range because properties of various thermoplastics were found to vary greatly with temperature changes. Bursting pressure for one type of material at 158° F, for example, may be only 5 per cent of its bursting pressure at 77°.

Static strength increases with lowered temperatures, while impact strength and elongation decrease under similar conditions, the report explained.

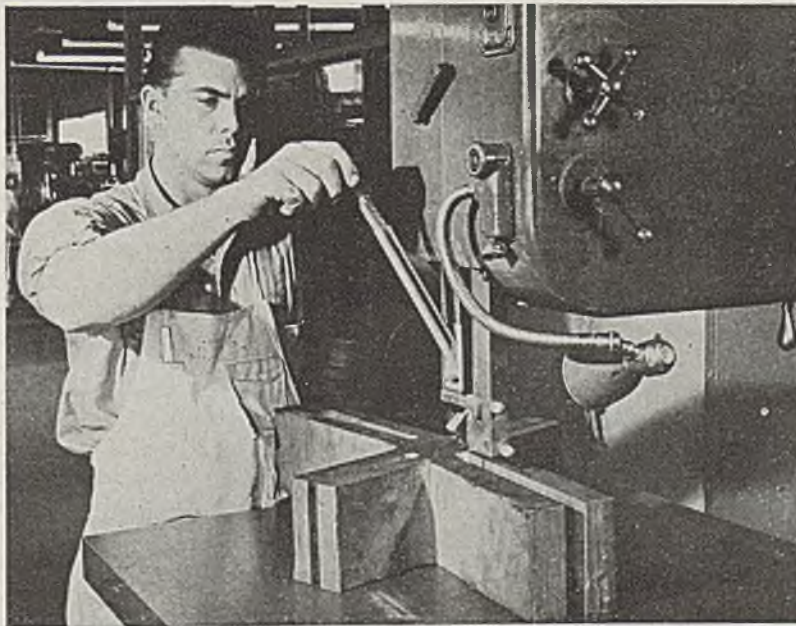
PRODUCTION of a new auxiliary fluoroscope that fits neatly into the specimen compartment of its Searchray 150 unit by North American Philips Co. Inc., New York, makes possible efficient fluoroscopy of small objects in the same compartment designed for work of much larger dimensions. The development, the company states, makes it possible to reduce the distance of the specimen from the tube target to about half that obtained when the specimen is mounted on the floor of the compartment. New unit is collapsible and can be swung out of the way at will to permit use of the full compartment when required.

ARRANGEMENTS were made recently by Sheffield Corp., Dayton, O., to sell exclusively the calibrated optical flats and Optron interference viewers made by Optron Laboratory. Optical flats are offered by Sheffield in both quartz and Pyrex, the former being finished within ½-micro inch per inch over total surface face, while the latter are finished to within 1 micro inch over the total surface

face. Interference viewer is an instrument which provides greater convenience and uniformity for optical interference measurements of gage blocks, anvils and sealing surfaces.

VARIOUS compositions of forging steels as well as the behavior of such compositions when subjected to mechanical working and heat treatment are discussed in a reference booklet on forgings published recently by Steel Improvement & Forge Co., Cleveland. Entitled "The Improvement of Metals by Forging," the publication describes equipment, tools, and forging techniques used in forging metals in closed impression dies.

IN finishing airplane control wheels of lightweight aluminum castings, Scott Aviation Corp., Lancaster, N. Y., is dipping them in Tenite II gel lacquers furnished by Tennessee Eastman Corp., Kingsport, Tenn. Finish imparted on the wheels is extremely tough, chipproof. According to Tennessee Eastman, the lacquers are made by dissolving cellulose acetate butyrate plastic pellets of desired color and opacity in suitable solvents. Coatings of this mixture adhere mechanically to the castings through shrinkage of lacquers as they dry.



IN A grueling lubricant test recently, part of an aircraft wing assembly of chrome-molybdenum 4¾-in. thick was cut at the rate of an inch every 10 min. Completed operation—a cut totaling 65 in.—was performed with only one 14-pitch saw blade operating at a speed of 105 fpm. Lubricant involved, newly compounded of turpentine, mineral oil, paraffin and other materials by Monogram Mfg. Co. of Los Angeles, was applied to the rotating blade in stick form by means of an applicator—a square metal holder, similar to the one shown above, attached to the saw guard of the machine. In action, a slot in the applicator guides a small weight resting on the stick of lubricant pushing the latter between the teeth of the saw blade

ADVANCEMENTS and refinements rapidly being made in the reduction of iron ore and its conversion to steel, lead to speculations on what might conceivably happen to the industry in the none-too-far-away future.

It is quite within the realm of possibility that ores will be beneficiated more extensively at the mines to eliminate gangue, and that the ore will be shipped in the form of graded lumps. Railroad shipments of graded ores probably will be made in closed cars like bulk cement, and stored under cover at dock pockets, stock piles and furnace bins to prevent the absorption of moisture which adds to the weight to be handled and transported, and eventually must be driven

eliminate the prime need for coke, the coke plant and coal.

Some coke and coke breeze would be used in the electric furnace to supply the carbon, but not anywhere near the amount now used in the blast furnace where it provides both mechanical support for the ore burden and support for the combustion in the reduction process. Extensive use of electricity also will eliminate use of fuel oil in the open hearths since the direct process of melting will require no open hearths. The electric furnace would produce gas but of much smaller volume, perhaps about one-sixth of that per ton in the blast furnace. The gas would be good for heating purposes after cleaning.

brought nearer to the required chemical analysis. Characteristics and physical properties desired will be more intensively controlled by the method of subsequent heat treating to produce steels conforming to individual and different requirements.

Speculation regarding heat treating leads to the belief that in future steel plants the heat-treating department will eventually become the predominating department. It will become the most vital center in the whole system of steelmaking. All present processes such as annealing, normalizing, spheroidizing, stress relieving, nitriding, hardening, martempering and the like will be centered in this department, and new ones such as those producing color in steel will become routine operations. High intensity induction heating developing rapid heating will make entirely new heating techniques possible. With this method, heating can be precisely controlled not only in intensity but in extent and depth.

Shaping steels of the future will be done by tapping the final stage furnace or hot-metal mixer as suitable temperatures, and conveying the fluid steel through refractory-lined ducts which may possibly have the exit ends formed somewhat like the ultimate shape of the product, being led to the rolls or presses, or to extrusion dies, at the proper temperature and in the proper plastic state for the particular operation and the final shape.

Extrusion will become as much a reality in the making of steel shapes in the future as it now is in the nonferrous industries. Many fabrication costs, which often constitute the largest percentage of total costs, will be reduced by collaboration of designer and steel producer. Extrusion under great pressure produces metal that is dense and fine-grained and free from blow holes. In the nonferrous industries the present limiting dimension for extrusion is about 8 in., but larger sizes can be built up by dovetailing. Monel metal is extruded so why not the chromium-nickel stainless steels? Why not all steels? Extensive extrusion would mean more dies, and more dies would mean more of the heat-resisting, high-alloy or tool steel grades, or maybe even carbide or diamond dies.

All these direct-from-furnace-to-processing operations have tremendous cost-cutting and time-saving possibilities. They eliminate present intermediate steps of ingot molding, soaking furnaces, blooming and billet mills and refurnacing. It is possible that they might eliminate non-integrated steel producers since, by the direct method, there would be less need for secondary processors of semifinished material. On the other hand, it could be contended that with the intensified use

Speculations on **FUTURE** **STEELMAKING**

Many direct-from-furnace-to-processing operations envisioned by a steelmaker may have tremendous cost-cutting and time-saving possibilities if realized in the steel plant of tomorrow

off at the expenditure of heat, which adds to the cost of production.

Shipping only graded lump ores will either reduce the number of lake ore carriers or enable more tonnage of usable ore to be brought down the lakes each navigable year, if steel mills continue to be concentrated in the East.

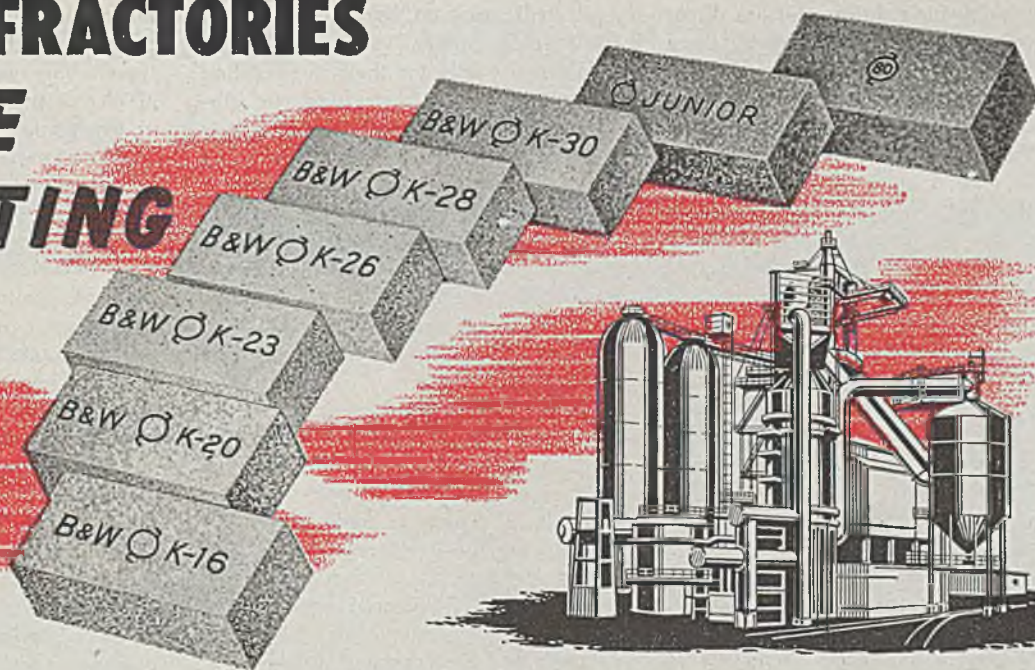
Elimination of fines by grading the ores at the mines will eliminate the ever-present necessity of sintering at the plants in order to convert them to usable form. Sintering plants would thus be transferred from the plants to the mine locations.

Speculating on graded and blended ores leads to the thought that in the not far distant future, reduction from ore and conversion to steel will most certainly be done in one stage in batteries of electric melting furnaces. This will eliminate the present intermediate stages of reduction in the blast furnace and conversion in the open hearth, which in turn will

If coke plants continue to be operated by steel companies—and due to the lesser need for coke there would be little reason why they should—the coke oven gas could be used either to generate steam for electricity by means of waste heat boilers or, with the advancements already made on gas turbines, it might be used directly in the gas turbine to generate the electricity needed for reduction and processing.

In the more extensive reduction and conversion with batteries of electric furnaces, more attention will be paid to the physical chemistry of steelmaking. Closer study also will be made of metallurgical reactions, slag compositions and deoxidation, all of which will lead to still greater refinement, production and control of the steel. Analysis of heats in the first stage furnaces will be of secondary importance because resulting heats will be blended in either a last-stage furnace or a hot-metal mixer where it will be

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Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

of electricity for reducing the ore direct to steel in the electric furnace, there would be no economical necessity for steel plants to be located within reasonable distance of coal mines. They could be located anywhere consistent with reasonable cost of getting ore to the plant and the cost of electricity. It is thus conceivable that large plants as we know them today might become segregated into very many smaller plants.

No matter whether the large integrated or the small specialty plant proves to be the most economical producer of the rustless and stainless steels, the scrap becomes more and more of a problem. After a period of years, continued production by the direct-from-furnace-to-processing methods, and particularly by extrusion, will conceivably reduce the home scrap and will further reduce the scrap now obtainable from outside sources such as machine shops, forging shops, etc. With extruded shapes there will be far less forming, milling, drilling, reaming, planing, shaping, threading, tapping and other metal-removing processes which create scrap.

It is more than likely that rustable

steels will cease to be made—that all steels of the future will be rustless or stainless, not only for their rust-resisting properties, but for their high strength-weight ratios which will permit lighter structures, yet increased margins of safety. In the intervening years, during the transition from the carbon steels to the rustless and stainless steels, the scrap problem will become more and more intensified for the carbon steel maker because of the increasing percentage of alloy steel in whatever scrap he does get.

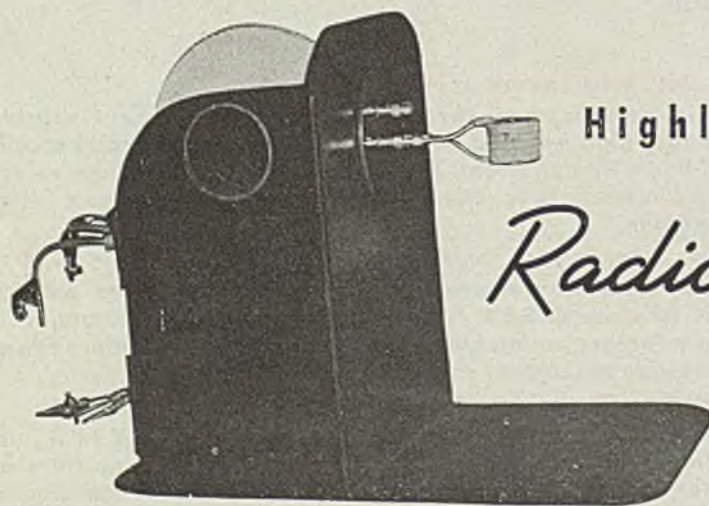
Implications involved in these speculations have tremendous import for the steel industry. None of the implied changes will come all at once, but will come in a gradual manner unless influenced by the development of atomic energy.

Possibilities of increased cost of bituminous coal being brought about by labor demands and by increasing freight rates, might conceivably do more than anything else to drive steelmakers to seek a solution of the fuel and freight problems through the greater use of electricity as their primary source of heat for thermic

processing. In economic self-defense there might thus conceivably be migrations to the vicinities of the large sources of electricity generated by water power or by atomic energy.

Who at present knows just what fission and nucleonics or nuclear physics may do for mankind and industry in the way of liberating controllable heat energy for excessively cheap electricity through high temperature boilers, heat engines or turbines, or even by the use of the heat energy applied directly for ore reduction and refining? Physicists tell us that the possibilities along these lines are tremendous and experiments are being conducted in a pilot plant to bring fissionable material within the range of economic usability.

In any event, the main influencing factor for the steel industry will always be the relative cost of heat, no matter whether it is derived from coke, electricity or atomic energy. The question of amortization of capital investment in blast furnaces, open hearths, soaking pits, etc., would also have to be balanced against the same factors and results to be derived from electric processing.



Highly Efficient

Radio Frequency Transformer

A TRANSFORMER for induction and dielectric heating having a delivery of radio frequency power from generator to load of 74 per cent at 3.5 megacycles has been developed by Concord RF Corp., an affiliate of Davis Transformer Co., Concord, N. H.

According to the maker, design of transformer, shown in illustration, permits its use in converting dielectric heaters to induction heating. Induction heating, using frequencies in range of dielectric heating, 5 to 25 megacycles, is useful where heat penetration depth is to be limited or where thin case hardening is desired. Transformer eliminates the neces-

sity of making work coil part of generator itself as it is possible to use long leads from power source to coil.

Development incorporates electrical and mechanical improvements and innovations which result in desirable operating characteristics and efficiency. Mechanical coupling is enhanced by use of an insulating material which allows a separation of primary and secondary of only 0.015-in. Transformer is "hi-potted" at 25,000 v radio frequency to guard against breakdown of this insulation.

Control of distributed capacity in both primary and secondary is possible. Conversion from a one-turn secondary to a

two-turn secondary, or vice versa, can be made. Water cooling is incorporated into the design.

Transformer protects operator from fear of shock or burn as coil may be handled freely or shorted by bare hand without danger. Working in the coil without gloves while current is on is therefore possible.

The same transformer with no change of any sort will work as efficiently at 500 kilocycles as at 4.25 megacycles, the company states. It is manufactured in standard frequency ranges from 100 to 900 kilocycles, 1 to 10 megacycles and 10 megacycles and up.

Are you using 4 different processes to do work like this?



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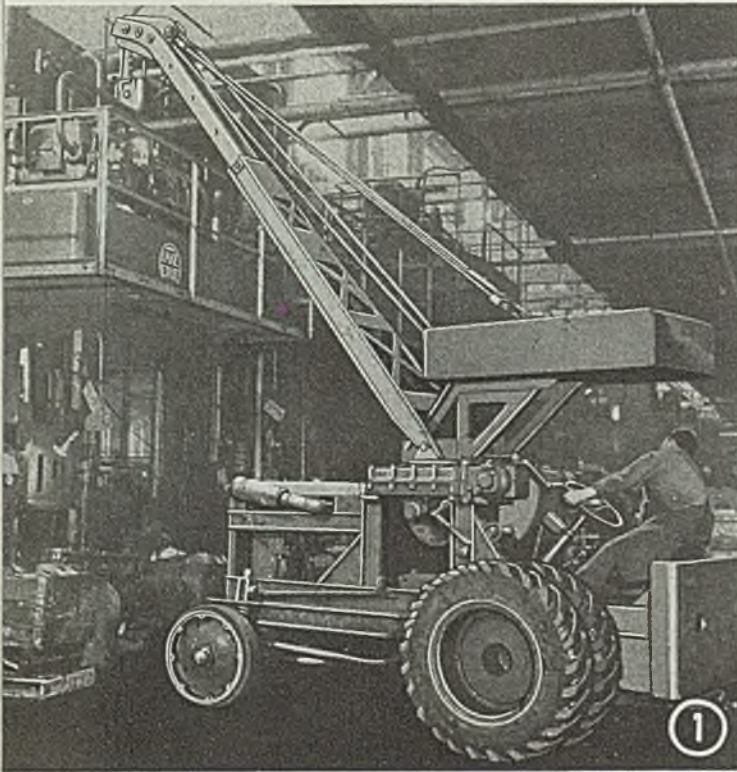
- These are only a few of the ways in which you can consolidate your reproduction work with Ozalid. Actually, your entire organization will depend upon it for prints—in seconds—whenever needed!
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Division of
GENERAL ANILINE AND FILM CORPORATION
Johnson City, New York

Ozalid in Canada
Hughes Owens Co., Ltd., Montreal



MOBILE CRANE

*Cases non-routine
material movements*

Odd materials-handling jobs performed by versatile free-roving crane-tractor operating outside and inside industrial plants

FACTORY and plant management, in recent years, have devoted a great deal of time to the problem of movement of materials through the plant in relation to production processes and time sequences. The whole aim of these studies has been to better utilize space and time; to set up production lanes so that, as nearly as possible, they would be continuous and in one direction from the receiving of raw materials to the shipment of the finished product.

The time-saving development in production sequences has been largely accomplished by the use of free-moving, independent crane power that hustled about the shops with swift efficiency, moving material from operation to operation without the loss of time ordinarily sustained in the waiting period occasioned by more rigid moving mechanisms.

While this time-and-money-saving theory was being formulated and put into effect, there was no parallel development

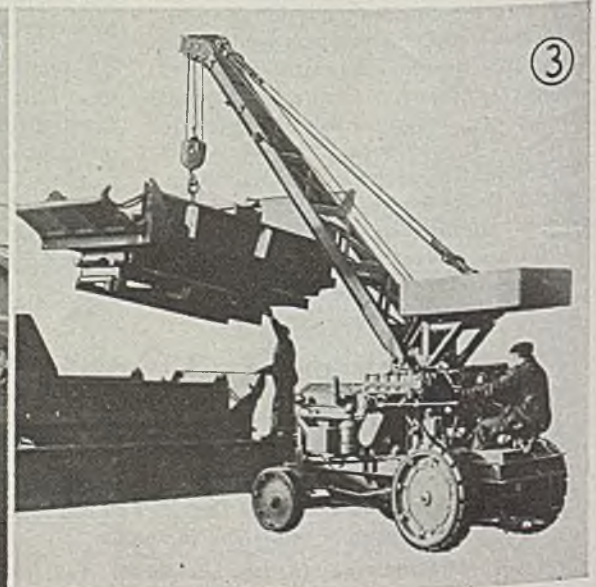
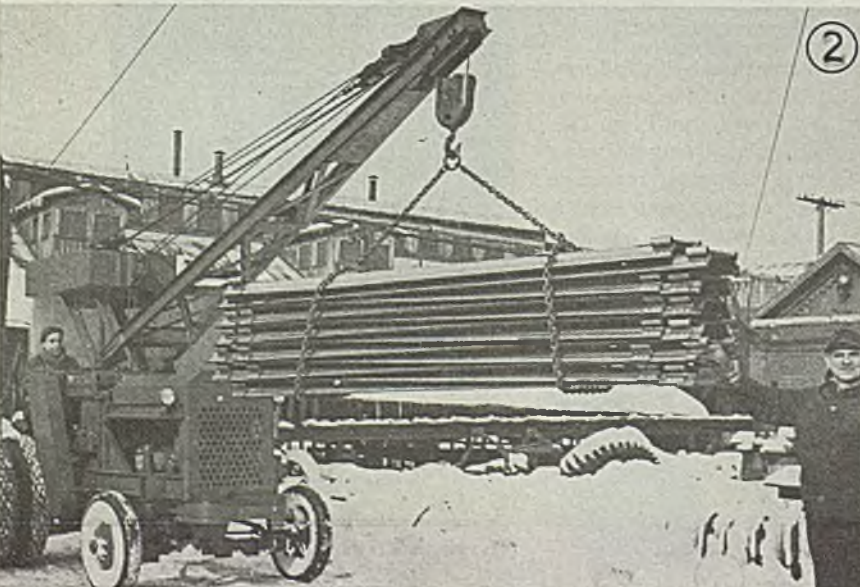
of either equipment or organization for the handling of materials outside the plant or shop or outside normal channels of production routine.

The exterior disorder of many plants constitutes a drain on the company's budget; operating expenses pile up because the need for systematized handling of exterior stockpiles and miscellaneous paraphernalia—or a competent tool for such handling—has been overlooked in the rush to facilitate material handling

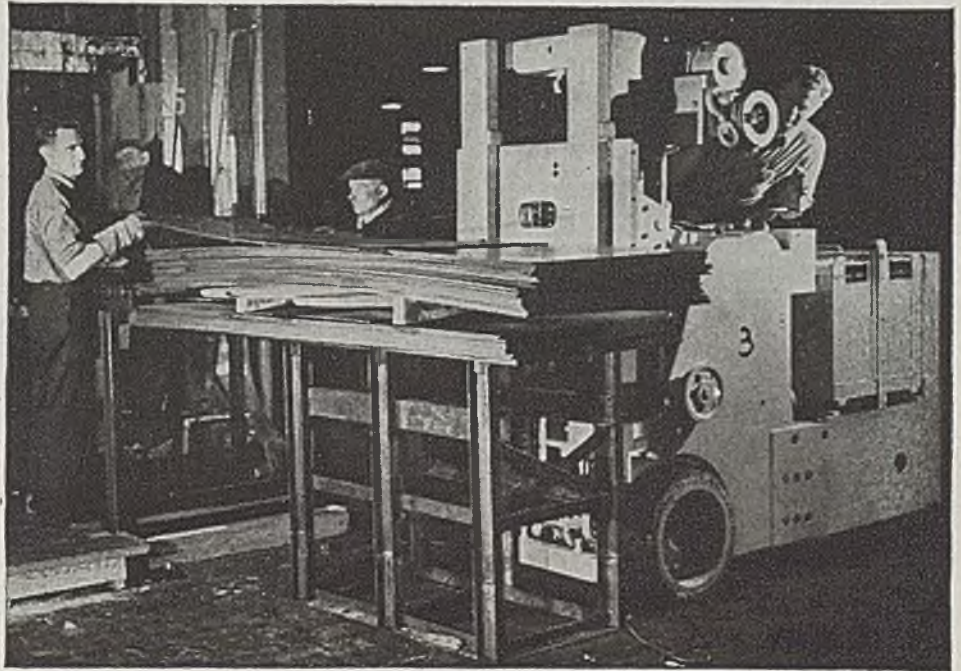
Fig. 1—Crane-tractor removing motor from top of press at Scovill Mfg. Co., Waterbury, Conn.

Fig. 2—Load of prefabricated steel is handled by Hughes-Keenan Roustabout crane in snow-blanketed yard

Fig. 3—At Diamond-T Motor Car Co., Chicago, crane does all body handling necessary in the plant. Shown here it is stacking truck bodies on railroad car prior to shipment from the plant



BATTERY TRUCKS keep machines busy...



...ALKALINE BATTERIES keep trucks on the GO

In Industrial Trucks, Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically**; grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They can be **charged rapidly**; gassing cannot dislodge the active materials.
- They **withstand temperature extremes**; are free from freezing hazard; are easily ventilated for rapid cooling.
- They are **foolproof electrically**; are not injured by short circuiting, reverse charging or similar accidents.
- They can **stand idle indefinitely** without injury. Merely discharge, short-circuit, and store in a clean, dry place.
- They are **simple and easy to maintain**.

Fast, steady and efficient movement of materials to and from machines, 24 hours a day, is one of the important ways battery industrial trucks are helping to speed production, save man-time and cut handling costs in all kinds of busy plants. A continuous flow of materials in process is maintained without interference to machine operations. Work is spotted in the most convenient and accessible locations for feeding each machine with the least manual handling.

Keeping machines busy on round-the-clock schedules is a continuous stop-and-go handling job in which the battery industrial truck excels because of its inherent flexibility, high availability and economy.

Exchange batteries keep the truck continuously supplied with power. While one battery operates the truck, another is being charged. Except for the few minutes needed to change batteries, the truck need not stop for servicing its power unit. Its electric motor drives have a minimum of wearing parts; are inherently simple and trouble-free. The truck starts instantly; accelerates smoothly; operates quickly; gives off no fumes; consumes no power during stops. Not only does it make efficient use of power but the current used for battery charging is the lowest cost power available.

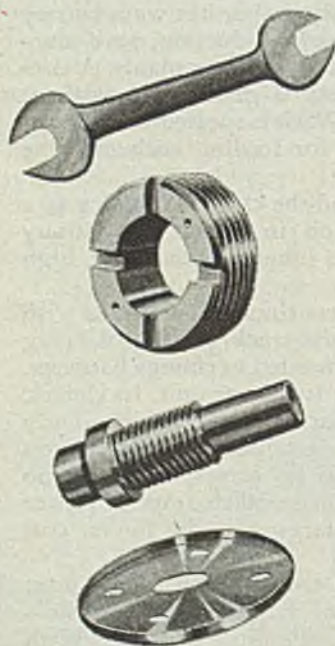
Altogether, the battery industrial truck is one of the most dependable and economical types of handling equipment—especially when powered by Edison Alkaline Batteries. With steel cell construction, a solution that is a preservative of steel, and a fool-proof electrochemical principle of operation, they are the most durable, longest lived and most trouble-free of all batteries. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.

Edison
ALKALINE BATTERIES

Now is the time
to take advantage
of **OAKITE'S**

COST-CUTTING materials and methods for **Cleaning and Surface Conditioning**

**FORGINGS...DIE
CASTINGS...MACHINED
PARTS...STAMPINGS**



WHATEVER your product... whether the metal is steel, cast iron, aluminum, brass, copper, bronze, zinc, magnesium... the intermediate and final cleaning and surface conditioning operations before final finishes are applied, must be performed with exacting thoroughness and come within specified cost limits.

Final Finish Depends on Thorough Preliminary Cleaning

Here is where cost-cutting Oakite cleaning and surface-conditioning materials, each one designed for use on certain metals, and the successful experience gained in applying them to forgings, die castings, machined parts and stampings, can be helpful to you. Used in tank or automatic washing machine, these high quality Oakite materials give you the chemically or physically clean surfaces so essential to the finish you want.

No Substitute for Experience

There is no substitute for successful experience and "know-how." It is why so many thousands of leading concerns in the metal working industries continue to rely on Oakite materials and the technical personalized service back of them. We should like to serve you in the same practical way.

Your Production Cleaning Problem Invited

If you have a production cleaning operation that you feel could be speeded up, improved, or its cost lowered, our Technical Representative in your locality will be glad to stop in and discuss it with you. There is no obligation. Your letterhead inquiries invited and promptly answered.

Oakite Products, Inc., 24 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**

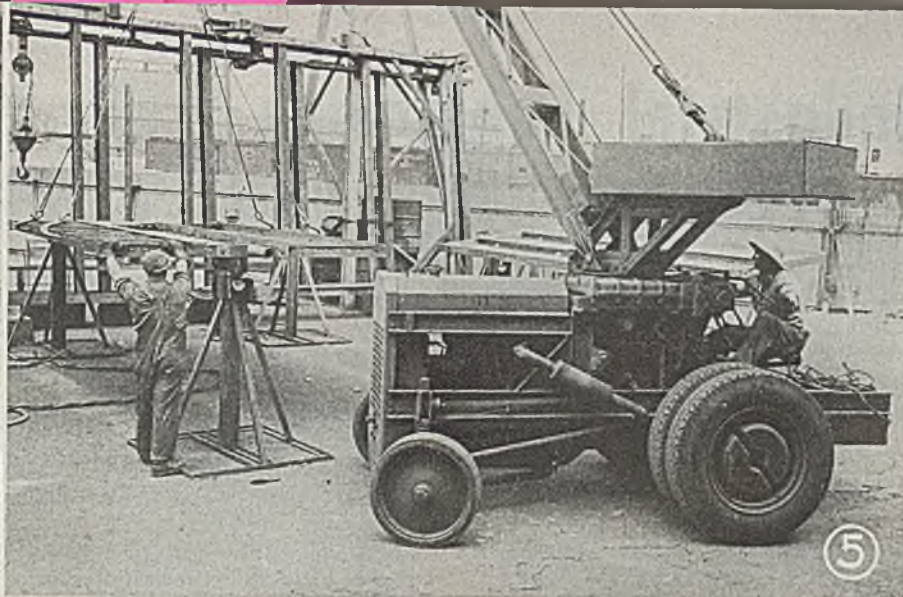
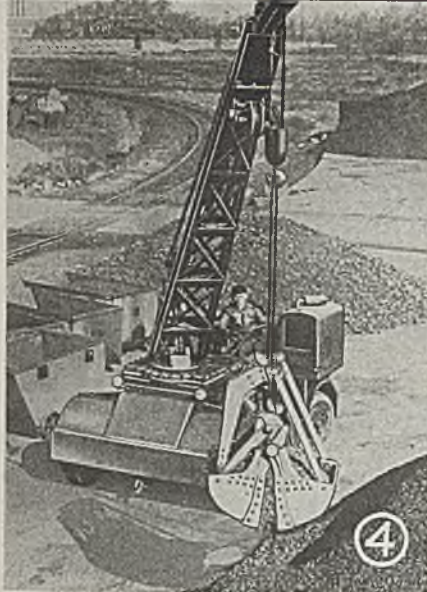


Fig. 4—Crane equipped with grab bucket attachment moves slag from pile to waiting car at Thompson Aircraft Products Co., Cleveland

Fig. 5—Structural steel being set at National Iron Works, San Diego, Cal

operations within the plant.

There are two reasons for the lack of analytical reasoning applicable to outside load handling. First is the fact that conventional analysis based on repetitive movements and sequences is not conducive to solution of a problem where irregularity is predominant. Second is the failure to recognize that operations outside a factory building are important in overall material movement, and that in total they are far more numerous and labor-consuming than is evident on the surface. Third and supplementary reason is the fact that until recently there has not been available really modern equipment for this particular load-handling field.

Type of equipment used to augment track-bound, indoor load-handling devices, was somewhat limited in application. Chassis built for operation on smooth interior surfacings rapidly deteriorated under the stress and strain of rugged outdoor work. What was needed but only recently available was a new type of free-roving large capacity crane, a good example of which is the Roustabout crane, built by the Hughes-Keenan Co. of Mansfield, O.

This type crane is primarily a load-handling device, for lifting and swinging and for outside or yard use. It is completely mobile and maneuverable and is flexible enough in employment to handle easily any shape, size or weight load up to its capacity. It can be used for piling and stacking outdoors or indoors, or for transferring from one type of transport to another, from piles to cars or vice versa. Combined with a trailer, it becomes an industrial truck for yard use.

The area of usefulness of a free-roving crane for any specific owner is, in general, the whole exterior of the plant property and in many cases, such as in heavy fabricating industries, much of the interior also. There it becomes a portable crane of several tons capacity. In any shop it can be used as a hoist for

erecting or dismantling machinery, lifting and placing beams, for construction work on furnaces or ovens, for moving dies.

Usefulness of the crane for any specific business is in proportion to the number of miscellaneous load handling jobs to which it can be adapted. In almost every case this will be much greater than would be predicted in advance. The jobs that are taken over from previous methods often become outnumbered by applications which would not be undertaken at all if such a crane were not available.

For example, Brown Industries, operators of the Gray Iron foundry in Sandusky, O., uses a Roustabout in the unloading of pig iron, steel scrap, cast scrap and any material that can be handled with a magnetic attachment. After employing the crane in this manner it was discovered that it could be utilized in the loading of the cupola charging car, speeding that operation considerably.

Then it was decided to try the crane for shaking out hot flywheel castings. According to Mr. O. F. Rinderle, vice president, it is extremely difficult to get men for this type of work because the castings retain their heat for a long time. Boom on the crane is lowered to a horizontal position and run slowly over the molding floor, picking up one large flywheel at a time from the hot sand. By swinging boom to one side, casting is dropped in a tray that is handled on a monorail system.

As shown in Fig. 1, motors are removed from the tops of machines, repairs effected and the motors replaced at the plant of the Scoyill Mfg. Co., of Waterbury, Conn. Clutches, flywheels and gears can be lifted from the press without installing chainfalls. Machinery is moved from one spot to another either

on the crane or pulled or pushed, using the crane as a tractor.

Heavy, loaded trailers are lifted when a wheel has broken down. With a crane of the Roustabout type the corner of the trailer can be raised and the wheel replaced without removing the load. This crane in many cases, has taken the place of manual labor and rigging in such locations where it can be brought to the job.

The American Car Foundry Co. at Berwick, Pa., uses the crane for placing and removing machine parts on machine tools, for erection and dismantling—and even in the erection of structural steel.

The Consolidated Vultee Aircraft Corp., located in San Diego, Calif. states that the crane has affected a 75 per cent reduction in manpower and release of equipment for other critical work. This company uses it for the handling and placing heavy steel while it is being welded on fabricated aircraft work platforms.

Adapted to the needs of steel mills, foundries, locomotive and car wheel shops and heavy industry generally, cranes maximum mobility means that it can get to the job quickly, over any kind of ground, get into closer quarters, place itself more favorably for the job it has to do. It can be brought indoors and used as a hoist and the smaller models can even get into and out of freight cars if necessary.

In all steel mills, foundries, etc. a high percentage of raw and finished products must be loaded and unloaded by crane from railroad cars. Here the free-roving crane proves a big time-saver by eliminating the need for switching or placing each car. Crane unloads one car and moves on to the next and so on until all are unloaded. It permits the unloading of

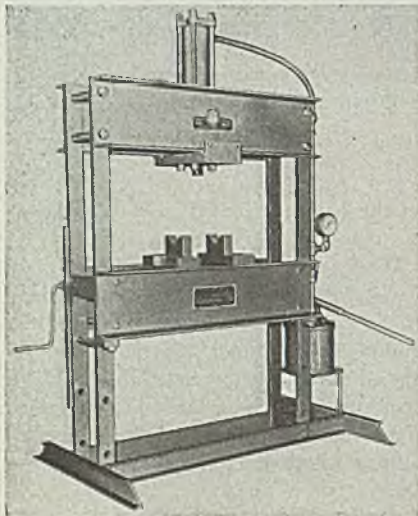
(Please turn to Page 121)

Industrial Equipment

Hydraulic Press

A shop press of 60 ton capacity, announced by Rodgers Hydraulic Inc., Minneapolis, features fast operation, versatility and large capacity for work size. Power is supplied by a 2-speed hydraulic hand pump which, in high speed, moves the ram $2\frac{1}{2}$ -in. per pump stroke, giving up to 2000 lb pressure.

Hydraulic cylinder of the press rests on rollers which ride flanges of upper



bolster, and may be moved across entire working width of press when desired. Ram travel is a full 13 in.

Flexibility of press is achieved through adjusting lower bolster by means of a hand crank. Latter provides a minimum opening of 8 in. to a maximum of 38 in. Working width is 45 in. Long pieces may be handled through open sides.

Steel 7/29/46; Item No. 9359

Radius Dresser

Designed to be as accurate as gage blocks, a new wheel dresser is being marketed under the name of Jo-Set by James H. Cross Co., 2765 West Eighth street, Erie, Pa. Radius dresser requires only



three simple steps to set-up for precision operation. These consist of setting point of diamond to movable gage, setting radius by inserting gage block between stop and jib and setting stops.

A hardened and ground master gage maintains center of axis for life of tool. Holder is designed with an independent

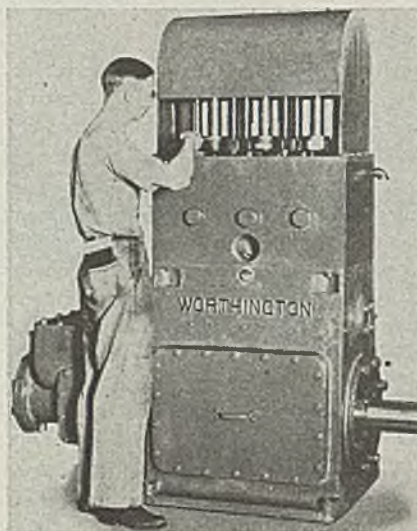
adjustment to correct error in diamond sharpness. Greater accuracy is claimed because it dresses wheel where it grinds and permits dressing while wheel guard is in place.

Steel 7/29/46; Item No. 9541

Variable Stroke Pump

A variable stroke triplex pump, termed Variflo by its manufacturers, Worthington Pump and Machinery Corp., Harrison, N. J., has a 0-100 per cent capacity variation. View shows a unit rated for a 75-hp driving motor.

Crankshaft is located at base, in fully enclosed frame, with bearings of roller



type. Automatic pressure lubrication is provided by direct-driven gear oil pump, which also provides oil pressure for operating hydraulic control cylinder.

Stuffing boxes are on top of cylinder for ease in adjustment and packing. Outboard location of boxes prevents leakage finding its way into crankcase. The pump functions on principle of varying position of eccentric to suit desired stroke or pumping capacity.

Steel 7/29/46; Item No. 9407

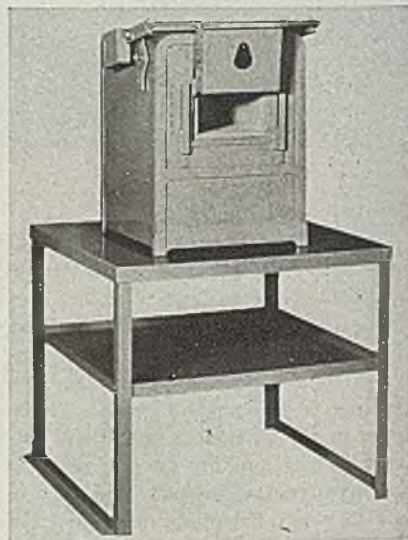
Heat Treating Furnace

Muffle type electric furnaces manufactured by Cooley Electric Mfg. Corp., Indianapolis, incorporate a counter-weighted vertically operated door for use where only partial door opening to furnace is required, or a door which forms a loading shelf.

Manufactured in two sizes, chamber dimensions of 8 x 6 x 14 in., and 10 x 6 x 8 in., furnaces are rated for continuous operation at 1750° F or intermittent operation at 1850° F. Heating time to

1400° F is approximately 40 min while heating time to 1850° F can be accomplished in 65 min.

Furnaces may be used for operations such as drawing, tempering, normalizing, annealing, preheating for high-speed hardening, emergency repairs and experimental testing. A heavy steel stand of



welded construction serves as a bench for furnace, also providing a shelf for storage space beneath table.

Steel 7/29/46; Item No. 9408

Temperature Recorder

Announcement of an inkless temperature recorder, designed for use with resistance temperature detectors installed in generators, transformers and other electrical apparatus, was made recently by Meter and Instrument Division of General Electric Co., Schenectady, N. Y. Development also can be used with separate detector units to record temperature in

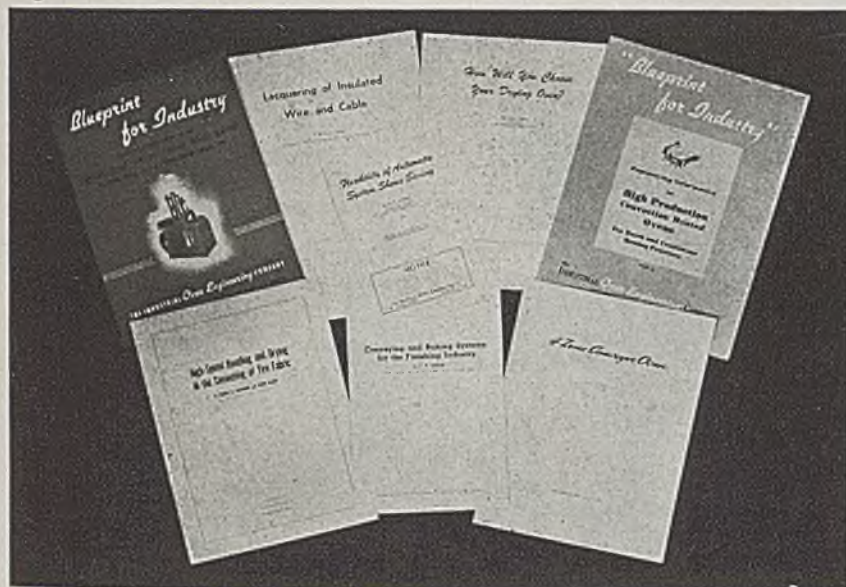
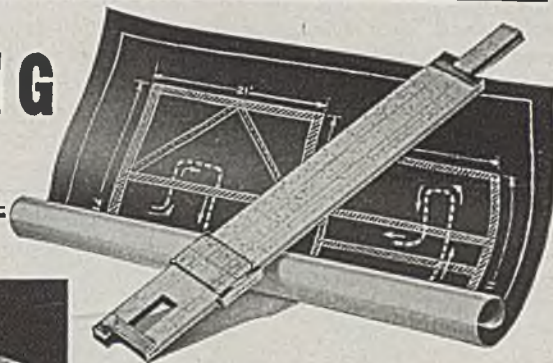


ovens, heat-treating tanks, refrigerating machines, air ducts and liquid handling systems.

Designated as type CF-2, the recorder consists of a portable recording instrument and an external power-supply unit. Equip-

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 111.)

OVEN ENGINEERING NEWS



Write for These Technical Bulletins on Oven Engineering Installations

The battle of costs is a battle that never ends. Present day problems dictate the policy of constantly surveying your existing facilities for materials-handling as well as your oven-processing systems, in order to keep your manufacturing costs at a profitable level.

The Industrial Oven Engineering Company designs, engineers, manufactures and installs complete materials-handling and oven-processing systems for many different industries.

These installations are described in the pamphlets listed below. They are well illustrated with photographs and drawings. A good many of these installations are probably applicable with slight variation, to your own processing problems.

These pamphlets are free. They are briefly described below. Check off the ones you want and drop us a line.

☐ **Blueprint for Industry, Part III**—Complete engineering information on our constant-speed, constant-tension windup

machine for wire, cable, textile, tape, coated fabrics and other continuous materials, the only machine of its kind on the market.

☐ **Lacquering of Insulated Wire and Cable**—A 16-page reprint of a thorough-going article on cable lacquering techniques and equipment, originally published in the trade magazine "Wire and Wire Products". Illustrated with drawings.

☐ **How Will You Choose Your Drying Oven?**—A description of the role of the infra-red lamp in modern drying ovens.

☐ **Blueprint for Industry, Part II**—A comprehensive 18-page brochure on high-production ovens for many batch and continuous heating processes. In addition to detailed descriptions and engineering details of many efficient oven-materials-handling systems, it contains two pages of engineering data on gases and other materials, along with fan engineering data.

☐ **High-Speed Handling and Drying in the Cementing of Tire Fabric**—A description of a continuous, safe method of fabric cementing in which high-calendering speeds were obtained by the designing of equipment which would fit into limited manufacturing space.

☐ **Flexibility of Automatic Systems Shows Saving**—A description of a 3-zone automatic conveyor oven installation which increased production speed, reduced the number of necessary attendants without loss of floor area.

☐ **Conveying & Baking Systems for the Finishing Industry**—A thorough discussion of the different types of conveyor and baking systems with an analysis of their respective advantages.

☐ **Four-Zone Conveyor Oven**—This reprint describes a four-zone conveyor oven through which products are conveyed successively through ventilation, preheating, baking and cooling zones at production speeds and free from all dust.

Get This Unusual Story of Wire Lacquering



We have in our last four advertisements described several different cable lacquering systems that we have engineered and installed. For those interested in securing a more complete picture of the basic IOE cable lacquering systems there is available, *Lacquering of Insulated Wire and Cable*, a 16-page reprint of a thorough-going article on cable lacquering technique and equipment, originally published in WIRE AND WIRE PRODUCTS. Our work on cable lacquering systems in particular, represents *new basic thinking* on an old problem, that has a wide number of new applications. Perhaps some of your own problems would benefit by the application of our engineering experience.

(This is No. 25 of a series. Reprints of previous advertisements sent free upon request.)



THE INDUSTRIAL *Oven Engineering* COMPANY
13825 TRISKETT ROAD, CLEVELAND 11, OHIO

★ ASSOCIATED COMPANY: JAMES DAY MACHINERY LTD., LONDON, W. 1, ENGLAND ★

ment records on a 4 in. strip chart the temperature variations that produce resistance changes. Range of fixed scale and chart scale on the recorder is 20 to 140 degrees. With a chart length of 65 ft, driving motor can be adjusted to provide record length of from 8 days to 2 years on a single chart.

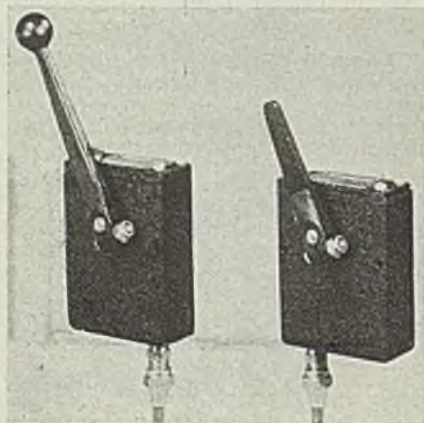
External power unit contains constant voltage direct current source, a part of bridge circuit, and a lead-resistance compensating device.

Steel 7/29/46; Item No. 9538

Hydraulic Control

A miniature hydraulic remote control has been developed by Sperry Products Inc., 1505 Willow avenue, Hoboken, N. J., for throttle, mixture, governor, and position indicator controls.

Control transmitter, left, and receiver, right, made of bronze, together weigh



3.7 lb. Any motion of transmitter arm will be duplicated by receiver arm, either of which will move through an arc of 60°. Receiver arm may be drilled at any location to obtain desired linear travel of actuating rod. Complete system is enclosed in dust-proof and water-proof enclosure.

Steel 7/29/46; Item No. 9411

Pyrometer Controller

A multiposition electronic pyrometer controller, the Multronic Capacitrol, developed by Wheelco Instruments Co., Chicago 7, provides accurate indication and control of temperature, voltage, current, signalling and similar variables. It also provides on-off control at one or two points, control of two separate fuel systems on a single port or other heat treating type furnace, automatic positioning control for electric, oil and gas fired equipment, on-off control plus automatic fuel shutoff and multi-signalling at two points or two signals at dual points.

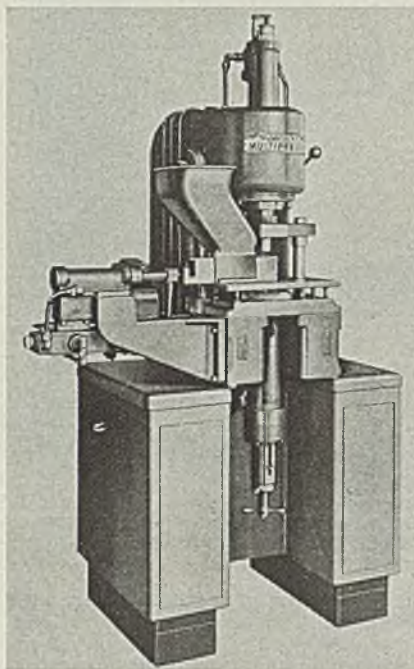
In the instrument, two electronic con-

trol circuits with no mechanical contacts operate in harmony with each other, but independently, to control variables as measured by an indicator, giving instantaneous control action. Capacitrols operate on either 115 or 230 v, a voltage changer permitting change-over by alternating two selector plugs.

Steel 7/29/46; Item No. 9467

Shuttle Feed

A shuttle feed accessory for use on Multipress hydraulic press is announced by Denison Engineering Co., Columbus 16, O. Basic 4 or 6-ton press is equipped, as shown, with a hydraulic ejection cylinder and a hydraulic cylinder for actua-



tion of a powder feed box. Three hydraulic rams—press ram, ejection ram and feeding box ram—are all interlocked.

Multipress units used in setting up a pelleting machine also are equipped to provide vibratory action. Press ram action can be pre-adjusted to deliver up to 18 short strokes in conjunction with each full stroke. Length of these short vibratory strokes is subject to adjustment in range from 1/32 to 1/2-in. Maximum rate of ram travel is 200 ipm down and 300 ipm up. During last 2 in. of ram stroke pressure downward, speed can be reduced any place in range downward to 40 ipm.

Accurate and variable die fills can be obtained by raising or lowering a bottom stop adjustment in knock-out cylinder. Die fills up to 3 in. in depth may be obtained and dies up to 4 in. in diameter can be accommodated on the press shown. Different filling boxes utilizing same feed hopper can be provided in variable widths and heights so that minimum pressing

ram stroke required for a particular operation can be used.

Steel 7/29/46; Item No. 9461

Belt Booster

Island Equipment Corp., 101 Park avenue, New York is offering an elevating conveyor known as an "ultimate belt booster" for conveying automatically any type of solid article from one level to another. It consists of an adjustable frame which can be elevated from 10 to 45° to a maximum elevation of 16 ft.

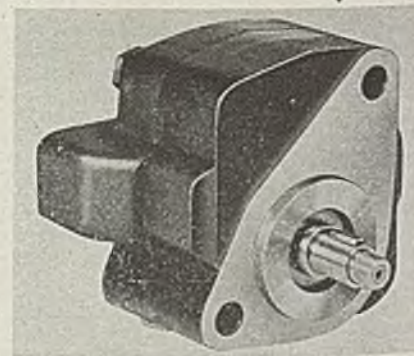
Traveling between two frame arms of conveyor is an endless cleated belt operating around two rollers located at top and bottom of frame. Belt travels at 50 fpm through a chain drive. Power is furnished by an electric motor.

Raising and lowering for elevation is performed by a hand winch on side of conveyor frame. Entire assembly is carried on four 6-in. ball-bearing steel casters, permitting unit to be moved easily.

Steel 7/29/46; Item No. 9414

Hydraulic Pump

A gear-type model H657-A hydraulic pump announced by Aro Equipment Corp., Bryan, O. delivers pressure up to 2000 psi with 5½ gpm at 2800 rpm. Volumetric efficiency of the pump using SAE



10 oil is above 90 per cent. It is suitable for hydraulic systems ranging from 100 to 2000 psi.

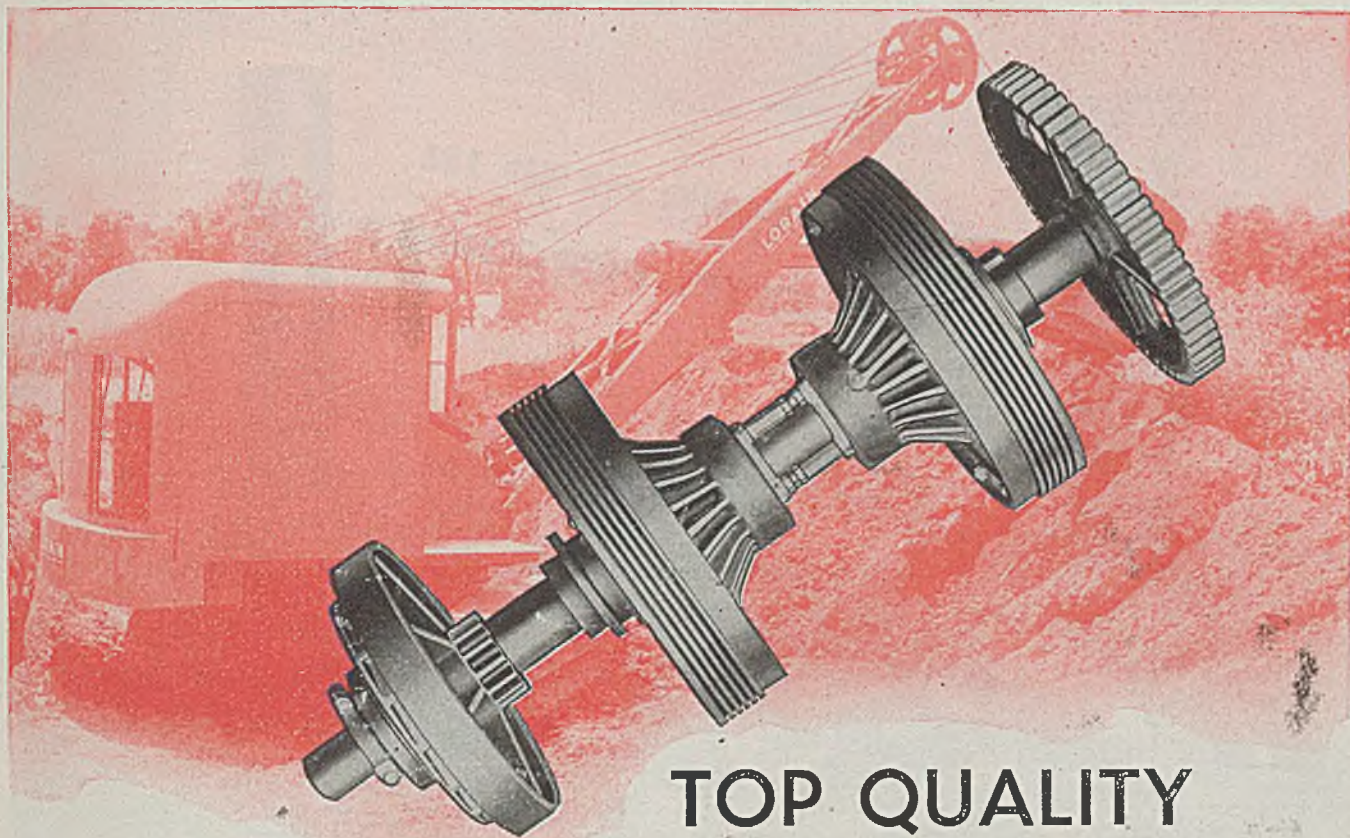
Pump employs Nitralloy gears in cast iron body of "sandwich" design. Unit is approximately a 3½-in. cube, with ½-in. diam. by 11/16-in. drive shaft extension, plus threaded portion for ¾-in. nut.

Steel 7/29/46; Item No. 9463

Plug Gage Sets

United Precision Products Co., 3524 West Belmont avenue, Chicago announces two standard plug gage sets in tolerances of XX, X, Y, Z and ZZ.

Cabinet No. 500 contains 471 gaging



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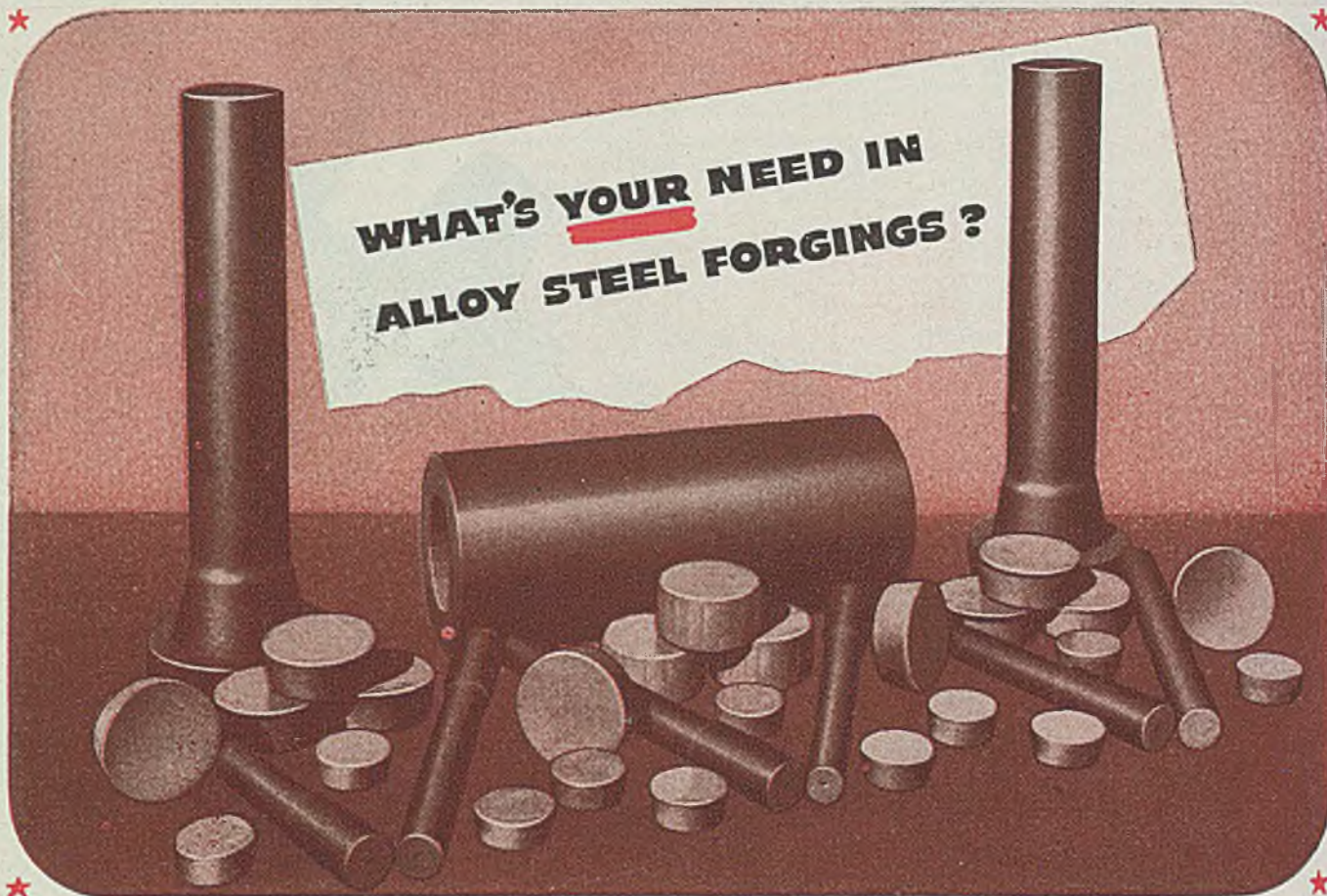
ARISTOLOY ELECTRIC FURNACE ALLOY STEEL is being used by The Thew Shovel Company in the swing shaft of their Lorain-82's and Lorain-41's. They recognize the need for the combination of *precision* and *strength* in this important part.

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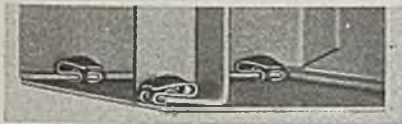
members, sizes 0.030 to 0.500-in. in increments of 0.001-in. each with its own plastic collect. Seven new lightweight handles, and four drifts to fit all size ranges are provided. Gaging members are progressively stored, each in its own receptacle of a three-drawer cabinet, and size of gage is stamped on collets.

Cabinet No. 600 contains 501 gaging members in four drawers with size ranging from 0.500 to 1.000-in. in increments of 0.001-in. Plastic collets for each pin are included.

Steel 7/29/46; Item No. 9292

Speed Nut

A new special J type speed nut with self-contained cap to cover protruding end of screw is announced by Tinnerman Products Inc., 2039 Fulton road, Cleveland. Object of new design, illustrated as



used in a junction box, is to prevent chaffing of electric wires on sharp edges of screw.

Heat-treated steel nut may be used in any type of sheet metal assembly where friction against internal parts is to be avoided. Nut snaps over screw hole in self-retaining position so that it may be used in blind location assembly.

Steel 7/29/46; Item No. 9391

Surface Plate

A new surface plate of specially alloyed close grain iron is announced by gage division of DoAll Co., Minneapolis. Measuring 14 x 24 in., surface plate undergoes careful annealing and treatment by alternate heat and extreme cold in production to impart stability.

The number of ribs, their placement



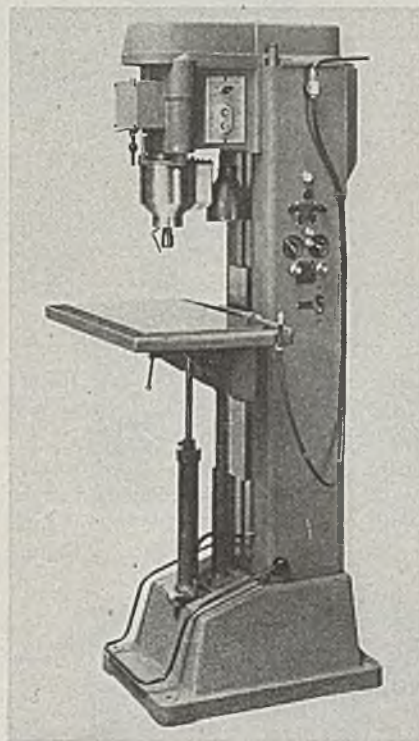
and depth are engineered to prevent any appreciable deflection and give ample support to working surface. Working surface has 22 or more evenly distributed bearing spots per square inch. Maximum deviation of bearing areas from a mean plane is 0.0002-in.

Underside of the $\frac{3}{4}$ -in. overhang is machined all around so that work or fixtures may be clamped to plate. Edge of working surface is drilled and tapped on 2 in. centers for mounting of gages and special fixtures. Plate comes with removable handles and plywood covers lined with oil-saturated felt.

Steel 7/29/46; Item No. 9382

Tapping Machine

A new electric-air controlled tapping machine utilizing new principles in piston and air cylinder construction and an air operated table raising and lowering unit is announced by R. G. Haskins, 615 South California avenue, Chicago. A new rigid



welded steel base gives greater strength to the unit.

A hinged door the full length of the control chamber permits easy access to all controls mounted inside. The cast aluminum air head with bronze cylinder walls and graphite carbon pistons resists rust and corrosion resulting from air line moisture.

Foot pedal control is designed to be within easy reach regardless of operator's position in relation to machine. Foot pedal operates a microswitch which actuates 24 v solenoid valves to offer sensitive pressure control on either automatic or controlled cycle of operation, as well as synchronizing electric-air operated fixtures with stroke of tap head. Full operator control, semi-automatic and automatic controls are possible.

Four machines are offered with capaci-

ties of No. 2 to $\frac{1}{8}$ -in. in mild steel, No. 6 to $\frac{1}{8}$ -in., No. 10 to $\frac{3}{8}$, N. F., and $\frac{1}{4}$ to $\frac{5}{8}$ -in. N. C., $\frac{3}{4}$ -in. N.F.

Steel 7/29/46; Item No. 9405

Grinding Wheel Dresser

The Samson grinding wheel dresser, manufactured by G. J. Wallen Mfg. Co., 617 Bryant street, San Francisco 7, utilizes forced-feed lubrication to keep grit from bearings and cutters. Bosses on each side of tool prevent sideplay, making possible peeling of grinding



wheel, cutting under any soft metal embedded in wheel.

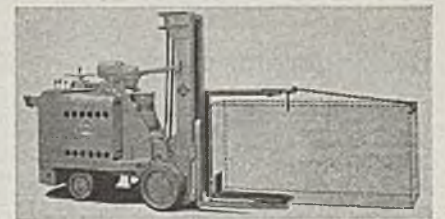
Grease within head of dresser catches dust and fine grit, preventing it from being inhaled. Two models are made, No. 1 for wheels up to 12 in. diameter and with a 2 in. face, and No. 2, for wheels up to 60-80 grit and diameters down to 3 in.

Steel 7/29/46; Item No. 9434

Articulated Load Carrier

A device which may be attached to any fork-type industrial truck manufactured by Elwell-Parker Electric Co., Cleveland, converts it into an articulated handler. With this device, the truck is adaptable to loading large crates on freight cars and transporting and tiering heavy, bulky objects in narrow aisles with right angle turns.

One part of attachment is a small turntable bolted to truck's lower forks to sup-



port the load. An overhead fork is bolted to lower fork's rear framework, and is adjustable for height of load. A chain extends from outer end of upper fork and a hooked clamp on end of chain fits down over edge of load. When slack in chain is taken up weight of load tenses it, holding it in position.

Turntable permits load to be swiveled

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 111.)

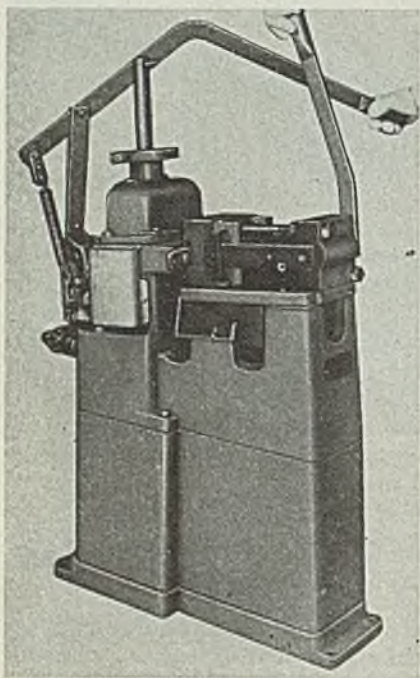
for maneuvering. Removal of a few bolts releases attachment and frees truck for any work not requiring device.

Steel 7/29/46; Item No. 9462

Die Casting Machine

An extremely light die casting machine, simple in operation, is announced for machine shop use by DCMT Sales Corp., 401 Broadway, New York. This high speed machine takes only a few minutes to set up and may be operated by unskilled operators.

Completely prefabricated blank die sets are offered, permitting manufacturer to



make his own dies. All that is required is machining die cavity and grinding the gate. High or low production runs can be produced as required, eliminating need for large inventories. Runs as low as 250 parts can be run economically, while speeds of 600 shots an hour may be reached.

Steel 7/29/46; Item No. 9380

Die Separator Truck

Optional features for application to die handling operations are now offered with 2000-lb capacity hydraulic high lift truck offered by Lyon-Raymond Corp., 2645 Madison street, Greene, N. Y. Separator consists of a removable boom with adjustable hooks to which die is fastened by chains, lowering of platform accomplishing the separation of the two sections.

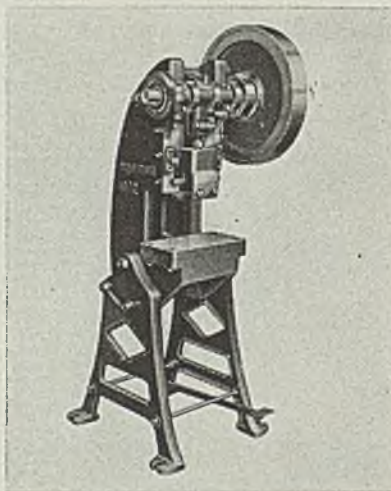
A gear type winch with a 38 to 1 ratio for pulling dies and fixtures in and out of racks and presses is also available. Both die separator and winch may be furnished

with standard truck or added to those in use. Truck is equipped with motor-driven hydraulic pump for platform elevation. Provision is also made for manual operation.

Steel 7/29/46; Item No. 9286

Power Punch Presses

Announcement of two new open back, inclinable power punch presses of 12 and 14-ton capacity is made by Diamond Machine Tool Co., 3429 East Olympic



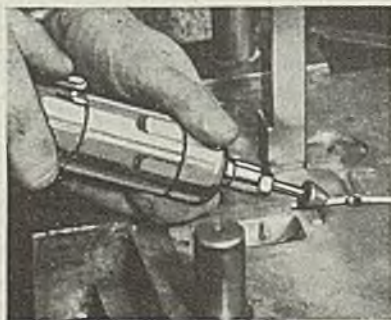
boulevard, Los Angeles 23. They feature a 6½-in. opening in back of frame and will incline 40 degrees.

Bed area is 8 x 15 in. and bed opening 5 x 7 in. for both models. Standard stroke for the 12-ton model is 1½-in. and 2 in. for the 14-ton model. Presses require 28 x 28 in. floor space.

Steel 7/29/46; Item No. 9464

Rotary File

An extremely small and lightweight pneumatic file and die grinder is announced by Ideal Industries Inc., 1921



Park avenue, Sycamore, Ill. Although only 6½-in. long, 1½-in. in diameter and weighing but 16 oz, it is rated at ¼-hp, 19,000 rpm.

Vane type motor of the unit maintains its speed under heavy loads. The harder

it works, the cooler it becomes. Dust and chips are blown away by exhaust air from ports at chuck end of grinder, leaving work clear for observation at all times.

Collet chuck is of double grip type with flexible sleeve which holds both oversize and undersize shanks. Standard chuck, made for tools having ¼-in. shank or flexible sleeve, may be obtained for ⅜ or ½-in. shank. Offered with either lever or button type controls, it handles wheels up to 1½-in. diameter.

Steel 7/29/46; Item No. 9522

Roller Shop Truck

A new tote box truck designed to save time and energy in moving boxes containing compact, heavy loads throughout a shop is announced by Rolock Inc., Fairfield, Conn. Designated as George, it con-



sists of a metal frame that holds two sets of ball-bearing rollers, one on which the load rests and another that serves as a means of moving truck.

A traction-hook fits through any one of a series of holes in the shoulder-high handle to assist in rolling boxes onto the frame. Hook is operated by putting it in box handle and pulling back on handle, the box coming over beveled edge of frame and onto rollers.

Steel 7/29/46; Item No. 9404

Portable Brazier

A new portable 10 kva brazier with air-cooled tongs for general brazing service in joining copper or copper alloy parts is announced by Westinghouse Electric Corp., Pittsburgh.

The single phase, 60-cycle unit weighs 100 lb and is provided with caster-type wheels and handles for moving or carrying. It operates from a 220 or 440-v source. Alternating current from an adjustable voltage transformer passes

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 111.)

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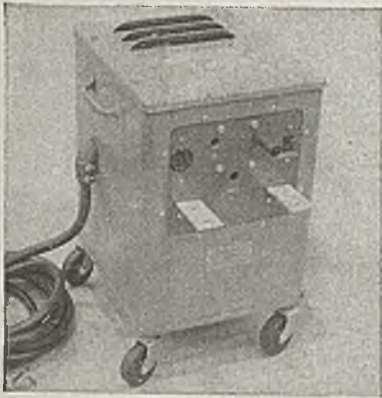


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through the tongs and parts to be brazed. Transformer with line contactor is enclosed in a sheet-metal case. Control panel contains outlets for brazing tong cables, receptacle for foot switch pilot cable, and voltage tap changing plug.



Two pronged plug-in switch changes brazing voltage to 12, 10 or 8 v. Cooling of unit is effected by natural air draft which enters at bottom.

Steel 7/29/46; Item No. 9511

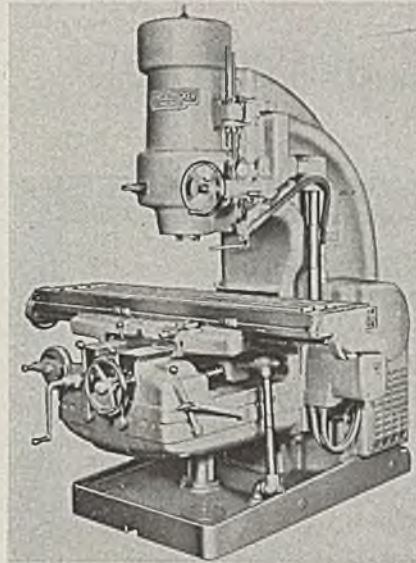
Milling Machine

A new line of knee-type milling machines designed to have increased rigidity and horsepower, and to give a more uniform flow of power to the spindle is announced by Kearney & Trecker Corp., Milwaukee. Designated as CSM line, machines are offered in 20, 30 hp sizes in horizontal and vertical (illustrated) models.

Solid-back column has spindle drive motor cross mounted in the base. Power is transmitted to spindle through multiple V-belts and spindle speed selection box, which has 16 speeds from 50 to 1250 rpm. Spindle is provided with a center bearing which reduces deflection

eight times. Heavy flywheel splined to spindle assures uniform flow of power to cutter.

A feed and rapid traverse drive motor mounted on right side of knee furnishes power to table feed mechanism. Thirty-two feed rates from $\frac{1}{8}$ to 90 ipm in ap-



proximate geometrical progression are provided. Climb cutting equipment is provided for table.

Steel 7/29/46; Item No. 9386

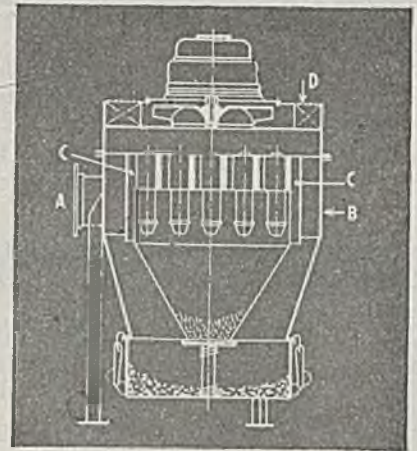
Dust Collector

An integral grinding dust collector introduced by Aerotec Co., White Plains, N. Y. operates with a no-pressure build-up characteristic that assures continuous equal suction at throat of hoods.

Dust laden air enters and coarse material is precipitated in primary B as indicated by diagram. Partially-cleaned air enters annular space C into tube second-

ary where fine dust is precipitated. Cleaned air is exhausted back into room through annular space D, conserving heat within room.

Unit is applicable to practically all



grinding dust collection problems. Where extremely fine dust is encountered, an electrical secondary, operating from a standard lighting circuit may be added.

Steel 7/29/46; Item No. 9469

Two-Operator Welder

Hobart Bros. Co., Troy, O., is offering a 2-operator gasoline engine-driven arc welder consisting of two 300-amp generators on a common shaft supplied with separate excitation from a common exciter. Unit is directly connected to an 8-cylinder Chrysler industrial engine.

Two operators can work independently of each other as engine is governed to maintain constant speed for all loads. Paralleling switches enable unit to be turned into a single operator 600-amp unit.

Steel 7/29/46; Item No. 9354

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9411	9405	9386
9467	9434	9469
9461	9462	9354
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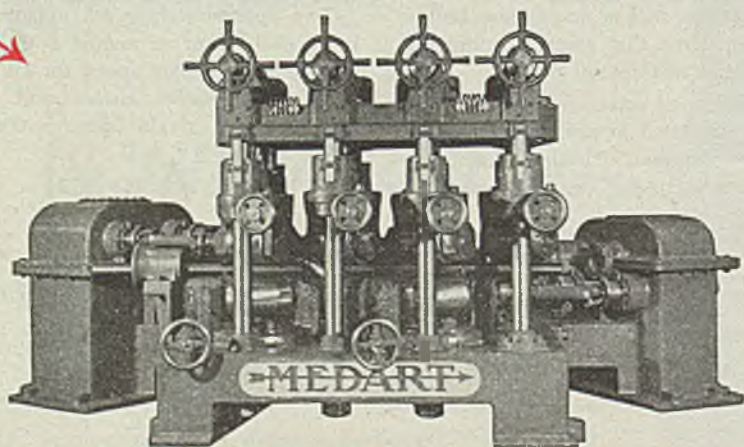
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5. **SINGLE MOTOR**—All four driven rolls powered from a single motor, for synchronization and economy.
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Resistant Alloys

(Concluded from Page 75)

time while welding operations were being performed.

Welding of A, B, and C sheet and plate can be performed by either the oxy-acetylene process with bare rod, or the metallic arc process with special flux-coated rod. The atomic hydrogen process can also be used, and produces sound welds. For large fabricated equipment, metallic arc process is usually preferred.

Simple forgings can be made from alloys A and B. Forging operations must be done hot, and forging cannot be carried out under 1900° F without danger of cracking. Optimum forging temperature for both A and B is approximately 2100° F. For upsetting bolts and forging small parts, hot-rolled bar stock is recommended. The bar stock should be centerless ground to remove any superficial surface checks which might open up on forging. Close control of furnace atmosphere is also required—the muffle-type furnace, where controlled atmosphere can be held, is preferred. The atmosphere should be kept as nearly neutral as possible. Coal, coke and oil direct-fired furnace equipment are not suitable for heating these alloys for forging.

Alloy A is readily machinable by ordinary methods. Alloys B and C can be machined at comparatively low cutting speeds. Alloy D is practically unmachinable, and if alloy D parts are to be finished, grinding is recommended. However, simple machining operations such as facing-off flanges can be performed where grinding is not practical.

High speed steel cutters should be used for milling alloys A, B, and C, and it is essential that cutting edges be kept constantly sharp and that the work be flooded with a stream of soluble oil. Surface speed of the cutter should be approximately 20 fpm with a feed of from 1 in. to 2 ipm. Depth of cut should rarely exceed 1/8-in.

Typical wheels for grinding Hastelloy alloys are shown in Table IV. Similar wheels of other brands can, of course, be used. For lapping, finishing compound H440 coarse, as supplied by the Carborundum Co., or similar material of other brands, is recommended for alloy D. Alloys A, B, and C cannot be lapped readily; so in preference to lapping, it is recommended that the surfaces be finished to close tolerances by grinding.

Grinding conditions should be severe enough to yield some wheel breakdown, and a roughing cut of 0.005-in. and finishing cut of 0.0025-in. are recommended. A continual stream of good soluble grinding lubricant should flow on the metal at all times.

STEEL

Inventory Control

(Continued from Page 77)

The planner also must know precisely how much rack space is needed to store given quantities of bar stock. Weight of stock means nothing unless it can be translated into terms of definite number of racks needed for storage. No attempt will be made to present elaborate formulae for estimating areas of racks and number of different sizes that will fit into each rack. Required information is available in all storerooms. Each storekeeper, in addition, should have a record of his own in which he lists all sizes and shapes of bars carried in stock, and the quantity of each that will fit into the different types of racks in his storeroom. With such a chart, he can estimate the amount of storage space needed for any incoming shipment. The procedure is a simple arithmetical one that requires no extensive training or background. For example, a shipment of 75,000 lb of 1 in. stock means 28,089 ft (75,000 divided by 2.67 lb, weight per foot for 1 in. steel). If bars average 12 ft, approximately 2300 bars can be expected. Dividing this figure by the number of 1-in. bars that will fit into a rack, number of racks required is found.

Paperwork: With all above information, final factor required to plan for bar stock space is paper work. Planning sheets printed in but one color and with no fancy art work are surprisingly effective. A mimeographed sheet will do the trick. The planning sheet basically is a ruled sheet of paper, each ruled section representing a section of rack. Only qualification is that squares be large enough to enable planner to write within them. A typical planning sheet for bar stock is shown in accompanying illustration.

With this sheet, the storekeeper can plan all new shipments for any predetermined period of time. As shown in Fig. 1, the sheet is numbered and lettered just as is the rack. In each section of the sheet he indicates the type and quantity of stock stored in the corresponding section of the rack. In doing so, individual "shorthand" systems can be utilized. On the illustrated sheet, a drawn line across the square indicates the amount of stock in the rack. A letter symbol indicates the type of material stored. (A for 1020 cold drawn, B for 1020 hot rolled, etc.)

Department activities then can be charted. Rack space is allocated for new shipments by indicating the purchase order number in the location the material will occupy. Stock to be moved is indicated by placing a dot on the right hand corner of the box. Under the dot is noted the new location of

the material. Place to which material is to be moved is noted by placing an X in the left-hand corner of the box.

Under the X is noted the location from which material is being moved. This is shown in section 14A. The black dot in the right-hand corner indicates that material is to be moved, the symbol 15G under the dot indicates that material is to be moved to that section. The X in left-hand corner of section 15G means that material is to be moved into this section. The 144A under X indicates that material is to be moved from that location. After duplicating the rack on paper, and after visualizing how the rack will look after issuances are made, the planner can then proceed to allocate space for all new shipments that will be received during the planning period. In allocating space for new shipments the storekeeper must keep in mind several important storage principles for bar stock. Stock should be racked so that heaviest pieces are nearest the floor. This is a common sense safety procedure as well as an economical way of handling stock.

Bar stock should be arranged by type and treatment of steel. A rack where metals are stored indiscriminately is a rack that invites wrong deliveries and contributes to wrong stock getting into production. With the planning sheet, stock can be rearranged gradually both by shifting and by requisitioning.

Active bar stock should be located

in the most accessible and easy-to-get-at portions of the rack; obsolete and slow-moving stock should be given the less desirable locations.

Additional Uses: In addition to fulfilling the basic requirements of good storekeeping of bar stock, planning sheets can serve many additional uses. Often work in storerooms is of a highly fluctuating nature with the men being very busy one time and entirely without work at another time. On the basis of information on the planning sheet, work of shifting stock can be planned to fill in during periods of inactivity.

As a daily guide for stores activity the planning sheet may reveal, for example, that 10 tons of bar stock are to be received in a few days. The manpower and equipment entailed in handling this shipment can be made ready if the storekeeper plans his activities so that when the shipment arrives, arrangements will be cleared to handle it without delay.

In general all shifting and moving of bar stock should first be done on paper. Paper work juggling of bar stock compares in no way with actual juggling of stock.

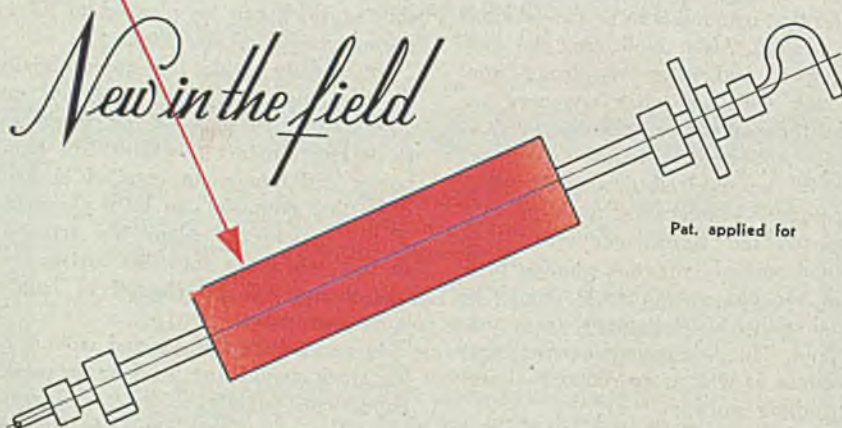
An error on paper can be rectified readily by use of an eraser. An error in actual handling of stock is much more serious, and incidentally quite costly. Rush orders, returned stock, opportune purchases, transportation tie-ups, and such familiar circumstances will do much



LIFT TRUCK UNLOADER: Shown here loading box car is new hydraulically operated device manufactured by Towmotor Corp., Cleveland, for use in unloading lift trucks. To push load off forks driver operates two double-acting cylinders, one on each side, moving vertical rack forward. Forty-ton box car is said to be loaded in 28½-min., reducing loading costs from 50 to 20 cents per ton. Pulling power of loader is equal to pushing power

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to throw off even the best laid plans; however, allowances for such contingencies can be made. Marginal rack space should be available to cover such emergencies and flexibility should temper all planning activities.

Castings and Forgings: Castings and forgings, because they can be used for one part only, or in some cases for a few select parts, are ordered on the basis of known production requirements. And because such pieces must be fabricated from special molds and forms, the ordering period is usually longer. These are favorable conditions that make possible closer planning over longer periods of time.

Castings and forgings have a variety of shapes. It is difficult to estimate the amount of space required to store such pieces. When pieces are received, it is quite a problem to store them efficiently. Large castings and forgings present a special storage problem. When castings approach freight-car-size, the problem fortunately passes over to general shop planning. Such impossible-to-store pieces should spend no time in stores; machines should be waiting for them as soon as the train pulls in at the siding. Handling these unusually large pieces is a plant planning problem and transcends stores planning. All other castings and forgings, however, are very much a stores planning problem and provisions must be made to handle them properly.

Planning Casting Store Space

Means of planning store space for castings and forgings are in several instances similar to those for bar stock. Knowledge of castings and forgings to be received during the planning period as well as knowledge of materials to be issued from stores can be ascertained through the use of shortage sheets and other means as described for bar stock control.

Previous experience with similar castings and forgings can serve as a valuable guide. If, for example, 75 housings are to be received, the storekeeper can estimate his space requirements by any of the following methods: (1) He can check to see if any such castings are in stock. (a glance into the rack will tell him how much space each casting occupies); (2) if castings are out of stock, the storekeeper can protect himself by keeping a record in his back-pocket notebook of space required for different kinds of castings and forgings; (3) if the casting is new and has not been stocked previously, the storekeeper should obtain a blueprint and from the overall dimensions shown thereon estimate storage space required.

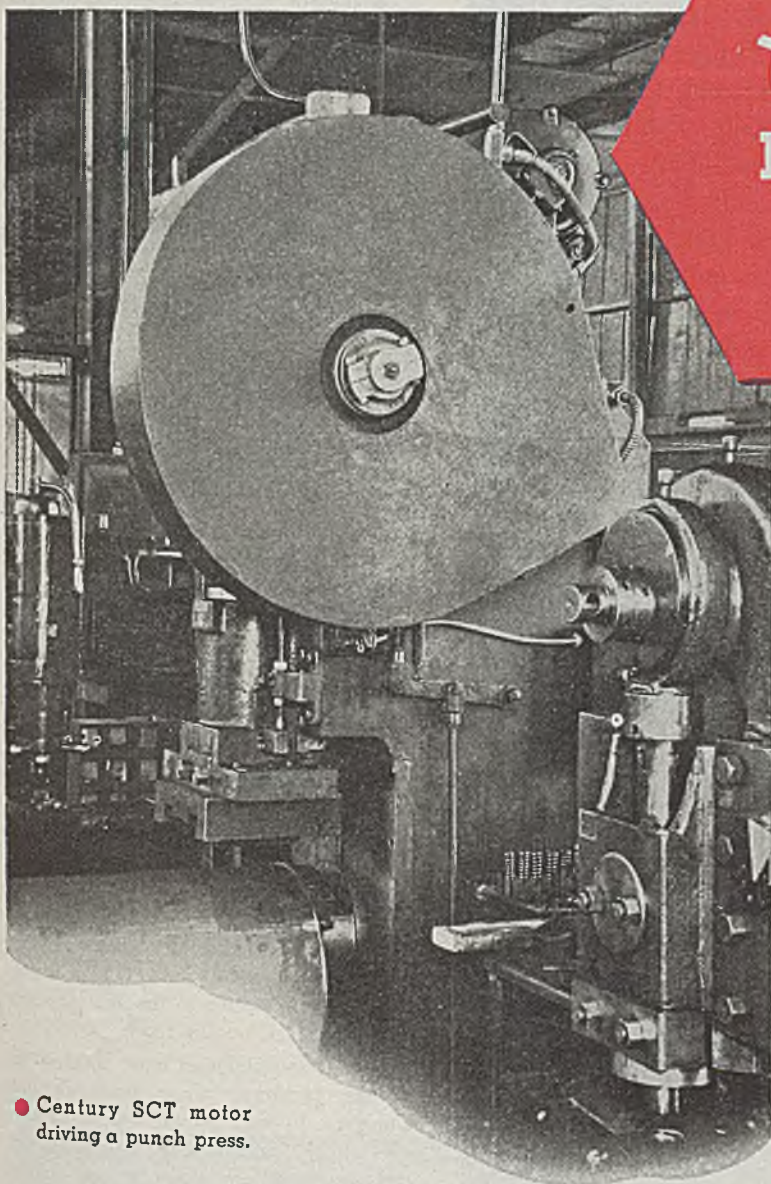
In addition to knowing space required for each casting a good storekeeper

STEEL

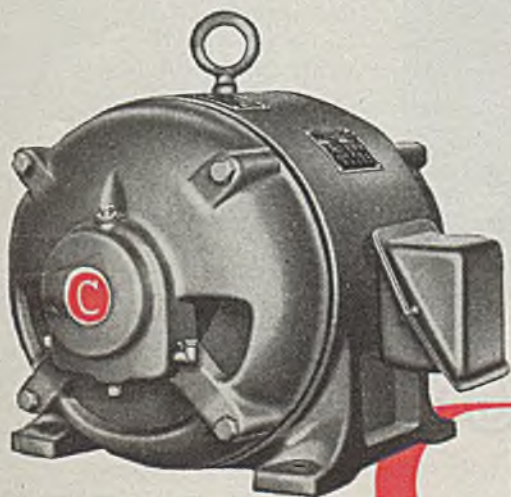
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Century high torque, high slip (type SCT) motors cushion the shock of the peak of high impact loads. As the machine reaches the peak of the operating cycle, the motor speed pulls down and the machine absorbs energy stored in the flywheel. Then the motor speeds up again, storing energy for the next cycle.

Century high torque, high slip motors are particularly adaptable to applications where the length of the cycle allows time for speeding up and slowing down.

The use of the high slip motor on such applications results in smoothing out the load curve and saving wear and tear on mechanical transmission equipment.

Specify Century motors on all your electrically powered equipment. Engineered to the functional characteristics of the machines they drive to assure top performance — Century motors are a vital factor in producing a better product at a lower cost.

They are built in a wide range of types and sizes from 1/20 to 600 horsepower.



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Every Inswell electric-welded link in this CM Herc-Alloy steel chain personifies safety and lifting strength. From the white hot ingots in the nation's steel mills to the finished structural girders for our skyscrapers, CM Herc-Alloy Sling Chains have been doing a handling job that ranks them "tops" in industry... "tops" in dollar value, service life, maximum safety or any other yardstick of measuring.

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should know as well the best manner of storing and arranging stock in bins.

Planning sheets used for castings and forgings (No. 2 in illustration) are modifications of those used for bar stock. Proportions of the sheets are different just as racks for castings and forgings are different. On the basis of the planning sheet the storekeeper can proceed to plan out all storing and handling problems in his department. Using the sheets he can bring about desired results by moving stock in and out of racks in accordance with plans. All uses for planning sheets listed for bar stock apply equally as well for castings and forgings.

On chart No. 2, instead of size and type of steel, part numbers are used to indicate the nature of the material being stored. Section 5C of this chart shows how the planner utilizes his knowledge of materials to be issued during the planning period. He knows that the 46,666 castings in that rack will be issued and therefore allocates that rack for purchase order A765 because when the material is received the rack will be empty.

Planning period for castings and forgings can be longer than for bar stock because of the nature of the stores.

Finished Stores: Unique factors about finished stores that have a bearing on planning follow. They should be considered before any plans are formulated.

Finished parts must be protected from unnecessary handling. The finish of the parts and the accurate machining done to such parts necessitate that parts be placed in racks or bins as soon as possible. Leaving such material on the floor or scattered about in stores is like issuing a gilt-edge invitation to the nearest scrap dealer to back up his truck.

Special consideration must be given to storage facilities. Some parts require wrapping in wax paper; others require protective coatings of oil, grease, or rust-preventatives; some are so fragile that perspiration from hands can mar the finish; still others must be stored separately like eggs in a carton. In allocating space on planning sheets these factors must be considered.

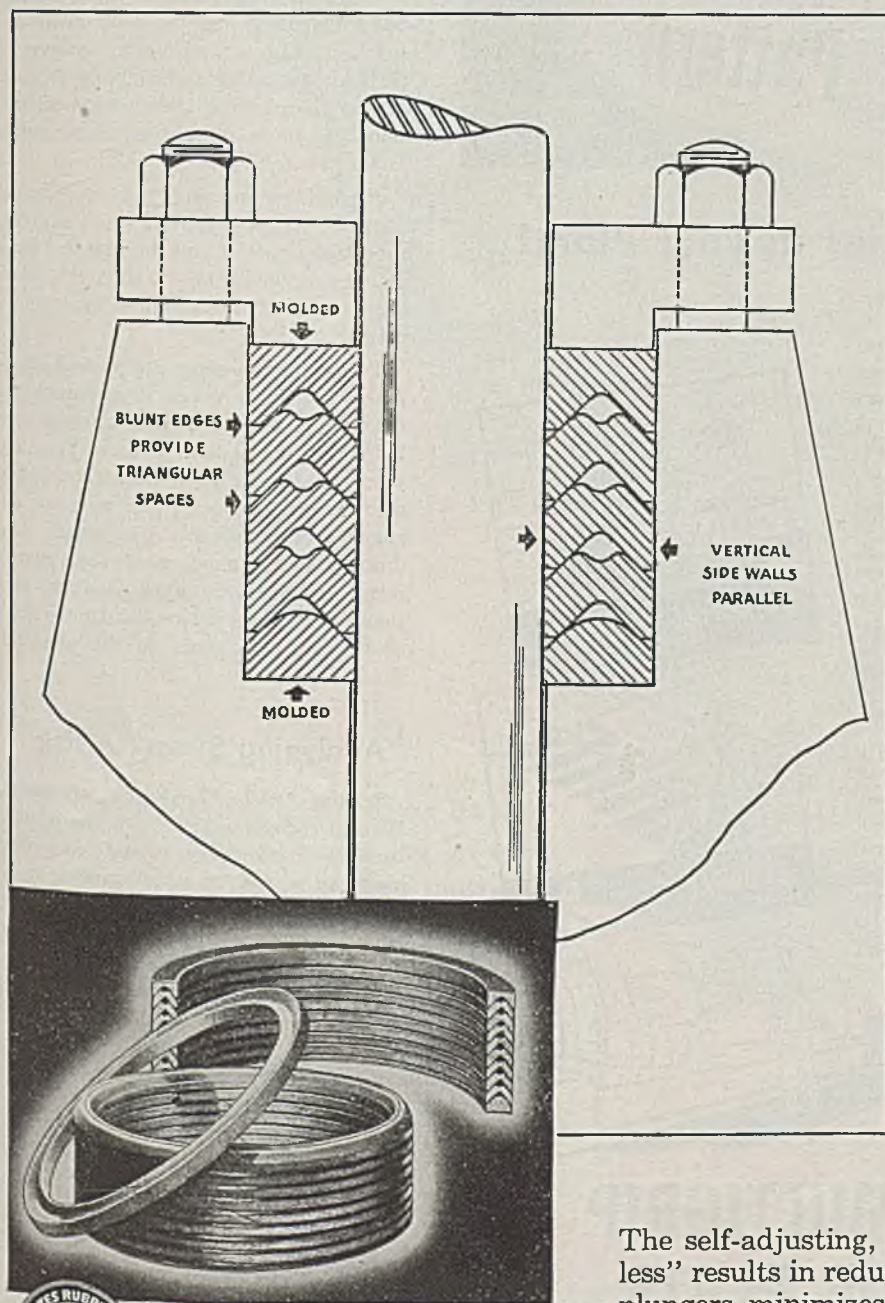
Space considerations for finished parts are far more complex than for any other type of stores. It is difficult to estimate in advance space required for any given shipment. Some materials must be stored in original containers, others, as pointed out above, must be given special storage facilities.

Variety of parts stored in most finished storerooms is amazingly large and complex. And because of this, racks used are similarly as complex.

Finished stores alone includes the problem of receiving materials not only from outside vendors but also from within

SERVING YOU THROUGH SCIENCE

Longer Life FOR RODS AND PLUNGERS WITH UNIQUE U.S. MATCHLESS PACKINGS



No Other Packing Has All These Advantages

BLUNT EDGES—Give more efficient shape; allow fabric to reach end of packing, providing uniform strength throughout. In conventional packing (feather-edge design) fabric cannot be forced into sharp edge, leaving unprotected soft-rubber end to cause curling and chipping.

TRIANGULAR SPACES—Blunt edges provide triangular spaces for trapping loose scale, oil, etc. Result is less friction, less power required, and scaling does not score entire length of packing set.

PRESSURE BREAK—The triangular space of each ring breaks the pressure more quickly than ordinary types without this feature. With "Matchless" design, automatic action is faster, more effective.

MOLDED END RINGS—Tests show the female ring and the one next to it take 70% of the pressure on the set. In "Matchless" all rings are molded, are of proper density, and have no sharp edges to break off, as on end rings cut from slab.

EASY TO INSTALL—Matchless Packing has parallel side walls, while conventional packings are made with varying degrees of wall flare. "Matchless" rings slide easily into stuffing box; the flare type requires considerable effort and time.

The self-adjusting, automatic action of "Matchless" results in reduced wear and tear on rods and plungers, minimizes friction and keeps down packing costs. For hydraulic equipment, presses, rams, triplex pumps, outside packed pumps, and swivels on rotary drilling rigs. Write for details.

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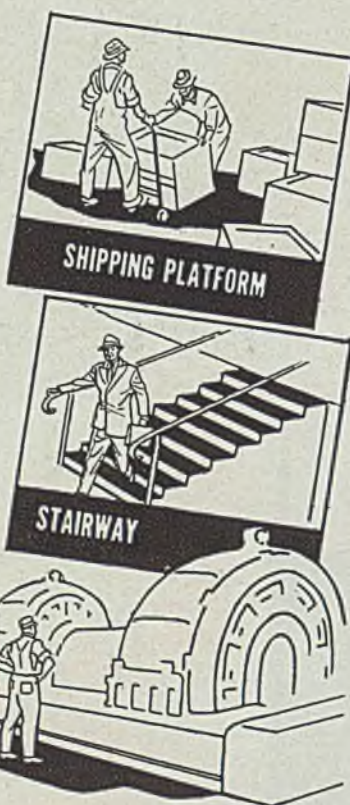


Guard Danger Zones in your Plant!

WHEREVER there is work to be done, men need protection from stumbles, falls and fatigue that frequently cause serious injuries. In plants where industrial trucks must move safely and speedily, flooring must be extra strong and durable. That is why so many plant managers have installed U.S.S. Multigrip Floor Plate on entire floors, on aisles, walkways, ramps, step plates and other spots that have proved to be accident breeders.

In the illustration you can readily see that Multigrip is designed for safety. The arrangement of its closely-spaced risers assures positive traction and skid resistance, in every direction. These flat-topped risers are comfortable under foot, tending to reduce fatigue and increase efficiency.

Rolled of tough, durable steel, Multigrip Floor Plate protects the underfloor, strengthens it structurally, and remains safe—wet or dry—under the wear and tear of plant traffic for years on end. Easily cleaned, quickly installed, Multigrip reduces lost man-hours and vehicle repair. It increases the life of flooring, thereby decreases its cost. Write today for information or contact your local U.S.S. Multigrip distributor.



LISTEN TO ... the "Hour of Mystery" presented by United States Steel on the radio every Sunday evening. Consult your local newspaper for time and station.



U-S-S MULTIGRIP FLOOR PLATE

CARNEGIE-ILLINOIS STEEL CORPORATION
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United States Steel Export Company, New York

UNITED STATES STEEL

the shop itself. Because of this, shortage sheets as outlined for bar stock, castings, and forgings must be supplemented by additional paper work. To obtain a precise knowledge of receipts for parts made in the shop, the storekeeper must resort to production schedules, flow charts, and similar planning paper work which will indicate when parts are scheduled to arrive in finished stores. By using such paper work for "inside" receipts and the shortage sheet for parts purchased outside, the storekeeper will know what he can expect during any given period of time. As with receipts, issuances can be anticipated from contacts with assembly foremen and others concerned with requisitioning and ordering finished stores. The planning sheet with modifications (No. 3 in illustration) is the same as for bar stock.

Aside from insuring precise, accurate control over all phases of stores activity, the planning sheet and the planning procedures outlined here can serve as a basis for estimating future stores requirements.

Parts of stores often are hacked off to make room for other departments on the basis of nothing more than vague and indefinite information. Because planning sheets indicate future conditions, the sheets should serve as the basis for all changes or modifications of stores. Additional racks, more men, new equipment, additional handling facilities, etc. should be purchased or hired only after consideration is given to the planning sheets.

"Analyzing Stress" Article

In the Article "Analyzing Stresses in Welded H-Section Trusses" in the July 22 issue of STEEL, page 99, reference was made to a test in which trusses were loaded to a total of 254,000 lb—the equivalent of dead load represented by a cement tile roof deck plus the "live load" figured at 35 lb per square foot. Actually, reference should have been made to "twice the live load." The heading over this article also should have made it clear that 144 strain gages were employed, as described in detail in the article.

War-time production and battlefield accomplishments of the employees of Mullen Mfg. Corp., Salem, O., is told in a recently published 66-page book entitled "We Worked to Win—We Fought to Win." With page-to-page illustrations book outlines the manufacture and military use of the company's various products including ammunition components, airplane parts and varied items of automotive equipment.

STEEL

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PIPE FEEDING
AND HANDLING TABLE

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Tube Mill production can be considerably upped by the installation of Taylor-Wilson machines. These modern machines have the power to resist fatigue and to operate continuously month after month, which in front office language means greater output and lower cost per unit of production.

Inquiries invited

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Straightening, Burnishing and Sizing Machines
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Small Seamless Tube Mills
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Complete line of Equipment for finishing of pipe.

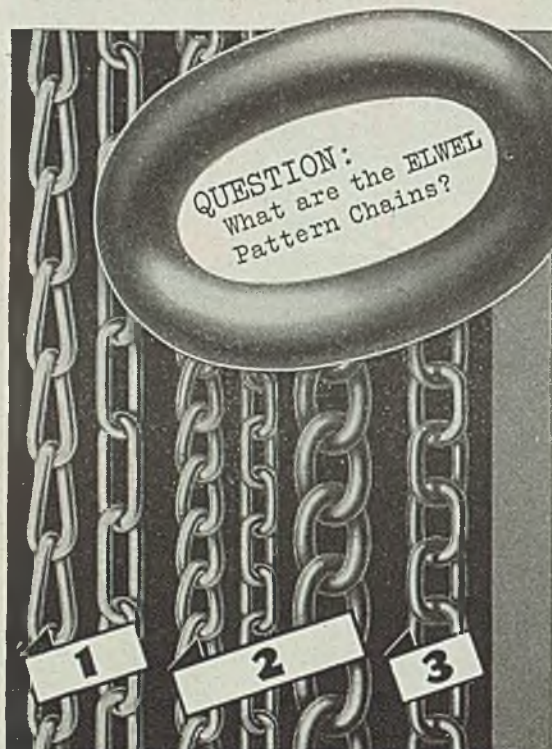
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AMERICAN CHAIN

Answers Another Chain Question ...



"Elwel" Chains are the smaller sizes of American Chain's high quality electrically welded steel chain. There are three basic patterns as follows:

1. Elwel Coll Chain — either straight or twist link—made in 12 sizes from 5 ($\frac{7}{16}$ ") to 7-0 ($\frac{5}{16}$ ").

2. Elwel Machine Chain — straight or twist link—12 sizes, from 5 ($\frac{7}{16}$ ") to 7-0 ($\frac{5}{16}$ ")—from 25 to 11 links per foot. Elwel Truck Chain is similar to Elwel Machine twist link but is made in heavier sizes—up to 12-0 ($1\frac{1}{2}$ ").

3. Elwel Passing Link—with links designed wide enough for links to pass—removing tendency to kink. Sizes 2-0 (No. 6 Ga.) to 7-0 ($\frac{5}{16}$ ").

Elwel Assemblies. Equipped with rings, hooks, toggles, snaps, etc., Elwel Pattern Chains are made into a variety of assemblies for farm and industrial use.

Abrasive Belt Grinding

(Continued from Page 81)
the particular finish desired.

Other Features Developed: The machines of today are a far cry from those early designs. They include such important features as an ammeter indicator on the motor-driven contact roll which allows the operator to make sensitive pressure adjustments for grinding and finishing.

Automatically, by use of an electric eye or by automatic air control, the abrasive belt is run in a straight plane and prevented from skewing despite variations in pressure across the line of contact. Without this, inequalities in the thickness of the sheet and the resulting increase in drag might cause the belt to weave lengthwise, producing a poor finish pattern.

Hydraulic drives are used for passing the sheet in and out of the machine. Pressure controls are used with the automatic billy roll and with automatic controls.

Strip Grinding: Along with the development of sheet grinding came the development of wide belts for strip grinding of stainless steel. Essentially, the principle of the machine for strip grinding and finishing is the same as those in sheet grinding. Instead of using a bed or table, however, the strip is handled in coils through the abrasive belt strip grinder by a pay-off reel and tight coiler, or a pay-off and an up coiler (see Fig. 6).

Internal Grinding—Polishing: Early attempts at polishing internal diameters of tubing were not too satisfactory because they employed a small abrasive wheel or hone revolving inside the tube. Production was poor and the costs were prohibitive.

Many types of stainless steel tubing, such as those used for carrying milk, in dairy plants, required internal surfaces with high finish to prevent bacteria from becoming lodged in pits or pores in the surface. Fig. 5 shows a special machine developed to provide finishes of this high quality.

The long bed of this unit takes a full length tube and rotates it on three pairs of supporting wheels. An abrasive belt is threaded through it and the ends joined. The abrasive belt covers only a portion of the tube circumference.

As the belt travels through the tube, a mandrel or expanding head is pushed slowly through the tube, forcing the abrasive belt against the inside diameter. Speed of belt, tube rotation and mandrel movement are synchronized to produce the grinding-polishing action desired. Principal advantages of this method include high production and excellent finish at comparatively low cost.

Billet Grinders: Fig. 7 shows a special

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American Chain Division makes all types of electric welded and fire welded chain — all types of weldless chain made of formed wire or stampings — a complete line of chain fittings, attachments and assemblies — repair links — cotter pins — hooks.

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**AMERICAN CHAIN DIVISION
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In Business for Your Safety

billet grinder using abrasive belts to handle the facing of aluminum blocks, cut from billets, on a high production basis. A continuous pusher type conveyor supports the blocks and carries them past two wide abrasive belts which grind and polish the sawed faces. After the blocks pass these two wide belts, the conveyor carries them past a series of eight belts which chamfer the edges. Horizontal loose fitting guides hold the blocks in the one position. Grit sizes of the belts are so selected as to remove a maximum amount of metal. Each belt is driven by its own individual motor. It is possible to combine various abrasive belts in a like manner to handle an extremely wide variety of grinding and polishing operations on a continuous production-line basis.

(To be concluded next week)

Mobile Crane

(Concluded from Page 101)

cars in the order of need, regardless of how they happen to be placed in relation to the loading platform, or it can be used to move a car into place for hand unloading.

One of the most important plus-values of this type of crane is its availability as stand-by or emergency equipment. The unexpected always happens—and with increasing frequency. Materials arrive in larger units than ordinary and have to be handled differently. Machinery breaks down or needs to be dismantled or moved unexpectedly. Small construction jobs arise which can be done easily if a roving crane is available, but which otherwise might incur delay and disrupt other operations.

In most of these unforeseen, emergency situations the solution depends generally on load-handling of an unusual, non-routine, type. The availability of a free-roving crane's mobility, maneuverability and load handling capacity makes it unnecessary to improvise hoisting and moving apparatus. Men do not have to be taken from other jobs. In place of slow, time-and-labor-wasting methods, a quick, safe, efficient solution can be worked out with this type of crane.

Modern engineering planning is now going out the window and taking in all plant areas instead of just the interiors devoted to production and shipping. The new trend is to make all space productive and the simplest way to accomplish this is to make all space accessible. And to continue the logic—the easiest way to make all space accessible is to install equipment that can reach it.

The free-roving, tractor-footed crane is helping plant movement engineers to work toward the ideal situation in material movement.



Towmotor and the 40 Fertilizers

Scheduling the production of forty varieties of fertilizer to meet variable demands for each type presents a complex production problem. At the Camden, N. J., plant of I. P. Thomas & Son Company, chemical manufacturers, this problem was further complicated by a lack of space in which to accumulate stock to meet future requirements.

To establish a controlled schedule that would permit long, economical production runs, four Towmotor Lift Trucks were selected to maintain a steady flow of materials through the plant and to provide the additional storage space required. Operating in a dust-laden atmosphere, these units stack 2,000-lb. loads of bagged fertilizer to 12-foot heights, in a systematic sequence that makes each grade

immediately accessible when needed. In addition to creating added storage space, Towmotors have reduced over-all handling time 40% and have materially speeded up truck loading operations.

For every handling problem, however unusual, there is an engineered solution... a solution based upon Towmotor experience and "know-how" gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, 1223 East 152nd Street, Cleveland 10, Ohio.

**TAKE IT UP WITH
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THE ONE-MAN-GANG**

The Business Trend

Rising Production Seen As Curb on Inflation

RELATIVELY FREE from major strikes, industry is stepping up production, offering hope that the increasing flow of goods will help curb inflation.

Strikes still handicap some phases of production but many plants are setting new all-time records for output. Weekly production for all four factors in STEEL's index of industrial activity now exceeds the weekly average for 1936-1939, inclusive. However, the results of this high rate of production are not readily discernible, for it has prevailed only a short time and the aggregate volume of goods produced is only a fraction of the amount needed to fill the needs of a vast market.

The increasing tempo of industrial activity pushed STEEL's index for the week ended July 20 up to 148 per cent (preliminary), a new postwar high, and 4 points above the previous postwar high mark established in the week ended July 13.

AUTOS—Although weekly automobile production is not as high as it was in some of the weeks of prewar years the output in the week ended July 20 was estimated at 78,995 units, the first time the postwar weekly production has exceeded the 1936-1939 weekly average of 75,502. Auto production in the week ended July 20 was the greatest since the week ended Jan. 24, 1942.

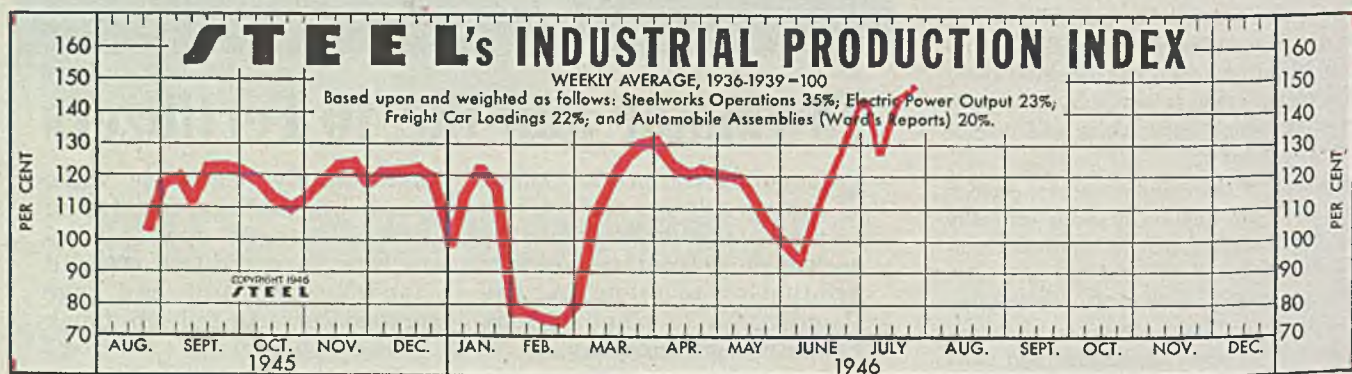
STEEL—While steel production has been only slightly

under 90 per cent of capacity it will have to remain at this rate for some time before the supply of finished steel can be brought into line with demand.

COAL—Output of bituminous coal continues at a high rate and is making up some of the loss incurred during the miners' strike earlier this year. Through July 13, production this year totaled 254,225,000 tons, 63,178,000 tons or 19.9 per cent behind that for the corresponding period of last year. A few weeks ago output was 64,850,000 tons, or 25.9 per cent, behind last year.

PRICES—Sharp increases for a number of industrial goods raised average prices of all commodities other than farm products and foods 0.6 per cent during the week ended July 13, the U. S. Bureau of Labor Statistics reported. However, many manufacturers continued to hold prices at levels prevailing when the OPA expired. The Bureau's index of wholesale prices for all commodities rose in the week ended July 13 to 120.7 per cent, 3.5 points above the preceding week, principally as a result of higher food prices. In the first two weeks after end of OPA controls the Bureau's index rose 8 points.

EARNINGS—Publicly reported cash dividend payments of corporations totaled \$133,600,000 in May, a 12.2 per cent increase over the \$119,100,000 paid in May, 1945, the Department of Commerce reported. Dividends during the three months ended May 31, 1946, totaled \$867,800,000 and were 6.2 per cent above the comparable period's total of \$816,900,000 in 1945. Dividend payments by the iron and steel industry in May amounted to \$9.5 million, compared with \$10.3 million in May last year.



The Index (see chart above):

Latest Week (preliminary) 148

Previous Week 144

Month Ago 135

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	88	86	85	90
Electric Power Distributed (million kilowatt hours)	4,293	4,156	4,129	4,385
Bituminous Coal Production (daily av.—1000 tons)	2,114	1,095	2,023	1,988
Petroleum Production (daily av.—1000 bbls.)	4,937	4,934	4,949	4,944
Construction Volume (ENR—Unit \$1,000,000)	\$130.4	\$150.6	\$105.8	\$50.1
Automobile and Truck Output (Ward's—number units)	78,995	74,015	54,475	18,080

*Dates on request. †1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

TRADE

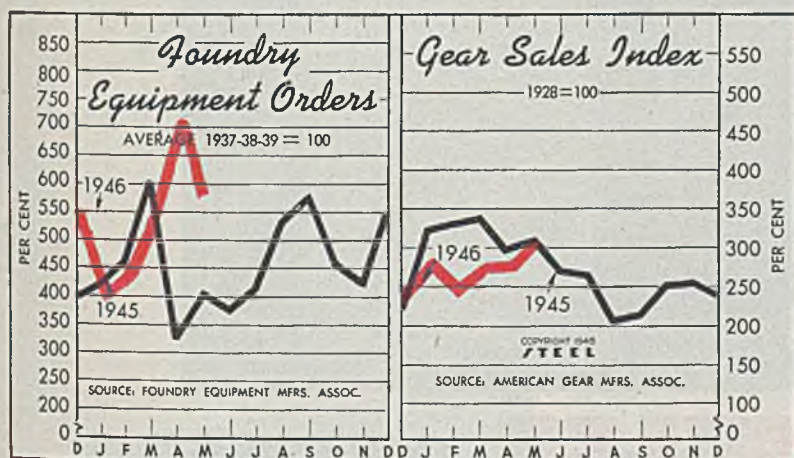
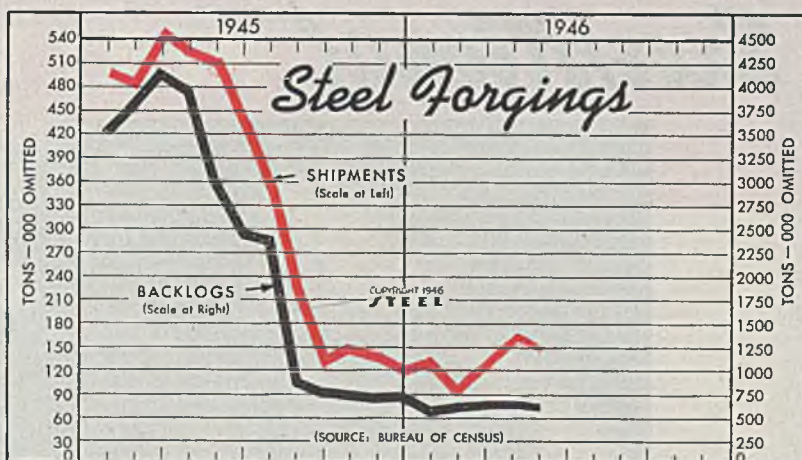
Freight Carloadings (unit—1000 cars)	895†	895	858	882
Business Failures (Dun & Bradstreet, number)	25	15	25	12
Money in Circulation (in millions of dollars)†	\$28,241	\$28,335	\$28,116	\$26,901
Department Store Sales (change from like wk. a yr. ago)†	+25%	+26%	+37%	+14%

†Preliminary. †Federal Reserve Board.

Steel Forgings

Tons—000 omitted

	Shipments		Unfilled orders ^a		Consumption of steel	
	1946	1945	1946	1945	1946	1945
Jan. ...	130	493	561	3,502	182	644
Feb. ...	93	483	596	3,826	125	628
Mar. ...	123	549	612	4,139	164	718
Apr. ...	155	524	604	3,961	208	666
May ...	139	510	599	2,989	197	655
June ...	...	430	...	2,420	...	548
July ...	...	345	...	2,356	...	438
Aug. ...	...	227	...	841	...	293
Sept. ...	...	126	...	745	...	172
Oct. ...	...	145	...	735	...	197
Nov. ...	...	135	...	708	...	185
Dec. ...	...	119	...	724	...	156

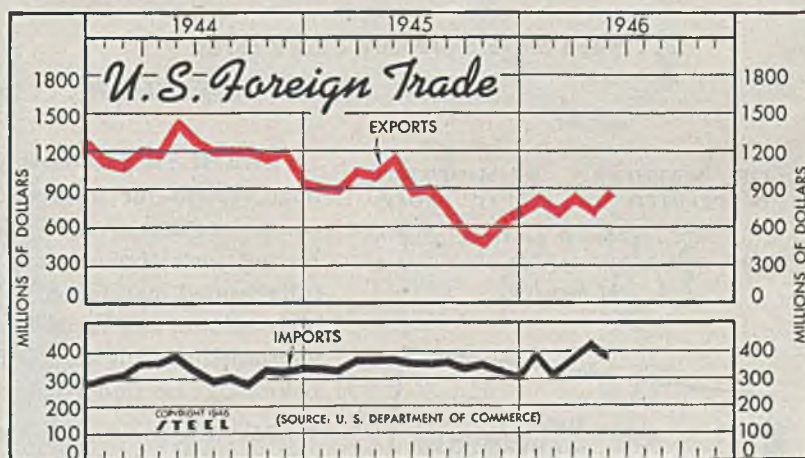
^a Forgings for sale.

	Foundry Equipment Orders			Gear Sales		
	Index—(1937-38-39=100)			Index—(1928=100)		
	1946	1945	1944	1946	1945	1944
Jan. ...	392.8	422.4	378.3	269	323	246
Feb. ...	432.8	465.3	456.8	253	331	214
Mar. ...	536.6	604.7	498.4	275	339	485
Apr. ...	701.2	325.0	385.7	284	296	308
May ...	577.3	404.7	503.9	313	309	305
June ...	...	375.4	466.1	...	271	328
July ...	...	411.7	375.8	...	264	242
Aug. ...	...	532.2	450.5	...	205	247
Sept. ...	...	577.2	388.0	...	213	248
Oct. ...	...	457.8	526.5	...	251	293
Nov. ...	...	416.6	369.5	...	255	209
Dec. ...	...	547.6	397.4	...	239	219
Ave. ...	461.7	433.1	...	275	279	...

Foreign Trade
Bureau of Foreign and Domestic Commerce

(Unit Value—\$1,000,000)

	Exports			Imports		
	1946	1945	1944	1946	1945	1944
Jan. ...	800	901	1,124	398	334	300
Feb. ...	671	882	1,086	318	324	313
Mar. ...	815	1,030	1,197	384	365	359
Apr. ...	758	1,002	1,182	406	366	359
May ...	851	1,133	1,419	397	372	386
June ...	...	866	1,271	...	360	330
July ...	...	893	1,198	...	356	293
Aug. ...	...	737	1,207	...	360	302
Sept. ...	...	515	1,199	...	335	280
Oct. ...	...	455	1,140	...	344	327
Nov. ...	...	639	1,184	...	322	322
Dec. ...	...	736	934	...	297	336
Total ...	9,789	14,141	...	4,135	3,907	...



FINANCE

	Latest Period ^a	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions) ...	\$13,058	\$10,738	\$13,997	\$11,850
Federal Gross Debt (billions) ...	\$268.3	\$268.2	\$269.3	\$261.8
Bond Volume, NYSE (millions) ...	\$17.8	\$17.8	\$21.4	\$28.8
Stocks Sales, NYSE (thousands) ...	4,660	4,501	5,834	5,229
Loans and Investments (billions) [†] ...	\$60.6	\$61.0	\$62.9	\$64.2
United States Gov't. Obligations Held (millions) [†] ...	\$42,185	\$42,744	\$45,716	\$47,338

[†] Member banks, Federal Reserve System.

PRICES

	Latest Period ^a	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average ...	\$64.45	\$64.45	\$64.45	\$58.27
All Commodities [†] ...	120.7	117.2	111.8	105.6
Industrial Raw Materials [†] ...	137.2	135.2	125.8	117.6
Manufactured Products [†] ...	115.3	110.9	106.8	101.9

[†] Bureau of Labor Statistics Index, 1926 = 100.

Exceptional **HEAT UNIFORMITY**



...with **MAEHLER** ovens...

... mean more uniformly baked cores

RECENT TESTS SHOW ... temperature variations of only 5°

93.6%
OF MAEHLER'S PRODUCTION
IS DEVOTED TO REPEAT ORDERS!
..... There is no better proof of
the superiority of Maehler ovens
and furnaces.

MAEHLER'S leadership in developing the recirculating air heat system for industrial ovens has resulted in a line of equipment that gives heat uniformity that is virtually perfect! Recent tests show that a Maehler oven operating at 500°F fully loaded maintained a heat uniformity within 5°, through high volume and rapid air heat circulation and highest grade instruments. This kind of temperature control means uniform baking ... no under-baked nor over-baked cores.

Maehler core and mold ovens are available in a complete range of oil fired, gas fired and electrically heated units, incorporating the Maehler recirculating principle for high uniformity and output, at low cost.

Let us quote you on your requirements.

THE PAUL MAEHLER COMPANY
2208 W. Lake Street • Chicago 22, Ill.

A Few Users of
MAEHLER EQUIPMENT
AMERICAN BRAKESHOE
& FOUNDRY
GREENLEE BROS.
PACKARD MOTOR CAR CO.
EBALLOY FOUNDRIES
BOHN ALUMINUM
& BRASS CORP.
GENERAL MOTORS CORP.
SARGENT & GREENLEAF
HOWARD FOUNDRIES

MAEHLER

Industrial Ovens and Furnaces
for Core Baking, Mold Drying,
Heat Treating, Enameling, etc.

TAYLOR-WINFIELD Portable Spot Welders

(AIR AND AIR-HYDRAULIC)

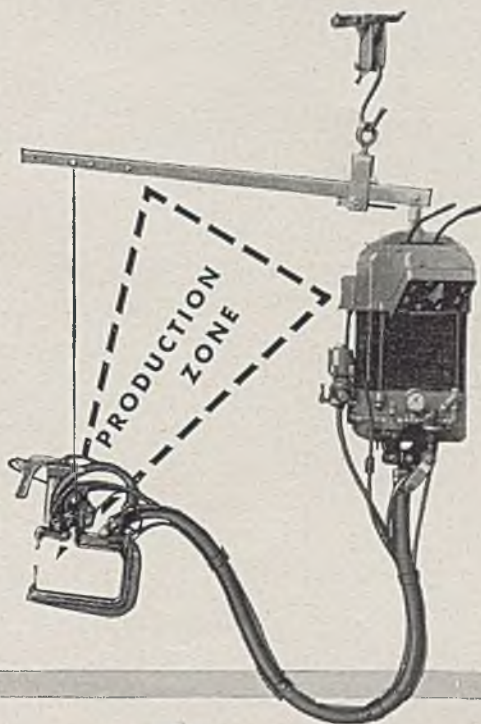
Which of these designs will help your production?

When a part is too bulky or too complicated to move to a resistance welding machine, take the welder to the part.

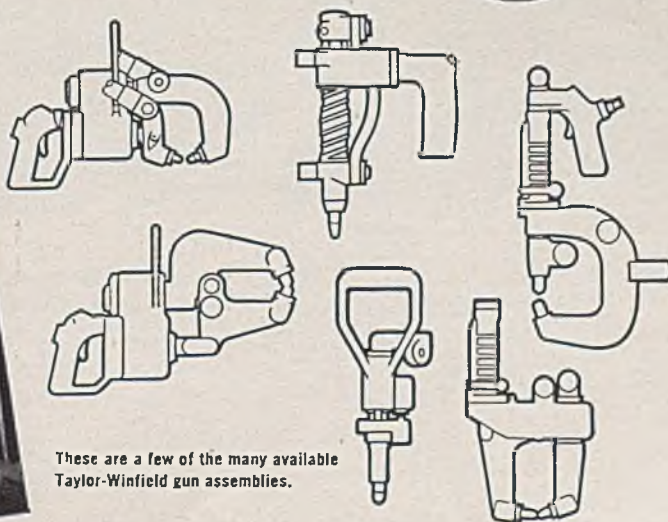
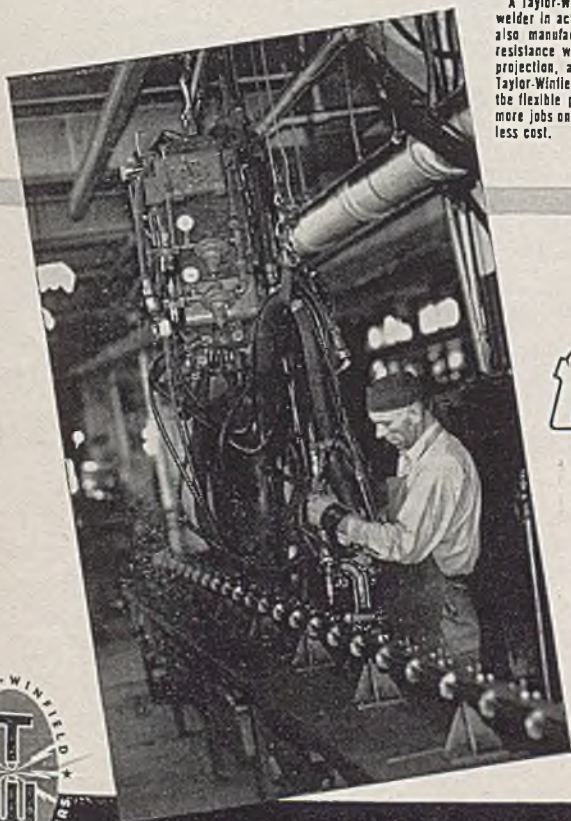
Taylor-Winfield makes a diversified line of portable spot welders, both air and air-hydraulic, many of which are illustrated here.

Because parts to be joined by resistance spot welding differ widely in size, shape, and weight, portable welders must be designed for specific work. Taylor-Winfield cuts the high cost of this procedure by standardizing on gun, transformer and accessory designs. With this unit principle of construction, many different combinations can be applied, without resorting to special designs.

Information on your requirements at your request.



A Taylor-Winfield portable spot welder in action. Taylor-Winfield also manufactures all forms of resistance welders (seam, spot, projection, and flash-butt.) All Taylor-Winfield welders feature the flexible production zone... more jobs on the same welder at less cost.



These are a few of the many available Taylor-Winfield gun assemblies.



The Taylor-Winfield Corporation
WARREN • OHIO

The Taylor-Winfield Corporation
Warren, Ohio

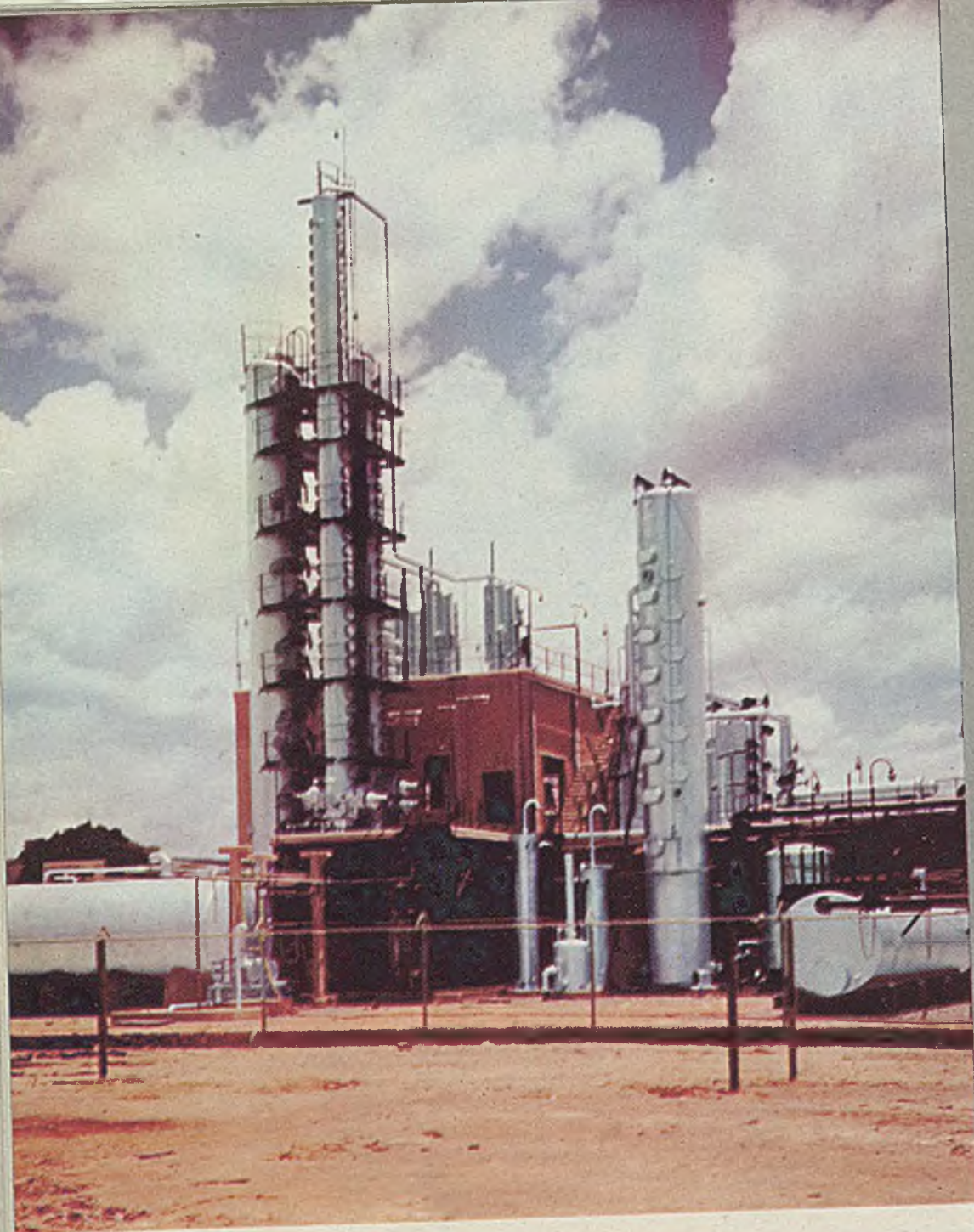
Send us Bulletin on Portable Spot Welders.

Name _____

Company _____

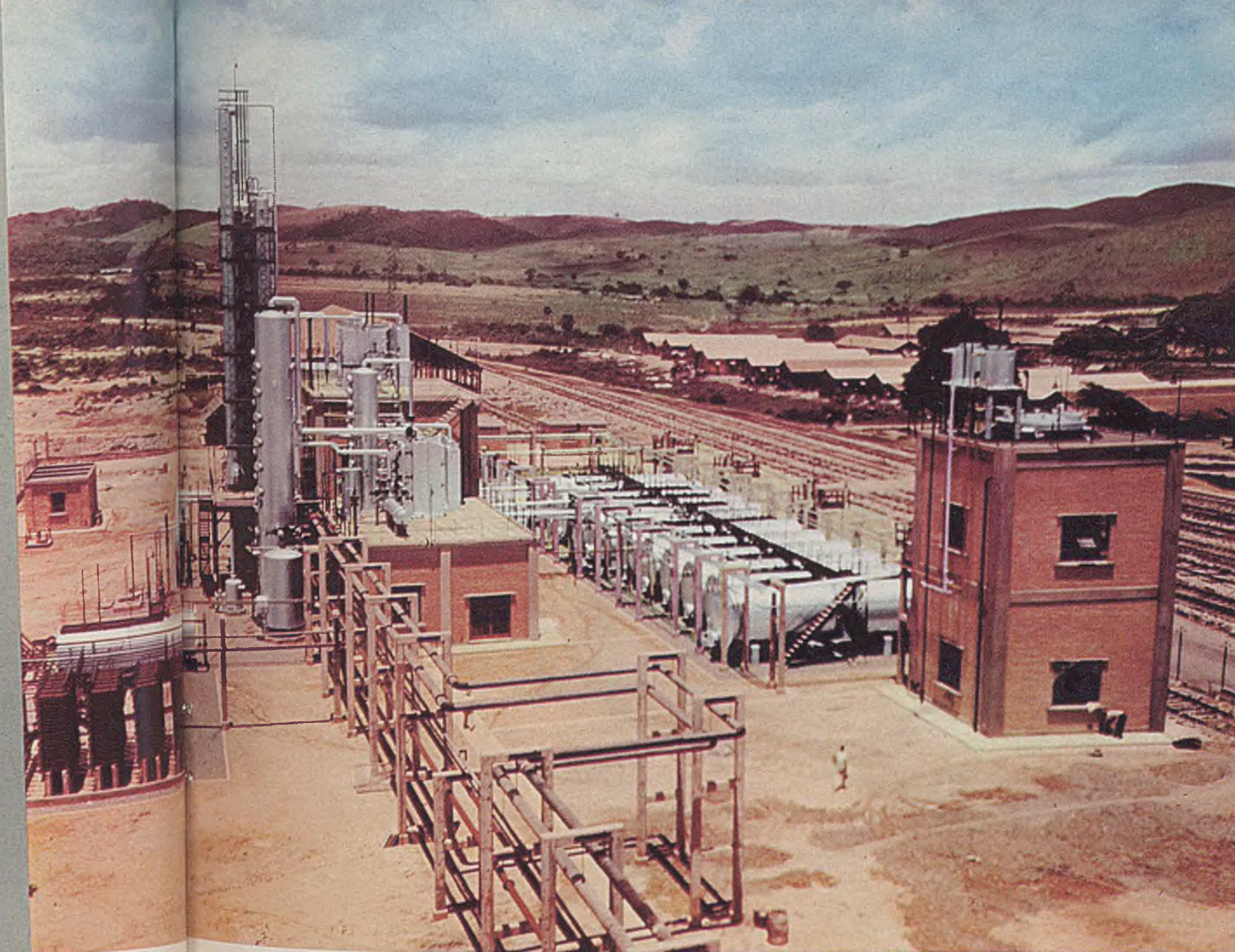
Address _____

City _____ State _____



↑ The picture above shows a view of the wash-oil still, continuous forerunnings and nitration-benzol columns and batch toluol-xylool still with kettle.

↗ This view shows the general arrangement of the wash-oil distillation and light-oil refining plant. There is wide substitution of concrete for locally scarce steel.



the first
light oil refining plant in South America
PRODUCING PURE BENZOL, TOLUOL, XYLOL AND SOLVENT NAPHTHA

leads to another

This is the first plant in South America for the recovery and refining of light oil, and, since its construction was started, Koppers has received an order for a similar plant for the Societe Anonyme du Gaz de Rio de Janeiro, where benzol was never previously recovered.

This first plant is at the Companhia Siderurgica Nacional, Volta Redonda, Brazil. It has a capacity of 5,000 gallons of light oil per day. It is designed to produce 100% pure products, and is equipped with a Koppers Continuous Automatic Wash Oil Purifier. It is now in production.

This plant, and the new one at Rio de Janeiro will go a long way toward relieving Brazil of the necessity for importing these aromatic oil products.

KOPPERS
THE INDUSTRY THAT SERVES ALL INDUSTRY

KOPPERS COMPANY, INC., Engineering & Construction Division, Koppers Building, Pittsburgh 19, Pa.

STEEL TUBING

MECHANICAL TUBING

SEAMLESS

WELDED

CARBON

ALLOY

STAINLESS

AIRCRAFT TUBING

PRESSURE TUBES

SEAMLESS-WELDED

BOILER TUBES

CONDENSER TUBES

EVAPORATOR TUBES

HEAT EXCHANGER TUBES

SEAMLESS STEEL PIPE STAINLESS STEEL PIPE

TUBULAR SERVICE CORPORATION

32 BROADWAY, NEW YORK 4, NEW YORK

1400 NIXON ST., NS., PITTSBURGH 12, PA.

2117 READING ROAD, CINCINNATI 2, OHIO

1529 N. BROADWAY, ST. LOUIS 6, MO.

1528 WASHINGTON AVE., PHILADELPHIA 46, PA.

9200 BLAINE AVE., CLEVELAND 6, OHIO

5050 JOY ROAD, DETROIT 4, MICH.

1509 4th AVENUE, N. BIRMINGHAM 3, ALA.

NEW ENGLAND SALES REPRESENTATIVE

TUBULAR SALES INCORPORATED, 137 SPRING ST., EVERETT 49, MASS. (BOSTON DISTRICT)

A Complete Tubular Service

Renewed Control Expected To Bring Price Review

OPA was ready to grant some increases when end came . . . No important changes likely in steel products immediately

RESUMPTION of price control under a modified law re-establishing Office of Price Administration is expected to bring a survey of the price situation in iron and steel. Most leading trade observers, however, look for little early change in prices of principal steel products, although an advance in pig iron fairly soon is considered probable, in view of the fact that OPA officials before eclipse of that agency June 30 had indicated willingness to grant a general increase of \$2 per ton, in view of the urgent need for stimulating production.

Scrap prices also seem in line for consideration as sellers renew appeals for higher prices and there is need for stimulating flow of this material. The latter result is expected with resumption of OPA control, terminating the period of doubt under which expectation of possible higher prices tended to cause hoarding.

Although review of steel prices was scheduled to take place within 90 days after the general advance of about \$5 per ton in February, conditions until recently were so unsettled that a sound survey of costs has been impossible. As a result trade leaders do not expect important changes until possibly after third quarter records have been reviewed.

Production has been pushed to a high point in spite of raw material shortages, but consumers still are short of tonnage. The increased flow of certified tonnage for housing and agricultural implements has snarled schedules severely, notably in sheets and other flat-rolled materials. Some producers within the past few days have announced quotas for the remainder of the year. This is done in spite of the possibility Direction 12, or something similar to it, may be extended into fourth quarter. These quotas are similar to those for third quarter, except in galvanized sheets, which are appreciably lighter. These quotas are

DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended July 27	Change	Same Week 1945	Same Week 1944
Pittsburgh	95	- 3	87.5	90.5
Chicago	80	-11	95	100
Eastern Pa.	87	+ 2	86	95
Youngstown	88	+ 1	90	95
Wheeling	93.5	+ 2	91.5	97
Cleveland	92	+ 5	90.5	96
Buffalo	88.5	None	90.5	90.5
Birmingham	99	None	95	95
New England	87	+ 2	86	90
Cincinnati	85	+ 8	96	52
St. Louis	54.5	None	70	87
Detroit	83	None	83	83
Estimated national rate	86.5	-1.5	90.5	96

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.

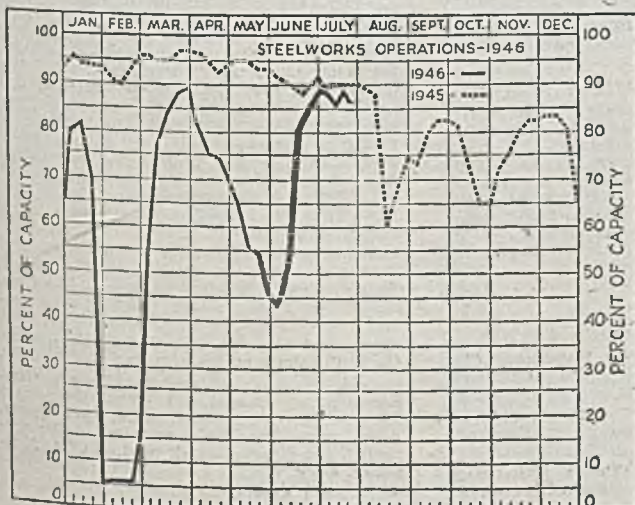
subject to later revisions, depending largely on the disposition of certified tonnage after third quarter.

The situation in scrap, with shortage occurring at the same time pig iron supply is deficient, is taking toll of steelmaking capacity, best efforts of producers being unavailing to keep all open hearths in operation even under the best planning of melts. While some small sales of lower grades of scrap may have been made occasionally above the former OPA ceilings, steelmaking grades have held the line, consumers refusing to pay higher. Some material undoubtedly is being held back by producers and dealers until the matter of price is settled but the total is not thought to be large, though its sale at this time would relieve the situation to some degree. A disquieting feature of the situation is the prospect of not being able to accumulate any inventory for winter use under the present situation.

Directives calling for rolling of approximately 70,000 tons of finished steel for export to devastated countries during September impose a heavy burden on mills which are already sold solidly for that month. The directives call for 2 per cent of the current production of any one of the products involved, to be set aside for export.

Estimated national steelmaking rate for last week declined 1½ points to 86½ per cent, mainly because of reduced operations at Chicago because of a freight car shortage and a decline at Pittsburgh where the scrap situation is having some effect. Chicago operations for the week declined 11 points to 80 per cent, Pittsburgh 3 points to 95 per cent. Wheeling advanced 12 points to 93½, Cincinnati 8 points to 85, Cleveland 5 points to 92, eastern Pennsylvania 2 points to 87, Youngstown 1 point to 88 and New England 2 points to 87. Rates were unchanged as follows: Birmingham 99, Buffalo 88½, St. Louis 54½, Detroit 83 and West Coast 84.

Average composite prices of steel and iron products are unchanged, steelmakers and pig iron producers refraining from advancing prices until the fate of OPA was definitely settled. Finished steel composite is \$64.45, semifinished steel \$40.60, steelmaking pig iron \$25.75 and steelmaking scrap \$19.17.



COMPOSITE MARKET AVERAGES

	July 27	July 20	July 13	One Month Ago June, 1946	Three Months Ago April, 1946	One Year Ago July, 1945	Five Years Ago July, 1941
Finished Steel	\$64.45	\$64.45	\$64.45	\$64.09	\$63.54	\$58.27	\$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	25.75	25.75	25.75	25.50	25.50	24.00	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

	July 27, 1946	June, 1946	Apr., 1946	July, 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.82	2.82	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	2.465	2.465	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	2.55	2.55	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	3.55	3.25	2.90
Tin plate, per base box, Pittsburgh	\$5.25	\$5.25	\$5.25	\$5.00

Pig Iron

	July 27, 1946	June, 1946	Apr., 1946	July, 1945
Bessemer del. Pittsburgh	\$27.69	\$27.69	\$27.69	\$26.19
Basic, Valley	26.00	26.00	26.00	24.50
Basic, eastern del. Philadelphia	27.93	27.84	27.84	26.34
No. 2 fdry., del. Pgh. N. & S. sides	27.19	27.19	27.19	25.69
No. 2 foundry, Chicago	26.50	26.50	26.50	25.00
Southern No. 2, Birmingham	24.88	22.88	22.88	21.38
Southern No. 2 del. Cincinnati	28.94	28.94	28.94	25.44
No. 2 fdry., del. Philadelphia	28.43	28.34	28.34	26.84
Malleable, Valley	26.50	26.50	26.50	25.00
Malleable, Chicago	26.50	26.50	26.50	25.00
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. Pittsburgh	26.69	26.69	26.69	25.19
Ferromanganese, del. Pittsburgh	140.00	140.00	140.00	140.33

Scrap

	July 27, 1946	June, 1946	Apr., 1946	July, 1945
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	20.00	20.00	20.00	20.00

Coke

	July 27, 1946	June, 1946	Apr., 1946	July, 1945
Connellsville, furnace ovens	\$8.75	\$7.50	\$7.50	\$7.50
Connellsville, foundry ovens	9.50	8.25	8.25	8.25
Chicago, by-product fdry., del.	15.10	13.75	13.75	13.35

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: Fob mill base, rerolling quality, standard analysis, \$33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrp, \$48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$39; Detroit, del., \$41; Duluth (billets), \$41; Pac. ports (billets), \$51. (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; Duluth, billets, \$49; forging billets fob Pac. ports, \$59. (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 \$60.43; eastern Mich. \$61.43.

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— $\frac{1}{2}$ in. inclusive, per 100 lb, \$2.30. Do., over $\frac{1}{2}$ — $\frac{1}{2}$ in., incl., \$2.45; Galveston, base, \$2.40 and \$2.55, respectively. Worcester add \$0.10; Pacific ports \$0.50.

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., 2.60c; eastern Mich., 2.65c; New York, del., 2.84c; Phila., del., 2.86c; Gulf ports, dock, 2.85c; Pac. ports, dock, 3.15c. (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., 3.021c. (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.....	3.326
3000.....	0.541	5100.....	0.379
3100.....	0.920	5130 or 5152 ..	0.494
3200.....	1.461	6120 or 6152 ..	1.028
		6145 or 6150 ..	1.298
3400.....	3.462	8612.....	0.703
4000.....	0.487	8720.....	0.757
4100 (1.15-25 Mo)	0.757	9830.....	1.407
(.20-.30 Mo)	0.812		

* 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., 3.725c; eastern Mich., 3.755c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c;

Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

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., 2.525c; eastern Mich., del., 2.575c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 2.985c. (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 2.60c, on hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del., 3.425c; New York, del., 3.615c; Phila., del., 3.635c; Pacific ports, 3.925c.

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, 4.60c.

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, 4.60c; 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., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.
Electrical Sheets No. 24:

	Pittsburgh	Pacific	Granite
	Base	Ports	City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c

Transformer
72 6.625c 7.375c
65 7.625c 8.375c
58 8.125c 8.875c
52 8.925c 9.675c

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (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., 3.15c; eastern Mich., del., 3.20c; 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

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, 4.30c.

Long Termes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

Manufacturing Termes (Special Cont'd): Pittsburgh, Chicago, Gary, 100-base box, \$4.55; Granite City, Birmingham, Sparrows Point, \$4.65.

Roofing Termes: Pittsburgh base per package 112 sheets, 20 x 28 in., coating I. C. 8-lb \$12.60; 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; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, 2.74c; Boston, del., 2.86c; Pacific ports, 3.05c; Gulf ports, 2.85c.
(Granite City Steel Co. may quote carbon plates 2.65c fob D.P.C. mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.80c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

Clad Steel Plates: Coatesville, 10% cladding: nickel-clad, 19.72c; 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, 3.00c; Gulf ports, 2.70c.
(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, 3.20c.

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)

Adjustments Pend

Delivered prices quoted on these pages are subject to upward revision in line with the Interstate Commerce Commission's order authorizing an increase in railroad freight rates, effective as of July 1. The order authorized a general 6 per cent increase with certain exceptions.

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 \$0.50 for Pacific ports.

†Add \$0.30 for Worcester, \$0.50 for Pacific ports. Nichols Wire & Steel may quote \$4.25.

‡Add \$0.50 for Pacific ports.

§Add \$0.10 for Worcester, \$0.70 for Pacific ports.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
1/2	53	30	1/2	21	0 1/2
3/4 & 1/2	56	37 1/2	3/4	27	7
1 1/2	60 1/2	48	1-1 1/2	31	13
1 3/4	63 1/2	52	1 1/2	35	15 1/2
1-3	65 1/2	54 1/2	2	34 1/2	15

Boiler Tubes: Net base prices per 100 feet
 cut Pittsburgh in carload lots, minimum wall,
 cut lengths 4 to 24 feet, inclusive.

Roller Tubes: Net base prices per 100 feet

fob Pittsburgh in carload lots, minimum wall,

cut lengths 4 to 24 feet, inclusive.

		Seamless—		Elec. Weld—	
		Hot Cold		Hot Cold	
O.D.	B.W.G.	Hot	Cold	Hot	Cold
1" sizes
1" sizes
1¼" sizes
1½" sizes
1¾" sizes
2" sizes
2¼" sizes
2½" sizes
3" sizes
3½" sizes
4" sizes
4½" sizes
5" sizes
6" sizes

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, 4.75c; heat treated, 5.00c. Tie plates \$51 net ton, base. Standard spikes, 3.65c.

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

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 1, 1946; discounts remain unchanged.)

		Carriage and Machine	
½ x 6 and smaller	65½ off	
Do., ¾ and ¾ x 6-in. and shorter	63½ off	
Do., ¾ to 1 x 6-in. and shorter	61 off	

1½ and larger, all lengths	.....	59 off
All diameters, over 6-in. long	.....	59 on
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.
½-in. and smaller	64
¾-in. and smaller	62
1-in.-1-in.	60
1½-in.-1-in.	59
1½-in.-1½-in.	57
1½-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, ¾-in. and larger	.....	60 off
No. 10 and smaller	.....	70 off

Rivets

Fob Pittsburgh, Cleveland, Chicago,

Birmingham

Structural	.....	3.75c
¾-inch and under	.....	65.5 off

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, 1c1 \$2.75-\$3.00 off

Stainless Steels

Base, Cents per lb

		CHROMIUM NICKEL STEELS			
		H. R.		C. R.	
		Bars	Plates	Sheets	Strip
302	.....	25.96c	29.21c	36.79c	23.93c
303	.....	28.13	31.38	38.95	29.21
304	.....	27.05	31.38	38.95	29.25
308	.....	31.38	36.79	44.36	30.84
309	.....	38.95	43.28	50.85	40.03
310	.....	53.02	56.26	57.35	52.74
312	.....	38.95	43.28	53.02	.....
*316	.....	43.28	47.61	51.94	43.28
†321	.....	31.38	36.79	44.36	31.65
†347	.....	35.71	41.12	48.69	35.71
431	.....	20.56	23.80	31.38	18.94

STRAIGHT CHROMIUM STEEL

403	.....	23.93	26.51	31.92	22.99
**409	.....	20.02	23.93	28.67	18.39
416	.....	20.56	23.80	29.21	19.75
†420	.....	25.96	30.84	36.25	25.70
430	.....	20.56	23.80	31.38	18.94
†430F	.....	21.10	24.35	31.92	20.29
440A	.....	25.96	30.84	36.25	25.70
442	.....	24.35	27.59	35.17	25.96
443	.....	24.35	27.59	35.17	25.96
446	.....	29.76	33.00	39.49	37.87
501	.....	8.66	12.98	17.04	12.98
502	.....	9.74	14.07	18.12	14.07

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	.....	9.00- 9.25
Wise county, foundry	.....	7.75- 8.25
Wise county, furnace	.....	7.25- 7.75

By-Product Foundry

Kearney, N. J. ovens	.....	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	.....	†15.18
Birmingham, delivered	.....	12.25
Indianapolis, delivered	.....	14.85
Cincinnati, delivered	.....	14.60
Cleveland, delivered	.....	14.55
Buffalo, delivered	.....	14.75
Detroit, delivered	.....	15.10
Philadelphia, delivered	.....	14.63

* Operators of hand-drawn ovens using trucked coal charge \$9.35.

†15.68 from other than Ala., Mo., Tenn.

WAREHOUSE STEEL PRICES

Base delivered price, 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	4.985
New York	4.103 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	4.553 ²¹	5.075
Jersey City	4.153 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 ¹³	5.139 ¹⁴	4.564 ²¹	5.084
Baltimore	4.093 ¹	4.05 ¹	3.865 ¹	5.543 ¹	3.84 ¹	4.293 ¹	4.193 ¹	5.365 ¹³	5.118 ¹⁴	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 ¹³	5.007 ¹⁴	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 ¹³	4.552 ¹⁴	4.877 ²¹	.....
Bethlehem, Pa.	.....	3.70 ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.	.....	3.70 ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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 ¹³	4.625 ¹⁴	4.20 ²¹	4.98
Buttalo (country)	3.50 ¹	3.55 ¹	3.55 ¹	5.15 ¹	3.475 ¹	3.85 ¹	3.75 ¹	5.10 ¹³	4.525 ¹⁴	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 ¹⁴	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	3.75 ¹	5.10 ¹³	4.525 ¹⁴	4.10 ²¹	4.60
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 ¹⁴	4.20 ²¹	4.70
Cleveland (country)	3.50 ¹	.....	3.55 ¹	.....	3.475 ¹	3.85 ¹	3.750 ¹	.....	4.525 ¹⁴	4.10 ²¹	4.60
Detroit	3.70 ¹	3.952 ¹	3.90 ¹	5.572 ¹	3.675 ¹	4.050 ¹	3.950 ¹	5.491 ¹³	4.725 ¹⁴	4.25 ²¹	4.95
Omaha (city, del.)	4.32 ¹	4.37 ¹	4.37 ¹	5.97 ¹	4.035 ¹	4.53 ¹	4.43 ¹	6.00 ¹³	5.72 ¹⁴	4.945 ²¹	.....
Omaha (country)	4.22 ¹	4.27 ¹	4.27 ¹	5.87 ¹	3.935 ¹	4.43 ¹	4.33 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 ¹³	4.271 ¹⁴	4.602 ²¹	.....
Youngstown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown, O.	.....	.....	.....	.....	3.475 ¹	3.85 ¹	3.750 ¹	5.10 ¹³	4.85 ¹⁴	.....	.....
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 ¹³	4.425 ¹⁴	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 ¹³	4.583 ¹⁴	4.358 ²¹	5.058
Indianapolis	.....	3.88 ¹	3.88 ¹	5.48 ¹	.....	4.11 ¹	4.018 ¹	5.368 ¹³	4.743 ¹⁴	4.43 ²¹	.....
St. Paul	4.092 ¹	4.142 ¹	4.142 ¹	5.742 ¹	3.817 ¹	4.292 ¹	4.192 ¹	5.668 ¹³	4.767 ¹⁴	4.852 ²¹	5.393
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 ¹³	4.593 ¹⁴	4.522 ²¹	5.223
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 ¹³	.....	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 ¹³	5.077 ¹⁴	4.99 ²¹	5.468
New Orleans (city)	4.358 ¹	4.408 ¹	4.408 ¹	6.329 ¹	4.283 ¹	4.658 ¹	4.558 ¹	5.808 ¹³	5.304 ¹⁴	5.079 ²¹	.....
Houston, Tex.	4.00 ¹	4.50 ¹	4.50 ¹	5.75 ¹	3.988 ¹	4.668 ¹	4.568 ¹	5.763 ¹³	5.19 ¹⁴	4.10 ²¹	.....
Los Angeles	4.65 ¹	4.90 ¹	5.20 ¹	7.45 ¹	5.235 ¹	5.30 ¹	5.200 ¹	6.55 ¹³	7.425 ¹⁴	6.033 ²¹	5.863
San Francisco	4.20 ¹	4.15 ¹	4.15 ¹	5.85 ¹	4.125 ¹	5.35 ¹	4.50 ¹	6.35 ¹³	6.875 ¹⁴	5.783 ²¹	7.588
Portland, Oreg.	4.70 ¹	4.70 ¹	5.00 ¹	6.75 ¹	4.875 ¹	6.65 ¹	5.000 ¹	6.20 ¹³	6.825 ¹⁴	5.983 ²¹	.....
Tacoma, Wash.	4.60 ¹	4.70 ¹	5.00 ¹	6.75 ¹	4.87 ¹	5.80 ¹	4.60 ¹	6.40 ¹³	6.85 ¹⁴	6.23 ²¹	.....
Seattle	4.60 ¹	4.70 ¹	5.00 ¹	6.75 ¹	4.87 ¹	5.80 ¹	4.60 ¹	6.40 ¹³	6.85 ¹⁴	6.23 ²¹	.....

* Basing point cities with quotations representing mill prices, plus warehouse spread; † open market price.

BASE QUANTITIES

—400 to 1999 pounds; —400 to 14,999 pounds; —any quantity;
 —800 to 1999 pounds; —400 to 8999 pounds; —300 to 9999 pounds;
 —400 to 39,999 pounds; —under 2000 pounds; —under 4000 pounds;
 —500 to 1499 pounds; —one bundle to 39,999 pounds; —150 to 2249 pounds; —150 to 1499 pounds; —three to 24 bundles. —450

to 1499 pounds; —one bundle to 1499 pounds; —one to nine bundles;
 —one to six bundles; —100 to 749 pounds; —300 to 1999 pounds;
 —1500 to 39,999 pounds; —1500 to 1999 pounds; —1000 to 39,999 pounds;
 —400 to 1499 pounds; —1000 to 1999 pounds;
 —under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base;
 —300 to 4999 pounds.

Ores

Lake Superior Iron Ore	48% 2.8:1	\$39.75
Gross ton, 51% (Natural)	48% 3:1	41.00
Lower Lake Ports	48% no ratio	31.00
Old range bessemer	44% no ratio	\$27.40
Mesabi nonbessemer	45% no ratio	28.30
High phosphorus	48% no ratio	31.00
Mesabi bessemer	50% no ratio	32.80
Old range nonbessemer	44% 2.5:1 lump	\$33.65
	48% 3:1 lump	43.50

Eastern Local Ore

Cents, units, del. E. Pa.
 Foundry and basic 58-63% contract 18.00

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% S. C., Portland, Oreg., or Tacoma, Wash. Nom.
 Spanish N. 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,

Molybdenum

Sulphide conc., lb., Mo. cont. mines \$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy contents)

Basic open-hearth Electric furnaces

	Designation	Carbon	Mn	Si	Cr	Ni	Mo	Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
NE 9413	13-18	80-110	20-35	30-50	30-60	08-15	\$0.812	16.230	1.353	\$27.050
NE 9425	23-28	80-120	20-35	30-50	30-60	08-15	.812	16.230	1.353	27.050
NE 9442	40-45	100-130	20-35	30-50	30-60	08-15	.866	17.312	1.407	28.133
NE 9722	20-25	50-80	20-35	10-25	40-70	15-25	.703	14.066	1.244	24.886
NE 9912	10-15	50-70	20-35	40-60	100-130	20-30	1.298	25.968	1.677	33.543
NE 9920	18-23	50-70	20-35	40-60	100-130	20-30	1.298	25.968	1.677	33.543

Extras are in addition to a base price of 2.921c. per pound on finished products and \$58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Prices per gross ton. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	\$27.50	\$27.00	\$28.50	\$28.00
Newark, N. J., del.	29.20	28.70	30.20	29.70
Brooklyn, N. Y., del.	30.28			30.78
Birdsboro, Pa., base	27.50	27.00	28.50	28.00
Birmingham, base	22.85-26.88	21.50-25.50	27.50	
Baltimore, del.	28.22-32.22			
Boston, del.	27.68-31.68			
Chicago, del.	26.72-30.72			
Cincinnati, del.	26.94-30.94	26.06-30.06		
Cleveland, del.	26.62-30.62	25.74-29.74		
Newark, N. J.	28.82-32.82			
Philadelphia, del.	28.05-32.05	27.55-32.55		
St. Louis, del.	26.62-30.62	27.54-31.54		
Buffalo, base	26.50	26.00	27.50	27.00
Boston, del.	28.03	27.56	29.06	28.56
Rochester, del.	28.03		29.03	28.53
Syracuse, del.	28.58		29.58	29.08
Chicago, base	26.50	26.00	27.00	26.50
Milwaukee, del.	27.60	27.10	28.10	27.60
Muskegon, Mich., del.	27.69			27.69
Cleveland, base	26.50	26.00	27.00	26.50
Akron, Canton, del.	28.04	27.54	28.54	28.04
Detroit, base	26.50	26.00	27.00	26.50
Saginaw, Mich., del.	28.81	28.31	29.31	28.81
Duluth, base	27.00	26.50	27.50	27.00
St. Paul, del.	29.13	28.63	29.63	29.13
Erie, Pa., base	26.50	26.00	27.00	26.50
Everett, Mass., base	27.50	27.00	28.00	27.50
Boston, del.	28.06	27.56	29.06	28.56
Granite City, Ill., base	26.50	26.00	27.00	26.50
St. Louis, del.	27.00	26.50	27.00	26.50
Hamilton, O., base	26.50	26.00		26.50
Cincinnati, del.	27.68	27.18		27.68
Neville Island, Pa., base	26.50	26.00	27.00	26.50
*Pittsburgh, del. N. & S. sides	27.19	26.69	27.69	27.19
Provo, Utah, base	24.50	24.00		
Sharpsville, Pa., base	26.50	26.00	27.00	26.50
Sparks Point, base	27.50	27.00		
Baltimore, del.	28.60			
Strelton, Pa., base		27.00		
Swedenland, Pa., base	27.50	27.00	28.50	28.00
Philadelphia, del.	28.43	27.93		28.93
Toledo, O., base	26.50	26.00	27.00	26.50
Youngstown, O., base	26.50	26.00	27.00	26.50
Mansfield, O., del.	28.66	28.16	29.16	28.66

*To Neville Island base add; 55 cents for McKees Rocks, Pa.; 84 cents, Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Alliquippa; 97 cents (water), Monongahela; \$1.11, Oakmont, Verona; \$1.24, Brackenridge.

Exception 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.

High Silicon, Silvery

6.00-6.50 per cent (base) ... \$32.00
6.51-7.00 ... \$33.00 9.01-9.50 ... \$38.00
7.01-7.50 ... \$40.00 9.51-10.00 ... \$39.00
7.51-8.00 ... \$35.00 10.01-10.50 ... \$40.00
8.01-8.50 ... \$36.00 10.51-11.00 ... \$41.00
8.51-9.00 ... \$37.00 11.01-11.50 ... \$42.00
Fob Jackson county, O., per gross ton; Buffalo base \$1.25 higher.
Buyer may use whichever base is more favorable.

Electric Furnace Ferroalloy: Si 14.01 to 14.50%, \$48 Jackson co.; each additional 0.50% silicon up to and including 18% add \$1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add \$1.

Bessemer Ferroalloy

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 iron 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., \$32.00 base; \$33.38, del. Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, \$29.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, \$2 a ton; for each additional 0.25% nickel, \$1 a ton.

Refractories

Per 1000, fob shipping point.
Net prices

Fire Clay Brick

Super Duty
Pa., Mo., Ky. \$76.00

High Heat Duty

Pa., Ill., O., Md., Mo., Ky. 60.40
Ala., Ga. 60.40
N. J. 65.90

Intermediate Heat Duty

Ohio 50.40
Pa., Ill., Md., Mo., Ky. 54.80
Ala., Ga. 49.15
N. J. 57.65

Low Heat Duty

Pa., Md., Ohio 42.35

Malleable Bung Brick

All bases 70.40

Ladle Brick

(Pa., O., W. Va., Mo.)
Dry Press 56.40
Wire Cut 54.15

Silica Brick

Pennsylvania 60.40
Joliet, E. Chicago 69.80
Birmingham, Ala. 60.40

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.
Bulk 22.00
Bags 28.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick 54.00
Chem. bonded chrome 54.00
Magnesite brick 76.00
Chem. bonded magnesite 65.00

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective CaF₂ content, 70% or more, \$33; 65% to 70%, \$32; 60% to 65%, \$31; less than 60%, \$30.

Ferroalloy Prices

Ferromanganese, standard: 78-82% c.i. gross ton, duty paid, \$135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer. Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); \$140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add \$6 for packed c.i., \$10 for ton, \$13.50 for less ton; \$1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., \$36; Pittsburgh, \$40.50; Chicago, \$40.60.

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 14c for hydrogen-removed metal.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.i., 79.50c, 2000 lb to c.i. 80c; central 81c and 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.

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.i. 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.i., 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.i.; central zone, add 0.4c for bulk, c.i., and 0.65c for 2000 lb to c.i.; western zone, add 0.5c for bulk, c.i., and 1.85c for 2000 lb to c.i.; 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%.

Special Foundry Ferrochrome (Cr 62-66%, C about 5-7%): Contract, lump, packed, eastern zone, freight allowed, c.i. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. 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.i. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. and 1.85c 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 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

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.

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.

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, 13.00c, central; 13.25c, 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

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.

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, \$1.84, less \$2.01, eastern; freight allowed; \$1.903 and \$2.023, central; \$1.838 and \$2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Fe 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 5 tons \$2.00, less than ton \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

Chromium-Copper: (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.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V₂O₅ and 5.84% Na₂O; or air dried, 83-85% V₂O₅ and 5.15% Na₂O, \$1.10 per lb contained V₂O₅, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

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; 18.00c, 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.

Briquets Ferromanganese: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Briquets, Ferrochrome: Containing exactly 2 lb Cr, packed, eastern zone, c.i. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 1% for c.i. and 0.5c for smaller lots; western zone, add 0.70c for c.i. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

Silicomanganese, containing exactly

2 lb Mn and about 1/4 lb Si, eastern zone, bulk, c.i. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.i. and 1c for ton lots; western, add 0.55c for c.i. and 0.20c for ton lots. Ferrosilicon, weighing about 5 lb and containing exactly 2 lb Si, or about 2 1/2 lb and containing exactly 1 lb Si, packed, eastern zone, c.i. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.i. and 0.40c for smaller lots; western zone, add 0.30c for c.i. and 0.45c for smaller lots. Prices are f.o.b. shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Ferromolybdenum: 55-75% per lb contained Mo, fob Langloeth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of \$3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.i. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.i. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.i. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.i. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Grainal: Vanadium Grainal No. 1 \$7.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.i. 12.90c; 2000 lb to c.i., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.i. 12.50c, 2000 lb to c.i., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.i. 30c, 2000 lb to c.i., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Ferrotungsten: Spot 10.00 lb or more, per lb contained W, \$1.90; contract, \$1.88; freight allowed as far west as St. Louis.

Tungsten Metal Powder: Spot, not less than 97%, \$2.50-\$2.60; 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.

High-Carbon Ferrotitanium: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Missis-

sippi river and north of Baltimore and St. Louis, 6.8% C \$142.50; 3-5% C \$157.50.

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.

Isortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 45c lb.

Ferrovandium: Va 35-55%, contract basis, per lb contained Va, fob producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Zirconium Alloys: Zr 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton \$102.50; packed \$107.50; ton lots \$108; less-ton lots \$112.50. Spot up \$5 per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up 1/4c.

Alsilur: (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 1/4c.

Siminal: (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

Monsil: 3 to 4% B, 40 to 45% Si, \$6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25

Cast Grades

(Fob Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices)

No. 1 Heavy Melt. Steel	\$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstripped Motor Blocks	17.50
Stove Plate	19.00

BOSTON:

(Fob shipping points. Boston differential 99c higher, steelmaking grades; Providence, \$1.09 higher)	
No. 1 Heavy Melt. Steel	\$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.31
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

BUFFALO:

(Delivered consumers' plant)

No. 1 Heavy Melt. Steel	\$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25

Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
No. 1 Cast	25.00
Low Phos.	21.75

PITTSBURGH:

(Delivered consumers' plant)

Railroad Heavy Melting	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	*20.00
Heavy Breakable Cast	*16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00
* Shipping point.	

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD:

(Delivered consumer's plant)

Machine Shop Turnings	\$15.00
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CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50

No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shoveling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-22.00
Scrap Rails	20.50-21.00
Stove Plate	18.50-19.00

DETROIT:

(Delivered consumer's plant)

Heavy Melting Steel	\$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

CHICAGO:

(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)

No. 1 R.R. Heavy Melt.	\$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dir. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Rolling Rails	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

ST. LOUIS:

(Delivered consumer's plant; cast grades fob shipping point)

Heavy Melting	\$17.50
No. 1 Locomotive Tires	21.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shoveling Turnings	12.50
Rolling Rails	21.00

Street Car Axles	24.50
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Cupola Cast	20.00
Charging Box Cast	19.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Gate Bars	15.25
Brake Shoes	15.25

BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	\$22.50
Structural, Plate Scrap	19.00
Scrap Rails Random	18.30
Rolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	11.00
Cast Iron Borings	13.00
Iron Car Wheels	20.00

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Dir. Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1, No. 2 Bundles	17.00
No. 3 Bundles	9.00
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut, Structural, Plate	18.00
1 ft and under	7.00
Alloy-free Turnings	14.50
Thin Bundles	21.50
No. 2 Steel Wheels	24.00
Iron, Steel Axles	20.50
No. 2 Cast Steel	18.00
Uncut Frogs, Switches	18.50
Scrap Rails	20.50
Locomotive Tires	20.50

SEATTLE:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$14.50
No. 2 Heavy Melt. Steel	14.50
Heavy Railroad Scrap	15.50
(Fob shipping point)	
No. 1 Cupola Cast	20.00

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¼c 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) 15.25c; 88-10-2 (No. 215) 18.50c; 80-10-10 (No. 305) 18.00c; No. 1 yellow (No. 405) 12.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 9.50c, select 9.60c, brass special 9.75c, intermediate 10.00c, high grade 10.50c, E. St. Louis, for carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.40c; under 2000 lb 0.50c.

Lead: Common 9.35c, chemical 9.45c, corroding, 9.45c, 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 ¼c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 12.25c; No. 12 foundry alloy (No. 2 grade) 11.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 13.50c; grade 2 (92-95%) 12.50c; grade 3 (90-92%) 11.50c; grade 4 (85-90%) 10.50c. 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, 2¼c 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, 99.49-99.49% 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, nom.; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) nom. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ¼c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, 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, \$98-\$100 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, nominal.

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.

Iridium: 99.9%, \$2.25 per troy ounce.

Silver: Open market, N. Y. 70.625 per ounce.

Platinum: \$67-\$70 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 12.50c; cut sheets 12.75c; pipe 11.75c. New York, 11.75c, Philadelphia, Baltimore, Rochester and Buffalo, 11.75c Chicago, Cleveland, Worcester and Boston.

Zinc Products: Sheet fob mill, 15.15c; 36,000 lb and over deduct 7% ribbon and strip 14.25c, 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 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chromic Acid: 9.75%, 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 ¼c 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	5.250
Phos. br., A, B, 5% ..	12.750	12.500	11.500
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 ¼c for shipment of 60,000 lb of one group and ¼c 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, 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 "ucets" 9.50c; bell metal 17.25c; babbit-line 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 7.25c, old zinc 5.75c, fob point of shipment, add ¼c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ¼c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.80c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ¼c 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 ¼% 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 per lb contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheets, Strip . . .

Preference tonnage to take 20 per cent of third quarter output, with carryover heavy to fourth quarter

Sheet & Strip Prices, Page 130

New York—Although the outlook for fourth quarter is uncertain, some sheet producers within the past week have set up quotas for that period. In at least one case, due to prospects of a substantial carryover, quotas will be lighter than for the current quarter, which in turn were down substantially from second quarter. However, even these quotas may be subject to further revision, in view of the probability that Direction 12, or something very similar to it, will be extended into fourth quarter.

Producers, even those not operating on a quarterly quota basis, have not yet opened their books for next year, although there is little question that most of their schedules will be absorbed by carryovers when the time comes. As a matter of fact, certain producers now figure they will be two or three months behind at the turn of the year.

Preferred tonnage under Direction 12 will take about 20 per cent of third quarter sheet production, it appears. This prediction was made in Washington at the time the direction was put into effect and subsequent developments seem to bear it out. Most tonnage now scheduled under this direction was originally on the mill books, but delayed in shipment because of production difficulties, principally strikes. However, a fair amount of new tonnage is said to be included, consumers getting special approval through Washington.

Pittsburgh — Tonnage of sheet and strip now on books for late fourth quarter delivery may be carried over into 1947 unless some unforeseen scheduling improvement occurs in the meantime. Distribution of flat-rolled products, possibly more than other commodities, is feeling the effects of Direction 12 to M-21, since considerable tonnage is consumed in critical shortage industries such as housing and farm implement manufacture. If government production controls are extended into fourth quarter, it is anticipated that shipments to non-essential consumers will again be delayed and schedules once more rearranged.

Cincinnati—District sheet mills are operating near capacity with resumption of some units recently down for repairs. The steelmaking rate has also been mixed although some interests are not far from exhaustion of scrap supplies. Demand for sheets and pressure for deliveries, complicated by certified tonnages, are making difficult the compiling of the fourth quarter schedules now under way. Undoubtedly there will be considerable carryover from third quarter.

Cleveland—About 20 per cent of flat-rolled steel orders on producers' books are certified and the percentage is likely to rise further by the end of the month. Orders falling under this classification are chiefly for hot-rolled and galvanized material. Some producers report that order books have been disrupted more by the CPA warehouse directive than they have been by the

certification program. Under that directive, producers must ship, after filling certified orders, to warehouses tonnages equal to those received in fourth quarter of 1945. In many instances, however, this was being done even before CPA issued its directive. Automotive and household appliance manufacturers are the chief industries from which tonnages have been diverted.

Finishing mills have increased production to around 85 to 90 per cent of capacity and a steady increase in sheet and strip output is expected, especially in light gages. Flat-rolled steel producers do not expect to attain a balance between supply and demand until at least third quarter of next year. One of the main factors exerting pressure for material is the widespread desire among manufacturers to double or triple production above prewar levels. Steel producers, obviously, are unable to satisfy demands which would be required under such expansion.

Boston—Still below expectations, hot strip deliveries to converters are lagging notably in low carbon grades; cold-rolled inventories with consumers of low carbon are depleted. Alloys and high carbon are in slightly better supply, but not balanced sufficiently to permit stability in cold-rolling schedules. Tin mill requirements have marked effect on lighter gages of strip and sheets, not only in matter of steel, but also in taking capacity on equipment which otherwise might be utilized. Electrolytic zinc-coated stock, for which there is a strong demand, is retarded, although in medium gages some orders for delivery late this year have been placed, significant in view of shortage in hot-dipped and intensified by certifications against galvanized tonnage. Substantial part of galvanized allotments is taken up by certified orders and hot-rolled pickled to less degree; other consumers will get less this quarter to the extent this volume cuts into schedules, although most priority applies against existing orders. Carry-overs in flat-rolled into next year will be heavy and no firm orders for that period are being taken, although under pressure some are held for uncertain openings well in the future.

Steel Bars . . .

Carbon bar sellers are out of the market for the year but alloy bars can be had for August delivery

Bar Prices, Page 130

New York—Hot carbon bar sellers are now out of the market for the remainder of this year on all sizes. Cold drawers are practically out on all sizes until December, but can still book tonnage before the end of the year on sizes ranging from $\frac{5}{8}$ to $3\frac{1}{2}$ inches. Hot alloy bars are available for August shipment in one or two quarters, and for September shipment where special processing is involved. Demand from forgers is improving, reflecting increasing activity in the automobile industry. However, as indicated especially by the easy delivery promises in alloy grades, this demand is still far from highly active.

Cleveland—Despite the rise of national steel ingot production, bar mills are receiving less steel than had been ex-

pected, forcing a cut in operations. While the overall steel supply in increasing, sheet, strip and other finishing mills are the beneficiaries rather than bar mills. Some bar mills in this district, for instance, operated only 9 turns last week. Delivery promises are based on substantially higher operations and, therefore, order backlogs increased. The percentage of certified and rated orders is relatively low, since most customers were able to switch orders on producers' books to obtain the necessary deliveries. The present tight supply situation is expected to continue for at least another year.

Philadelphia — As bar sellers have not opened books for first quarter substantial demand is accumulating for carbon steel, especially in small sizes. Producers generally are well behind on current commitments with the probability that when books are opened for next year most will allow for a carryover of one to two months. Hot carbon bar producers now have no tonnage available for this year in any size and sellers of cold-drawn carbon bars have little to offer before December and nothing under $\frac{5}{8}$ -inch. On the other hand alloy bar producers can offer early shipment. Until late last week certain sellers could promise August delivery.

Boston — Bessemer grade quotas for August are canceled or drastically reduced by some producers and tonnage this month is below expectations; converter-produced stock is tightening with limited scrap supply a factor. Carbon bar orders are not being taken for delivery next year on a firm basis, although under pressure some volume falls in the when-and-if category. This means little, however, until extent of carryovers is established. Forge shops are short of carbon stock, but generally balanced on alloys; most shops use both grades and frequently offer alloy tonnage as a lever for carbon, but with limited success. Cold-drawing plants have improved supplies of hot bars, substantially higher in one instance, but in small sizes there is no easing in carbon grades. There is no great switch to alloy from carbon, but a fair volume of alloy normally enters into considerable number of products as in chain, including the 2500 nickel alloy series; most of these fabricators are not too badly off for steel.

Rails, Cars . . .

Track Material Prices, Page 131

New York—Domestic freight car business has taken a spurt with award of 1750 by the Louisville & Nashville, 1000 by the Erie and 200 by the Central of Georgia.

Pacific Fruit Express Co. has been authorized by its parent companies, the Union Pacific Railroad and the Southern Pacific Co., to purchase an additional 3000 refrigerator cars for delivery before the end of 1947.

Action on subway cars for the New York City Board of Transportation appears to be indefinitely postponed because of difficulty in getting electrical equipment. Deliveries on this equipment at present are said to be more than one year off.

Boston—For the want of fastenings and track accessories railroads are revising rail laying programs and one New England carrier has canceled 1946 rail contracts.

Steel Plates . . .

Shortage of plates handicaps tank fabricators and other users, mills being booked through year

Plate Prices, Page 131

New York—Most tank fabricators are unable to promise shipments under 12 months, due mainly to difficulty in getting steel for desired schedules. Fabricators assert that the major portion of their business is from commercial sources, although there is considerable public work, notwithstanding the fact that cost exceeds appropriations in many cases. Commercial requirements represent replacements in many instances, and expansion in a number of others. Substantial demand, it is said, is coming out from manufacturers of plastics, for tanks, bins and the like. Plate requirements of tank fabricators fall mostly in gages from $\frac{1}{4}$ to $\frac{3}{4}$ inch, inclusive.

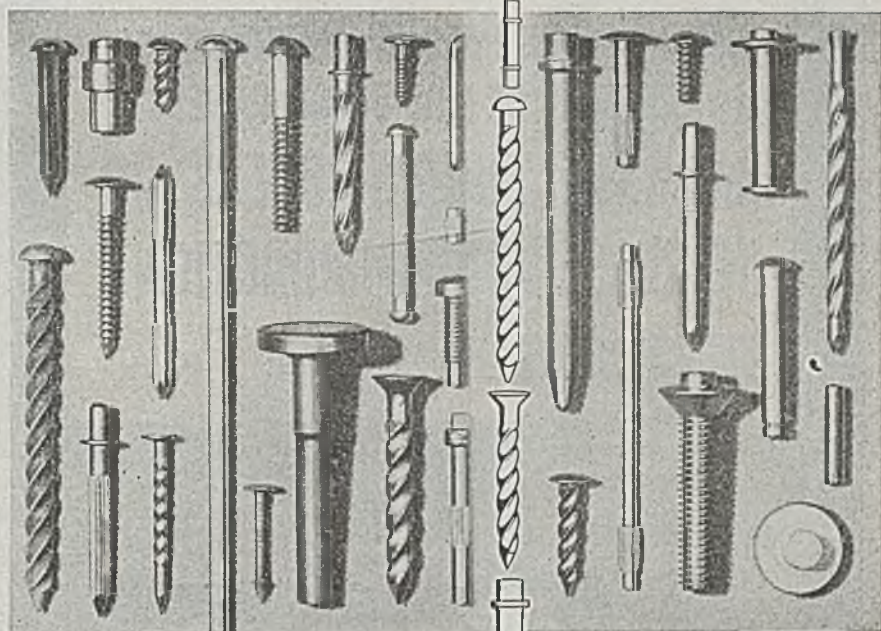
Most plate mills are booked well into first quarter of next year, and continue to move slowly in acceptance of plates ranging from $\frac{1}{8}$ to $\frac{1}{4}$ -inch. At least two producers at present are accepting no tonnage of this character.

Boston — Extent of duplicate orders, if any, is expected to show up in plates first and some foresee scattered openings in schedules by late fourth quarter. As mills are now booked through or into first quarter this seems paradoxical; any easing would have impact on premium priced tonnage, both in backlogs and new volume. Selectivity in bookings over recent months is apparent and continues. Fabricators place tonnage for carbon welding quality plates with difficulty, demand for tank steel being heavy; mills taking this volume are increasing carry-over backlogs. Delivery volume of plates against delinquent orders is improving gradually; Maine shipyard, with trawler contracts for the French, is getting plates in better volume. First launchings were delayed two months by lack of materials, including keel plates. Plate requirements for weldments are substantial and maintained, although the shortage and extended delivery situation in casting seems to have had limited effect on demand.

Philadelphia — At present district plate mills are behind anywhere from one to three or four months on current commitments, with nothing to offer in new tonnages before first quarter and even second quarter in one case. Ship requirements, backbone of plate demand during the war, are fairly negligible, but there still is good demand as a result of diversified requirements. Plate production in this district is scheduled to decline this week with one mill planning to reduce steel output to 40 per cent of capacity with resultant reduction in rolling operations and at least one other producer planning a cut, all because of pig iron and scrap scarcity. Scarcely a mill in the district is not operating hand-to-mouth, confronted by possibility of early reduction unless these raw materials take a turn for the better.

Lukens Steel Co., Coatesville, Pa., was the only bidder on 300 tons of high tensile steel for the naval gun factory, Washington, quoting December delivery.

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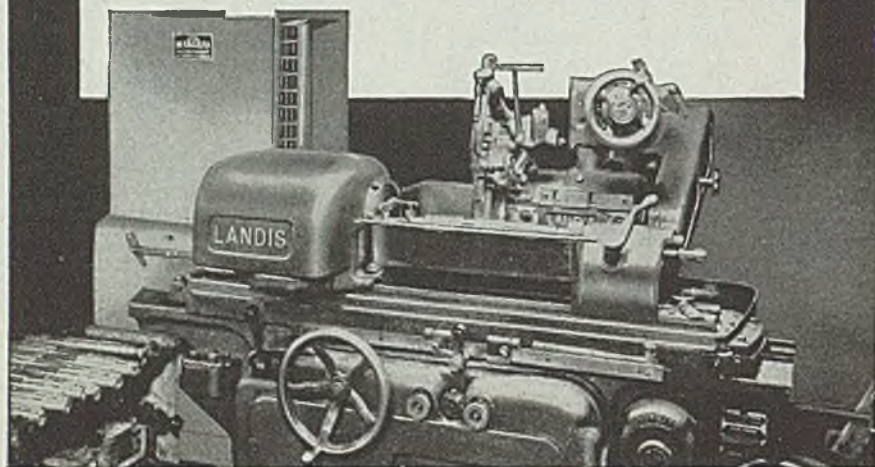
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Tubular Goods . . .

Pipe production is larger with better steel supply but deliveries are slow

Tubular Goods Prices, Page 131

New York—One leading mill has just opened books for first half of next year on casing and other oil country tubing. On merchant pipe, however, this producer and pipe sellers generally continue to quote on a monthly quota basis. Since the beginning of the year some months have been skipped entirely, as many as three months in some cases, due to labor disturbances in the steel and coal industries; however, production has now reached a point where shipments are moving at virtual capacity and some quotas are larger than they have been at any time this year. Mill shipments, nevertheless are still short of demand, with distributors' stocks unbalanced. In fact, much pipe is sold even before it arrives from the mills.

Boston—More steel is diverted to skelp for pipe mills and production is rising, although one producer only now is getting back into volume output. Stocks four-inch and under, butt-weld notably, with distributors are small and unbalanced. Wrought iron pipe backlogs, on quotas, are beyond six months with deliveries 14 to 16 weeks, substantially ahead of steel. Deliveries on smaller sizes of cast pipe, four to six-inch, stand to improve; in these sizes Direction 12 certifications are heaviest, pointing to improved pig iron supply.

Cleveland—Production of tubular products is maintaining a high rate here with most butt-weld and electric-weld and seamless mills operating at virtual capacity. Jobbers' quotas for August have not been raised, however, above the level which held during second quarter, because producers are attempting to bring shipments to other classes of customers up to schedule. Some producers are preparing for the opening, tentatively scheduled for late in fourth quarter, of 1947 books. They are asking their casing, tubing and line pipe customers to estimate their 1947 needs. This information is be supplied by Nov. 1 when producers will estimate production and will establish a formula under which all customers will receive equal treatment.

Chicago—One of the largest inquiries for cast iron in this territory in some time was issued here last week. Department of Public Works, Chicago, has asked for bids Aug. 5 on four proposals on water pipe, with centrifugally cast pipe specified. The inquiries total 10,170 net tons and include 15,000 feet of 6-inch, 150,000 feet of 8-inch, 30,000 feet of 12-inch and 10,000 feet of 16-inch.

Wire . . .

Wire Prices, Page 131

Pittsburgh—Some openings for fourth quarter business in 1/4-in gage and heavier are about the only bright spots on the wire horizon, so far as consumers are concerned. Practically all capacity for lighter carbon weights is booked solid to the end of the year, with producers hesitating to make further delivery

STEEL

commitments. Orders for alloy grades are being accepted for December. Part of the backlog jamming was caused by a gradual, but nevertheless noticeable decline in production during the past few weeks. Orders booked on an expected pre-strike capacity output could not, obviously be shipped on time when production slipped from that level, and the carry-over tonnage was simply built up to even larger proportions.

Boston—Higher production of drawn wire is hampered by limited supply of rods and integrated producers are now confronted by shortages in semifinished stemming from lack of raw materials. Most eastern wire mills, back in production after holidays they could ill afford from a production viewpoint, are raising output slowly under a maze of handicaps, including rod supply, schedule revisions, lost production, copper shortages, overdue new equipment and in many cases less production per employee. Bessemer stock has tightened further and there are more frequent substitutions for screw stock.

Some easing in pressure for most types of wire required by the automobile industry is imminent, paralleling this trend in cushion spring wire. Production of cars has not advanced to the level expected on which some wire deliveries were specified; coupled with shortages of other parts, stocks of wire to auto plants and supplies are filling some pipe lines; despite production difficulties since first of the year, wire supplies have kept better pace with disappointing car assembly than some other vital materials and components.

New York—Not only are wire users getting less tonnage than asked for, but some consumers of low carbon basic have lost usual sources of supply, result of reduced production in those grades. Increase in nail prices will not apparently lift output to estimated requirements this year and bale ties are in shorter supply. Overall wire production is disappointing, beginning with rods and filtering through the list of most products. Because of shortages in low carbon marginal grades, some fabricators are revising specifications to take higher grades in production, paying extras or higher base to obtain material. This has appeared in bed spring and other spring wire.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 131

Chicago — Lack of bars and other reinforcing material is throttling building construction. New inquiries of large size are few, but the volume of small projects is large. Competition for this business is almost nonexistent, since suppliers are unable to take care of commitments they already have. Contractors are desperate for material and delayed building projects are beginning to pile up. One midwestern contractor is reported to have purchased merchant bars, alloy bars and miscellaneous shapes to permit work to go ahead. Another is understood to have bought long mill lengths from seaboard warehouses, paid full freight to Detroit, engaged a fabricator to unload, cut and reload and added these expenses to the standard bending charges.



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Structural Shapes . . .

Mills increase output but demand is heavy in spite of CPA restrictions on general building

Structural Shape Prices, Page 131

Boston—Contracts for fabricated structural steel approximate 2000 tons in New England, in addition to several thousand tons placed by a Boston engineer-contractor for outside this district. Authorized construction includes foundations for a 14-story telephone building in Boston, \$946,000; Turner Construc-

tion Co. has this contract for eventually 16,000 tons. Authorizations for the week ending July 20 were heavier, 35 applications approved, \$3,415,946 while proposed construction amounting to \$1,197,529 was disapproved. An addition for the L. S. Starrett Co. plant at Athol, Mass., and a gas turbine and jet propulsion laboratory for Massachusetts Institute of Technology, Cambridge, \$188,992, were given favorable attention. Against heavy backlogs structural mills are rolling high volume; if held, some dent in the overall backlog may appear next quarter, although potential tonnage to be moved into openings, when they develop, is large. Procurement of stock fill-in tonnage to round out small contract requirements is increasingly difficult while de-

liveries on medium and larger size fabricated work extend well into first quarter.

Pittsburgh—As in all other commodities, supply of structural shapes is far behind demand. However, with ingot production of the leading structural producer at 103.7 per cent of theoretical capacity and district operations at 94.7 per cent, fabricators hope that more steel will find its way into structural rolling mills. For the week ending July 18, local CPA approvals on 21 new construction projects involved a total of \$284,600 including \$47,000 for repairs to Carnegie-Illinois' Clairton by-product coke works. During the same period CPA rejected 29 applications valued at \$463,025.

Philadelphia — While structural demand continues restricted as a result of CPA regulations shape mills and fabricating shops have heavy backlogs, especially considering the relatively limited amount of steel diverted to shapes. Shape mills are booked solidly through this year on basis of present prospects for obtaining steel in addition to such construction as is approved by CPA and confronted by excess demand from jobbers and exporters.

New York — Estimated fabricated steel bookings for June total 128,053 tons, compared with 165,266 tons in May. First half bookings were 964,090 tons, an increase of 29.5 per cent over the average for the same period in 1936-40. June shipments were 124,102 tons, compared with 123,975 tons in May. First half shipments were 644,478 tons against 673,079 tons in the five-year average, the American Institute of Steel Construction reports.

Birmingham—Volume of new structural inquiries has fallen off somewhat in recent weeks. This is especially noticeable in highway and bridge construction and other work not covered by CPA regulations. Fabricators, however, are heavily booked and are in need of shapes generally, although structural mill output is close to capacity and has been for several weeks.

Pig Iron . . .

Shortage continues, with prices held at OPA levels, awaiting outcome, higher prices likely soon

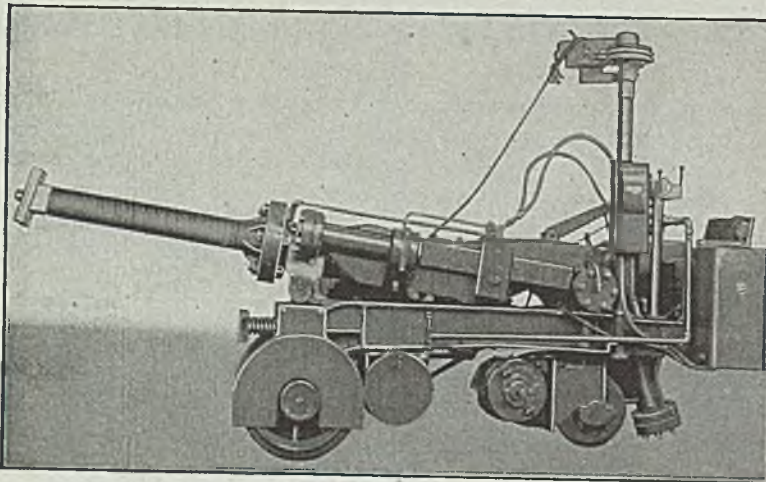
Pig Iron Prices, Page 133

New York—Question prevails as to whether the melt at district foundries this month will exceed that for June. Most foundries were down completely during the July 4 holiday week, and some were slower in resuming production than had been anticipated. Certain foundries were down for full two weeks, and some so far this month have never been above 50 per cent of operations. The major difficulty has been lack of pig iron and scrap, although the coke situation, which was an important retarding factor in June, has smoothed itself out.

Broadly, pig iron production has improved, but offsetting this in its effect on foundry melt, was the decline in inventories throughout June, which left a number of foundries with practically

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Open Hearth Auto Floor BOX CHARGER



The Brosius 4,000 pound Auto Floor Box Charger shown above is designed to handle a standard 5' 0" charging box for serving open hearth and similar melting furnaces. The load is discharged into the furnace by rotating the box.

For charging open top furnaces a stationary open end box and a moving pusher head are provided. In this design the box is not rotated, the load being pushed from the end of box by a power actuated pusher head.

Brosius Auto Floor Chargers are built in capacities of from 2,000 to 20,000 pounds.

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Designers & Manufacturers of Special Equipment for Blast Furnaces & Steel Mills

SHARPSBURG, Pittsburgh (15) PENNSYLVANIA

nothing on hand at the beginning of the current month.

Last week certified orders began to appear for August and September delivery, under the program for expediting the production of castings for housing work and agricultural equipment. In view of the fact that the priority system for these two months was decided upon so late, consumers making casting for emergency work were given until July 29 to get their requests for preference in and approved for August tonnage. They will have until Aug. 15 to get in their preference orders for September shipment.

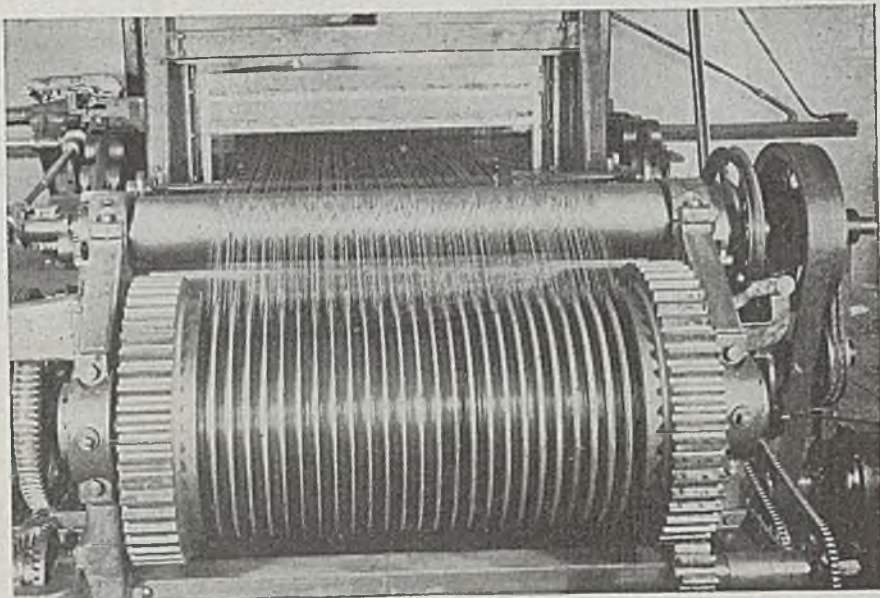
Pittsburgh—Foundries here are operating on a hand-to-mouth basis as the pig iron shortage continues unrelieved. At the same time, merchant producers are watching Washington and holding prices at OPA levels in spite of the Birmingham increase. With higher ore and fuel prices and the rise in freight rates, some action will be forthcoming as soon as OPA's fate is known.

Reflecting on the cost of fuel alone, producers here consider that good blast furnace practice requires about 1700 lb. of coke for each ton of pig iron. Since present merchant iron prices were set, beehive coke has gone up \$1.35 a ton for hand-drawn and \$1.25 for machine-drawn. By-product coke is up \$1.35. Consequently it is safe to guess that the new pig iron price increase will, in all probability, be a matter of \$1.50.

Cincinnati—Shortage of pig iron continues to restrict the district melt and shipments fail to indicate any trend toward improvement. Foundry stocks are so low that any deterioration in the situation, possible in diversion of tonnage on certified orders, may bring some shutdowns, at least temporary. Prices on southern iron, delivered at Cincinnati, continue confused.

Philadelphia—While more iron is being produced less is in the hands of consumers because of inventory depletion during recent weeks. Consequently melt in this district this month, particularly in foundry iron, is down even from June. Vacation shutdowns have played a part in this situation but suspensions at various foundries were longer than planned, because of iron and scrap scarcity and some consumers did not get back to full operations. Some foundries, with OPA not operating, paid well above the ceiling for cast iron and thus were able to increase production considerably by a large scrap use. One pipe foundry recently was using 90 per cent scrap and others 75 per cent. These consumers, however, now will be able to bring their mixtures to better balance as a result of priorities set up for August and September to expedite the housing and agricultural programs. One district furnace is switching from basic to foundry about Aug. 1. Another is expected to go in blast fairly soon, after having been down for relining several weeks, although it is expected run on basic. With resumption of OPA appeals for higher pig iron prices are to be submitted. Just before the lapse of OPA officials of that agency had indicated willingness to grant a \$2 increase, but the latter sought a greater rise, with the result nothing was done.

Chicago—On the long pull, foundries seem assured of high level operations for at least two years; for short range, materials shortages, principally pig iron,



25-COUNT 'EM—STEEL SPACING RINGS BENT BY KING!

Mummert-Dixon Company of Hanover, Pennsylvania, makes a Heavy Duty Wire Loom. The business part of it is the warp drum shown in the photo above. On the warp drum are 25 steel spacing rings and these are furnished Mummert-Dixon as rough welded flanges by King Fifth Wheel. Mummert-Dixon shrinks on the rings and accurately machines them. Here's another example of King versatility, service, engineering experience put to work for its client.

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dim prospects for full production schedules for some time. Already short when postwar castings orders started to pour in, pig iron assumed a more critical position when the steel and coal strikes occurred, and now it is being affected by the growing scrap shortage. Blast furnace output, some of which might be channeled into the merchant trade were steelmaking scrap plentiful, goes into hot metal for open hearths. Of the district's 41 blast furnaces, 36 are operating, although four suffered brief bankings last week, two because of a strike and two because of a railroad car shortage.

Buffalo—Urgent demand for pig iron continues as merchant producers report a portion of July bookings will be carried

over into August. Sellers report that New England and eastern seaboard consumers are curtailing operations because of insufficient iron. Deliveries to these consumers have been pared as sellers narrowed territories during the iron pinch. Pig iron output continues to expand with Hanna Furnace blowing in its fourth and only idle stack, giving the area 14 out of 16 active stacks. Producers report future operations depend on coke supplies. Uncertainty is prolonged over future prices. Current delivery contracts contain a retroactive clause to May 29. Higher prices are anticipated. If the OPA is not reinstated to establish prices, the industry is expected to set higher scales. Sellers say price boosts are justified in

view of heavier charges for labor, coal, coke, etc.

Boston — Most pig iron certifications are on malleable in New England, although there are some exceptions, and the total tonnage is not predominant even in the malleable branch. Effect of certifications on delivery are expected to be felt from demands in other districts, however, in attempts to minimize cross hauling and overall supply. Third quarter delivery schedules beyond July are subject to adjustments in priority tonnage and supply of iron is as tight as ever. Numerous melters, including steel works, are on the brink of exhausting raw material, although ratio of pig iron in melts has been cut to the bone. Several machine tool plants and most larger melters are low on iron. An emergency lot of southern iron will tide over one Connecticut machine tool plant probably, this foundry being threatened with forced closing with loss of molders and vital production. Some additional shipments of malleable have also reached Connecticut against July quotas and ahead of additional certified tonnage expected. Several plans have been advanced for resumption of blast by Mystic furnace, but are still held in abeyance. Domestic heating coke supply is an important hinge on which this door swings.

Birmingham—The pig iron situation gradually tightens as far as many essential users are concerned. Shipments show little improvement and some users, including foundries and cast iron pipe plants, are operating on a hand-to-mouth basis. The certification program, while helping some interests, is working a hardship on others.

Scrap . . .

Small supply causes some cuts in steelmaking but prices hold generally at OPA ceilings

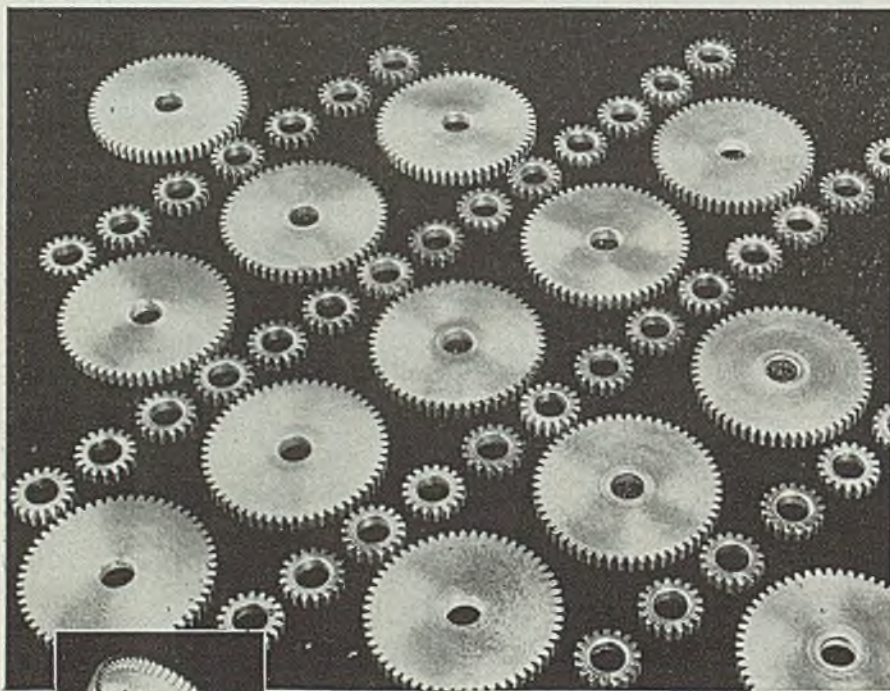
Scrap Prices, Page 134

Pittsburgh—Consumers here are getting scrap in homeopathic doses while everyone waits for a decision on OPA. Prices remain unchanged this week with all big steel interests adamant in their refusal to outbid each other for the small quantity of scrap that is moving. Observers here believe that the psychological influence of the recently-announced government scrap drive will steady the market further. It is also felt that the present high production rate in industries producing the bulk of steel scrap will ease the tightness, provided operations continue without interruption.

New York—New York City board of transportation recently sold 600 tons of rail at \$22, point of shipment and approximately 900 tons of miscellaneous steel scrap at \$16 to \$20. This was brought by Luria Bros. & Co. Meanwhile demand for melting steel and cast scrap continues heavy, with Pittsburgh district mills competing with eastern seaboard consumers for material.

Cincinnati—The situation in scrap iron and steel shows no change, unless it is in a further pinch. Mill reserves vary, some district interests working uncomfortably close to exhaustion of reserves and almost desperately seeking tonnage.

Cleveland—A desperate situation continues in scrap, melters unable to obtain



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anything like their requirements and struggling to maintain steelmaking operations on the meager supply, with larger use of pig iron. Mills are holding firmly to OPA ceilings, avoiding competing price-wise for the small supply, awaiting decision on the fate of OPA in Congress. Production of industrial scrap shows no material increase, even though general manufacturing is in better position. Foundries are unable to obtain sufficient cast scrap and with pig iron supply short some are operating at a low rate.

Buffalo—Tension gripped the scrap market as a showdown on future prices appeared near. Dealers said they were shipping against old orders at former OPA ceilings. Consumers, however, were of the opinion that some scrap was being held back in anticipation of better prices. Meanwhile, the flow of scrap is a mere trickle and the scramble for available supplies continues. Mills are making further inroads on vanishing stockpiles and the day of curtailed operations seems to be drawing near. Railroad lists were reported moving on the basis of price at time of shipment.

Boston — Cast scrap price touched as high as \$30 delivered in desperate efforts of at least one consumer to maintain production. Not only are steel and cast scrap short, but the critical supply has been further endangered by increase of scrap ratio in melts; short as scrap is, pig iron is worse with many consumers. Steel scrap prices have held officially, or on the surface, but No. 1 heavy melting has brought the low phos premium, \$16.56 or \$17.55, shipping point. For 300 tons No. 1 and No. 2 heavy melting at Portsmouth navy yard, Harcon Corp. paid \$15.36. Production of industrial scrap is below normal, and lack of equipment and automobile wrecking keeps down cast supply.

Chicago—Steel mills are rapidly reaching the bottom of the bucket as regards scrap. One plant dropped operations about 4 points last week for lack of melting material; others are virtually on a hand-to-mouth basis, maintaining operations by augmenting receipts with make-up from their scant inventories. One large mill, getting only about half of its requirements, eased its situation by transferring a good tonnage from the Pittsburgh district. Re-imposition of OPA will make former ceilings effective once more and is not likely to induce those who have held material for higher prices to release it. Sentiment is that OPA will be forced to grant some increase in prices to break the bottleneck. Mills almost universally have adhered to the policy of offering no more than ceiling prices but takers have been few. There are reports that in a few isolated cases bundles have brought \$2 or so over ceiling, but transactions are difficult to confirm and are not representative of the market.

Philadelphia — Reinstatement of OPA regulations is expected to ease the flow of scrap somewhat. However, scrap sellers will resume their appeal for higher prices, notwithstanding its rejection a few weeks ago, and until Washington expresses a further opinion there is likely to be some holdup in sales by dealers and producers. During the interim some business, particularly in cast, was done well above the former ceiling. Some pipe foundries paid as high as \$28.50 for No. 1 cupola cast. Question now is whether higher prices will hold against tonnage not shipped against these orders. Some sellers believe a period of perhaps

30 days will be granted for completion of shipments, similar to the allowance at the time OPA was instituted, for clearing up old orders. Others doubt if any time will be allowed.

Birmingham—Little scrap is moving in this district, although a fairly good sized tonnage is scattered about in dealers yards. The inclination is to hold supplies, awaiting OPA developments. Some observers believe the situation will register in steelmaking within a few days.

Warehouse . . .

Warehouse Prices, Page 132

Philadelphia—Some jobbers voice disappointment over volume of tonnage re-

ceived from mills this month, but expect a better movement under Direction 12 as the quarter advances. Some distributors say they already have fared reasonably well and that while sales may be off a little this month business is unusually good for this season of the year. Others believe their business for this month will show an appreciable drop and assert that unless there is a marked spurt in mill tonnage their August showing will be even poorer. They point out that inventories have been declining steadily for some time and that stocks have reached the point where they are decidedly unbalanced.

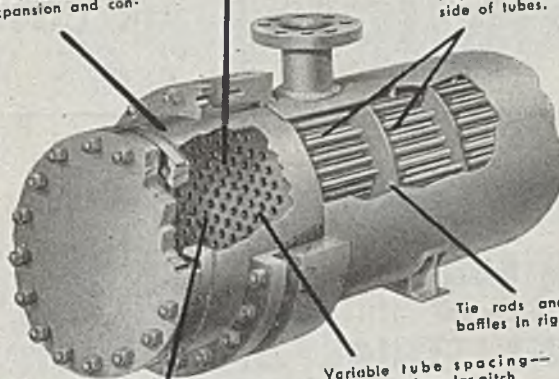
Pittsburgh — Expected third quarter general improvement in mill shipments has not materialized although warehouse

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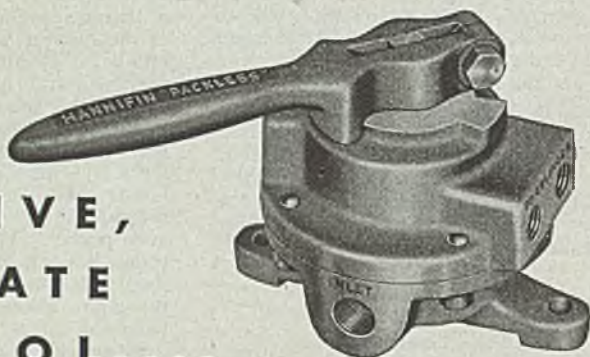
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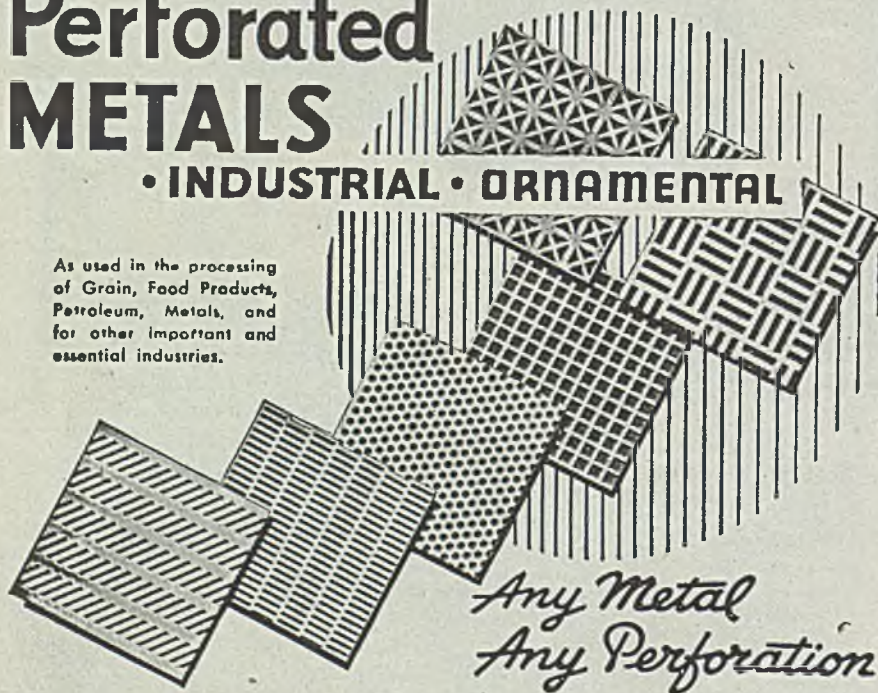
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interests here had been optimistic that they would receive more tonnage under CPA regulations. Any permanent balancing of inventories still seems remote, especially in such critical commodities as flat-rolled products and heavy structural shapes. In the past week, however, there was some slight improvement in supply of hot-rolled bars, rounds, squares and flats 1½-in. and larger, and somewhat less in plates. While inventories are short hundreds of items, one distributor reports that a great deal of material is moving in and out of his warehouse in a matter of one or two days, never appearing on the books for any length of time.

Chicago—Warehouses are still unable to meet despite the fact that for several weeks mills have been shipping in heavy volume. Explanation probably is that shipments are not well balanced as to product and specification. Warehouse inventories are badly out of balance but improve slowly. Carbon stocks are woefully low, but alloy and stainless products, cold-drawn bars and carbon steel tubing are in relatively good condition.

Nonferrous Metals . . .

Nonferrous Prices, Page 135

New York — Under the amended OPA more realistic and liberal pricing policy is expected. Although June 30 prices are restored under the new legislation profitable operations may be maintained, as the policy of new pricing and numerous directives affecting prices, including nonferrous metals, is ahead. The premium price plan goes back and high cost copper producers may return to production. Demand for copper continues heavy with shortages widespread in most consuming industries. The foreign price for copper has averaged slightly better than 16 cents fas, New York, and consumers are seeking fourth quarter tonnage.

An adjustment in brass prices will be likely should higher prices apply to zinc. An increase in the former ceiling of 8½ cents for zinc is thought probable. Need for lead production is also a factor in the likelihood of early establishment of a price of 9½ cents, although the rollback in price to 8½ cents may take place. About 11,200 tons of lead imports will be available for August delivery in addition to 25 per cent of domestic production.

Government-owned copper stocks approximate 300,000 tons, compared with 500,000 tons at the start of the year. CPA has advised the brass mill industry that if undue delays develop in supplying copper products to builders, spot assistance to that end will be put in operation. Brass mill production increased to 200 million pounds in June, the highest peacetime output, but housing requirements will absorb the increase. Domestic refined copper production totaled only 202,000 tons in the first half of this year and foreign imports were 128,000 tons, a total of 330,000 tons. Consumption was 532,000 tons, accounting for a 200,000 drain on the stockpile. Second half requirements may reach 650,000 tons, with an estimated supply of 345,000 tons. Government stocks are out of balance, heavy with fine refined and relatively light in electrolytic, the former grade not being suitable for the electrical industry.

Iron Ore . . .

Iron Ore Prices, Page 132

Consumption of Lake Superior iron ore in June totaled 4,994,936 gross tons, compared with 2,990,189 tons in May and with 6,897,091 tons in June, 1945, according to figures compiled by the Lake Superior Iron Ore Association, Cleveland. Cumulative consumption to July 1 this year was 24,242,288 tons, compared with 40,346,303 tons for the corresponding period in 1945.

Stocks of ore at furnaces and on Lake Erie docks July 1 were 26,264,914 tons, compared with 24,847,472 at the same date a year ago.

September Export Directive Is Heavy Burden on Mills

New York — Approximately 70,000 tons of finished steel will be rolled in September for war devastated countries abroad under the recent directives set up by CPA calling for 2 per cent of current production of any one of the products involved. While relatively small under normal conditions, the tonnage will impose a heavy burden on producers, inasmuch as they already are solidly booked for that month. Export tonnage not involved in these directives will be the first to give way.

This program replaces schedules originally set up early in the year but with the exception of tin plate, never applied because of labor interruptions. While present directives apply only to September, it is believed likely additional directives for subsequent months may be set up. Major items on the new program, it appears, will involve hot and cold-rolled and galvanized sheets, commercial bars, shapes, wire rods and some finished wire products and also pipe, which was not originally included in the rehabilitation program.

CPA Plans to Re-establish Bottleneck Priority Aid

Civilian Production Administration last week intimated it planned to re-establish restricted priorities assistance on steel in the breaking of acute production bottlenecks.

This assistance regulation was suspended Jan. 21 when the steel strike broke out. At that time all outstanding preference ratings for steel, including the MM military rating, the CC civilian rating for bottleneck items, and AA emergency ratings were withdrawn.

Representatives of CPA at a meeting of the Steel Industry Advisory Committee last week said that the brighter outlook for sustained, high-level steel operations justified resumption of such priorities assistance at this time.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

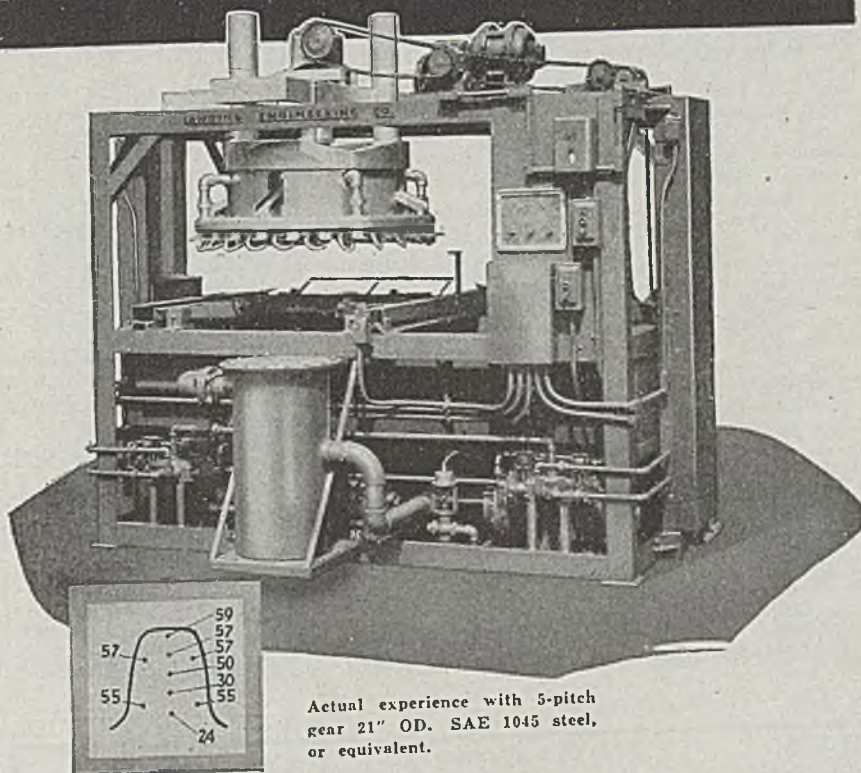
2000 tons, branch store for R. H. Macy & Co., New York, to Harris Structural Steel Co., New York.

1200 tons, plant addition for General Bronze Corp., Long Island City, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, paper mill, Pensacola, Fla., for L. Morris Mitchell, to Virginia Bridge Co., Roanoke, Va.

700 tons, laboratory for Smith, Kline & French,

Lansing GEAR TOOTH HARDENING MACHINE



Actual experience with 5-pitch gear 21" OD. SAE 1045 steel, or equivalent.

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Produces hard layer at all tooth contact points.

Preserves tough core of graduated hardness in tooth for extra shock resistance.

Does away with gear "growth" and distortion, allowing gears to be finish machined before hardening.

Operation: Gear is placed on adjustable table and pushed over hydraulic elevator which lifts gear into burner ring. At end of heat cycle, gear is lowered automatically into timed oil quench, thence to discharge chute.

Quenching oil is force circulated, strained and cooled to constant temperature. Fuel mixture supplied from Selsas gas mixing combustion controller unit passes to super heat burners through double sealed rotating gas gland. Super heat burners mounted on extensible arms connected with heat resisting flexible metal tubing.

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Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, power station, Lansing, Iowa, for Interstate Power Co., to Vierling Steel Works, Chicago.

600 tons, paper mill at Lock Haven, Pa., for New York-Pennsylvania Co., placed through J. W. Ferguson Co., Paterson, N. J., general contractor.

600 tons, woolen mill addition, Passaic, N. J., to American Bridge Co.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

500 tons, state bridge, Clearfield county, Pennsylvania, to American Bridge Co., Pittsburgh.

500 tons, plant building for National Magnesium Co., Elkton, Md., to Belmont Iron Works, Eddystone, Pa.

475 tons, two additional buildings, General Electric Co., West Lynn, Mass., to American Bridge Co., Pittsburgh.

375 tons, hangar, Northeast Airlines Inc. Logan airport, Boston, to American Bridge Co., Pittsburgh.

475 tons, 605-foot, four-span continuous deck girder bridge, Sheldon Springs, Vt., to American Bridge Co., Pittsburgh; Marson Construction Co., Cambridge, Mass., general contractor.

150 tons, bascule bridge, Oyster Harbor, Mass., to Phoenix Bridge Co., Phoenixville, Pa.; Burke-Moore Co., Boston, general contractor.

184 tons, bridge, Pacific Junction, Mills county, Iowa, for state, to Des Moines Steel Co., Des Moines; bids April 30.

180 tons, plant addition, Standard Steel Works, Burnham, Pa., at American Bridge Co., Pittsburgh.

150 tons, for Philadelphia navy yard, to American Bridge Co., Pittsburgh.

115 tons, switchyard, Spec. 1370, Earp, Calif., for Bureau of Reclamation, to Muskogee Iron Works, Muskogee, Okla.; bids July 12.

102 tons, bridge, Ida county, Iowa, for state, to Des Moines Steel Co., Des Moines; P. K. Duvall & Co., contractor; bids April 30.

STRUCTURAL STEEL PENDING

16,000 tons, 14-story, central operating building, New England Telephone & Telegraph Co., Boston; Turner Construction Co., Boston, general contractor; foundations authorized, \$946,000.

1000 tons, laboratories for Pathe Co., New York.

700 tons, reconstruction blast furnace No. 4, Gary, Ind., for Carnegie-Illinois Steel Corp.; Chicago Bridge & Iron Co., Chicago, contractor.

600 tons, manufacturing building, Cicero, Ill., for Edison General Electric Co.

600 tons, cracking plant, Joplin, Mo., for Junge Cracker Co.

600 tons, sheet piling, contract D-8, Dearborn St. subway, Chicago, for city; bids Aug. 29.

530 tons, paper mill extension, Pasadena, Tex., for Ebasco Services Inc.

400 tons, contract D-8, Dearborn St. subway, Chicago, for city; bids Aug. 29.

375 tons, foundry extension, General Electric Co., Everett, Mass.

325 tons, addition to mill building, Opelika, Ala., for Batson-Cook Co.

280 tons, factory building for Piasecki Helicopter Co., Springfield, Pa.

250 tons, plant addition for Standard Pressed Steel Co., Jenkintown, Pa.

250 tons, bridge, Clement, Pa.

154 tons, bridge, Sec. 136F-2, Cache, Alexander county, Ill., for state; bids July 26.

120 tons, state bridge, Cambria county, Pennsylvania; bids Aug. 9.

Unstated, Idaho state bridge, Clearwater river, estimated at \$1¼ million; bids soon to highway department, Boise, Idaho.

Unstated, 12-story doctors' building, Portland,

Oreg.; D. M. Drake Co., general contractor.

Unstated, six coaster gate hoists, Grand Coulee project; McKiernan-Terry Corp., Harrison, N. J., apparently low at \$125,352.

Unstated, switchyard and other utilities, Grand Coulee; Lehigh Structural Steel Co., New York, low at \$26,535.

Unstated, shapes for substations; bids in to Bonneville Administration, Portland, Oreg.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, expansion, Whiting, Ind., for Standard Oil Co. of Indiana, to Carnegie-Illinois Steel Corp., Chicago.

700 tons, Seattle, stadium, to Bethlehem Pacific Coast Steel Co., Seattle.

435 tons, diesel engine plant, Peoria, Ill., for Caterpillar Tractor Co., to Inland Steel Co.; S. N. Nielsen Co., Chicago, contractor.

275 tons, addition to state custodial school, Buckley, Wash., to Bethlehem Pacific Coast Steel Co., Seattle.

200 tons, milling plant, Huron, O., for Eastern Mill Co-operative Association, to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart Corp., Chicago, contractor.

150 tons, addition A-1 and research building, North Chicago, Ill., for Abbott Laboratories, to Joseph T. Ryerson & Son Inc., Chicago; W. E. O'Neil Construction Co., Chicago, contractor; bids June 22.

150 tons, additional award Puget Sound navy yard improvements, to Bethlehem Pacific Coast Steel Co., Seattle.

140 tons, Shorn Paint Co. plant, Seattle, to Bethlehem Pacific Coast Steel Co., Seattle.

100 tons, addition to Securities Bldg., Seattle to Northwest Steel Rolling Mills, Seattle.

REINFORCING BARS PENDING

2600 tons, contract D-8, Dearborn St. subway, Chicago, for city; bids Aug. 29.

885 tons, tunnel, Champaign, Ill., for University of Illinois; bids Aug. 3.

650 tons, water filtration plant, Hammond, Ind., for city; bids Aug. 1.

300 tons, station and underground garage for Standard Oil Co., Seattle; Sound Construction & Engineering Co., Seattle, general contractor.

180 tons, highway and bridge, route 25, section 1B, Mercer county, New Jersey; bids Aug. 7, Spencer Miller Jr., state highway commissioner, Trenton.

Unstated, additions to state reformatory, Monroe, Wash., \$500,000 project; bids to Olympia soon.

Unstated, Empire laundry plant, Seattle; Aurora Construction Co., Seattle, general contractor.

Unstated, doctors' building, Portland, 12 stories; D. M. Drake Co., general contractor; John Reiff, engineer.

PLATES . . .

PLATES PLACED

2100 tons, surge gates and risers, Ft. Peck dam, Ft. Peck, Mont., for U. S. Bureau of Reclamation, to Chicago Bridge & Iron Co., Chicago; Fegles Construction Co., Minneapolis, contractor; bids June 3.

PLATES PENDING

5600 tons, including 2600 tons bench mined liner plates and 3000 tons shield mined liner plates, contract D-8, Dearborn St. subway, Chicago, for city; bids Aug. 29.

2595 tons, penstocks, Bull Shoals dam, Arkansas, for U. S. Engineer; White River Constructors, Houston, Tex., low on general contract; bids July 11.

PIPE . . .

CAST IRON PIPE PENDING

5730 tons, 10,000 feet of 16-inch centrifugally cast water pipe, Proposal 98-46, for Depart-

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VARIOUS WIDTHS
OF FACE AND
COIL WEIGHTS

PAXSON MACHINE CO.
SALEM, OHIO

ment of Public Works, Chicago; bids Aug. 5.
1480 tons, centrifugally cast water pipe, Proposal 89-46, including 5000 feet of 6-inch, 50,000 feet of 8-inch and 10,000 feet of 12-inch, for Department of Public Works, Chicago; bids Aug. 5.

1480 tons, centrifugally cast water pipe, Proposal 90-46, including 5000 feet of 6-inch, 50,000 feet of 8-inch and 10,000 feet of 12-inch, for Department of Public Works, Chicago; bids Aug. 5.

1480 tons, centrifugally cast water pipe, Proposal 91-46, including 5000 feet of 6-inch, 50,000 feet of 8-inch and 10,000 feet of 12-inch, for Department of Public Works, Chicago; bids Aug. 5.

1100 tons, various sizes, water system improvement; Fred J. Early Co., San Francisco, apparently low for general contract.

Unstated, 15,000 feet for 1947 delivery to Pasco, Wash.; bids soon.

Unstated, 18,000 feet, 2 to 6-inch for Annapolis, Wash.; bids to Parker & Hill, engineers, Seattle, Aug. 6.

Unstated, 11,000 feet, 4 to 8-inch and fittings; bids to A. W. Hays, clerk, Othello, Wash., Aug. 2.

STEEL PIPE PENDING

5500 tons, 9600 feet, 12 discharge pipes, Columbia Basin project, Western Pipe & Steel Co., San Francisco, low at \$1,208,000.

Unstated tonnage, steel pipe for Jordan Narrows siphon and pump plant penstock, discharge pipe, Bureau of Reclamation, Provo river project, Western Pipe & Steel Co., Los Angeles, low at \$113,670 f.o.b. shipping point, spec. 1363.

Unstated, 60-inch steel discharge pipes, Pasco, Wash., Pacific Coast Engineering Co., Alameda, Cal., low at \$46,000.

Unstated, 37,500 feet, 36-inch gravity water pipe for Olympia, Wash.; bids Aug. 20.

Unstated, 18-inch pipe, Columbia Basin project, American Pipe & Steel Co., Alhambra, Calif., low at \$2,465.

Unstated, 23,520 feet 14-inch, 8-gage, welded steel pipe; bids in to U. S. engineer, Portland, Oreg.

RAILS, CARS . . .

RAILROAD CARS PLACED

Central of Georgia, 200 fifty-ton pulp wood cars, to Pullman-Standard Car Mfg. Co., Chicago.

Erie, 500 fifty-ton box cars to American Car & Foundry Co., New York; 300 fifty-ton hoppers, to Greenville Steel Car Co., Greenville, Pa.; 200 seventy-ton gondolas, to Bethlehem Steel Co., Bethlehem, Pa.

Louisville & Nashville, 750 hoppers to American Car & Foundry Co., New York; 1000 box cars to Pressed Steel Car Co., Pittsburgh; these are in addition to 1250 hoppers recently placed with Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Delaware, Lackawanna & Western, 19 coaches, comprising 15 passenger cars, 2 dining cars and 2 tavern-lounge cars; bids July 29.

Pacific Fruit Express, 3000 refrigerator cars; purchase authorized by Union Pacific and Southern Pacific, joint owners; in addition to 2000 similar cars purchased in January.

LOCOMOTIVES PLACED

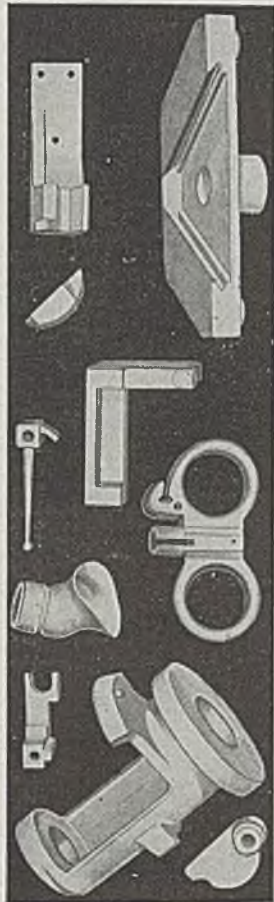
Chilean State Railways, 12 steam locomotives to Baldwin Locomotive Co., Philadelphia.

Erie, 20 diesel switch engines, 16 to American Locomotive Co., New York, and four to Baldwin Locomotive Co., Philadelphia.

Finnish State Railways, 10 steam locomotives to Baldwin Locomotive Works, Philadelphia.

Utah Copper Co., seven 3000-horsepower electric locomotives, to General Electric Co., Schenectady, N. Y.

Western Maryland, two diesel switch engines, to Baldwin Locomotive Works, Philadelphia.



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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

BERKELEY, CALIF.—Trailmobile, Gilman and Seventh Sts., has let contract to Maxwell Read, 939 33rd St., Oakland, Calif., for a one-story plant building, to cost about \$140,000. R. H. Cooley, 939 33rd St., Oakland, is engineer.

BURBANK, CALIF.—Pacific Airmotive Corp. has let contract to Buttress & McClellan, 1013 East Eighth St., Los Angeles, for a one-story airplane maintenance building at Winona Way and Hollywood Way, covering 112,000 square feet, equipped with three and five-ton cranes. Jack McDonald, 1018 East Eighth St., Los Angeles, is architect.

INGLEWOOD, CALIF.—Charles O. Earl, 1016 North Market St., is building a steel tool manufacturing plant at 601 West Beach St., covering 4800 square feet, to cost about \$10,000.

LOS ANGELES—General Motors Corp., 7800 Van Nuys Blvd., has building permit for concrete oil tanks and pumping plant, to cost about \$30,000.

LOS ANGELES—U. S. Electrical Motors, 200 East Slauson Ave., has building permit for storage building 30 x 120 feet, to cost \$19,000, at 5857 Los Angeles St.

LOS ANGELES—California Metal Enameling Co., Vernon, Calif., has building permit for a plant covering 45,000 square feet, costing about \$135,000, at 6650 East Slauson Ave., Bell Gardens, Los Angeles.

LOS ANGELES—Pacific Metal Products Co. has building permit for a warehouse building at 3005 Marguerite St., 50 x 100 feet, to cost \$18,900.

LOS ANGELES—General Machine Works,

3017 San Fernando Rd., has building permit for a machine shop addition 47 x 50 feet, to cost about \$14,000.

OAKLAND, CALIF.—American Can Co., 230 Park Ave., New York, has let contract to Larsen & Larsen, 629 Bryant St., San Francisco, for a plant addition to cost about \$100,000.

VERNON, CALIF.—Chase Steel & Supply Co., 2113 East Eighth St., has CPA approval for a reinforced concrete warehouse building, 60 x 120 feet, to cost about \$25,000, at 2113 East Eighth St.

ILLINOIS

CHICAGO—Sampson Electric Co., 3201 South Michigan Ave., will let contract soon for a one-story plant building. A. Epstein, 2001 West Pershing Rd., is engineer.

MONSANTO, ILL.—Monsanto Chemical Co., 1700 South Second St., St. Louis, plans remodeling and additions to former government chemical warfare plant at estimated cost of \$1 million.

INDIANA

ORLEANS, IND.—L. Shortridge, clerk of town trustees, has called for bids July 31 for a water treatment plant, including two 200 gpm high service and one 250 gpm low service pumps, with piping, filters and earth dam, to cost about \$70,000. Martin L. Burden & Associates, Alexandria, Ind., are consulting engineers.

IOWA

DAVENPORT, IOWA—Swan Engineering & Machine Co., 105 Brady St., Chicago, H. D. Bloch, president, has let contract to Priester

Construction Co., Davenport Bank Bldg., for a one-story 60 x 200-foot plant building and 50 x 75-foot office building, estimated to cost about \$100,000, with equipment.

DUBUQUE, IOWA—McDonald Mfg. Co., Pine and Twelfth Sts., will let contract soon for a plant building to cost about \$125,000. E. O. Sessions & Co., 1 North LaSalle St., Chicago, are engineers.

MASSACHUSETTS

CAMBRIDGE, MASS.—Harvard University has let contract to McCreery & Theriault, 126 Newbury St., Boston, for a two-story 50 x 100-foot cyclotron building and laboratory, estimated to cost \$250,000.

MICHIGAN

DETROIT—Rausch Industries Inc., 423 Ford Bldg., has been incorporated with \$100,000 capital and 125,000 shares no par value to manufacture machinery, by Ray R. Rausch, 2346 Penobscot Bldg.

DETROIT—Centri-Spray Corp., 14290 Meyers Rd., has been incorporated with \$100,000 capital to manufacture appliances, instruments and machines, by Albert J. Schimpke, 28050 Golden Gate Drive, RFD No. 3, Birmingham, Mich.

DETROIT—Hancock Tool & Die Corp., 17005 Fullerton Ave., has been incorporated with \$250,000 capital to manufacture tools, dies and jigs, by Arthur M. Jorgenson, 1210 West Maple Rd., Adrian, Mich.

DETROIT—Lemay Tool & Engineering Corp., 10319 East Warren Ave., has been incorporated with \$50,000 capital to manufacture tools, dies and fixtures, by E. Henry Sward, 1010 Kensington Rd., Grosse Pointe, Mich.

DETROIT—Suburban Tool & Mfg. Co., 554 Jefferson Court, has been incorporated with \$50,000 capital to manufacture tools and dies, by Tony Misuraca, 5327 Chalmers Ave.

MUSKEGON, MICH.—Melrotor Industries Inc., 206 Landreth Bldg., has been incorporated with \$100,000 capital to manufacture machinery, tools and appliances, by Adolph E. Melrose, 2139 Kinsey St.

VAN DYKE, MICH.—Micro Plating Co., 4965 East Nine Mile Rd., has been incorporated with \$150,000 capital to manufacture and plate metal articles, by Thomas A. Doench, 118 West Arizona St., Detroit.

WHITE PIGEON, MICH.—Process Metals Co., First Commercial Savings Bank of Constantine, has been incorporated with 8000 shares no par value to manufacture castings, by LaBour Co. Inc., 1605 Sterling Ave., Elkhart, Ind.

OHIO

AKRON, O.—Fair Mfg. Co. has been incorporated by Edgar L. Fair, 2676 Hawthorne Rd., and associates, to manufacture metal appliances and tools. Guy M. Showalter, March Bldg., Kent, O., is statutory agent.

BEDFORD, O.—Torq Electric Co., 34 Interstate Rd., J. E. Greenhut, manager, plans a two-story plant addition to cost about \$60,000. F. W. Mettler, 4004 Bluestone Rd., is engineer.

CANTON, O.—War Assets Administration has authorized sale of the plant formerly operated by the Dayton Malleable Iron Co., at \$200,000, to Babcock Printing Press Corp., New London, Conn.

CLEVELAND—Co-Operative Steel Treating Co. has been incorporated with \$25,000 capital and has leased former powerhouse of American Shipbuilding Co. on the lake front in which to do sandblasting and heat treating. Charles Vejvoda, 2907 East 118th St., is vice president.

CLEVELAND—Buel Metals Co. has been incorporated with \$100,000 capital to manufacture and fabricate metals and alloys, by James J. Laughlin Jr., Union Commerce Bldg.

CLEVELAND—Doan Plating Corp., William V.

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$$17\frac{1}{16} \times 16 \frac{19}{128} = \frac{273}{16} \times \frac{2048}{128} = 275.5327$$

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CLEVELAND, OHIO

White, president, has established its business at 1640 Doan Ave. to do plating work of all kinds.

CLEVELAND—National Advisory Committee for Aeronautics, Cleveland Municipal Airport, has let contract to Hunkin-Conkey Construction Co., 1740 East Twelfth St., for a one-story 89 x 100-foot four-burner test cell addition, to cost about \$165,000.

CLEVELAND—Midland Steel Products Co., 10600 Madison Ave., has let contract to Sam W. Emerson Co., 1836 Euclid Ave., for additions 80 x 350 feet and 60 x 450 feet, to cost about \$100,000. A. E. Rowe, 1900 Euclid Ave., is engineer.

CLEVELAND—Dec-Art Corp. has been incorporated by M. L. Jordan, of Jordan Specialty Mfg. Corp., 680 Broadway, to manufacture tubular furniture. Temporary location is at Scovill Ave. and East 28th St.

CLEVELAND—War Assets Administration has offered for sale the plant at 3695 East 78th St., formerly operated by the Champion Machine & Forging Co.; consists of five buildings with 117,000 square feet floor space.

CLEVELAND—Master Chrome Service Inc., 2709 German Ave., has been bought by a group headed by Simon J. Green, attorney, Hippodrome Bldg., with W. R. Fleck elected president.

CLEVELAND—Star Welding Co., 1104 East 134th St., plans a plant and office building to cost about \$60,000.

COLUMBIANA, O.—National Rubber Machinery Co. has started plant expansion, which will include welding shop, blacksmith shop and tin shop. An addition 40 x 309 feet will be constructed.

EAST PALESTINE, O.—L. W. Nash Co. has been incorporated to manufacture rolling mill and metalworking equipment and metal and aluminum products, by Henry L. Reese, 300 East State St., Salem, O.

GNADENHUTTEN, O.—Tusco Mfg. Co. has been formed by a group of Akron citizens and will occupy the \$15,000 plant being built by the local Boosters Club, D. V. Kennedy president. Building is 120 x 150 feet with wing 15 x 75 feet and will be used for manufacture of aluminum storm windows.

HARTVILLE, O.—Cleveland Tapping Machine Co., 3610 Superior Ave., Cleveland, W. R. Harrison, president, has bought six-acre site for erection of 100 x 100-foot plant for manufacture of automatic screw tapping machines and combination drilling and tapping machines.

JEFFERSON, O.—Perma-Brite Stainless Aluminum Corp. will occupy a new 80 x 200-foot plant costing over \$20,000 now being built by Lawrence Tavonne on Maple Ave., for manufacture of aluminum kitchen utensils.

MANSFIELD, O.—Shafer Valve Co. Inc. has been incorporated with \$200,000 capital to manufacture valves, controls and fittings, by H. J. Shafer, 577 Brae Burn St.

NILES, O.—Tripoli Equipment Co. Inc. has been incorporated to manufacture hydraulic hoisting equipment by Anthony J. and Louis J. Tripody, 915 North Main St.

SANDUSKY, O.—Bechtel-McLaughlin Inc. has been incorporated to manufacture, fabricate, polish and buff metal specialties and hardware, by R. W. Bechtel, of Bechtel-Higgs Ltd.

TOLEDO, O.—National Supply Co., Bishop St., L. A. Ringman, manager, has let contract to A. Bentley & Sons Co., 201 Belmont St., for a one-story 57 x 125 x 390-foot plant addition, 34 feet high, and office building 30 x 240 feet, estimated to cost about \$1 million.

TOLEDO, O.—Packard Motor Co., A. Nutt, manager, is having plans prepared by Gillett & Richards, 518 Jefferson St., for a super-sonic airflow laboratory, to cost about \$1 million.

WILLOUGHBY, O.—Willoughby Machine & Tool Co., H. Rogant, manager, has filed application with CPA for permission to build a \$100,000 plant at Church and Elm Sts.

for manufacture of gas conversion burners, space heaters, etc.

YOUNGSTOWN—Truscon Steel Co., P. Robertson, manager, is having plans prepared for a 60 x 200-foot addition to house hardware presses.

PENNSYLVANIA

ELLWOOD CITY, PA.—Manufacturers' Light & Heat Co. has let contract to J. F. Pritchard & Co., Fidelity Bldg., Kansas City, Mo., for a propane-air plant, including 16 propane storage tanks of 30,000 gallons capacity each, in Franklin Twp.

McKEES ROCKS, PA.—Federal Enameling & Stamping Co., McKees Rocks, has let contract to Brookside Lumber Co., Pittsburgh, for a five-story plant addition 100 x 185 feet, estimated to cost about \$100,000.

SHARON, PA.—Westinghouse Electric Corp., Maloney Bldg., Pittsburgh, plans erection of 40 x 418-foot transformer factory, to cost about \$200,000. L. C. Mechling, Maloney Bldg., is engineer.

TEXAS

BEAUMONT, TEX.—General Electric Co., Beaumont, has let contract to O. W. Collins, Port Arthur, Tex., for a shop building 100 x 120 feet. W. B. Livesay, San Jacinto Life Bldg., is architect.

ROBSTOWN, TEX.—South Texas Electric Co-operative, C. M. Wagner, manager, Nueces Electric Co-operative, Robstown, plans an electric generating plant to cost about \$2-225,000.

HOUSTON, TEX.—Mosher Steel Co., 3910 Washington St., is having plans prepared for a plant addition to cost about \$65,000.

ORANGE, TEX.—Consolidated Steel Co. of Texas has plans under way with CPA approval for two crane runways and extension to structural steel fabricating building, to cost about \$350,000.

WASHINGTON

ANNAPOLIS, WASH.—Local water district will open bids Aug. 6 for 18,000 feet of 2, 4 and 6-inch cast iron water pipe with fittings and accessories. Parker & Hill, Seattle, are engineers.

BELLINGHAM, WASH.—Puget Sound Pulp & Timber Co., Bellingham, has let contract to Howard S. Wright Co., 407 Yale Ave. N., Seattle, for a paperboard plant to cost about \$500,000.

OLYMPIA, WASH.—City will receive bids Aug. 20 for 37,500 feet of 36-inch steel gravity supply pipe. J. W. Carey, Seattle, is engineer.

WEST VIRGINIA

HUNTINGTON, W. VA.—Pure Oil Co., L. A. Hill, manager, plans a terminal plant, with pier, warehouse and gasoline storage facilities, to cost about \$200,000.

TRIADAPLHIA, W. VA.—Valley Camp Coal Co., Triadelphia, plans a four-story steel frame coal cleaning plant and tippie, estimated to cost about \$250,000. McNally Pittsburgh Co., 1017 Bessemer Bldg., Pittsburgh, is engineer.

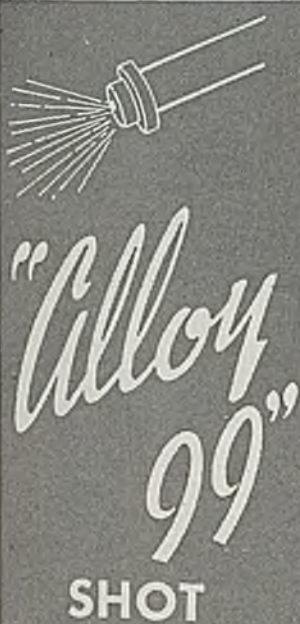
WISCONSIN

BELOIT, WIS.—Beloit Iron Works, 815 Second St., plans a one-story addition 130 x 190 feet, to cost about \$200,000.

NIAGARA, WIS.—Kimberley-Clark Corp., 128 North Commercial St., Neenah, Wis., has let contract to Fluor Bros. Construction Co., Oshkosh, Wis., for a three-story 90 x 450-foot machine shop.

RHINELANDER, WIS.—Daniels Mfg. Co. plans a 200 x 200-foot plant addition and remodeling of present plant, A. F. Billmeyer & Son, Wisconsin Rapids, Wis., are architects and L. A. DeGuere, Wisconsin Rapids, is engineer.

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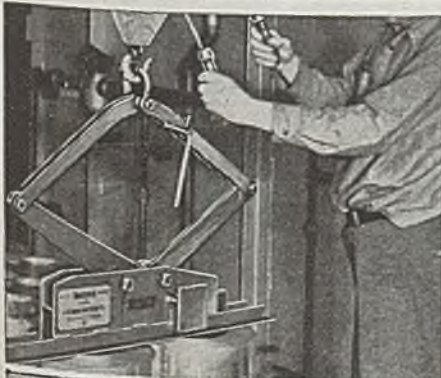
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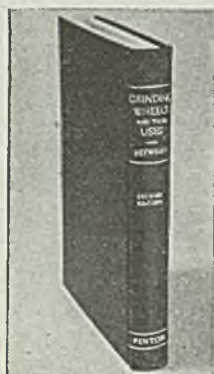

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 Surface Qualities and Finishes
 Selecting the Right Wheel For the Job
 Wheel Shapes and Sizes
 Truing, Dressing and Balancing
 Use of Grinding Fluids
 Tool and Cutter Sharpening
 Sharpening Cemented Carbide Tools
 Cylindrical Grinding
 Grinding Cams and Other Out-of-Round Surfaces
 Roll Grinding
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 Standard Grinding Wheel Markings
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