

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief
E. C. KREUTZBERG
Editor
A. J. HAIN
Managing Editor
G. W. BIRDSALL
Engineering Editor
J. D. KNOX
Steel Plant Editor
GUY HUBBARD
Machine Tool Editor
D. S. CADOT
Art Editor

ASSOCIATE EDITORS

G. H. MANLOVE W. J. CAMPBELL
 New York
 HAROLD A. KNIGHT
W. G. GUDE B. K. PRICE
 L. E. BROWNE
Pittsburgh *Chicago*
R. L. HARTFORD E. F. ROSS
Detroit *Washington*
A. H. ALLEN L. M. LAMM
 London
 VINCENT DELPORT

ASSISTANT EDITORS

GEORGE URBAN JAY DEEULIS
J. C. SULLIVAN LA VERNE NOCK
 New York
 JOHN H. CALDWELL

BUSINESS STAFF

G. O. HAYS
Business Manager
C. H. BAILEY
Advertising Service
New York E. W. KREUTZBERG
 B. C. SNELL
Pittsburgh S. H. JASPER
Chicago L. C. PELOTT
Cleveland R. C. JAEKNE
 D. C. KIEFER

J. W. ZUBER
Circulation Manager

MAIN OFFICE

Penton Building, Cleveland

BRANCH OFFICES

New York 110 East 42nd St.
Chicago 520 North Michigan Ave.
Pittsburgh Koppers Building
Detroit 6560 Cass Ave.
Washington National Press Building
Cincinnati 1734 Carew Tower
San Francisco 1100 Norwood Ave.
Oakland, Calif. Tel. Glencourt 7559
London Caxton House
 Westminster, S.W. 1

Published by THE PENTON PUBLISHING CO.,
Penton Building, Cleveland, Ohio. E. L. SHANER,
President and Treasurer; G. O. HAYS, Vice
President; F. G. STEINBEACH, Secretary.

Member, Audit Bureau of Circulations; Asso-
ciated Business Papers Inc., and National Pub-
lishers' Association.

Published every Monday. Subscription in the
United States, Cuba, Mexico and Canada, one
year \$4, two years \$8; European and foreign
countries, one year \$10. Single copies (current
issues) 25c.

Entered as second class matter at the postoffice
at Cleveland, under the Act of March 3, 1879
Copyright 1940 by the Penton Publishing Co



STEEL

ESTABLISHED 1882

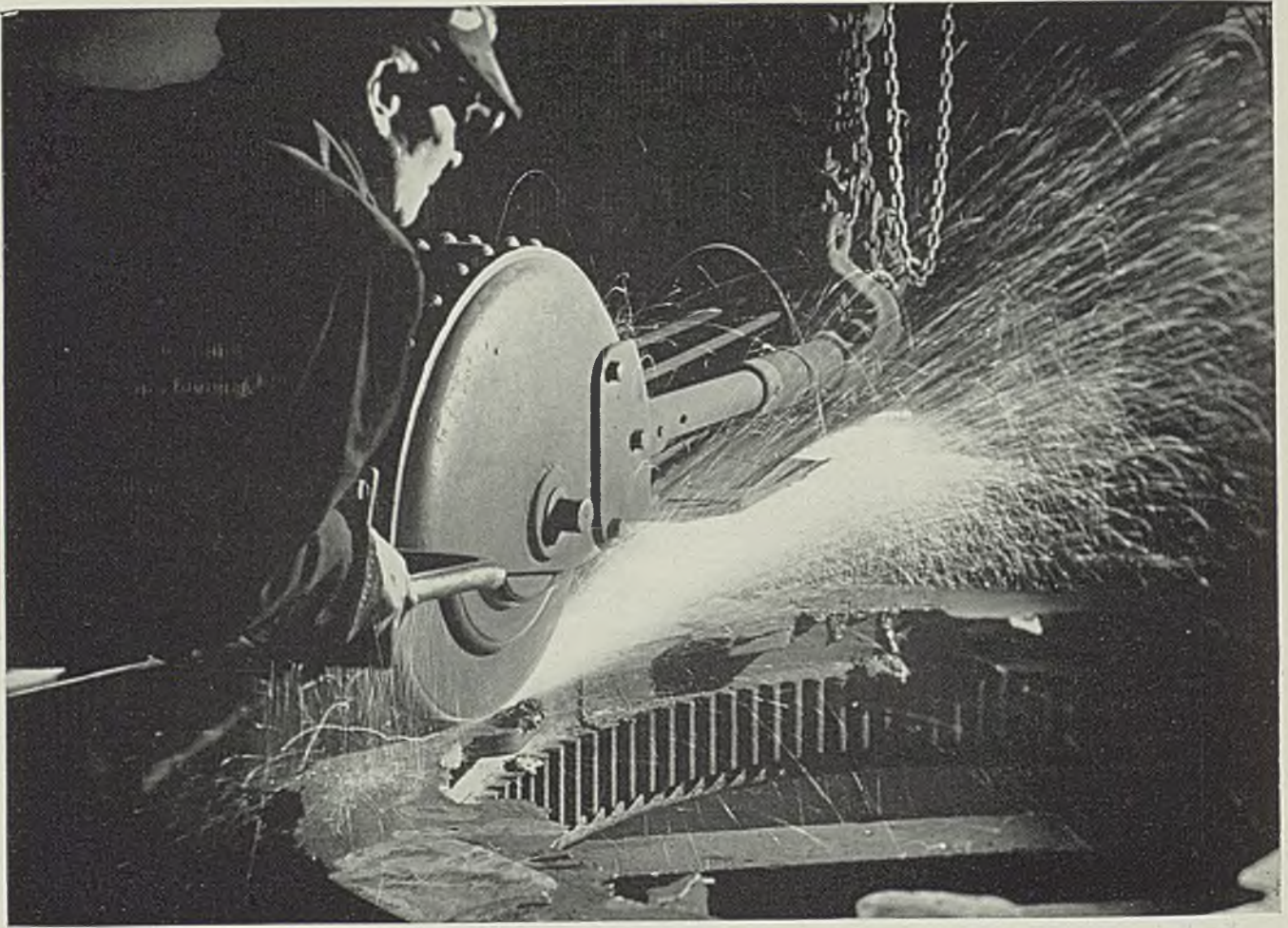
Contents



Volume 107—No. 27

December 30, 1940

READER COMMENTS	4
HIGHLIGHTING THIS ISSUE	11
NEWS	
2200 Low-Cost Family Units Have Steel Frames	13
Heavy Appropriations Outstanding in Record of 76th Congress	15
"Defense Primary Consideration," Republic Steel Officials' Pledge	16
Steelworks Operations for Week	17
Men of Industry	18
Canada To Increase Steelmaking Capacity 25 Per Cent in 1941	20
Obituaries	21
1941 Record Year for Steel; Ingot Output, 66,500,000 Tons	25
Government Defense Awards	30
Activities of Steel Users, Makers	85
WINDOWS OF WASHINGTON	23
MIRRORS OF MOTORDOM	27
EDITORIAL—Hillman Has Big Opportunity in OPM	34
THE BUSINESS TREND	35
TECHNICAL	
Shaping, Strengthening and Hardening Tubing in One Operation ...	40
Insulated Steel Building Reduces Operating Costs	46
Stove Manufacturer Saves One Hour Per Day by Simplifying Job	60
<i>Machining</i>	
Suicide Submarines in the Making	39
Broaching May Be Your Answer—By Guy Hubbard	48
<i>Joining and Welding</i>	
Gang Riveting Cuts Costs, Produces Uniform Work	44
<i>Materials Handling</i>	
Smart Management Watches Materials Handling (Part II)	54
<i>Metal Finishing</i>	
"Shrinking" Costs with Automatic Porcelain Enameling	58
<i>Progress in Steelmaking</i>	
Slipper Bearings	62
INDUSTRIAL EQUIPMENT	65
MARKET REPORTS AND PRICES	67
BEHIND THE SCENES	80
CONSTRUCTION AND ENTERPRISE	87
INDEX TO ADVERTISERS	94



SHARP *for Fast Cutting* . . .

An Important Feature of **NORTON RESINOID BONDED GRINDING WHEELS**

IN the foundry, where speedy stock removal is the first consideration, fast cutting action is the characteristic by which the grinding wheels are most frequently judged. So the Norton research laboratories set out to produce a "sharp" wheel—one whose cutting action would not easily dull. They started by subjecting the abrasive to special treatments to weed out all but the strong, solid grains that would withstand the severe service of foundry grinding. Then countless resinoid bond formulae were carefully studied and experimented with to develop one with just the right strength—a bond that would hold each grain firmly until its job was done but then release it to bring fresh, sharp grains into action. The result is a grinding wheel with definitely faster cutting action—and lower grinding costs.

NORTON COMPANY, WORCESTER, MASS.
New York Chicago Detroit Philadelphia
Pittsburgh Hartford Cleveland Hamilton, Ont.

W-787

NORTON ABRASIVES

HIGHLIGHTING THIS ISSUE

■ LABOR contracts in the steel industry usually stipulate that holidays on which there shall be no work excepting that required in connection with continuous operations are restricted to July 4, Labor Day and Christmas. Observance of Christmas last week caused the rate of ingot production to drop 15 points (p. 17) to 80 per cent of capacity. Normally there is a shutdown of at least a few days at the year-end in the steel industry. This is not the case this year; production was snapped right back and no further interruption now is expected until next July. All emphasis is on production because the steel supply (p. 67) now is the tightest that has prevailed at any time since the World war.

* * *

The steel industry's "practical" capacity at this time, says Walter S. Tower (p. 25), now is about 85,000,000 net tons of ingots; to this 1,300,000 are being added. . . Many who are wondering from what sources the steel industry will add to its order backlogs after the defense program begins to taper off will be interested in reading about what one large maker of steel-frame, low-cost housing is doing (p. 13) in introducing such structures on a substantial scale. . . Recent Supreme Court decision outlawing North Carolina's \$250 license levy on out-of-state retailers (p. 23) is hailed as an important victory in the campaign against state trade barriers.

Promoting Steel Houses

Leon Henderson (p. 23) soon will call meetings to consider prices on scrap, pig iron and some other products. Purpose is to eliminate the need for future advances in steel prices if possible. . . Aimed at speeding armament production, the President's new office for production management is expected to have the necessary powers; how it will function (p. 23) is not

More Price Conferences

yet revealed. . . International Harvester Co. (p. 14) will build two new open-hearth furnaces; Allegheny Ludlum Steel Corp. will expand its alloy steel capacity by 50,000 tons annually. . . Defense awards last week aggregated (p. 30) nearly \$250,000,000. . . Zinc production (p. 67) is expected to balance consumption in the first half of 1941.

* * *

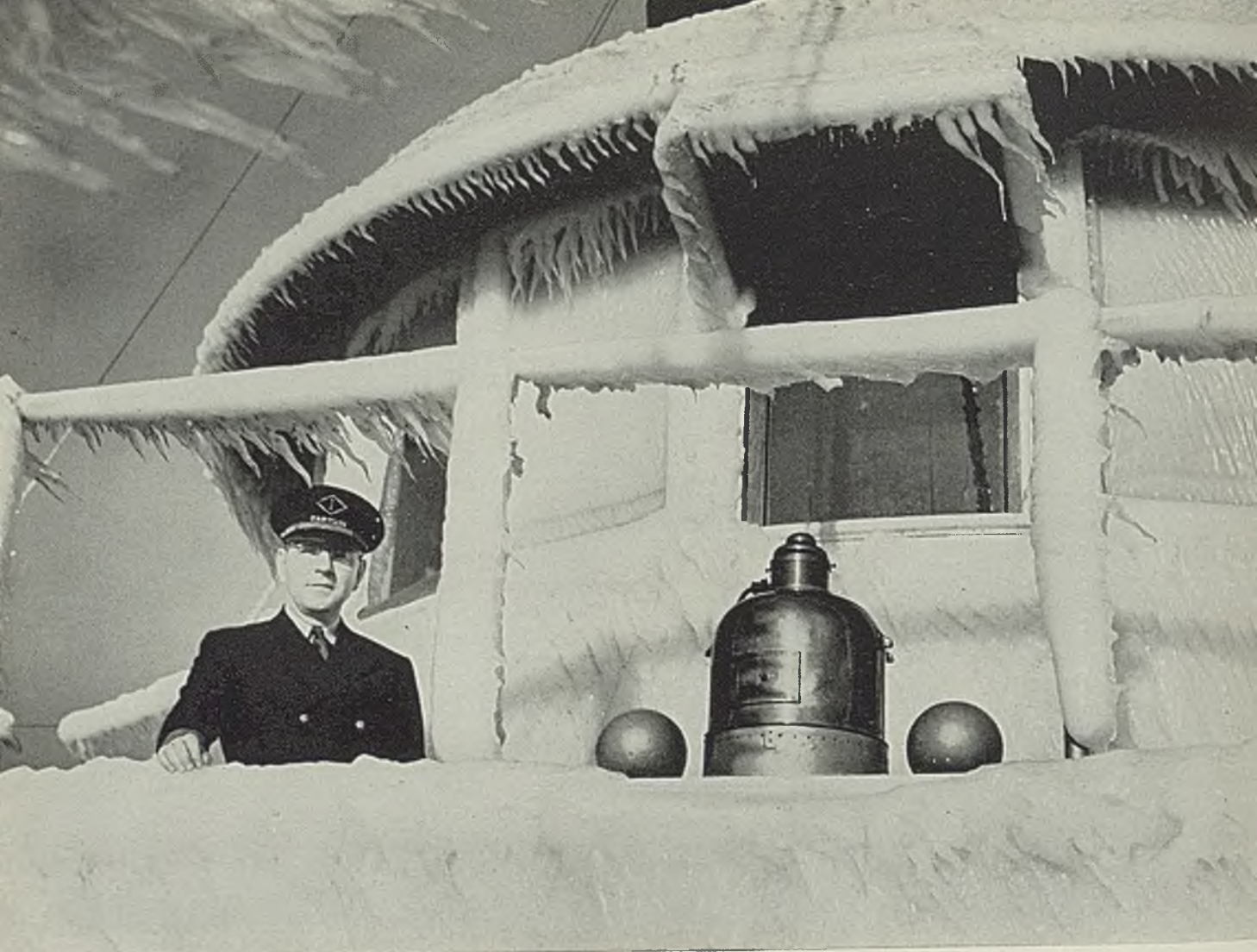
Some important bottlenecks in armament production will be eliminated through use of the broaching method, predicts Guy Hubbard, STEEL'S machine tool editor. Rifling and breech ring mortising, operations now requiring hours, can be broached in the same number of minutes, he declares (p. 48). Many other machining operations should be studied with due attention to the possibilities of broaching. . . . Threads on lathe lead screws up to 188½ inches long now are finished chased (p. 52) with but a single tool grind and yet error is being held to within 0.0005-inch per 12 inches of lead. . . A new nonmetallic slipper bearing (p. 62) contributes to the operating efficiency of universal couplings.

Broaching Speeds Work

* * *

Gang riveting is made possible by a new machine (p. 44) which in one stroke heads 10 to 16 flush-type rivets along a straight line. It is proving particularly useful in expediting aircraft construction. . . . By the Dewey process (p. 41) tubing is shaped, strengthened and hardened in one operation. The process permits changes in wall thickness at will, simultaneously with the shaping operation. It may be applied in making many products such as shells and bed posts, on a mass production basis. . . . Through an ingenious arrangement for feeding and applying steel strapping (p. 60) a stove manufacturer has effected a reduction in time required in packaging products for shipment.

Faster Packaging



Capt. Howard Kizer, standing near the pilot house of the ice-coated Inland freighter, the Joseph Block.

Steel Sailors Battle **THROUGH TERRIFIC STORM**

The wind had risen to a 75-mile gale, 50-foot waves crashed over freighter pilot houses, and at various points on Lake Michigan, ships were being battered to destruction. Through this terrific fall storm Captain Howard Kizer, of the Inland freighter *Joseph Block*, fought his way safely to the Inland docks at Indiana Harbor.

As the ship passed Little Point Sable near Ludington, the barometer began to fall, dropping to 28.40, a very dangerous level, and the wind shifted to the south. With the waves crashing perilously over the pilot house, Captain Kizer decided that he dare not head directly into the storm and so changed his course to take the full force of the sea at about four points on his beam. Despite this precaution, waves broke through the pilot house windows, the water freezing as it fell. The whole ship was sheathed with ice.

At the height of the storm, the freighter made no headway at all, but finally reached the west shore near Milwaukee, and arrived safely at Indiana Harbor eighteen hours late.

Less than 16 hours after arrival, the *Joseph Block* was again heading north for its next load, as usual.

This is only one instance of the many hazards encountered by the steel sailors of the Inland fleet. From the spring break-up of ice in the "Soo" until ice again locks the passage, these men navigate day and night through all kinds of weather to bring great tonnages of ore, limestone and coal to the Inland Mills.

Thus, ample stocks of uniform quality raw materials are always on hand and capacity production is assured.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATES • STRUCTURALS • PILING • RAILS • TRACK ACCESSORIES • REINFORCING BARS

INLAND STEEL CO.

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

2200 Low-Cost Family

Units Have Steel Frames

Already the steel industry—when it has a moment these busy days to sit back and think—is beginning to wonder from what sources it is going to replenish its order backlog when the defense program begins to taper off.

For years attention has been given to prefabricated steel houses as a tonnage source—but not a great deal of headway has been made in this direction in the past.

The present time is regarded by many as a golden opportunity for mass introduction of prefabricated, low-cost houses. With carpenters and many conventional building materials scarce, opposition to the prefabricated home is less active. Besides, low-cost housing is seen as a national defense need.

The accompanying article describes what one large company is doing to push prefabricated steel houses.

DETROIT

■ HOUSING projects for the navy department on the Pacific coast, at Norfolk, Va., and in Florida, involving upward of 2200 family units, some in apartment buildings, others individual small homes, are taking shape rapidly, all with steel frames supplied by Stran-Steel division of Great Lakes Steel Corp., Detroit.

Speed of erection, strength, rigidity and freedom from termite infestation, in addition to fireproof qualities and comparatively low cost, combine to make the projects attractive from both builders' and residents' viewpoints. They constitute a powerful promotion factor for the use of steel in residential construction.

First residential construction for the navy involved 50 five-room houses for married enlisted personnel at the naval operating base at Norfolk, Va. A crew of 16 men erected the entire steel framework for each house in one hour. Roof trusses and window panels were assembled by welding, studs were attached to plates by regular screws. Exteriors comprised panels of fir-tex nailed to the steel framing, over which was placed a wire mesh to receive the sprayed Gunite exterior material. The houses were completed at a cost of under \$2000 each.

Private Projects Under Way

Now going up at Norfolk are 92 buildings two stories in height and 40 x 125 feet in size. This project involves about 1500 tons of steel framing. It was started Nov. 20 and was erected by Dec. 26. In addition to steel frames, these apartments will have steel window and door frames, steel roof trusses and steel equipment in kitchens.

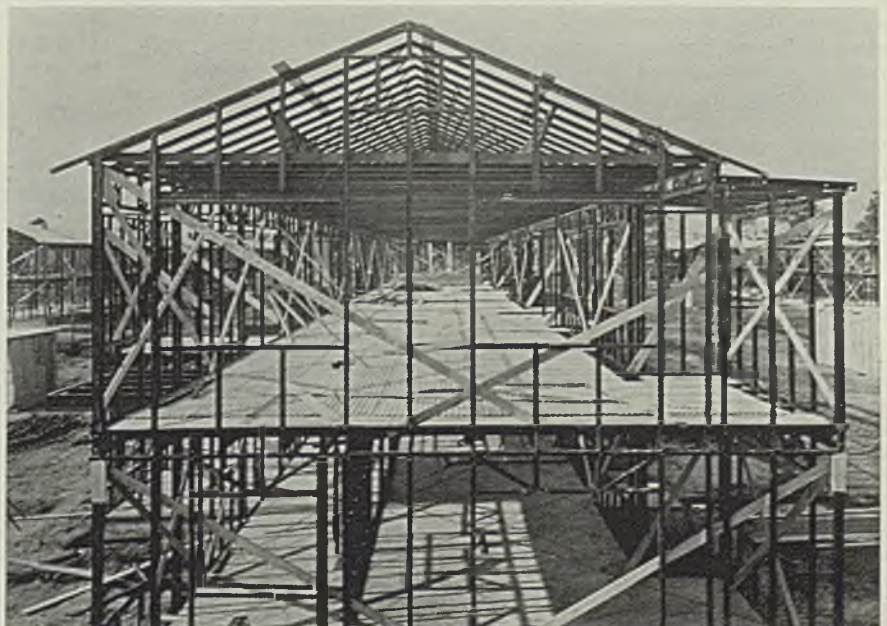
Two projects on the Pacific coast call for 500 duplex houses with steel framing. One in Florida involves 200 duplex units. A private housing project, in Washington, includes 80 buildings of eleven apartments each and requiring in all about 2000 tons of steel. Not for the navy department, this project is sponsored by the Cafritz Construction Co.

Another new private development is that of Mace Properties Inc. in Arlington, Va., where 514 separate homes, in two basic steel-frame designs, are being erected. This same organization also built 200 steel-frame houses for its nearby Westmont subdivision. Five-room houses, with 11,800-cubic foot content, sold for around \$4500, and six-room homes, with 16,600-cubic foot content, sold at \$5600. Specifications called for the use of 4870 pounds of steel in each home.

Steel houses, of course, are nothing new. In one form or another,

they have been designed and built for the past ten years, some with only a steel frame, others entirely of steel, including exterior and interior walls. Their promotion has lagged, for a number of reasons. First, cost is about 15 per cent in excess of that for a comparable wood-frame house. Second, standardized house designs obviously cannot offer flexibility or variety in appearance, particularly if they are of the mass production, prefabricated type.

The steel industry, with tonnage the constant cry, believes it wise to



■ About 1500 tons of structural steel is required in 92 buildings of this type being rushed to completion at Norfolk, Va., for housing navy personnel. All structural work was erected in five weeks



■ Fifty of these five-room homes were built for the navy department at Norfolk. Frame is steel. Exteriors are Gunitite sprayed over Firtex panels

concentrate on the type of house which can be turned out in large numbers and prefabricated for erection at the site. If each house is to call for different length frame members, individually styled trusses, window frames, door frames and whatnot, it is virtually impossible to compete in the residential field on a price basis.

So, despite obvious advantages of soundness, strength, long life and fireproof qualities, the steel house has lagged, except for certain ventures in scattered localities. Companies like General Houses Inc. in Chicago and others have kept plugging away, however, and have attempted to work out designs which are flexible and to overcome what seemed to be inbred objections among builders to steel construction.

Steel companies, such as Great Lakes, vitally interested in the steel house picture, are now looking ahead beyond the present defense emergency and are wondering whether the future possibilities for steel in low-cost mass housing projects may not be far beyond their estimates a few years ago. Certainly when the current pressure for steel relaxes, as it is bound to, there will come again the problem of promoting new outlets for steel. Housing may be one answer to the problem.

Promotion Has Lagged

Competitive materials, like wood, copper, etc., have benefited in housing applications from extensive and expensive promotion sponsored by associations of suppliers. Results of this promotion, in the minds of both the public and builders, is all too evident at times. The moment may be propitious for the steel industry to initiate a similar program of promotion for steel in houses, to pave the way for future progress.

One of the most troublesome factors in the steel house picture is the matter of building codes. In some cities these codes were de-

vised years ago to apply solely to wood construction. When applied to steel construction, their restrictions are purposeless and definite hindrances, yet there they are. About the only way to get around them is to bicker with local politicians or to persuade public action for code revision.

Just now, however, the steel house appears on the way up. Stran-Steel plant in Jackson, Mich., for example, is working three shifts, seven days a week, turning out around 2500 tons of fabricated frame members a month. The Stran-Steel member, it should be explained, is designed to replace wood only in joists, studs, sills and roof trusses. Of copper-bearing steel strip, varying in gage from 16 to 11 depending upon size of the member, the pieces are usually cut to length at the plant and then bolted together at the building site. A typical stud member comprises two channel sections, spot welded back to back to form an I-beam section. The web has a specially rolled shape to provide a firm grip on nails which can be driven into the center seam on the flanges.

Two More Open Hearths For Wisconsin Steel

■ International Harvester Co., Chicago, is adding two new open hearths to the battery of nine at its Wisconsin Steel Works, South Chicago, to even up production between raw steel and finishing capacities.

Present annual capacity is 480,000 gross tons of finished steel; total with the new units will be approximately 580,000 tons, about 20 per cent increase.

The company also will install auxiliary equipment consisting of a ladle crane, a charging machine and a new soaking pit. Total cost will be approximately \$1,500,000.

Convention Calendar

Jan. 6-10—Society of Automotive Engineers. Annual meeting, Book-Cadillac hotel, Detroit. John A. C. Warner, 29 West 39th street, New York, is secretary.

Jan. 7-9—Institute of Scrap Iron & Steel, Inc. Annual meeting, Baltimore. E. C. Barringer, Salmon Tower building, 11 West 42nd street, New York, is secretary.

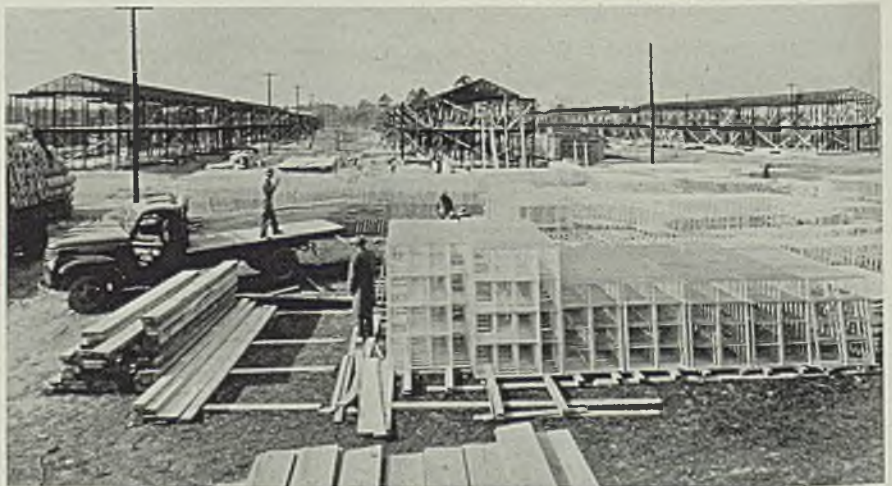
Jan. 8.—American Washer & Ironer Manufacturers association. Annual meeting, Morrison hotel, Chicago. J. R. Bohnen, 80 East Jackson boulevard, Chicago, is secretary.

Jan. 17-18—National Slag association. Annual meeting, Tutweiler hotel, Birmingham, Ala. T. E. Shaefer, 644 Earle building, Washington, is secretary.

Jan. 27-30—American Road Builders association. 38th annual convention and show, Hotel Pennsylvania, New York. Charles M. Upham, 914 National Press building, Washington, is national director.

Jan. 27-31—Electrical Engineering Exposition. Convention hall, Philadelphia. Charles F. Roth, Grand Central Palace, New York, is manager.

Jan. 27-31—American Institute of Electrical Engineers. Winter convention, Convention hall, Philadelphia. H. H. Henlein, 33 West 39th street, New York, is secretary.



■ General view showing three buildings for the navy project at Norfolk, with steel window sash in foreground

Heavy Appropriations Outstanding In Record of 76th Congress

WASHINGTON

■ ALL PEACETIME records for spending were exceeded by the third session of the 76th congress. Approximately \$25,000,000,000 was either directly appropriated or authorized. This amount was topped only in 1918, during the World war, when \$27,000,000,000 was appropriated and \$9,000,000,000 authorized, a total of \$36,000,000,000.

Sixteen billions of the recent spending was for defense and civil purchases in direct appropriations; \$4,000,000,000 was in contract authorizations; \$5,000,000,000 was for the two-ocean navy which was authorized but the cost of which will be spread over several years.

The third session of the 76th congress was the longest on record, outlasting the 354-day session in the war days of 1917-18. It convened Jan. 3, 1940, and apparently will be allowed to expire automatically on Jan. 3, 1941, when the 77th session starts.

Bills Affect Steel Industry

Many bills of special interest to the steel industry were considered, and some enacted, at this session. Foremost among these, of course, were the defense appropriations, the tax bills, and the act to permit the licensing of exports of scrap and other metal goods.

Other bills of direct interest:

In the senate no action was taken on S. 651 introduced Jan. 16, 1939, by Senator Schwollenbach, Washington. Bill provided for licensing scrap exports. Hearings were held by the senate military affairs committee but no report was made.

S. 1083, introduced by Senator Sheppard, Texas, Jan. 27, 1939, provided the secretary of war could exchange unserviceable machines and tools of ordnance *materiel* for new machines. Bill was favorably reported by the senate military affairs committee and was subsequently passed by the house and became law.

Senator Maloney, Connecticut, introduced S. 3037, Jan. 4, 1940, which provided that no scrap be exported from the United States except under license. It was referred to the senate committee on military affairs but no action was taken.

S. Jt. Res. 123, which would prohibit exports of iron and steel products as well as scrap, was introduced July 11, 1939, by Senator Pittman, Nevada, and referred to the senate committee on foreign relations, but no action was taken.

Senator Walsh, Massachusetts, in-

roduced S. J. Res. 274, June 10, 1940, providing for the acquisition of machine tools and similar equipment without advertising for bids. Bill was referred to the senate naval affairs committee of which Senator Walsh is chairman, but no action was taken.

H. R. 61, introduced by Representative Hoffman, Michigan, Jan. 3, 1939, provided for amending the tin act of 1936 and was referred to the military affairs committee of the house; no action was taken on the proposed amendment.

Representative Crawford, Michigan, introduced H. R. 979, Jan. 3, 1939, which also prohibited pig iron and scrap exports. It was referred to the house committee on interstate and foreign commerce; no action was taken.

House committee on foreign affairs took no action on H. R. 3419, introduced Jan. 30, 1939, by Representative Fish, New York, and which prohibited exports of scrap from this country to China and Japan.

H. R. 3587, introduced by Representative May, Kentucky, provided for the turning in of obsolete machinery and was similar to S. 1083 already discussed. The two bills were merged and became law.

Representative Burdick, North Dakota, introduced H. R. 3758 on Feb. 6, 1939, and it was referred to the house committee on ways and means, but never acted on. Bill provided for nationalization of the entire steel industry.

H. R. 4232, introduced by Representative Voorhis, California, Feb. 16, 1939, provided for the prohibition of scrap exports and was referred to the house committee on foreign affairs. No action was taken.

A bill, H. R. 5432, specifically prohibiting exports of scrap from the United States was introduced on March 29, 1939, by Representative Coffee, Washington, and referred to the committee on foreign affairs, but no action was taken by the committee.

Representative Faddis, Pennsylvania, introduced H. R. 5840, which amended the tin act in a minor way. It was finally passed by congress and became law.

H. R. 7658, introduced by Representative Smith, Connecticut, provided for the licensing of exports of iron and steel scrap. After hearings by the house military affairs committee, it finally was passed. It was in accordance with this law that the President promulgated the

licensing system for scrap exports now in effect.

H. R. 9958, introduced by Representative Steagall, Alabama, May 3, 1940, provided for the purchase of strategic minerals by the Reconstruction Finance Corp. and became law on June 27, 1940.

House ways and means committee took no action on H. R. 10059, introduced June 11, 1940, by Representative Whelchel, Georgia, which provided for further development of the iron and steel industry.

Action was also refused at the last session on H. R. 275, introduced by Representative Bloom, New York, which would have brought up to date a tin report made by a subcommittee of the house some years ago on tin. It was contended in the house when the bill was up that the various government departments have the information readily available at all times.

No action was taken either on H. J. Res. 42, introduced by Representative Crawford, Michigan, and which provided for an embargo on exports of pig iron and scrap.

Foundry Equipment Index Off in November

■ Foundry Equipment Manufacturers' association, Cleveland, reports index of net orders closed for new equipment in November was 278.8, compared with 284.8 in October. Index for repairs was 188.7 in November and 201.8 in October. Total sales index was 254.2 in November and 264.0 in October.

Indexes are per cent of monthly averages of sales to metalworking industries, 1937-39. Practical comparison on the old base, 1922-24, can be determined by multiplying new base figures by 1.328.

Pittsburgh Steamship Co. To Build Two Ore Carriers

■ Two new ore carriers will be constructed by the Pittsburgh Steamship Co., Cleveland, according to A. H. Ferbert, president of the company, a subsidiary of the United States Steel Corp.

Definite specifications as to the size or type vessels to be built have not been fully determined. It is anticipated that the new ships will be ready for service sometime during 1942.

The last ore carriers constructed on the Great Lakes were the four 600-foot vessels which were launched by the Pittsburgh Steamship Co. in the fall of 1937 and placed in service in 1938.

Pittsburgh Steamship's present fleet consists of 68 steamers and two barges.

"Defense Primary Consideration," Republic Steel Officials' Pledge

■ **MANAGEMENT** and employees must work together in complete co-operation with the government to insure necessary materials for national defense. This view was expressed by T. M. Girdler, chairman, and R. J. Wysor, president, Republic Steel Corp., Cleveland, in a letter to common stockholders last week.

The letter was accompanied by a dividend of 40 cents a share, a total of more than \$2,250,000.

The steel executives pointed out that while the national defense program is giving major impetus to the industry, actual steel requirements for domestic defense and for export to Great Britain and Canada are not great as compared to the country's total steel capacity.

"The steel industry," the letter said, "is co-operating with the government without reservation.

"The industry's co-operation takes many forms. Not only is it endeavoring to meet the government's requirements for many kinds of special steel products but it is supporting the government's effort to avoid the disaster of inflation. Basic steel prices have remained unchanged in the face of heavy demand and are likely to continue so

unless costs are seriously increased.

"There has appeared to be some confusion as to the real purposes of the defense program. Some regard it as a grandiose pump-priming scheme, the forerunner of a gigantic boom and the cure-all for unemployment; others regard it as the means of further socialization of industry and of unionization of all industrial employees; still others look upon it as a means of multiplying the luxuries available to every home.

"But the real objective of the defense program is none of these. It has only one purpose, and that is the production of armaments. To that purpose every other consideration must be secondary."

Neither real nor lasting prosperity, the letter continued, can result from the present great industrial activity which is based upon deficit-spending for armaments. Taxes will be extreme and business profits limited accordingly. Needed defense materials will mean the sacrifice of some peace-time advantages.

Commenting on the growth and development of Republic, the letter stated that on Dec. 31, 1930, the corporation had a working capital

of \$41,000,000 and a funded debt of \$56,000,000, while today its working capital is \$105,000,000, or more than \$8,000,000 in excess of its outstanding funded debt.

When the company was organized in April, 1930, it and its subsidiaries had \$65,000,000 in preferred stock outstanding, which was increased in 1935 by dividend arrearages of \$18,000,000. Today the corporation has \$40,000,000 of preferred stock outstanding, against which a purchase fund of \$6,300,000 has been provided; all back dividends have been paid.

Republic's ingot capacity during the past ten years has increased from 4,968,000 gross tons to 7,000,000 gross tons; and its electric furnace steel capacity, an essential in the armament program, from 120,000 gross tons annually to more than 500,000 gross tons per year.

During the same decade the company expended \$100,000,000 in the construction of new producing plants and in the modernization and improvement of existing plants.

"CAUSES ARE TRANSITORY," WARNS U. S. STEEL CHAIRMAN

Causes of the recent high operations in the steel industry are transitory and readjustments will follow when a more peaceful day is reached, Irving S. Olds, chairman, United States Steel Corp., warned in a year-end statement.

"Some commentators outside the steel industry have questioned the

Three Generations Among Employees of Disston & Sons Inc.



■ A luncheon for three-generation employees of Henry Disston & Sons Inc., Philadelphia, was held in connection with the Congress of American Industry under sponsorship of National Association of Manufacturers in New York, Dec. 11-13. Nine families were represented. Longest in service of the company for the first generation was John

Southwell, circular saw smithing department, 60 years employed; second generation was represented by his son-in-law, E. H. Biemuller, treasurer and office manager, in service 34 years; third generation was represented by E. H. Biemuller, industrial sales department, in service two and a half years. In the case of four families the same

name was perpetuated through the generations; for the William Semon family even the christian name carried through three generations.

In the accompanying photograph two of the company officers appear. Second from the left is William S. Disston, vice president; fourth, is S. Horace Disston, president.

adequacy of existing steel capacity to take care of demands during the present emergency. To date, the nation's defense effort has not been delayed by any shortage of steel and no such delays from that cause are anticipated by the industry. Present ingot capacity is about 60 per cent greater than the peak production in 1917—during the World war—and approximately 30 per cent greater than the ingot production of the record year of 1939."

Mr. Olds mentioned the "carefully considered program of plant improvement and extension" being executed by U. S. Steel. Expenditures during 1940 amounted to approximately \$80,000,000, and at year's end there was an unexpended balance on authorizations for the program of \$155,000,000.

"We start the new year with a deep sense of responsibility. The proper utilization of the great energies and resources of the country can be attained only by the sustained and co-ordinated efforts of all in willing obedience to the obligation to make the public interest and public need paramount to all other interests and aims. United States Steel Corp. considers itself prepared to fulfill its part in this great national undertaking," said Mr. Olds.

Association To Develop Standards Project

■ American Standards association, New York, recently undertook to develop a standards project on the application of statistical methods of control of materials and manufactured products. Project was undertaken at the request of the war department.

Request was based upon the need, in mass production, to control with specified accuracy quality of materials and dimensions of parts to insure satisfactory finished products. Desire is that a sufficiently simple formulation of the subject's principles may be made to facilitate use of these newer methods in the defense program. This in light of the necessary inspection, by the military departments, of materials delivered under government contracts by numerous manufacturing contractors and subcontractors.

Dr. R. L. Jones, Bell Telephone Laboratories Inc., is chairman of the association's special committee undertaking the work. Other committee members: L. F. Adams, General Electric Co.; Harold F. Dodge, Bell Telephone Laboratories Inc.; Stephen M. DuBrul, General Motors Corp.; Dr. John Johnston, United States Steel Corp.; Lieut. Col. A. B. Johnson, United States war department; and John S. Tawresey, SKF Industries Inc.



PRODUCTION... Down

■ STEELWORKS operations last week declined 15 points to 80 per cent, solely because of 24 to 36 hours interruption for Christmas observance. Without exception the rate was lower than the preceding week. A year ago operations were at 75½ per cent; two years ago they were 40 per cent.

Youngstown, O.—Down 13 points to 78 per cent because of holiday shutdown. Sharon Steel Corp. added an open hearth Thursday, and Republic Steel Corp. added one at the week end. This week the rate is scheduled to rise to 93 per cent, with 72 open hearths and three bessemers. Some producers will shut down Wednesday but work Saturday to make up.

Cleveland—Daily rate of output increased last week but the Christmas interruption caused the average for the week to drop 14½ points to 72 per cent.

St. Louis—Except for loss of time because of the holiday production was at the rate of recent weeks. Shutdowns caused a drop of about 8 points to 79½ per cent.

Birmingham, Ala.—Although production was at capacity except for Christmas day the average for the week was about 84 per cent, 13 points below the preceding week.

Cincinnati—One open hearth was added last week but the holiday

brought the weekly rate down 14 points to 73 per cent.

Central eastern seaboard—Most mills suspended production 24 hours, cutting output 13 points to 82 per cent. Resumption at 95 per cent is indicated for this week.

Pittsburgh—Active units remained unchanged but holiday shutdowns dropped the rate 20 points to 75 per cent.

Wheeling—Daily output remained unchanged but loss of a day Wednesday reduced the week's output to 76 per cent, down 22½ points.

Chicago—Down 18 points to 79½ per cent because of the holiday. Rebound is expected this week.

Detroit—Suspension of production for 30 to 36 hours cut production for the week 14 points to 76 per cent. New Years day will not be observed and the rate is expected to go to 96 per cent this week.

Buffalo—Solely from lost time Wednesday the rate for the week was 78 per cent, 15 points below the preceding week.

New England—Loss of 10 points to 90 per cent, though production was at capacity except for Christmas day.

District Steel Rates

District	Percentage of Ingot Capacity Engaged		Same week 1938	
	In Leading Districts	Week ended Dec. 28		
Pittsburgh	75	-20	70	26
Chicago	79.5	-18	81	46
Eastern Pa.	82	-13	77	29
Youngstown	78	-13	74	32
Wheeling	76	-22.5	76	50
Cleveland	72	-14.5	68	50
Buffalo	78	-15	74.5	39.5
Birmingham	84	-13	75	77
New England	90	-10	75	70
Cincinnati	73	-14	75	50
St. Louis	79.5	-8	77	42.5
Detroit	76	-14	85	79
Average	80	-15	75.5	40

Allegheny Ludlum To Increase Alloy Capacity

■ Allegheny Ludlum Steel Corp., Brackenridge, Pa., has announced a \$2,000,000 expansion program to increase its alloy steel capacity by 50,000 tons a year. The expansion will give the company increased electric furnace melting capacity and a corresponding increase in finishing facilities. Plants at Brackenridge, West Leechburg, Pa.; Watervliet, Dunkirk and Buffalo, N. Y.; Wallingford, Conn., and Detroit will be affected.

MEN of INDUSTRY

■ F. E. WHITTLESEY, general manager, Raymond Mfg. Co., Corry, Pa., will retire from active management Dec. 31, after having completed 50 years with the company. He will continue as vice president and assistant treasurer, in an advisory capacity.

E. W. Feldt becomes vice president and general manager in charge, and C. H. Holden, vice president and assistant treasurer in charge of purchasing, accounting departments and financial matters, effective Jan. 1.

Mr. Whittlesey joined the Raymond Mfg. Co. Jan. 1, 1891, when the company was very small. His nominal title was secretary, but his duties included keeping the books, billing, writing letters, packing the goods, and sometimes making them.

The company manufactured a line of goods in which springs were used and contributed much to the development of superior springs at the beginning of at least three major industries, bicycles, automobiles and airplanes. Mr. Whittlesey designed and built many machines for spring manufacture when such machines could not be purchased on the market. For the past 40 years the company has concentrated on manufacture of springs and stampings.

Mr. Whittlesey became general manager in 1909. He is a member of the American Society of Mechanical Engineers, Society of Automotive Engineers, and the American Society for Metals.

Stanley M. Hopkins has been appointed Pacific coast manager, Wheeling Steel Corp., Wheeling, W. Va., with headquarters in the Rialto building, San Francisco. He



Stanley M. Hopkins



F. E. Whittlesey

was for several years district sales manager at Wheeling Steel's Buffalo office, and before that was employed at Wheeling. He began work in the steel business at Portsmouth, O., when the Portsmouth works of Wheeling Steel was operated as the Portsmouth Steel Co., and later, the Whitaker-Glessner Co.

C. J. Stilwell, president and a director, Warner & Swasey Co., Cleveland, has been elected a director, Cleveland Trust Co.

George C. Spratt has been placed in charge of sales of Harnischfeger Corp.'s new zip-lift electric hoists for industrial materials handling.

George E. Cullinan, senior vice president, Graybar Electric Co. Inc., New York, will retire Dec. 31, after more than 39 years of active service.

Otto Kessler, chemical engineer, for many years with General Chemical Co., has become associated with the enlarged chemical division of Foote Mineral Co., Philadelphia.

Lynn Reynolds has been appointed chief engineer, Adel Precision Products Corp., Los Angeles. He formerly was metallurgical engineer with Worthington Pump & Machinery Corp., Harrison, N. J.

Harry Woodhead, president, Aviation Mfg. Corp., New York, and chairman of the board, Vultee Aircraft Inc., has been elected president of Auburn Central Mfg. Corp., Connersville, Ind. He succeeds John K. MacGowan, who will continue as a director. Mr. Woodhead will continue as president of Aviation Mfg. Corp. and as chairman of Vultee.

No change in the Auburn Cen-

tral personnel or management is contemplated. Eric O. Johnson, vice president and general manager of Auburn Central, will have active charge of management of the Connersville plant. Executive offices, formerly maintained in New York, will be established in Connersville.

Victor S. Barnes has been appointed general sales manager, Haselkelt Mfg. Corp., Chicago. He will direct all sales, sales promotion, sales research and advertising for all divisions of the corporation.

T. C. Sullivan has been named assistant to Richard W. Millar, president of Vultee Aircraft Inc., Los Angeles. Mr. Sullivan also will continue as secretary of the company.

William J. Sullivan, recently associated with C. H. Coulier & Co., New York, now is engaged as an individual in the export of iron, steel and associated metal products, with offices at 245 Seventh avenue, New York.

J. E. Lautsbaugh, the past 22 years director of purchases at the Mansfield, O., works of Westinghouse Electric & Mfg. Co., has become director of purchases of all products, Crosley Corp., Cincinnati.

James A. Gillis, former member of the New York order department of American Steel & Wire Co., has been named supervisor of warehouses, a newly created position, with headquarters in the company's main office in Cleveland.

George A. Bryant, executive vice president and general manager, The Austin Co., Cleveland, since 1930, has been elected president and gen-



Harry Woodhead



George A. Bryant

eral manager, succeeding the late W. J. Austin. Mr. Bryant, a native of Chicago, received his engineering education at the University of Illinois and became associated with the company as a field engineer 27 years ago. In 1916 he was named district superintendent for all Austin operations in New England, and in 1918 general sales manager.

C. M. Doiseau, since early this year vice president and general manager, Cincinnati Ball Crank Co., Cincinnati, has been elected president. He succeeds Reamy C. Field, chairman of the board, who has been acting as temporary president.

Rufus A. Heller, W. Heller & Son Inc., Peoria, Ill., has been elected third vice president, Chicago chapter, Institute of Scrap Iron and Steel Inc., succeeding Frank Parker, president, Iron & Steel Products Inc., Chicago.

Don J. Kirk, Detroit district representative for Greer Steel Co., Dover, O., has been promoted to assistant sales manager and will make his headquarters at the general office in Dover.

R. K. Shirley, associated with the Freeport Sulphur Co. since 1922, has been elected vice president and treasurer. A native Texan, Mr. Shirley began as chief clerk to the auditor and advanced successively to auditor, assistant general manager, assistant vice president and comptroller, and treasurer. He was transferred to the New York office in 1930.

Russell C. Fleming has been named editor, *Mining Congress Journal*. He succeeds Richard J. Lund, recently appointed an executive in the raw materials division, national defense advisory commission. A graduate of the University of Illinois, he began his career as miner and engineer in the coal mines of Illinois, Pennsylvania and West Virginia. For several years

he served as field representative of American Institute of Mining and Metallurgical Engineers and field editor of *Mining and Metallurgy*. Following this he was associated with Southwestern Engineering Co., Los Angeles, and subsequently with Timken Roller Bearing Co.

Harry A. Strain, the past four years assistant general superintendent, South Chicago, Ill., works of Carnegie-Illinois Steel Corp., has been promoted to director of raw materials, fuel and power, effective Jan. 1. He began his association with United States Steel Corp. subsidiaries in 1905 as a clerk.

Appointments of new assistant general superintendents at the Gary and South Chicago plants of Carnegie-Illinois Steel Corp. are as follows:

M. J. Devaney has been promoted to assistant general superintendent, South works, succeeding H. A. Strain, who has become director of raw materials, fuel and power.

At Gary works, E. G. Hill has been promoted to assistant general superintendent, succeeding S. M. Jenks, recently advanced to the general superintendency to succeed E. E. Moore, who is now vice president in charge of industrial relations.

At South works, Mr. Devaney is succeeded as superintendent of steel production by Michael F. Yarotsky, who has been assistant superintendent of the division. Mr. Yarotsky in turn is succeeded by George E. Gustafson, heretofore superintendent of No. 2 open hearth.

The vacancy created by Mr. Hill's promotion at Gary is being filled by Arthur D. Beers, chief metallurgist the past three years, who now is promoted to assistant to general superintendent.

Robert L. Lerch, associated 16 years with Haynes Stellite Co., unit of Union Carbide & Carbon Corp., New York, the past 11 years serv-



Robert L. Lerch



Harry A. Strain

ing as advertising manager and assistant to the general sales manager, has been promoted to general sales manager. Following graduation from Lehigh university in 1922 he spent a year and a half in various departments of Bethlehem Steel Co.'s Lehigh plant, Bethlehem, Pa.

Charles A. Merrill, purchasing agent in charge of outside plant material and nonferrous metals for the Bell system, Western Electric Co. Inc., New York, will retire Dec. 31, after 41 years of service. He will be succeeded by Tucker G. Stover, formerly assistant purchasing agent.

Mr. Merrill, an Amherst graduate, joined Western Electric as a paymaster at the Hawthorne plant near Chicago in 1899. He saw service in a number of the company's departments before he was named purchasing agent in 1927. His successor, Mr. Stover, joined the company as an assistant buyer in 1921, becoming assistant purchasing agent in 1930.

Purchase of nonferrous metals, formerly handled by Mr. Merrill, will become the responsibility of purchasing agent J. J. McKenna after Mr. Merrill's retirement. Kingsley Gernon, the past 11 years in charge of buying at the company's Point Breeze, Md., plant, has been transferred to New York to become assistant purchasing agent, succeeding Mr. Stover, while H. G. Ross will take Mr. Gernon's place at the Point Breeze plant.

Leroy Peters, Stanley Johnson and Warren Johnson have been named assistant purchasing agents, with offices in New York.

David L. George has joined the Vulcan Steam Forging Co., Buffalo, as plant manager. Mr. George was previously associated with General Electric Co., Erie, Pa., for 12 years; eight years with MacDonald Bros., management engineers, Boston, and the past year was with Curtiss Aeroplane Co., Buffalo.

Canada To Increase Steelmaking

Capacity 25 Per Cent in 1941

TORONTO, ONT.

■ CANADIAN steel producing capacity will be increased by at least 25 per cent by the middle of 1941, by expansions under way and projected. Among the new projects will be a \$3,516,000 expansion at the Trenton, N. S., plant of the Nova Scotia Steel & Coal Co., subsidiary of Dominion Steel & Coal Co., Sydney, N. S. The expansion will be financed by the Dominion government.

Dufferin Shipyards Ltd., Toronto, has been awarded a contract for six mine sweepers to cost \$600,000 each. Canada's shipbuilding program now aggregates \$80,000,000.

War orders announced last week by the department of munitions and supply totaled 1839, valued at \$7,536,183, as follows:

Shipbuilding: Morris Boat Works, Hamilton, Ont., \$9775; Cliff Richardson Boat Works, Meadford, Ont., \$9810.

Instruments: Accessories Mfgs. Ltd., Montreal, \$17,893.

Mechanical transport: International Harvester Co. of Canada Ltd., Ottawa, Ont., \$82,684; George W. Crothers Ltd., Leaside, Ont., \$6622; Ford Motor Co. of Canada Ltd., Windsor, Ont., \$19,963.

Aircraft: British air ministry, London, \$69,085; Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, Que., \$79,665; Canadian Vickers Ltd., Montreal, \$480,000; International Harvester Co. of Canada Ltd., Ottawa, \$5929; Macdonald Bros. Aircraft Ltd., Ottawa, \$5312; Standard Tube Co. Ltd., Ottawa, \$12,720; Renfrew Electric & Refrigeration Co., Renfrew, Ont., \$31,105; De Havilland Aircraft of Canada Ltd., Toronto, \$646,673; National Steel Car Corp. Ltd., Malton, Ont., \$8331; Macdonald Bros. Aircraft Ltd., Winnipeg, Man., 18,500.

Electrical equipment: Canadian Marconi Co., Montreal, \$91,841; Union Electric Supply Co. Ltd., Montreal, \$9706; Canadian General Electric Co. Ltd., Ottawa, \$20,639; Northern Electric Co. Ltd., Ottawa, \$17,387; Amalgamated Electric Corp. Ltd., Toronto, \$35,623; Crouse-Hinds Co. of Canada Ltd., Toronto, \$6036; Railway & Power Engineering Corp., Toronto, \$12,450; Robert Simpson Co. Ltd., Toronto, \$26,557.

Machinery: Fairchild Aircraft, Ltd., Longueuil, \$45,928; Dominion Engineering Co. Ltd., Montreal, \$86,330; Kelvin Bottomley & Baird (Canada) Ltd., Montreal, \$6896; International Harvester Co. of Canada Ltd., Ottawa, \$18,688; George W. Crothers Ltd., Leaside, \$21,420; Mussels Ltd., Toronto, \$5610; Young Engineering Service Ltd., Toronto, \$15,660.

Tools: Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, \$15,902.

Munitions: International Flare Signal Co. Ltd., Waterloo, Que., \$343,838; T. W.

Hand Fireworks Co. Ltd., Cooksville, Ont., \$343,838.

Miscellaneous: General Steel Wares Ltd., Ottawa, \$49,990; Beatty Bros. Ltd., Fergus, Ont., \$26,220; Dominion Wire Rope & Cable Co. Ltd., Montreal, \$7658; J. H. Ashdowne Hardware Co. Ltd., Calgary, Alta., \$75,496; Canadian Comstock Co. Ltd., Toronto, \$94,250; Parker Fountain Co. Ltd., Toronto, \$11,520; Connolly & Twizzell, Montreal, \$50,000; Metals Ltd., Calgary, Alta., \$10,000.

Construction projects: Arcadian Construction Co. Ltd., Halifax, N. S., \$110,086; Sutherland Construction Co. Ltd., Montreal, \$249,000; Armstrong Bros. Construction Co., Brampton, Ont., \$82,372; Cotter Bros. Ltd., Winnipeg, Man., \$104,132; Partridge-Halliday Ltd., Winnipeg, \$162,964.

Canada Sets New Ingot, Pig Iron Output Records

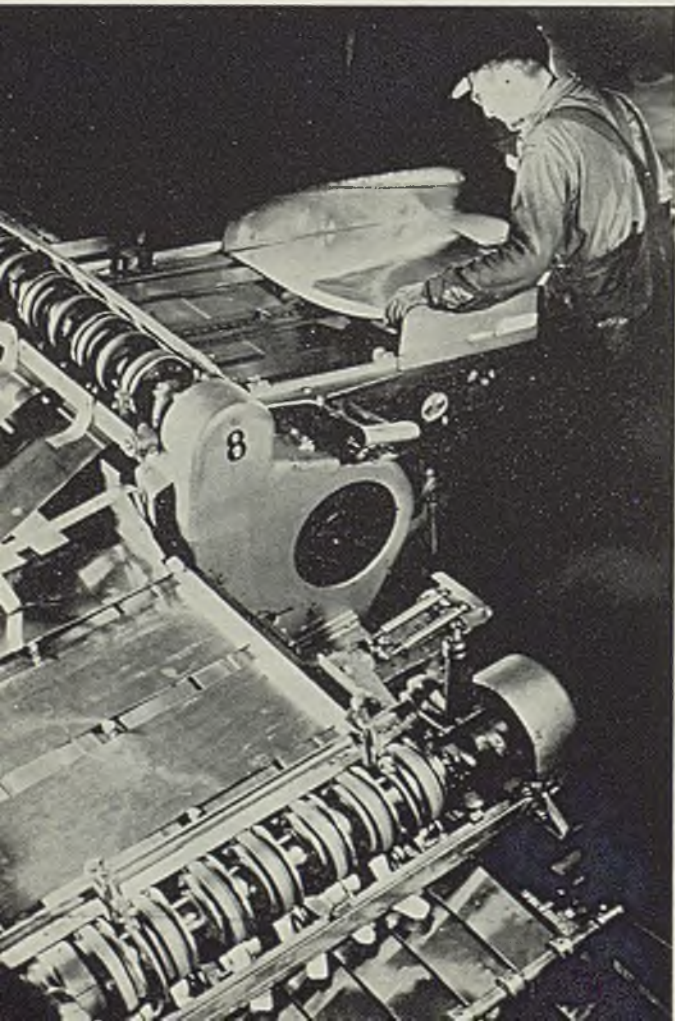
■ Canadian steel ingot and pig iron production for 11 months, 1940, set new records. Pig iron output in November was the highest for the year; ingot tonnage fell slightly below that of October. Ferroalloy output in November was smaller than in October, but total for 11 months this year greatly exceeded the corresponding period last year. Comparisons follow:

	Steel ingots	Pig Iron	Ferro-alloys
Nov., 1940 ..	176,113	109,576	11,654
Oct., 1940 ..	185,091	109,385	15,016
Nov., 1939 ..	147,182	87,822	7,258
11 mos., 1939	1,234,765	661,562	64,740
11 mos., 1940	1,825,752	1,058,417	117,015

Employees Drafted To Get Three Months' Pay

■ Employees of International Business Machines Corp., New York, in active naval or military service and who have been with the company a year or more, will receive from International the equivalent of three months' compensation while in service. Those who have been with the company less than a year will receive the equivalent of six weeks' compensation. Payments will be divided into equal monthly installments during the year the employees are in training. Compensation will be based on earnings at the time the men enter service, but not on a rate higher than \$4000 annually.

In a letter to all International employees in active naval or military service, Thomas J. Watson, president, assured them their continuous service record with the company would not be broken, and that insurance and other benefits would be kept in force. "We feel," Mr. Thomas said in his letter, "that your year's training will be beneficial to you physically, mentally and morally. As a result of this training, we believe you will come back to the company better equipped for future service in the IBM."



◆ Slitter cuts rectangular sheets of tin plate for can bodies. Feeding the new armed forces will be one stimulating influence in the container industry

Died:

■ ALBERT P. MEYER, 64, at his home in Pittsburgh, Dec. 25. Mr. Meyer was executive vice president, Pittsburgh Coke & Iron Co. When this company acquired control of the Struthers Furnace Co., recently, he was named to the Struthers directorate.

He also was an official in other subsidiary companies, including Buckite Refractories Co., of which he was president; Green Bag Cement Co. of Pennsylvania, Hunter Steel Co., of which he was executive vice president and a director.

Born at Sharpsburg, Pa., Oct. 26, 1876, Mr. Meyer graduated from the University of Pittsburgh law school in 1901 and was admitted to the bar. He practiced his profession several years, and then entered the iron and steel industry with George S. Davison. He was identified with Sharpsville Furnace Co., since absorbed by Pittsburgh Coke & Iron, and with Allen S. Davison Co., which later became Davison Coke & Iron Co. and subsequently Pittsburgh Coke & Iron Co., operating blast furnaces at Neville Island and Sharpsville, Pa.

Arthur G. Kimball, 60, president, Landers, Frary & Clark, New Britain, Conn., Dec. 23, in New Britain. At the age of 18 he joined the Chicago office of the company, later entering the sales department and reaching the presidency in 1918. He was a director, National Electrical Manufacturers association and was prominent in civic affairs in New Britain.

Harry R. Mark, 72, superintendent, weld point department, Clayton Mark & Co., Chicago, in Evanston, Ill., Dec. 22. He had been associated with the company 48 years.

John P. Eichleay, 64, general manager, Eichleay Engineering Co., Pittsburgh, recently in Wilmington, Del.

Judges Named for Defense Suggestions

■ More than 2,000,000 foremen, subforemen and workmen in America's metalworking industries will be eligible to compete for awards totaling \$10,000 offered by Revere Copper & Brass Inc., New York, for the ten suggestions that would best aid in speeding national industrial defense. C. Donald Dallas, Revere Copper & Brass president, declared the defense commission "looks with favor on our plan of tapping the vast resources of skill and experi-

ence belonging to men in our shops and factories."

Eligibility and application blanks, according to Mr. Dallas, will be ready for distribution shortly after the first of the year. All ideas submitted remain the property of the entrant, whether or not they win a prize. Awards will range from \$5000 for first prize, to \$250.

Jury selected to judge suggestions includes: Henry Heald, president, Illinois Institute of Technology, as chairman; Admiral Joseph Strauss, United States navy, retired; Maj. Gen. Frank Parker, United States army, retired; Robert Watt, former American labor delegate to the International Labor conference at Geneva, Switzerland; and Mr. Dallas.

McKee Will Increase Engineering Personnel

■ Contract for all engineering and design work for the complete new Brazilian steel plant, and other foreign and domestic contracts held by Arthur G. McKee & Co., 2422 Euclid avenue, Cleveland, necessi-



Stephen A. Derry

tates an immediate increase in the company's engineering personnel.

To be added are 50 men for general steel plant layout, 100 for concrete reinforcing and structural work, 25 mechanical and electrical engineers, and 25 technical specialists. Stephen A. Derry, director, Plan for Co-operative Placement, 872 Hanna building, Cleveland, has been appointed employment director and has opened a temporary office in the McKee building for interviewing and selecting men qualified for the positions.

The Brazilian steel plant, as noted in STEEL, Dec. 23, page 27, will be built by the Commissao Executiva Siderurgico Nacional near Rio de Janeiro. It will include coke ovens, a 1000-ton blast furnace, open-hearth furnaces, and various types rolling

mills for the production of a complete range of semifinished steel, rails, structural, sheets, tin plate and other materials.

The McKee company will move into its new offices and engineering building at 2300 Chester avenue, Cleveland, Jan. 15. New quarters are being equipped with modern drafting room facilities.

Licensing System Curbs Scrap, Pig Iron Exports

■ Export licensing and a tightening shipping situation are reflected in substantially lower scrap and pig iron exports in November, compared with October. Scrap shipments totaled 73,809 tons, valued at \$1,273,398, compared with 258,482, valued at \$4,625,109, in the preceding month. Canada took 35,709 tons and the United Kingdom took 33,971 tons.

Pig iron shipments fell to 21,630 tons, valued at \$746,986, against 48,426 tons, valued at \$1,096,575, in October. The bulk went to the United Kingdom. All of November's iron ore exports, 127,741 tons, went to Canada.

Exports of nonalloy ingots and blooms increased slightly, to 226,437 tons, valued at \$9,269,079, compared with 208,461 tons, valued at \$8,144,644, in October. Most went to England and Canada, although Japan received 3811 tons. Alloy ingots and blooms, including stainless, fell off sharply, November exports being 58,404 tons, valued at \$2,757,079, against 110,632 tons, valued at \$4,392,923, in October. Practically all went to Canada and United Kingdom.

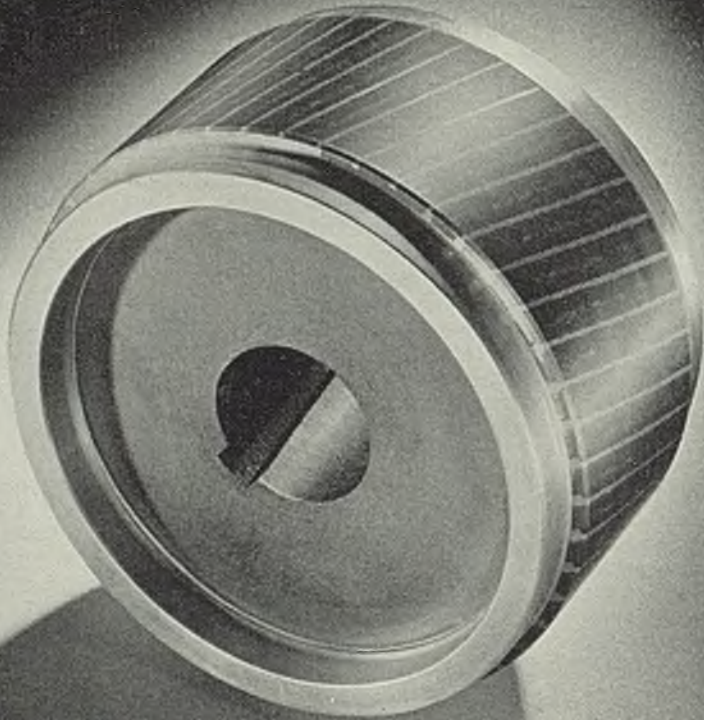
3,922,000 Gross Tons of Scrap Used in November

■ Domestic consumption of steel and iron scrap in November showed a decline because of the short month and the Thanksgiving holiday, according to the Institute of Scrap Iron and Steel Inc., New York.

The figure is estimated by the institute as 3,922,000 gross tons, compared with the record 4,233,000 tons in October and with 3,858,000 tons in November, 1939.

In the first 11 months domestic consumption aggregated 37,737,000 tons, exceeding consumption for the entire year, 1939, which totaled 32,434,000 tons. The annual record was made in 1937, when 38,006,272 tons was melted.

■ More than one-third of all the automobiles and trucks ever produced in the United States are still traveling the highways, the American Petroleum Industries committee reports.



MAKING HISTORY

...the ONLY motors with rotor windings centrifugally cast of COPPER!

● Fairbanks-Morse Motors with centrifugally cast rotor windings of *solid copper* are making history. That's natural. Every industry that uses motors has long needed the thermal and electrical characteristics that only motors with one-piece rotor windings of solid copper can provide. Every motor manufacturer has tried for years to build such a rotor. Many made centrifugally cast windings of OTHER metals—but NOT of *copper*.

Then Fairbanks-Morse did it. It took

time and money. But the result is worth the cost. Fairbanks-Morse now gives industry a better motor capable of standing up under certain conditions of *severe* service that no other motor could long endure. This motor reduces operating cost. It provides more years of trouble-free operation. It is worth investigating if you use motors. Write Fairbanks, Morse & Co., Dept. 96, 600 So. Michigan Ave., Chicago, Illinois. Branches and service stations throughout the United States and Canada.

7854-EA40,158

Copperspun

FAIRBANKS · MORSE  MOTORS

DIESEL ENGINES · ELECTRICAL MACHINERY · RAILROAD EQUIPMENT · WASHERS-IRONERS · STOKERS
PUMPS · FAIRBANKS SCALES · WATER SYSTEMS · FARM EQUIPMENT · AIR CONDITIONERS

Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

*Supreme Court Rules Against Interstate Trade Barrier.
Henderson To Call Scrap, Pig Iron Price Conferences.
Production Management Office Delegated Wide Powers.
Final Authority Retained by President Roosevelt.*

WASHINGTON
■ SUPREME Court last week invalidated North Carolina's \$250 license law on out-of-state retailers and warned "interstate commerce can hardly survive in so hostile an atmosphere" as that created by the levy. Decision was interpreted as a victory in the campaign against state trade barriers which have been causing the federal government much concern.

The Supreme Court held the \$250 investment in advance, required of out-of-state retailers, but not their local competitors, could operate only to discourage and hinder interstate commerce in the North Carolina retail market.

"The freedom of commerce which allows the merchants of each state a regional or national market for their goods is not to be fettered by legislation, the actual effect of which is to discriminate in favor of intrastate business, whatever may be the ostensible reach of the language."

Leon Henderson, member of the national defense advisory commission in charge of price stabilization, said last week that meetings with members of the scrap, pig iron and perhaps other industries will be called to discuss price situations.

Conferences have been scheduled as a result of a meeting held Dec. 19 with representatives of both integrated and nonintegrated steel companies.

It was agreed steelmakers cannot continue indefinitely to absorb the increased cost of raw materials without ultimate reflection in a higher price of finished steel, a re-

sult steel manufacturers do not desire.

Scrap dealers also are agreed they do not wish to see the price of that increase and sellers of scrap who also are purchasers of finished steel desire to see scrap and steel prices held down.

The following representatives of the steel industry were present at the conference: L. B. Block, vice president, Inland Steel Co., Chicago; Walther Mathesius, United States Steel Corp., Pittsburgh; T. R. Akin, president, Laclede Steel Co., St. Louis; J. C. Miller, vice president, American Rolling Mill Co., Middletown, O.; C. A. Ilgenfritz, manager, purchases and raw materials, Republic Steel Corp., Cleveland; Wilbur Murphy, secretary, Weirton Steel Co., Weirton, W. Va.; Charles R. Holton, purchasing agent, Bethlehem Steel Co., Bethlehem, Pa.; R. W. Wolcott, president, Lukens Steel Co., Coatesville, Pa.; Albion Brindley, general purchasing agent, Pittsburgh Steel Co., Pittsburgh; G. L. Rathel, vice president and purchasing agent, Continental Steel Corp., Kokomo, Ind.; and H. E. Pape, purchasing agent, Stanley Works, Bridgeport, Conn.

Board's Power "Nearly Absolute"

Office for production management is President Roosevelt's answer to criticism of the defense set-up. The new four-man organization is given responsibility for America's rearming; its power is said to be as nearly absolute as possible.

Headed by William S. Knudsen, the quartet includes Sidney Hillman as associate director, Secretary of

War Stimson and Secretary of Navy Knox.

Mr. Roosevelt promised he would delegate all power and responsibility which the constitution permits.

Actual creation of the new office will be accomplished by executive orders to be issued soon. Authority for its establishment is contained in a clause of the government reorganization act giving the President broad powers to set up emergency management machinery.

Although Mr. Roosevelt declined to say the purpose or effect of operation of this agency is the speeding up of the defense program, particularly the production phase, his decision follows weeks of complaint that drive and authority have been lacking. Numerous official and unofficial suggestions for a reorganization of the administrative structure have been considered.

Unites Skilled Responsibilities

New set-up was advised, the President said, to embrace into a compact unity the elements of skilled responsibility regarding army and navy needs, technicalities of production management and of labor. He considers no single person possesses all the qualifications required.

From now on, he continued, full-est possible responsibility for defense production, purchasing and priorities will be vested in these four men.

To implement their functioning, he went on, three principal divisions will be set up under the new office.

First of these will be concerned entirely and closely with the actual production of more munitions. This division may have several subdivisions and may call into service such men as Edward R. Stettinius and John D. Biggers.

Second of the subordinate divisions will be concerned with defense purchasing, to be directed by Donald Nelson, now procurement co-ordinator for the commission.

Third will be the priorities board substantially as it exists. Mr. Knud-

sen, Mr. Hillman and Defense Commissioner Leon Henderson will continue to serve in this capacity, Mr. Roosevelt said, and in certain instances Mr. Stettinius and Mr. Nelson also will participate. An administrator for priorities will be designated, the President explained, to carry out decisions and instructions of the board.

In emphasizing that he is prevented by the constitution from delegating his fullest powers and responsibilities to any other person, the President insisted, however, that every degree of authority permitted will be extended to this new agency and that it will be given thoroughly to understand that it is to make far-reaching decisions and back them up by action.

Predicts Unanimous Decisions

So confident did he seem that the four members will function in equitable fashion that he predicted unanimous agreement on decisions without recourse to vote-taking or the possibility of a deadlock through an even division of opinion. He added, however, that if, and whenever things seemed going wrong, he would still have the power to impose his own judgment.

On the question of whether the plan was devised for the purpose of speeding up the program, Mr. Roosevelt said that each 24 hours of the last months have brought an acceleration in the nation's mobilization. He did say, though, that it had become evident about a month ago that the end of the "study period" had been reached and that certain needs had been learned; accordingly, the reorganization was decided upon.

Creation of this new setup, incidentally, will not affect the advisory national defense commission, the President explained, since the problems handled by that group, particularly as they pertain to the nation's civilian life, still remain.

RFC LOANS TO PURCHASE RAIL EQUIPMENT DOUBTFUL

Reports were current again last week that Reconstruction Finance Corp. will lend money to the railroads to purchase freight cars and locomotives to help the defense program.

Some reports were to the effect the roads will buy 100,000 freight cars and others 500,000. Some said that 2000 locomotives would be purchased and others 20,000 locomotives.

Representatives of the railroads in Washington express doubt as to the truth in these stories as do railroad officials at the national defense commission. Railway representatives say that the roads will purchase additional cars and loco-

motives individually as the equipment is needed and they place no credence in the current reports.

U. S. RAILROAD EQUIPMENT ADEQUATE, SAYS PELLEY

United States railroads enter 1941 with a plant geared to meet any transportation demands that may be made of them, according to J. J. Pelley, president, Association of American Railroads. Not only is car and motive power supply adequate on the basis of traffic now anticipated, but the railroads are being operated at new high efficiency levels. New equipment is being added as traffic demands or the replacement of obsolete equipment may require.

In the current year the railroads installed 65,000 new freight cars and 400 locomotives and have 30,000 freight cars and 180 locomotives under construction. Since June 1, 1939, the number of freight cars in need of repairs has been cut in half. As a result, the number of freight cars in need of repair is now less than it has been at any time back to 1920.

Based on conservative estimates, which take into consideration new freight cars actually put in service or under construction as well as those undergoing heavy repairs, the railroads will have at least 160,000 more freight cars available this coming fall than they had two years ago.

Car buying, however, is a continuing program and unquestionably there will be a still further increase in such cars by next October. On the basis of utilization obtained from freight equipment in the past, those 160,000 cars will handle 100,000 carloads per week, or 5,200,000 carloads per year, which is equivalent to one-seventh of the total number of carloadings in 1940.

Capital expenditures in 1940 for equipment, roadway and structures and other improvements to property are estimated at \$400,000,000, compared with \$262,000,000 in the preceding year. This can be contrasted with \$794,000,000, the average annual capital expenditure from 1927 to 1930.

Increase in traffic as well as large expenditures for maintenance work resulted in a further increase in employment on the railroads in the past year, the average number of employes having been 1,026,000, or an increase of 3.9 per cent compared with the preceding year. Average annual earnings per employe in 1940 was \$1900 compared with \$1886 in 1939.

Loans made to the railroads by the government through the Reconstruction Finance Corp. and outstanding on Nov. 30, 1940, amounted to \$467,918,581. Of loans totaling

\$783,201,022 so far disbursed by that agency, the railroads up to Dec. 1, 1940, had repaid \$315,282,440. Loans made by the RFC to the railroads in the first 11 months of 1940, totaled \$118,090,561. The railroads in those 11 months this year made repayments amounting to \$93,814,318.

TWO PROMOTED ON LABOR BOARD'S LEGAL STAFF

Laurence A. Knapp has been appointed associate general counsel and Ernest A. Gross assistant general counsel of the national labor relations board. Mr. Knapp will assume the position held by Robert B. Watts until Mr. Watts' recent appointment as general counsel of the board. Mr. Gross will assume the position and duties of Mr. Knapp.

Mr. Knapp is a native of South Dakota, a member of the New York and District of Columbia bars. He entered government service as an attorney with the first national labor board in August, 1934, and has been with the present NLRB since its inception. For the past year and a half he has served as assistant general counsel in charge of enforcement.

Mr. Gross has spent five years as a government attorney and recently has been chief of the compliance section of the trial division.

YOUNG GRANTED LEAVE FROM COMMERCE BUREAU

Indefinite leave of absence has been granted James W. Young, director, bureau of foreign and domestic commerce.

Mr. Young, former advertising executive who became director of the bureau Sept. 5, 1939, leaves to carry out his duties as chairman, communications division, of the office of Nelson Rockefeller, coordinator of commercial and cultural relations between the American republics.

Carroll L. Wilson, assistant director of the bureau, will become acting director. Mr. Wilson, formerly associated with Scudder, Stevens & Clark, New York, investment counsel, was appointed special assistant to the secretary of commerce July 1, 1939. On Sept. 6 he was appointed by President Roosevelt as assistant director of the bureau.

■ Manufacturers of gray iron and semisteel castings, reporting to the 1939 census of manufactures, showed considerable decrease from 1937 figures in employment, wages and production. Wage earners in 1939 numbered 58,429, against 73,993 reported in 1937, a decrease of 21 per cent. Wages totaled \$70,757,644, compared with \$94,065,057 in 1937, a loss of 24.8 per cent.

1941 Record Year for Steel; Ingot Output, 66,500,000 Tons

By WALTER S. TOWER

President, American Iron and Steel Institute

■ PRODUCTION of steel in the United States during 1940 reached the highest level ever recorded, reflecting in part the influences of the war in Europe and the national defense program.

More than 66,500,000 net tons of steel ingots were produced, fully 8 per cent above the previous record of 61,400,000 tons for 1929, and nearly 27 per cent greater than the 1939 output of 52,500,000 tons.

Close to 18 per cent of the finished and semifinished steel products made for sale in 1940 was for export, about half of which was for Great Britain. A small part of the tonnage consumed here was for national defense, but by far the largest part went into regular channels. There was plenty of steel to meet all needs in 1940. The steel industry operated during the year at an average of 82 per cent of its capacity.

During the first quarter, demand from all sources was equivalent to only 72.6 per cent of capacity. Output in the second quarter represented an average of 72.7 per cent. Third quarter saw the industry operating above 90 per cent for part of the three months, and the average rate of operations for the entire quarter was 87.9 per cent.

In the final three months, all existing records for production were broken as the industry maintained operations at an average close to 95 per cent. Steelmaking capacity at the close of 1939 was rated at approximately 81,000,000 tons of ingots per year. That capacity was 15 per cent greater than could be produced with the equipment available at the close of 1929, and showed a gain of 38 per cent over capacity at the end of 1918, compared with a population increase of 27 per cent over that period.

\$1,500,000,000 for Improvements

During the past ten years (years for the most part of low rate of production and poor earnings in the steel industry) total expenditures for plant modernization and expansion approximated \$1,500,000,000. That policy of improving and enlarging is going on constantly and in the past year it has added substantially to ingot capacity, lifting the total to an estimated rated capacity of 83,000,000 net tons.

Actually, that "rated" capacity is about 10 or 12 per cent below max-

imum theoretical capacity because of allowances which steelmakers consider necessary to make for periodic repairs or unavoidable shutdown of furnaces. That is why, under pressure of great demand, such as exists now, steel companies frequently report operations at a rate in excess of their "rated" capacity.

Thus although its "rated" capacity now is about 83,000,000 tons of ingots per year, the practical working capacity for the industry is approximately 85,000,000 tons.

Plan Substantial Capacity Increase

To forestall any "bottleneck" in the production for defense and other purposes, members of the industry this year have set in motion various programs for substantially increasing productive capacity. Hundreds of new coke ovens, some new blast furnaces, a number of new open-hearth furnaces, and more than a score of new electric furnaces are planned or already in construction, while rolling mill capacity has been raised through the

construction of new mills and modernization of others.

Nearly all new electric furnaces are already in operation or will be shortly after the first of the year. Construction of other additional equipment also proceeds rapidly.

New electric furnaces will have an annual capacity of about 900,000 tons, which will increase by nearly 50 per cent the industry's electric furnace capacity as of close of 1939.

Approximately 1,300,000 tons of additional capacity for producing open-hearth steel will be added as a result of programs now under way, exclusive of the substantial additions to capacity expected from enlargement of older furnaces.

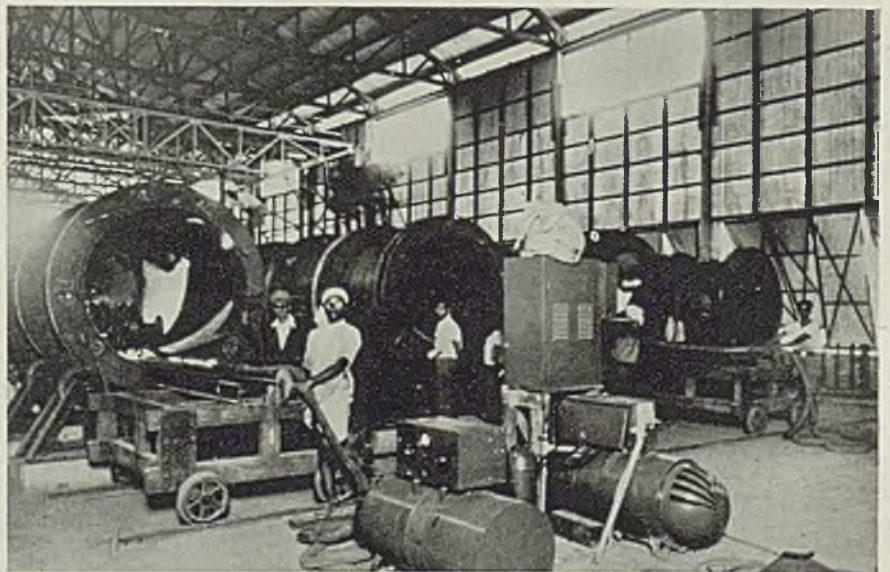
Employment and payrolls during 1940 rose far above 1929 levels. An average of approximately 550,000 men was employed, or nearly 20 per cent more than in 1929, and payrolls of \$950,000,000 were 13 per cent above 1929 in spite of the current shorter work week.

Hourly wages of steelworkers in 1940 were nearly 30 per cent higher than in 1929, and stood at the highest level in history.

High rate of steel operations in the last half brought no indications of a shortage of labor, nor is there any threat in the future.

Despite high levels of steel production, prices for steel products have shown little change for the past year and a half, and today are at the lowest level in nearly three years.

Rangoon Pipe Line Fabricated by Welding

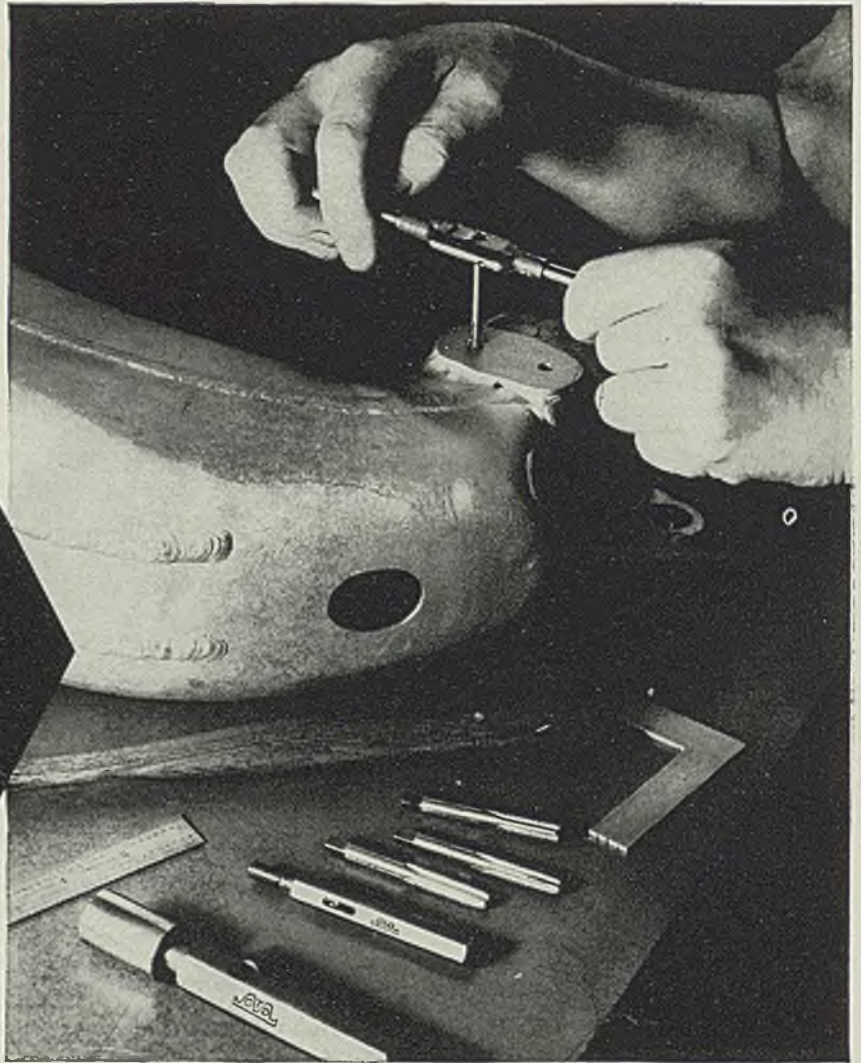


■ A 43-mile, 58-inch diameter water line, which utilized welded construction exclusively for fabrication of pipe, recently was completed six months ahead of schedule for the city of Rangoon, India.

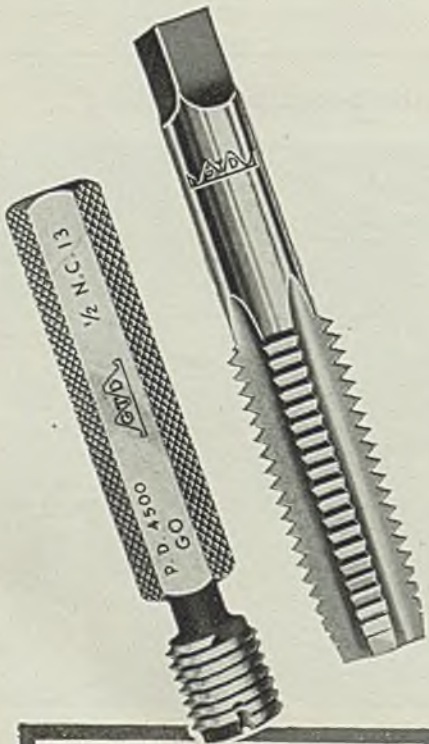
All welding was done with American-made equipment, the pipe hav-

ing been fabricated by the automatic carbon arc process of Lincoln Electric Co., Cleveland. Steel plate used in fabricating the pipe was rolled by Tata Iron & Steel Co., at Jamshedpur. Fabrication of the pipe was by Messrs. Braithwaite, Burns & Jessop.

This workman is using a 5/16-24 "G.T.D. Greenfield" Ground Thread Tap—turning it with a "G.T.D. Greenfield" Tap Wrench, and testing the hole with a "G.T.D. Greenfield" Plug Thread Gage.



Here's a Tough Job!



For Accuracy: "G.T.D. Greenfield" Precision Ground Taps and Precision Thread Gages.

This looks like aluminum—actually it's chrome molybdenum steel. No. 46S23, tensile strength, 180,000 lbs. It's an elbow assembly for aeroplane landing gears and production conditions require a hand operation with precision ground thread taps. We are told that production is only 60 holes per tap, and taps have to be sharpened after every 10 holes. Pretty low? Well, before "G.T.D. Greenfield" taps were used the production was only 35 holes per tap with 6 holes between grinds.

The fact that "Greenfield" taps excel on extremely tough assignments is extra assurance that they will turn in equally superior performances on easier jobs. Don't you want to arrange a test?

GREENFIELD TAP & DIE CORPORATION, Greenfield, Mass.

Detroit Plant: 2102 West Fort St. Warehouses in New York, Chicago, Los Angeles and San Francisco. In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ont.



TAPS • DIES • GAGES • TWIST DRILLS • REAMERS • SCREW PLATES • PIPE TOOLS

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Manna from Santa Burdens Detroit's Purchasers.

Buick Will Introduce New, Lighter Model Soon.

Packard Striving To Show New Cars by March 15.

Ford Explains Labor Policy in Newspaper Ads.

DETROIT

■ CHRONOLOGICAL curiosity is the fact that there were 53 Mondays in the year now closing; thus readers of these pages are enjoying (?) a 2 per cent dividend this year at the editors' expense. Like the fellow whose birthday fell on Feb. 29, this issue can be regarded as something of a freak, in which anything is likely to happen.

Motor news and views take a back seat to the holiday season in this Christmas-New Year hiatus, and while outside the newsboys clamor over terrible happenings all over the world, while Washington whip-hands do their worst to drive public opinion into a frenzy for war and aid to Britain, inside hundreds of offices throughout this territory—and probably throughout the land—holiday cheer is being dispensed in copious quantities and presents exchanged in profusion.

In sales offices here Santa Claus really goes to town. Early in December each man draws up a long list of customers and prospects he wants to remember, together with the amount of money involved. This then is usually submitted to the "home office" for approval and a check, after which the salesman turns purchasing agent and starts on a tour of liquor stores, cigar stores and men's furnishing stores.

After several days, fretting over whether Joe Jones should get one or two bottles of Scotch, he decides that maybe two would give the company a better break next time he calls, so two it is.

Then a few more days are required to deliver the goods, and pass the time of day with the recipients, at the same time sniffing

around for prospects of some business. The only trouble is that these days, salesmen are having to shy away from orders, because their home offices are so loaded with business they don't want any more. All that is left for the salesman is to assure his buyer friends maybe he can speed deliveries.

With hundreds and hundreds of salesmen and contact men calling on the motor industry purchasing and engineering departments, it is small wonder that the presents pile up on the desks of these people. The custom is becoming so firmly entrenched that some salesmen almost fear to remove a prospect from their Christmas list lest he feel so slighted that he would not see the salesman on his next call.

Yule Harvest for Buyers

This sounds like the rankest kind of bribery and of course may be a little exaggerated. There are several companies which print small, neat reminders distributed to vendors at Christmas time, expressly requesting them not to offer Christmas presents to anyone in the company, for the reason that it is preferred to keep vendor-buyer relationships on a purely impersonal and strictly business plane. By and large, however, the manna from Santa continues to descend on the lucky buyers.

■ SHORTLY after the first of the year you can look for a new Buick model to appear on dealers' floors. It will be a less expensive job, using

Material appearing in this department is fully protected by copyright, and its use in any form whatsoever without permission is prohibited.

the smaller Buick motor, probably on the Series 40 chassis, but with the body used by Chevrolet for 1941 and by Olds and Pontiac on their lowest-priced lines. Other minor refinements undoubtedly will be made.

Introduction of this model could in no wise be construed as reflecting any dissatisfaction by the Buick management over sales of present models. In the first ten days of December, for example, Buick deliveries totaled 8687 units, 11 per cent ahead of the corresponding period last year. This was accompanied by an increase in new orders of 22.5 per cent over last year, and represents an extension of the high rate of sales enjoyed by this GM division since introduction of new models.

Buick now is firmly lodged in No. 4 position in the industry, behind Chevrolet, Ford and Plymouth. Offering of a new and lower-priced model could be taken as an effort to cut into the Dodge-Olds-Pontiac market. Furthermore, the Chevrolet body for 1941 has caught on in a big way with the public and both Olds and Pontiac are producing a large number of models in this body type. It is a modified Torpedo design, unusually wide and roomy for a car in the Chevrolet class, with concealed running boards and other recent innovations.

Body can be adapted readily to the Buick chassis and provides this manufacturer with a model which will appeal to business people particularly, because of the lower price, lighter weight and perhaps better maneuverability. However, Buick looks at the addition chiefly as "insurance against the future," particularly insofar as the defense program might interfere with future new model activity.

Great things are being talked up for the new Packard models, mentioned here last week. It develops the company is shooting for March 15 as introductory date, but may have some difficulty in making it due to protracted deliveries on body

parts and to the long time required for construction of special dies. One feature heard in connection with the body is a completely new treatment of rear quarter panels by which rear fenders would be eliminated and incorporated integrally with the body panels. The car will be an 8-cylinder model, patterned somewhat along the lines of the Chrysler Thunderbolt, which made such a hit at the automobile shows.

The much-discussed Ford 6-cylinder car is due and some suppliers have started shipments of parts, one for example now furnishing 100 pieces per day with schedules calling for immediate upward movement of this figure in January to 600 per day. Assemblies are proceeding about on this basis. Meanwhile some promotion material is being prepared for introducing the engine on the present line of Ford cars. It appears to be the intention to offer buyers either a V-8 engine in 85-horsepower or 95-horsepower type, or the new six which develops around 92 horsepower at full torque. Either of the three engines would be available in any of the standard body types.

Ford Explains Labor Policy

To make clear the Ford Motor Co.'s position on labor and wages, a forceful full-page newspaper advertisement has been released, citing some interesting statistics on Ford labor. In the year ended Nov. 30, the Ford payroll throughout the United States averaged 113,628 hourly wage earners who were paid \$185,105,639.12, or an annual

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.....	226,952	356,692	449,492
Feb.....	202,597	317,520	422,225
March...	238,447	389,495	440,232
April....	237,929	354,266	452,433
May.....	210,174	313,248	412,492
June....	189,402	324,253	362,566
July.....	150,450	218,494	246,171
Aug.....	96,946	103,343	89,866
Sept....	89,623	192,678	284,583
Oct.....	215,286	324,688	514,374
Nov.....	390,405	368,541	510,973
11 mos...	2,248,211	3,263,600	4,185,407
Dec.....	406,960	469,120	.....
Year	2,655,171	3,732,608	.....

Estimated by Ward's Reports

Week ended:	1940	1939†
Nov. 30	128,783	93,638
Dec. 7	125,690	115,488
Dec. 14	125,625	118,405
Dec. 21	125,350	117,705
Dec. 28	82,545	89,365

†Comparable week.

wage of \$1629. This compares with average annual wage of \$841 for the 45,000,000 workmen in the entire country.

Breakdown of Ford labor by age groups shows that nearly half of the men are 40 or over, the oldest, a railroad car inspector, being 87. On the payroll are about 10,000 men who are in some way incapacitated for normal productive work but who are kept on the job because of Mr. Ford's conviction that the responsibility of a large company

to labor goes beyond the point at which the unfortunate workman can no longer produce profitably.

According to word from Washington, Hudson Motor Car Co. here will build and equip a \$12,000,000 ordnance plant for the navy department to be located on a site near Detroit. The plant will supply medium and small parts for gun mounts and for torpedo tubes, with shipments being made to gun plants in Louisville, Ky., and Washington for assembling.

■ CHOICE bits, roasted and toasted, with little or no significance, yet good space fillers: Al Zinser, Pop-eye of the Pontiac assembly line, flexed his tremendous biceps the other day after lifting 5,500,000 car wheels in the space of seven years. He places wheels on a conveyor belt leading to the final assembly line and was astounded to learn he had lifted 50,875 tons of steel wheels in seven years. "When I first came on this job I couldn't lift my voice," says Zinser, who amuses his cronies during lunch time by picking them up with one hand.

Cotton for Autos

A new rhinoceros for the Toledo, O., zoo is expected to arrive about Jan. 1. It is a 4-year-old baby about 9 feet long weighing more than 500 pounds and crated for shipment. Considering the day of his arrival he will be accompanied, no doubt, by a shipment of pink elephants and assorted snakes.

General Motors' silver-red Futur-liners which are setting out on a tour of southern cities, exhibiting the corporation's Parade of Progress, have steering wheels in the center of the "pilot's" compartment, placed 10 feet off the road in front and styled aerodynamically; also a rubber bumper around the entire body.

Chris Sinsabaugh, editor of *Automotive News*, is autographing copies of a new book from his pen, titled *Who, Me? or My AUTO-Biography* or *The Saga of the First 100 Years on Rubber*. Copies may be obtained from the Penton Publishing Co. book department (\$3.75).

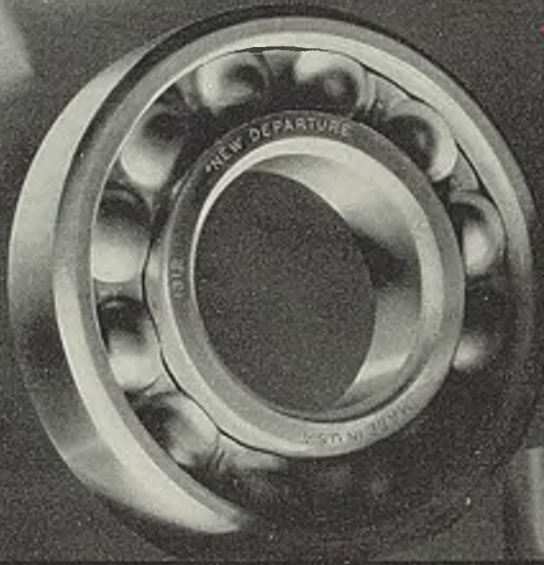
Total of General Motors stockholders for the fourth quarter of 1940 was 397,928. At the same time in 1929 there were only 198,600. Highest figure ever reached was 403,282, in the second quarter of 1938.

Cotton-Textile institute in New York says the crop from 1,890,000 acres will be needed to fill orders for cotton in the automotive industry for 1941. A total of 945,000 bales or 460,000,000 pounds will be used with individual models consuming between 50 and 80 pounds of raw cotton. 'Taint hay!



■ Spark testing, illustrated, is an important aid to production at the Flint, Mich., Buick plant, insuring against mixed steel stocks, and also as a check on specifications. Among major items spark-tested: All transmission gear stock; all king-bolt stock; all SAE 1335, X1335 and X1340 steel; valve rocker arm shaft steel; a percentage of all washer stock; tool steels of high-speed and high-chrome oil hardening types; and a percentage of SAE 1020 rivets and torque tube stock

Creative Engineering



New Departure's Famous "Firsts" include:

- first coaster brake for bicycles
- first yellow taxicab
- first monobloc engine
- first dual purpose ball bearing
- first preloaded bearing
- first self-sealed pump shaft bearing
- first bearing with oil-circulating system
- first self-sealed conveyor roll bearing
- first successful treadle roll ball bearing
- first "lubricated-for-life" ball bearing
- first self-sealed mine car bearing

This company has been pioneering for over fifty years. It is "young enough to venture, old enough to know how." These new departures by New Departure are evidence of the creative ability of its engineers, which is freely at your disposal to improve your machine performance. New Departure, a division of General Motors, Bristol, Connecticut.

NEW DEPARTURE

THE FORGED STEEL BEARING

2954

Aircraft Builders' Contracts Lead Week's National Defense Awards

DEFENSE contracts last week reported awarded by the war and navy departments aggregated \$246,444,907.11. Navy awards totaled nearly 40 per cent more than those of the army. Bureau of supplies and accounts, for the navy, and ordnance and quartermaster corps, for the army, continued principal contractors.

Largest single award was \$63,202,820.65, to Curtiss-Wright Corp.'s Curtiss Propeller division, Clifton, N. J., for propeller assemblies and control sets. Other large awards included \$36,250,455.15 to Grumman Engineering Corp., Bethpage, Long Island, for airplanes and spare parts, and Brewster Aeronautical Corp., Long Island City, N. Y., \$15,160,502 for airplanes.

Sites for aircraft assembly plants have been selected by the war department as follows: Omaha, Nebr., for medium bombers, to be operated by Glenn L. Martin Co., Baltimore; Kansas City, Mo., medium bombers, to be operated by North American Aviation Corp., Inglewood, Calif; and Tulsa, Okla., heavy bombers, to be operated by Consolidated Aircraft Corp., San Diego, Calif. Negotiations for construction and operation of the plants have not been completed.

War department announced the following:

Ordnance Department Awards

American Brass Co., Waterbury, Conn., brass disks, \$644,393.75.
 American Hardware Corp., New Britain, Conn., ammunition components, 3114-495.
 Barber-Colman Co., Rockford, Ill., cutting tools, \$5594.68.
 Barker Tool Die & Gauge Co., Detroit, gages, \$7265.
 Barwood & Co., Philadelphia, gages, \$5837.
 Bendix Aviation Corp., Julien P. Friez & Sons division, Baltimore, fire control equipment, \$25,000; Marine division, Brooklyn, N. Y., fire control equipment, \$12,500.
 Brown & Sharpe Mfg. Co., Providence, R. I., grinders, \$2610.
 Bulova Watch Co., New York, ammunition components, \$11,626.
 Continental Motors Co., Detroit, engines, \$47,944.
 Detroit Broach Co. Inc., Detroit, broaches, inserts and sections, \$3570.
 Eastman Kodak Co., Rochester, N. Y., fire control equipment, \$3,710,016.87.
 Edgewater Steel Co., Verona, Pa., artillery materiel, \$7480.80.
 EX-Cell-O Corp., Continental Tool Works division, Detroit, mills, \$1714.50.
 Fairchild Aviation Corp., Jamaica, N. Y., fire control equipment, \$516,474.
 Federal Products Corp., Providence, R. I., gages, \$6375.
 Fidelity Machine Co., Philadelphia, shearing machines, \$2370.
 Fitchburg Grinding Machine Corp., Fitchburg, Mass., grinders, \$3739.
 Fox Munitions Corp., Philadelphia, gages, \$7767.50.

General Electric Co., Schenectady, N. Y., electric furnace, \$44,603.
 Gibbs, Thomas B., & Co. Inc., Delavan, Wis., machines, \$354,832.
 Gilbert & Barker Mfg. Co., Springfield, Mass., small arms materiel, \$13,906.72.
 Hanssen's, Louis, Sons, Davenport, Iowa, grinder bench machine, \$1139.10.
 Johnson, J. F., & Co., Philadelphia, gages, \$1760.
 Lees-Bradner Co., Cleveland, thread milling machines, \$35,530.
 Lincoln Park Tool & Gage Co., Lincoln Park, Mich., gages, \$11,466.39.
 Logansport Machine Inc., Logansport, Ind., shaving machines, \$6420.
 Mack Molding Co. Inc., Wayne, N. J., ammunition components, \$15,820.
 Micromatic Hone Corp., Detroit, machines, \$2668.12.
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., chambering machines, reamers, \$43,188.
 Oliver Farm Equipment Co., Springfield, O., signal projectors, \$13,086.25.
 Penn Instrument Works, Philadelphia, gages, \$16,681.
 Pennsylvania Tool & Mfg. Co., York, Pa., gages, \$35,267.
 Precise Tool & Mfg. Co., Farmington, Mich., gages, \$123,687.60.
 Production Machine Co., Greenfield, Mass., polishing machine, \$2223.50.
 Putnam Tool Co., Detroit, cutting tools, \$1646.20.
 Revere Copper & Brass Inc., Baltimore, ammunition components, \$764,480.44.
 Service Caster & Truck Co., Somerville, Mass., electric lifting device, \$2128.

Sheffield Gage Corp., Dayton, O., gaging machine, gages, \$14,505.07.
 Shuler Axle Co. Inc., Louisville, Ky., artillery materiel, \$2258.10.
 Standard Gage Co. Inc., Poughkeepsie, N. Y., gages, \$6031.60.
 Standard Pressed Steel, Jenkintown, Pa., ammunition components, \$1,696,412.
 Summerill Tubing Co., Bridgeport, Pa., tubing, \$1511.20.
 Thurston Mfg. Co., Providence, R. I., cutters, \$1743.40.
 Timken-Detroit Axle Co., Detroit, forgings, \$52,466.08.
 Turbine Equipment Co., New York, oil reclaiming equipment, \$14,492.
 Union Metal Mfg. Co., Canton, O., pallets, \$2752.
 Union Spring & Mfg. Co., New Kensington, Pa., springs, \$1155.
 Union Twist Drill Co., Athol, Mass., hobs and cutting tools \$4212.96.
 Vinco Corp., Detroit, gages, \$41,351.60.
 Wood, John, Mfg. Co., Muskegon, Mich., artillery materiel, \$169,250.44.
 Wright Aeronautical Corp., Paterson, N. J., tool sets, \$5494.68.

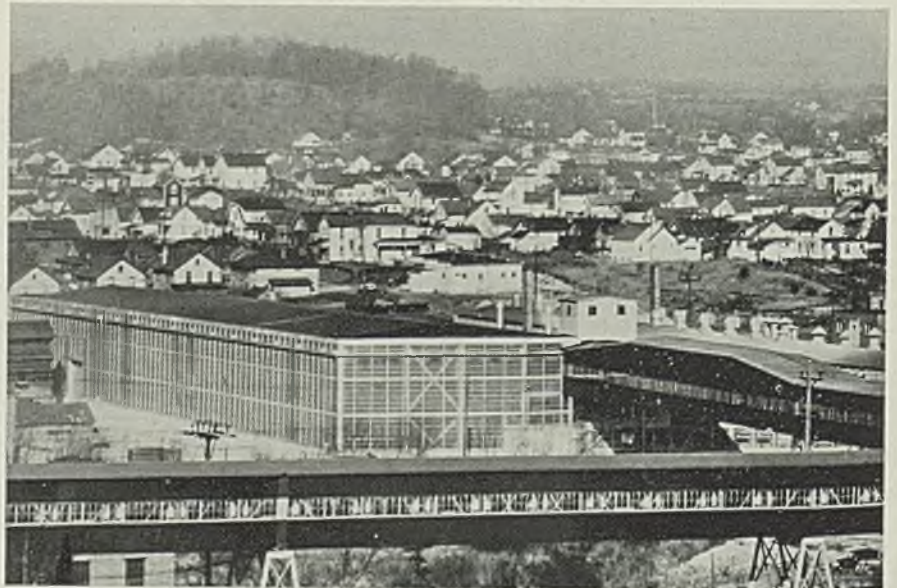
Signal Corps Awards

Gar Wood Industries Inc., Detroit, reel unit and gasoline engines, \$909,834.40.

Quartermaster Corps Awards

Adams, S. G., Co., St. Louis, kitchenware, 40,000 tin dippers, \$18,900.
 Aluminum Goods Mfg Co., Manitowoc, Wis., 40,000 aluminum coffee pots, 200,000 aluminum syrup pitchers and meat platters, \$368,000.
 Bush, Thomas C., Stockton, Calif., administration building, temporary housing, utilities, Stockton airport, California, \$3787.
 Conns, Henry E., Redwood City, Calif., gas distribution system, Forts Barry, Cronkhite and Baker, California, \$32,995.48.

Glass-Walled Stamping Plant for "Ghost Town"



All-glass sides feature this new three-story metal-stamping building constructed for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in the outskirts of Mansfield, O. Costing \$500,000, the 70 x 360-foot building is part of Westinghouse merchandising division's \$1,500,000 expansion program at Mansfield, a city recently labeled

a "ghost town" by Sidney Hillman, defense commissioner in charge of labor. Metal parts will be fabricated in the new building, enamelled next door in the vitreous enamel plant, and then carried by conveyor belt along the 1000-foot overhead bridge in the foreground to the assembly plant. Westinghouse photo

Cowley, Thomas C., Cheyenne, Wyo., gasoline and oil filling stations, Ft. Francis E. Warren, Wyoming, \$11,135.

Davidson, Harley, Milwaukee, motorcycles, \$1,000.

Diamond T. Motor Car Co., Chicago, trucks, \$5,311,085.

Dierks, A., & Co. Inc., Brooklyn, N. Y., boiler house and distribution system for hospital group at Bolling field, Washington, \$19,925.

Dimeo Construction Co., Providence, R. I., hospital, Ft. Getty, Rhode Island, \$132,703.

Di Sandro Bros., Providence, R. I., hospital, \$149,998.

Early, Fred J., Jr. Co., San Francisco, sales commissary building, Ft. Gulek, Canal Zone, \$66,777.

Federal Motor Truck Co., Detroit, tractor-trucks, \$3,246,150.

Ferguson & Son Inc., Rockford, Ill., highway bridge, Savanna ordnance depot proving ground, Illinois, \$66,300.

Filnn, H. I., Montgomery, Ala., temporary housing including utilities, Augusta arsenal, Augusta, Ga., \$42,286.

Geuder, Paeschke & Frey Co., Milwaukee, 32,000 dsh pans, \$25,520.

Glover, George J., Co. Inc., New Orleans, general hospital, New Orleans, \$1,428,461.

Irwin & Leighton, Philadelphia, replacement center, Aberdeen proving ground, Maryland, \$4,898,920.

Jones, J. A., Construction Co. Inc., Charlotte, N. C.; Fliske-Carter Construction Co., Spartanburg, S. C.; and Boyle Construction Co., Sumter, S. C., replacement center, Spartanburg, S. C., \$6,739,327.

Karns-Smith Co., Trenton, N. J., temporary housing, electric system, roads and surface drainage, water and sanitary sewer systems, Ft. Dix, New Jersey, \$1,407,000.

Kreamer, A., Inc., Brooklyn, N. Y., kitchenware, \$5940.

Mack-International Truck Co., Long Island City, N. Y., cab over engine tractor-trucks, trucks, \$3,437,360.

McKee, Robert E., Los Angeles, quartermaster barracks at Schofield barracks, Territory of Hawaii, \$258,200.

Natkin & Co., St. Louis, cold storage rooms, Scott field, Illinois, \$14,620.

Pinney, E. J., Inc., Springfield, Mass., additions, armory, Springfield, \$70,856.

Pittsburgh-Des Moines Steel Co., Pittsburgh, elevated steel tank, piping and accessories, Ft. Dix, New Jersey, \$44,490.

Presto Gas Mfg. Co., Chicago, 8500 air pumps, \$9180.

Servel Inc., Evansville, Ind., fire units for field ranges, \$196,100.

Standard Electric Construction Co., San Francisco, electric transmission system, Forts Baker, Barry and Cronkhite, California, \$42,979.

Star Machinery Co., Seattle, deep well pump and high head surface type pump, national guard cantonment, Ft. Lewis, Washington, \$4517,81.

Thelan & Co., Syracuse, N. Y., fire escapes for hospital, Ft. Ontario, New York, \$1266.

Thornton Heating Co., Washington, boiler in central heating plant, Bolling field, Washington, \$14,000.

Travelcar Corp., Detroit, semi-trailers, \$121,360.

Villa, Guy, & Sons Inc., Westfield, N. J., additions to water distribution system, Ft. Dix, New Jersey, \$73,555.

Village Blacksmith Folks, Watertown, Wis., 13,300 butchers' cleavers, \$12,450.

Western Pump Co. Ltd., San Jose, Calif., deep well pump, Salinas airport, California, \$2960.

Yellow Truck & Coach Mfg. Co., Pontiac, Mich., trucks, \$571,722.12.

Willys-Overland Motors Inc., Toledo, O., 4-ton reconnaissance trucks, \$1,424,115.

Corps of Engineers Awards

Alban Tractor Co., Marion, O., shovels, \$341,066.

American Locomotive Co., Schenectady, N. Y., locomotives, \$121,600.

Crouse Hinds Co., Syracuse, N. Y., searchlight units, \$35,726.25.

General Bronze Corp., Chicago, portable steel bridges, \$51,500.

Haffner-Thrall Co., Chicago Heights, Ill., railroad cars, \$82,900.

Irving Subway Crating Co., Long Island City, N. Y., airplane landing mat and tools, \$203,845.

North American Iron & Steel Co., Brooklyn, N. Y., searchlight towers, \$22,845.

Air Corps Awards

American-LaFrance-Foamite Corp., Elmira, N. Y., control panel assemblies, \$53,298.60.

Banner Die Tool & Stamping Co., Columbus, O., bomb racks, \$31,365.

Bendix Aviation Corp., Pioneer Instrument division, Bendix, N. J., meters, \$1,924,560; Bendix division, South Bend, Ind., wheel assemblies, \$127,495.

Clark Equipment Co., Clark Tractor division, Battle Creek, Mich., tractors, \$552,502.48.

Federal Aid for Expansions

■ Plant expansion projects reported by the war and navy departments last week:

Consolidated Aircraft Corp., San Diego, Calif., contracted with navy department for building expansion and improvements at the corporation's plant in San Diego; estimated cost, \$3,090,044.69. Defense Plant Corp. also entered into an agreement with Consolidated for acquisition and construction of additional plant facilities. Maximum the Defense Corp. is required to expend under the contract is \$14,446,929.27. Title to the plant will remain with the Defense Corp.

Greenfield Tap & Die Corp., Greenfield, Mass., contracted with war department for \$1,009,000 gage-producing plant expansion.

Hercules Powder Co., Wilmington, Del., contracted with war department for architectural and engineering services, procurement and installation of equipment and operation of a bag-loading plant near Pulaski, Va. Award totaled \$6,756,399.

Liberty Aircraft Products Corp., Farmingdale, N. Y., contracted with the Defense Plant Corp. for acquisition and construction of additional plant facilities. Maximum amount to be expended is \$1,088,000.

Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., contracted with war department for expansion of gage-producing facilities to cost \$1,140,000.

RCA Mfg. Co. Inc., Camden, N. J., contracted with navy department for acquisition, construction and installation of additional plant facilities and equipment, and modification of the corporation's present plant at Camden; and for land, additional machinery and equipment at an additional plant at Indianapolis at total estimated cost of \$2,370,034.

Sheffield Gage Corp., Dayton, O., contracted with war department for expansion of gage-producing facilities to cost \$910,000.

Taft-Pelree Mfg. Co., Woonsocket, R. I., contracted with war department for expansion of gage-producing facilities to cost \$400,009.

Curtiss-Wright Corp., Curtiss Propeller division, Clifton, N. J., propeller assemblies and control sets, \$63,202,820.65.

Douglas Aircraft Co. Inc., Santa Monica, Calif., maintenance parts, \$57,294.15.

Edgewater Steel Co., Pittsburgh, adapter assemblies, \$193,106.

Fruehauf Trailer Co., Detroit, trailers and dollies, \$1,672,046.

General Motors Corp., Allison Engineering Co. division, Indianapolis, airplane engines, \$69,722,625.50.

Gosiger, C. H., Machinery Co., Dayton, O., precision lathes, \$107,465.40.

Holtzer-Cabot Electric Co., inverters, \$270,000.

Kennedy Mfg. Co., Van Wert, O., tool kits, \$26,639.60.

Link Aviation Devices Inc., Binghamton, N. Y., link trainers, \$4,097,412.

Minneapolis-Honeywell Regulator Co., Minneapolis, sight assemblies, \$244,500.

Medical Corps Awards

Ritter Dental Mfg. Co., Rochester, N. Y., dental equipment, \$546,433.

Chemical Warfare Service Awards

Beacon Devices, North Tonawanda, N. Y., cylinders, \$9012.68.

Chase Brass & Copper Co. Inc., Waterbury, Conn., brass, \$6982.44.

Florence Pipe Foundry & Machine Co., Philadelphia, valves and fittings, \$1094.20.

Kahl-Holt Co., Baltimore, pipe, \$1579.20.

Link-Belt Co., Chicago, screening and pulverizing unit, \$4720.

Logemann Bros. Co., Milwaukee, baler, \$2864.

National Lead Co., New York, solder wire, \$4500.

Pfandler Co., Rochester, N. Y., steel reactors, \$444,852.

Philadelphia Drying Machinery Co., Philadelphia, dryer units, \$17,862.

Sturtevant, B. F., Co., Baltimore, fan, \$1700.

United-Carr Fastener Corp., Cambridge, Mass., riveting machine, \$2000.

Wachter, Hoskins & Russell, Baltimore, steel pipe, \$1544.40.

Welch, W. M., Mfg. Co., Chicago, laboratory equipment, \$1014.90.

Navy department announced the following:

Bureau of Yards and Docks Awards

Dierks, A., & Co. Inc., Brooklyn, New York, heating plant equipment and piping, naval reserve aviation base, Anacostia, Washington, D. C., \$35,800.

Kaiser Co., Oakland, Calif., shore facilities at navy yard, Mare Island, California, on a cost plus fixed fee basis, \$3,300,000.

Leonard Construction Co., Chicago, housing facilities at Coco Solo and Balboa, Canal Zone, \$4,224,000 on a cost plus fixed fee basis.

Mortensen, Nelse, & Co., Seattle, barracks, quarters and filling houses at naval ammunition depot, Puget sound, Washington, \$245,413.

Richardson, R. R., & Co. Inc.; C. J. Lindemann; and Tunstall-Johnson Co. Inc., Norfolk, Va., improvements at the naval ammunition depot, St. Juliens Creek, Va., on a cost plus fixed fee basis, \$472,500.

Bureau of Supplies and Accounts Awards

Aero Instrument Co., Cleveland, pelorus-drift sight heads and bases, \$6250.

Ajax Electric Co. Inc., Philadelphia, electric furnaces, \$21,900.

Alban Tractor Co. Inc., Baltimore, crane, mounted on pneumatic tires, \$13,758.

American Chain & Cable Co. Inc., American Cable division, Wilkes-Barre, Pa., jackstays, pendants, lines, \$330,678.16.

American Fork & Hoe Co., Cleveland, adzes, hatchets, and hammers, \$39,084.61.

American-LaFrance-Foamite Corp., El-

Purchases Under Walsh-Healey Act

(In Week Ended Dec. 14)

mira, N. Y., fire extinguishers, \$31,130.48.

American Metal Co. Ltd., New York, tin-lead solder, pig tin, \$124,052.56.

American Scale Co., Kansas City, Mo., machinists' vises, \$12,712.70.

American Tool Works Co., Cincinnati, precision lathes, \$7592.

American Smelting & Refining Co., New York, pig lead, \$55,500.

American Steel & Wire Co. of N. J., Trenton, N. J., electric cable, \$97,179.60.

Anaconda Wire & Cable Co., New York, electric cable, \$99,071.

Austin-Hastings Co. Inc., Cambridge, Mass., upright drilling machines, \$19,283.

Babecock & Wilcox Co., Alliance, O., machine tools and other equipment, \$250,000.

Batteryless Telephone Equipment Co. Inc., Pittsburgh, diving telephones, \$34,950.

Bausch and Lomb Optical Co., Rochester, N. Y., machine tools, \$512,000.

Bay City Shovels Inc., Bay City, Mich., traveling crane, \$5200.

Bendix Aviation Corp., Pioneer Instrument division, Bendix, N. J., climb indicators, \$279,225.50; Eclipse Aviation division, Bendix, N. J., motor generators and regulators, \$86,800.

Bethlehem Steel Co., New York, turbine wheels, turbine nozzles, \$42,500.

Birtman Electric Co., Rock Island, Ill., machinists' vises, \$9320.28.

Breeze Corp. Inc., Newark, N. J., aircraft flowmeters, \$355,805.

Brewster Aeronautical Corp., Long Island City, N. Y., airplanes, \$15,160,501.60.

Bridgell, Chas. D., Inc., Crisfield, Md., butchers' cleavers, \$11,707.50.

Broderick & Bascom Rope Co., St. Louis, jacks, pendants, spreaders and wire rope slips, \$177,243.

Brown & Sharpe Mfg. Co., Providence, R. I., milling machines, \$52,656.

Bruning, Charles, Co. Inc., New York, protractors, \$14,445.

Buell, B. B., & Co., Seattle, oil burning ranges, electric ovens, \$20,057.

Buffalo Foundry & Machine Co., Buffalo, Impregnating tank, \$5829.

Bullard Co., Bridgeport, Conn., boring mill machine, \$14,387.25.

Burdny Engineering Co. Inc., New York, terminal solderless connectors, \$9523.14.

Burrows Filing Co. Inc., New York, iron paper weights, \$5626.

Carey Machinery & Supply Co., Baltimore, engine lathes, \$19,984.85.

Carnegie-Illinois Steel Corp., New York, building, machine tools and other equipment, South Charleston, W. Va., \$45,000,000.

Caswell, Strauss & Co. Inc., New York, pig tin, \$101,666.88.

Chase Brass & Copper Co. Inc., Waterbury, Conn., bronze rods; naval and commercial brass; brass tubing, \$49,050.13.

Chelsea Clock Co., Chelsea, Mass., deck clocks, \$22,150.

Chisholm-Moore Hoist Corp. Tonawanda, N. Y., chain hoists, \$15,473.54.

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling machines, \$52,030.

Clemson Bros. Inc., Middletown, N. Y., hacksaw blades, \$5505.19.

Clyde Cutlery Co., Clyde, O., boning and butchers' knives, \$20,175.

Collyer Insulated Wire Co., Pawtucket, R. I., electric cable, \$96,473.70.

Crane Co., Chicago, lift check valves, \$6720.

Crucible Steel Co. of America, New York, building extension, machine tools and other equipment, Harrison, N. J., \$125,000; slab steel, \$11,385.20.

Dana Tool-D Nast Machinery Co., Philadelphia, machinists' vises, \$6651.06.

Delaware Tool Steel Corp., Wilmington, Del., chisel blanks, chisels, pneumatic tool, \$5941.28.

Iron and Steel Products

Albert & Davidson Pipe Corp., Brooklyn, N. Y.

Alemite Co. of Maryland, Baltimore.

Allegheny Forging Co., Pittsburgh.

American Cutter & Engineering Co., Detroit.

American Fork & Hoe Co., Cleveland.

American Locomotive Co., New York.

American Rolling Mill Co., Middletown, O.

American Thermometer Co., St. Louis.

Anchor Post Fence Co., Baltimore.

Armstrong Bros. Tool Co., Chicago.

Associated Piping & Engineering Co. Ltd., Los Angeles

Austral Sales Corp., New York.

Baldt Anchor, Chain & Forge Corp., Chester, Pa.

Berkeley Steel Construction Co. Inc., Berkeley, Calif.

Bethlehem Steel Co., Bethlehem, Pa.

Bowen Products Corp., Auburn, N. Y.

Briggs Mfg. Co., Detroit.

Busch, J. C. Co., Milwaukee.

Carrollton Metal Products Co., Carrollton, O.

Cincinnati Tool Co., Cincinnati.

Cole, Wm. H., & Sons, Baltimore.

Columbia Steel Co., Provo, Utah.

Consolidated Steel Corp. Ltd., Los Angeles.

Crown Iron Works Co., Minneapolis.

Crucible Steel Co. of America, New York.

Doehler Die Casting Co., Toledo, O.

Duff-Norton Mfg. Co., Pittsburgh.

Franklin Hardware Co., New York.

Harnischfeger Corp., Milwaukee.

Harrisburg Steel Corp., Harrisburg, Pa.

IDL Mfg. & Sales Corp., New York.

Ingersoll-Rand Co., New York.

Iron Fireman Mfg. Co., Portland, Oreg.

Keller, William H., Inc., Grand Haven, Mich.

Keystone Bolt & Nut Corp., New York.

Leach Bros., Oshkosh, Wis.

Lord & Burnham Co., Irvington, N. Y.

MacLane Hardware Co., New York.

Mall Tool Co., Chicago.

Manning, Maxwell & Moore Inc., Jersey City, N. J.

Master Metal Products Inc., Buffalo.

Mercury Aircraft Inc., Hammondsport, N. Y.

Mildvale Co., Philadelphia.

Montgomery & Co. Inc., New York.

Moore Eastwood & Co., Dayton, O.

Mullins Mfg. Corp., Salem, O.

National Supply Co., Toledo, O.

Niagara Motors Corp., Dunkirk, N. Y.

Noland Co. Inc., Washington.

North & Judd Mfg. Co., New Britain, Conn.

Ohio Injector Co., Wadsworth, O.

Pacific Wire Rope Co., Los Angeles.

Pennsylvania Forge Corp., Philadelphia.

Plomb Tool Co., Los Angeles.

Pressed Steel Car Co. Inc., McKees Rocks, Pa.

Quality Buckle Co., Providence, R. I.

Reeves Steel & Mfg. Co., Dover, O.

Republic Steel Corp., Cleveland.

Roebbling's, John A., Sons Co., Philadelphia.

Sause Structural Steel Co., Youngstown, O.

Snead & Co., Jersey City, N. J.

Standard Steel Works, North Kansas City, Mo.

Stanley Works, New Britain, Conn.

Steel Improvement & Forge Co., Cleveland.

Stupp Bros. Bridge & Iron Co., St. Louis.

Taylor-Parker Co. Inc., Norfolk, Va.

Truscon Steel Co., Youngstown, O.

Uchtorff Co., Davenport, Iowa.

United States Barrel Co., Philadelphia.

United States Pipe & Foundry Co., Los Angeles.

Variety Aircraft Corp., Dayton, O.

Virginia Bridge Co., Roanoke, Va.

Washburn Co., Worcester, Mass.

Waterbury Buckle Co., Waterbury, Conn.

Wheeling Corrugating Co., Louisville, Ky.

Widm Metal Goods Co., Garwood, N. J.

Williamson Heater Co., Cincinnati.

Wyckoff Drawn Steel Co., Pittsburgh.

Zephyr Laundry Machine Co. Inc., Chicago.

Commodity

Amount

Steel pipe \$13,539.25

Fittings 19,824.75

Forging 15,980.00

Punches 40,210.50

Axes 23,150.48

Axles, disks 12,054.00

Steel magazines 24,080.00

Mount assemblies 20,537.50

Fencing 14,685.46

Wrenches 17,852.76

Piping 23,806.23

Screen guards 10,742.00

Steel anchors 20,700.00

Buoys 45,360.00

Wire rope, steel 38,472.28

Fuse covers 20,781.60

Steel bath tubs 475,852.72

Multiplex tables 32,200.00

Cake covers 12,976.00

Clamps 77,865.53

Hatchets, hoes 13,568.35

Anchors 43,200.00

Butterfly valves 148,500.00

Bridge equipment 331,740.00

Forgings, tool steel, projectiles 132,733.25

Nozzles 43,968.38

Jacks 11,412.50

Bolts and nuts 15,570.08

Bridge cranes 175,388.00

Cylinders 74,692.87

Shears 30,500.00

Air drills, saws 105,671.16

Mount assemblies 85,645.00

Screwdrivers 20,572.00

Blades, files 13,604.13

Bridge equipment 681,500.00

Footbridges 407,524.00

Saws, picks 26,146.38

Band saws 211,500.00

Handles 36,372.17

Steel chest 12,323.86

Wrenches 18,900.90

Forgings 26,775.00

Hand drills 12,204.00

Mount assemblies 85,050.00

Steel bath tubs 53,400.00

Forgings 12,726.00

Forgings 28,359.80

Jacks, levels 18,750.86

Slides, loops 30,517.87

Valves 37,246.25

Wire rope 22,777.20

Forgings 164,785.96

Wrenches 12,072.00

Forgings 1,230,000.00

Buckles 31,961.80

Buckets, cans 24,214.13

Steel 16,281.15

Wire rope 22,045.71

Structural steel 16,500.00

Bridge equipment 1,063,050.00

Stand assemblies 178,850.00

Valve guards 50,643.85

Forgings 47,032.50

Trashracks 50,388.00

Drills 24,263.20

Steel doors 22,316.00

Chests 18,588.00

Steel drums 66,400.00

Cast iron pipe 11,343.40

Stand assemblies 115,200.00

Bridge, parts 155,453.60

Wire clamps 10,364.32

Buckles 43,276.30

Wire fencing 10,775.22

Wire pikes 40,312.61

Furnaces 38,885.00

Steel *31,758.06

Truck tubs 44,852.85

*Estimated.

Nonferrous Metals and Alloys

Aluminum Co. of America, Pittsburgh.

American Brass Co., Waterbury, Conn.

C-O-Two Fire Equipment Co., Newark, N. J.

Foster Wheeler Corp., New York.

Fyr Fyter Co., Dayton, O.

Kennecott Sales Corp., New York.

Metal Reduction Corp. of N. J., North Bergen, N. J.

National Lead Co., Baltimore branch, Baltimore.

Phelps Dodge Copper Products Corp., New York.

Aluminum rivets \$11,612.59

Copper-nickel tubing, copper, brass, cartridge cups, seamless bands 502,308.24

Extinguishers 50,580.00

Brass pipe 176,962.63

Fire extinguishers 43,600.00

Copper 60,250.00

Ingot bronze 28,782.00

Metal 21,510.00

Brass pipe 12,657.45

(Please turn to Page 33)

Purchases Under Walsh-Healey Act (Cont.)

Defense Awards

(Concluded from Page 32)

Nonferrous Metals and Alloys	Commodity	Amount
Revere Copper & Brass Inc., Baltimore.....	Cartridge cases and disks, reworking scrap	\$256,614.03
Seovill Mfg. Co., Philadelphia	5-cent blanks, condenser tubes	201,314.32
United-Carr Fastener Corp., Cambridge, Mass.	Buttons, washers, clips	25,404.90
United States Steel Export Co., New York.....	Fabricated plates	85,943.00
Machinery and Other Equipment		
American Machine & Metals Inc., East Moline, Ill.	Washers, ironers	505,579.15
American Sterilizer Co., Erie, Pa.	Disinfectors	52,910.00
Austin-Hastings Co. Inc., East Cambridge, Mass.	Radial drills	17,276.00
Bertsch & Co. Inc., Cambridge City, Ind.	Straightening rolls	25,958.00
Bethlehem Steel Co., New York	Engine parts	10,352.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Screw machine	10,046.22
Buda Co., Harvey, Ill.	Engine parts	11,212.60
Bullard Co., Bridgeport, Conn.	Boring mills	31,207.35
Carlton Machine Tool Co., Cincinnati	Drills	21,334.00
Caterpillar Tractor Co., Peoria, Ill.	Tractors, graders	149,888.68
C. H. & E. Mfg. Co. Inc., Milwaukee	Pumping sets	14,875.00
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati	Grinders	83,342.17
Cincinnati Shaper Co., Cincinnati	Press machines	19,244.00
Clayton Mfg. Co., Alhambra, Calif.	Cleaners	25,222.50
Clearing Machine Corp., Chicago	Press brakes	14,200.00
Detroit Aluminum & Brass Corp., Detroit	Engine parts	22,180.75
Dierks, A. & Co. Inc., Brooklyn, N. Y.	Heating plant	35,800.00
Draper Corp., Hopedale, Mass.	Looms	38,226.40
Eichman Machinery Co., Kansas City, Mo.	Milling machine	18,634.00
Ex-Cell-O Corp., Detroit	Grinder	15,958.85
General Excavator Co., Marion, O.	Diesel shovel	12,646.00
Gisholt Machine Co., Madison, Wis.	Lathes	107,397.00
Hanson Clutch & Machinery Co., Tiffin, O.	Shovels	20,946.90
Harris Scybold Potter Co., Cleveland	Lithograph press	20,150.00
Hell Co., Milwaukee	Wagon scrapers	30,450.00
Hercules Co., Marion, O.	Rollers	19,575.00
Hospital Supply Co., and Watters Laboratories Consolidated, New York	Disinfectors	68,211.00
Huebsch Mfg. Co., Milwaukee	Presses	31,240.00
Independent Pneumatic Tool Co., Chicago	Drills	10,257.00
Ingersoll-Rand Co., New York	Air compressors	15,706.00
International Harvester Co., Chicago	Tractors	33,562.76
Iowa Mfg. Co., Cedar Rapids, Iowa	Crushing plant	28,375.00
Jackson, Byron, Co., Huntington Park, Calif.	Recoil mechanisms	2,643,709.88
Jensen Mfg. Co., Palmyra, N. J.	Washers	78,230.00
Jones & Lamson Machine Co., Springfield, Vt.	Lathe	10,241.00
Leavitt Machine Co., Orange, Mass.	Valve reseating outfits	16,717.00
Le Roi Co., Milwaukee	Generating units, air compressors	1,156,770.00
Leace-Neville Co., Cleveland	Engine parts	78,172.50
Leland-Gifford Co., Worcester, Mass.	Drilling machines	13,860.00
Lloyd & Arms Inc., Philadelphia	Lapping machine	11,940.05
McDonald Machinery Co., St. Louis	Shapers	16,065.00
Morgan Engineering Co., Alliance, O.	Electric cranes	118,540.00
Notch & Merryweather Machine Co., Cleveland.....	Grinders	61,900.00
National Broach & Machine Co., Detroit	Profiling machine	20,320.00
National Marking Machine Co., Cincinnati	Marking machines	252,720.00
Nelson, W. P., Iron Works Inc., Passaic, N. J.	Truck loaders	11,055.00
Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn.	Machines, drills, radial drills	70,875.00
Northwest Engineering Co., Chicago	Shovels	158,043.00
Norton Co., Worcester, Mass.	Grinding machines	34,923.00
Outboard Marine & Mfg. Corp., Waukegan, Ill.	Motors	75,233.16
Paving Supply & Equipment Co., Washington	Mixing plant	15,730.00
Prentiss, Henry & Co. Inc., New York	Boring machines	78,292.00
"Quick-Way" Truck Shovel Co., Denver	Crane	10,735.00
Racine Tool & Machine Co., Racine, Wis.	Hack saws	14,762.35
Ransome Concrete Machine Co., Dunellen, N. J.	Concrete mixers	31,319.40
Reed-Prentice Corp., Worcester, Mass.	Engine lathes	19,018.00
Roy Engineering & Iron Works Inc., Brooklyn, N. Y.	Disinfectors	17,104.00
Sebastian Lathe Co., Cincinnati	Lathes	177,641.25
Selfreat-Elstad Machine Co., Dayton, O.	Shapers	16,578.00
Sellers, Wm., & Co. Inc., Philadelphia	Boring machine, grinders	28,250.25
Shipley, W. E., Machinery Co., Philadelphia	Turning machines	45,112.50
Singer Sewing Machine Co., New York	Sewing machines	51,988.66
Smith, Drum & Co., Philadelphia	Ironers	43,722.00
Sterling Engine Co., Buffalo	Propulsion plants	652,800.00
Sullivan Machinery Co., New York	Drifter drills	51,085.00
Swind Machinery Co., Philadelphia	Boring machines, shear machines	165,777.00
Unipress Co. Inc., Minneapolis	Pressers	120,035.00
Universal Crusher Co., Cedar Rapids, Iowa	Crushing and screening plant	18,500.00
Vandyck Churchill Co., Philadelphia	Milling machines	14,971.00
Walraven, J. R., Atlanta, Ga.	Lathes	18,995.00
Warner & Swasey Co., Cleveland	Lathes	18,467.50
Weaver Mfg. Co., Springfield, Ill.	Engine holsts	84,000.00
Weiss, Albert, New York	Machines	11,849.16
Wiard Plow Co., Batavia, N. Y.	Road plows	14,045.40
Wiedemann Machine Co., Philadelphia	Machines	58,256.50
Worthington Pump & Machinery Corp., Harrison, N. J.	Pumps	37,788.00

DeLaval Steam Turbine Co., Trenton, N. J., pumps, \$1,350,000.
DeWalt Products Corp., Lancaster, Pa., woodworking machines, \$12,510.
Edison General Electric Appliance Co. Inc., Chicago, electric ranges, \$5043.
Electric Materials Co., North East, Pa., copper hammers, \$5018.47.
Electric Products Co., Cleveland, welding sets, control panels, \$76,496.
General Cable Corp., New York, electric cable, \$195,539.
General Electric Co., Schenectady, N. Y., electric cable, \$93,685.
Gisholt Machine Co., Madison, Wis., turret lathes, \$48,773.80.
Gleason Works, Rochester, N. Y., generator, \$8205.80.
Goss Printing Press Co., Chicago, building equipment and machine tools, \$864,600.
Greenville Steel Car Co., Greenville, Pa., railroad box cars, \$105,188.15.
Grumann Aircraft Engineering Corp., Bethpage, Long Island, N. Y., airplanes and spare parts, \$36,250,455.15.
Haffner-Thrall Car Co., Chicago, railroad flat cars, \$58,097.
Harrington, Russell, Cutlery Co., Southbridge, Mass., knives, \$37,375.
Harris, D. F. & Sons Inc., Gloucester, Mass., hammocks, \$23,900.
Highway Trailer Co., Edgerton, Wis., four wheel trailers, \$22,230.
Hydro-Blast Corp., Chicago, hydraulic blast cleaning room, \$92,604.
Ingersoll-Rand Co., New York, pneumatic wrenches, \$6090.40.
International Silver Co., New York, silverplated ware, \$127,705.50.
Jenison Machinery Co., San Francisco, multiple spindle drill, \$8965.
Kester Solder Co., Chicago, tin-lead solder, \$6703.64.
Kidde, Walter, & Co. Inc., New York, fire extinguishers, \$255,007.50.
Lamson & Goodnow Mfg. Co., Shelburne Falls, Mass., forks, knives, \$13,900.
Laughlin, Thomas, Co., Portland, Oreg., shackles, \$7214.
Lloyd & Arms Inc., Philadelphia, honing and lapping machine, \$35,690.
McKay Co., Pittsburgh, anchor chains, rings and balls, \$162,848.44.
McKiernan-Terry Corp., Harrison, N. J., boat crane machinery, \$56,570.
Midvale Co., Nicetown, Philadelphia, alloy steel forgings, \$220,640.
Monarch Machine Tool Co., Sidney, O., lathes, \$30,923.
National Electric Products Corp., Pittsburgh, electric cable, \$96,540.40.
National Malleable & Steel Castings Co., Cleveland, cast steel chain, \$26,880.
National Tube Co., Pittsburgh, steel tubing, \$6530.31.
Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., vertical universal shaper, \$7472.
Norris Stamping & Mfg. Co., Los Angeles, cartridge containers, \$1,006,205.
North American Smelting Co., Philadelphia, tin-lead solder, \$25,893.40.
Northern Pump Co., Minneapolis, buildings, machine tools and other equipment, diesel oil fuel pumps, \$5,485,962.
Okonite Co., Passaic, N. J., electric cable, \$97,760.30.
Oppleman, L. Inc., New York, cases, compasses and dividers, \$11,339.
Phelps Dodge Copper Products Corp., Hahirshaw Cable & Wire division, New York, electric cable, \$349,123.40.
Plumb, Fayette R., Inc., Philadelphia, axes, hammers, hatchets, mauls and sledges, \$11,494.15.
Pollak Mfg. Co., Arlington, N. J., powder and cartridge containers, \$515,440.80.
Prentiss, Henry, & Co. Inc., New York, boring and turning machine, \$28,841.
Providence Mill Supply Co., Providence, R. I., machinists' vises, \$31,987.59.
Rainear, C. J., & Co. Inc., Philadelphia, steel flanges, \$18,724.57.

(Please turn to Page 87)

Hillman Has Big Opportunity in OPM

■ LABOR has received important recognition in the revamped defense organization. The appointment of Sidney Hillman to the position of associate director of the recently created office of production management for national defense is a distinct victory for those who are guiding the present drive of union labor for increased power and prestige.

Just what will be the relationship between William S. Knudsen, as director of OPM, and Mr. Hillman, as associate director, remains to be seen. In some quarters in Washington one gains the impression that Messrs. Hillman and Knudsen are expected to be on the same level of authority. Others are of the opinion that Mr. Knudsen is in command of OPM and that Mr. Hillman is second man. This point probably will be clarified soon.

Regardless of what decision is made as to their ranking, one finds it difficult to argue against the advisability of according labor a powerful voice in the nation's administration of defense policies. Labor's rise to a more important place in the affairs of this country has been paced by an ascendancy for labor groups in almost every industrial nation throughout the world. In view of the pro-labor policies of the present government administration and of the world-wide tendency to entrust labor's representatives with greater responsibilities in government, the appointment of Mr. Hillman is logical and appropriate.

* * *

However, the labor situation in the United States differs from that in every other industrial nation in a way that may seriously complicate Mr. Hillman's participation in the defense effort.

Only a fraction of the wage earners in this country belong to unions. Many who hold union cards and pay dues do so against their will. In spite of the tremendous power exerted by union leaders and by the government itself to recruit

union members during the past eight years, an overwhelming majority of American wage earners have preferred to and have been able to remain outside union ranks.

Mr. Hillman, as "labor's" representative in the high councils of the government, must decide how he is going to serve his clientele. If he feels that he is committed to serving only the members of unions, or—worse yet—only the members of favored unions, he will not be a true representative of the element of American society which we loosely call "labor." On the other hand, if he considers that he is the agent of all employes—union or otherwise—he will be approaching the responsibility in a way that will augur well for success.

* * *

Unfortunately Mr. Hillman's attitude to date indicates that he thinks he is committed solely to the interests of the minority—the union members, if not the members of favored unions. He has tried to withhold defense contracts from companies who happen to have incurred the wrath of an admittedly biased labor board.

Does that mean that Mr. Hillman will find it difficult or impossible to place defense ahead of service to favored unions?

We hope not. We hope that Mr. Hillman's service to total defense will be so conspicuously outstanding that it will help to elevate the prestige of the legitimate labor movement.

Also we believe that he will have to perform a miracle to give the average working man—union or non-union—half the break that industrial employes received in 1918 when "labor's" representatives on the War Industries board, represented all who toiled for wages.

E. L. Shaner

The BUSINESS TREND



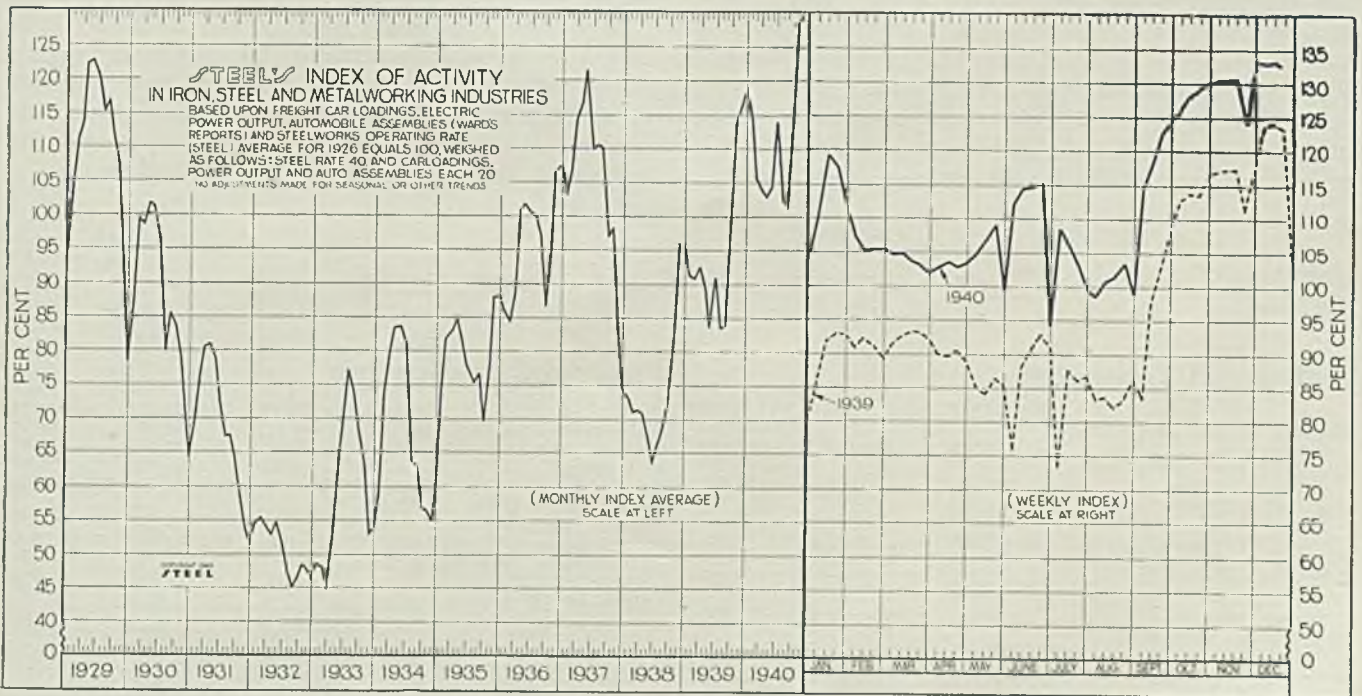
Index of Activity Holds Near Year's Peak Level

INDUSTRIAL production continues at an encouraging high level. Despite the adverse year-end influences, industrial output is at nearly the best levels of the year. Close to capacity production rates are being maintained quite generally, reflecting the large order backlogs accumulated during the past few months and the encouraging volume of new business.

Following the heavy purchasing of last fall, which represented one of the largest forward buying movements on record, many manufacturing concerns are now attempting to maintain inventories at the somewhat augmented level, taking into consideration what

is already on order. This is indicated by the moderate tapering off in new demand during the past few weeks. However, there is little evidence of any substantial reduction of order backlogs in those industries where they were heaviest; such as in the steel, machine tools, aircraft and shipbuilding lines.

Despite the sharp upturn in buying during the closing months of the year, inventories generally have risen only moderately. Manufacturers have been using practically all of the goods obtained and consequently their inventories have not shown the large increase that might be expected. Nor have distributors accumu-



STEEL'S index of activity declined 0.2 point to 132.4 in the week ended Dec. 21:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Oct. 5	124.4	112.5	Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Oct. 12	126.0	113.9	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
Oct. 19	128.3	113.6	March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
Oct. 26	129.9	116.2	April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Nov. 2	130.2	117.1	May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
Nov. 9	130.3	117.2	June	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
Nov. 16	130.3	117.3	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Nov. 23	124.7	111.4	Aug.	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Nov. 30	132.6	117.9	Sept.	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Dec. 7	132.5	128.9	Oct.	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Dec. 14	132.6	124.2	Nov.	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec. 21	132.4†	123.4	Dec.	.....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

†Preliminary.

lated excessive stocks. However, in some instances it is expected that inventories will rise considerably during the next few months as shipments are made against present commitments. Whether or not inventories will be excessive in some lines three or four months from now will depend chiefly on the extent of the expected increase in consumption, stimulated

Where Business Stands

Monthly Averages, 1939 = 100

	Nov., 1940	Oct., 1940	Nov., 1939
Steel Ingot Output	149.0	148.4	145.8
Pig Iron Output	151.5	147.9	143.7
Building Construction	128.5	129.5	115.4
Auto Output	160.8	165.4	118.5
Freight Movement	114.0	124.1	113.9
Wholesale Prices	102.9*	102.1	102.7

*Preliminary.

by the defense program and expanding purchasing power.

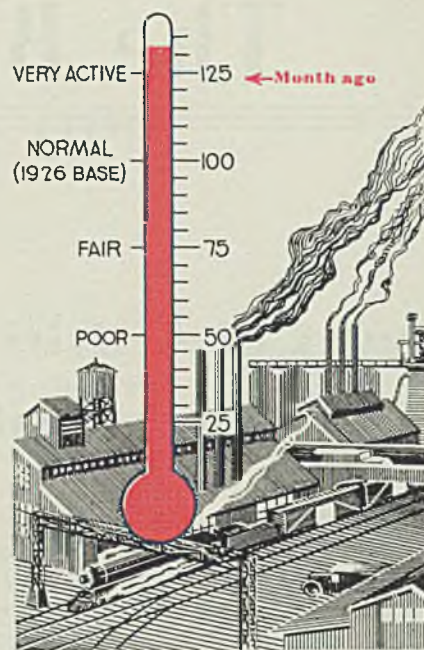
During the week ended Dec. 21, STEEL'S index of activity eased 0.2 points to 132.4. In the same period last year the index declined 0.8 points to 123.4, while in the corresponding week of 1938 it receded 5 points.

Steelmaking operations declined one-half point during the week ended Dec. 21 to 95 per cent. The national steel rate is now but two points below the year's peak of 97 per cent recorded during the latter part of November. At this time last year steelworks operations stood at 90.5 per cent. Most steel producing interests report an encouraging volume of new business in spite of the record tonnage placed during

Industrial Weather

TREND:

Sidewise



the fall months.

Automobile output for the week of Dec. 21 remained above the 120,000 weekly level for the sixth consecutive week, excluding the Thanksgiving day period. Automobile assemblies in the latest week totaled 125,350 units, against 125,625 the previous period and 117,705 in the corresponding 1939 week.

The defense program directly and indirectly continues to furnish the principal impetus to expanding industrial activity. Besides the large governmental expenditures for goods, there is the exceptional volume of plant construction and other preparation being made for production of defense equipment.

The Barometer of Business

Industrial Indicators

	Nov., 1940	Oct., 1940	Nov., 1939
Pig iron output (daily average, tons)	146,589	143,152	138,883
Iron and steel scrap consumption (tons)	3,922,000	4,233,000	4,025,000
Gear Sales Index	173	216	126
Foundry equipment new order index	337.6	350.6	192.2
Finished steel shipments (Net tons)	1,425,352	1,572,408	1,406,205
Ingot output (average weekly; net tons)	1,464,528	1,458,668	1,433,050
Dodge bldg. awards in 37 states (\$ Valuation) ...	\$380,347,000	\$383,069,000	\$299,847,000
Automobile output	510,973	514,374	368,541
Coal output, tons	\$40,300,000	\$38,300,000	.....
Business failures; number	1024	1111	1184
Business failures; liabilities	\$16,572,000	\$12,715,000	\$13,201,000
Cement production, bbls. ...	12,689,000	13,935,000	11,053,000
Cotton consumption, bales ..	744,088	770,702	718,719
Car loadings (weekly av.) ..	746,407	812,850	745,726

Commodity Prices

	Nov., 1940	Oct., 1940	Nov., 1939
STEEL'S composite average of 25 iron and steel prices ..	\$38.08	\$38.07	\$37.50
U. S. Bureau of Labor index ..	79.3	78.7	79.2
Babson monthly prices:			
Wheat (bushel)†	\$0.85	\$0.888	\$0.895
Corn (bushel)†	\$0.683	\$0.625	\$0.62

†October, September and October respectively.

Financial Indicators

	Nov., 1940	Oct., 1940	Nov., 1939
30 Industrial Stocks†	134.41	134.33	151.60
20 Rail stocks†	29.32	29.05	33.76
15 Utilities†	23.29	21.93	25.68
Bank clear'gs† (000 omitted) ..	\$25,289,000	\$21,083,000	\$22,469,000
Commercial paper rate, (N. Y., per cent)	½	½-¾	¾
*Com'l. loans (000 omitted) ..	\$9,162,000	\$8,909,000	\$8,656,000
Federal Reserve (ratio per cent)	90.8	90.1	86.3
Capital flotations: (000 omitted)			
New Capital†	\$257,603	\$110,687	\$338,340
Refunding†	\$453,017	\$114,752	\$404,370
Federal Gross debt (millions of dollars)	\$44,139	\$44,137	\$41,305
Railroad earnings†	\$86,988,444	\$74,193,237	\$101,716,356
Stock sales, New York stock exchange	20,887,311	14,489,085	19,219,736
Bond sales, par value† ..	\$151,000,000	\$126,400,000	\$170,300,000

†October, September and October respectively.

*Leading member banks Federal Reserve System.

†Dow-Jones Averages.

Foreign Trade

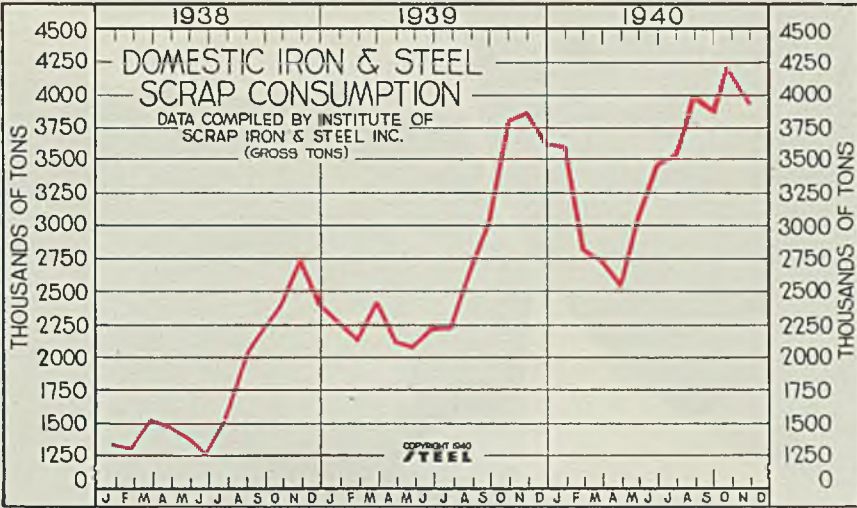
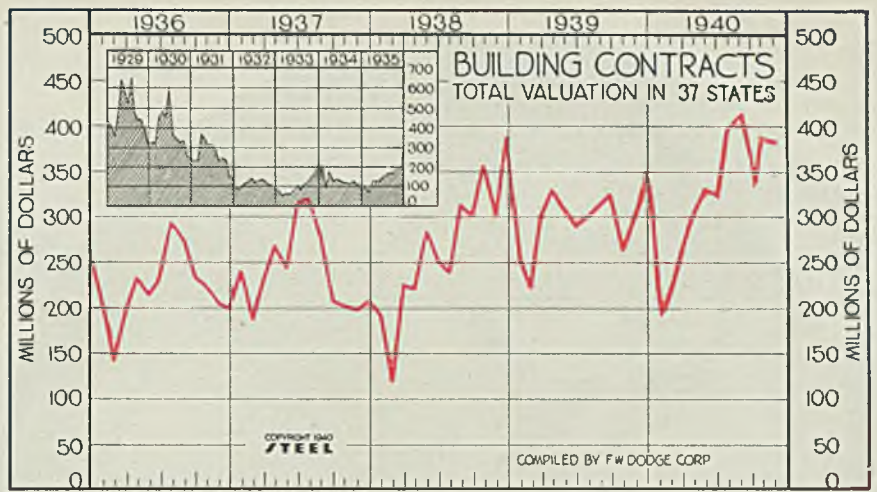
	Oct., 1940	Sept., 1940	Oct., 1939
Exports	\$343,485,000	\$295,245,000	\$331,978,000
Imports	\$207,141,000	\$194,928,000	\$215,289,000
Gold exports†	\$13,000	\$10,000	\$15,000
Gold imports	\$325,981,000	\$334,113,000	\$69,740,000

†September, August and September respectively.

Construction Total Valuation In 37 States

(Unit: \$1,000,000)

	1940	1939	1938	1937	1936
Jan.	\$196.2	\$251.7	\$192.2	\$242.7	\$204.8
Feb.	200.6	220.2	118.9	188.3	142.1
Mar.	272.2	300.7	226.6	231.2	199.0
April.	300.5	330.0	222.0	269.5	234.8
May.	328.9	308.5	283.2	243.7	216.1
June	324.7	288.3	251.0	317.7	232.7
July	398.7	299.9	239.8	321.6	294.7
Aug.	414.9	312.3	313.1	281.2	275.3
Sept.	347.7	323.2	300.9	207.1	234.3
Oct.	383.1	261.8	357.7	202.1	225.8
Nov.	380.3	299.8	301.7	198.4	208.2
Dec. . . . .	.....	354.1	389.4	209.5	199.7
Ave. . . . .	.....	\$295.9	\$266.4	\$242.8	\$222.3



Iron and Steel Scrap Consumption

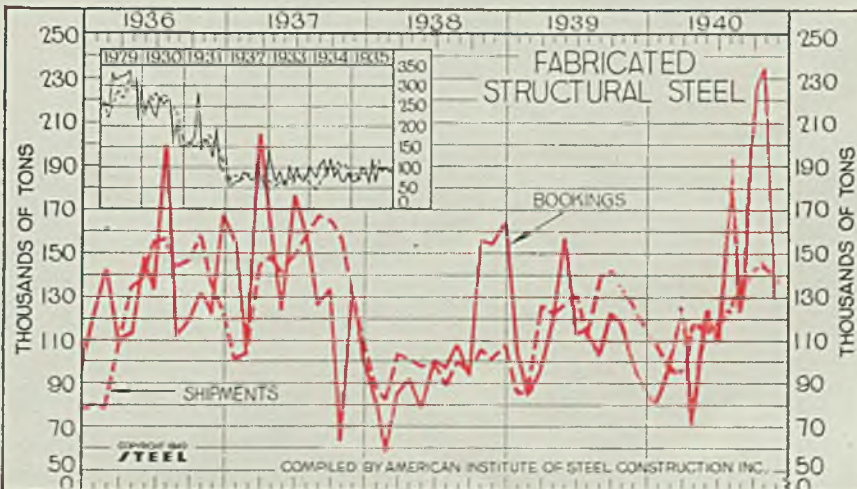
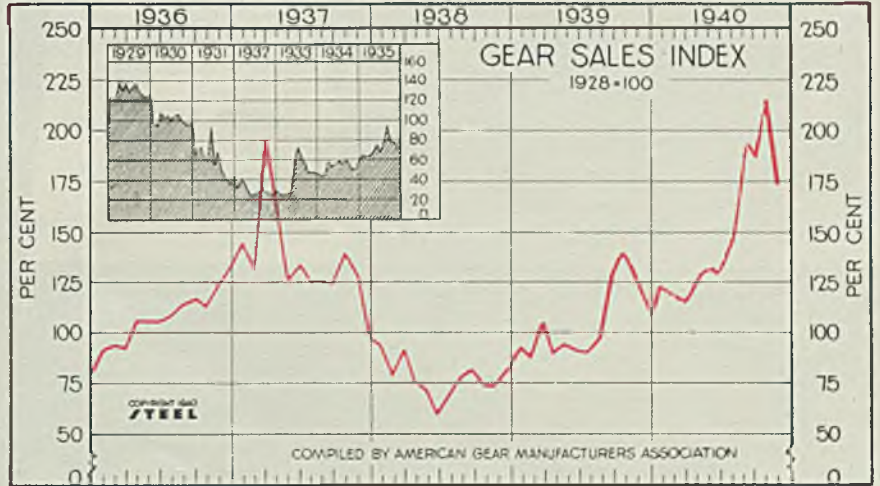
(Gross Tons)

	1940	1939	1938
		(000 omitted)	
Jan.	3,581	2,257	1,331
Feb.	2,812	2,124	1,306
Mar.	2,728	2,419	1,543
Apr.	2,548	2,114	1,477
May	3,061	2,079	1,387
June	3,482	2,221	1,257
July	3,526	2,247	1,520
Aug.	3,968	2,675	1,953
Sept.	3,876	3,018	2,218
Oct.	4,233	3,809	2,393
Nov.	3,922	3,858	2,732
Dec. . . . .	.....	3,613	2,411
Total . . . . .	.....	32,434	21,528
Mo. Av.	3,434	2,703	1,794

Gear Sales Index

(1928 = 100)

	1940	1939	1938	1937	1936
Jan.	123	91.0	93.0	144.0	90.5
Feb.	116	86.0	77.0	130.5	93.0
Mar.	114	104.0	91.0	195.0	92.0
April	128	88.0	74.0	164.0	105.0
May	133	93.0	70.0	125.5	105.0
June	129	90.0	58.0	134.0	105.0
July	141	89.0	67.0	124.0	107.5
Aug.	191	96.0	76.5	125.0	113.0
Sept.	183	126.0	80.5	123.0	115.5
Oct.	216	141.0	72.5	139.5	112.5
Nov.	173	126.0	72.0	127.5	122.5
Dec. . . . .	.....	111.0	81.0	97.0	132.5
Ave. . . . .	.....	103.5	76.0	135.5	107.5



Fabricated Structural Steel

(1000 tons)

	Shipments			Bookings		
	1940	1939	1938	1940	1939	1938
Jan.	110.9	84.3	87.8	81.7	101.7	80.3
Feb.	97.2	84.4	81.2	98.9	82.7	57.1
Mar.	95.9	125.3	103.3	128.3	95.1	84.3
Apr.	116.3	120.9	100.0	73.8	118.3	91.2
May	115.6	125.9	96.4	126.8	156.9	77.3
June	119.1	130.1	98.6	109.7	111.6	99.9
July	127.1	110.5	88.0	194.9	114.1	96.0
Aug.	134.9	139.7	98.6	122.5	100.9	106.8
Sept.	142.8	140.8	93.5	225.5	121.4	92.5
Oct.	144.1	133.8	105.0	235.1	118.8	154.8
Nov.	136.8	128.2	99.9	129.3	99.3	153.1
Dec. . . . .	.....	116.2	106.5	.....	84.4	163.4
Total	1440.1	1158.8	.....	1305.0	1256.6	.....

Suicide

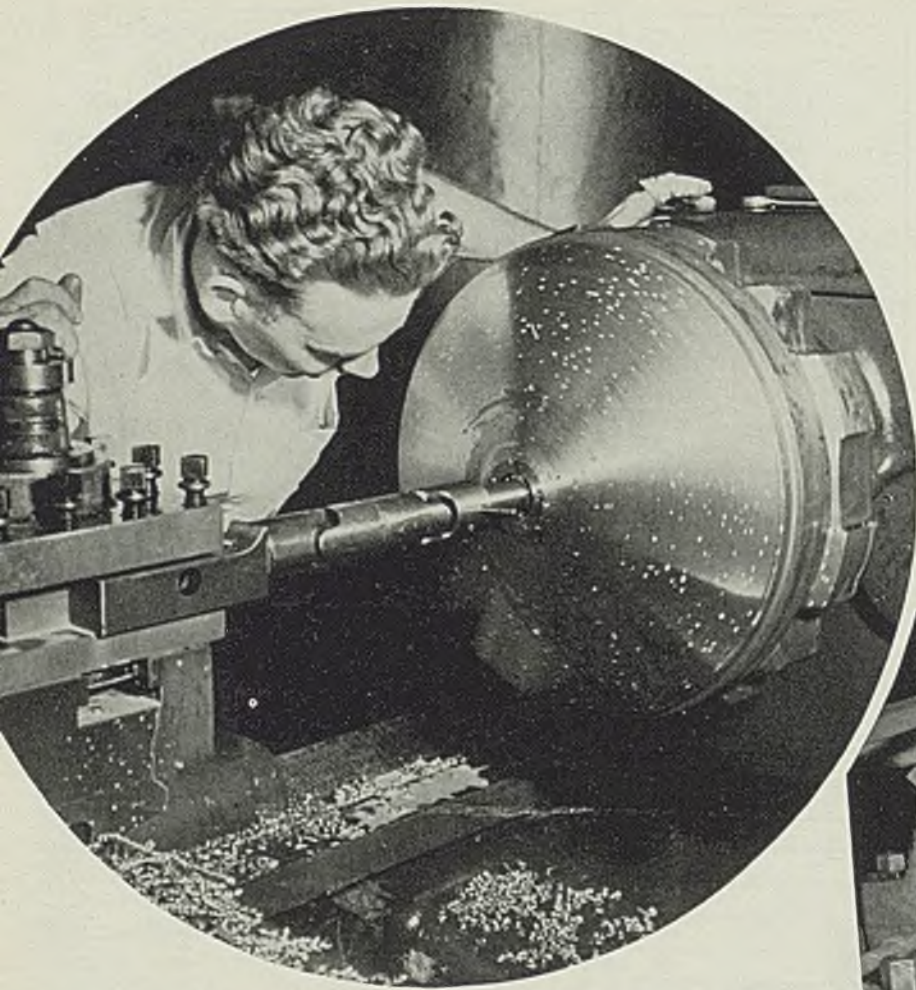
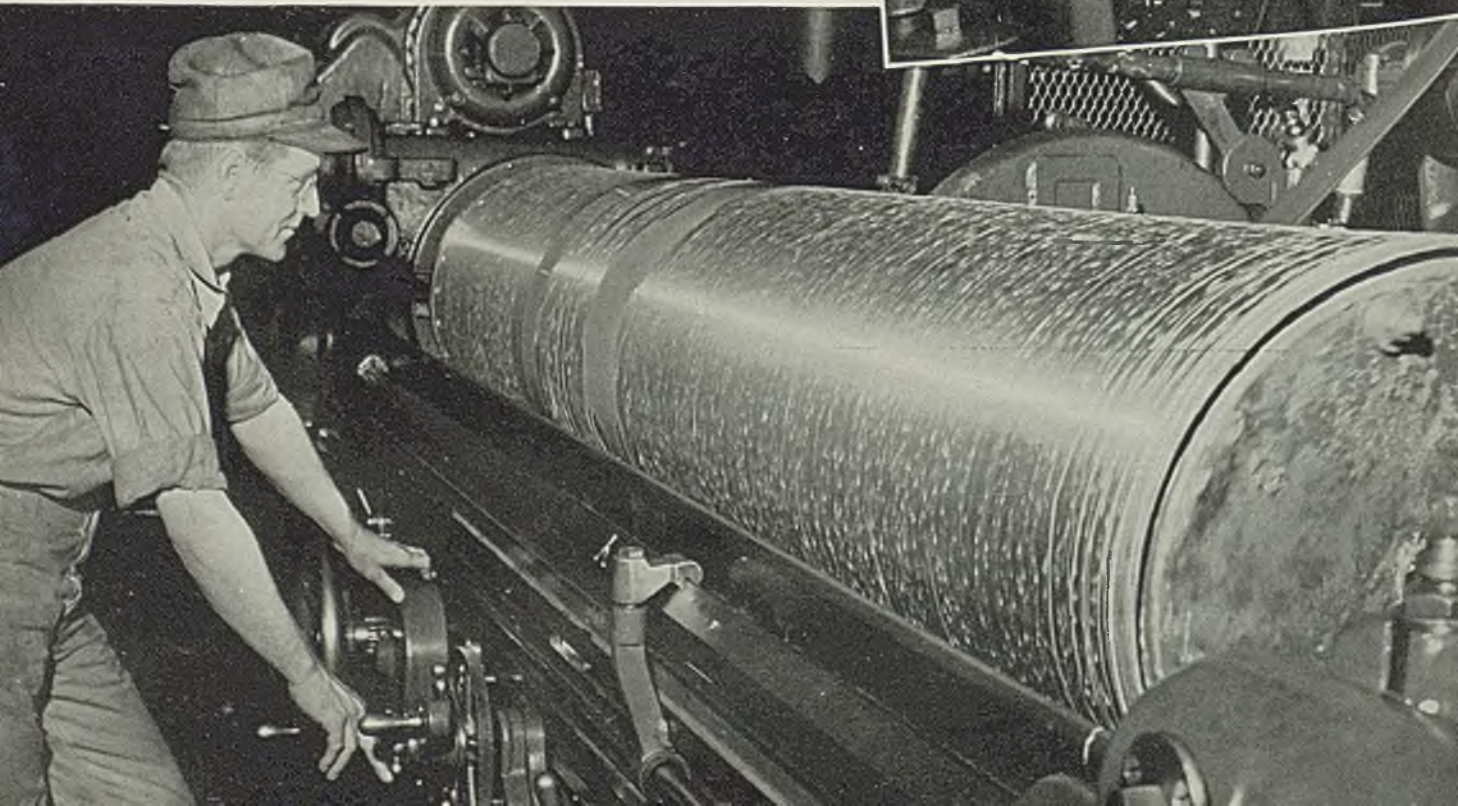


Fig. 1—Machining one of the forged steel end bulkheads, by means of tools held in turret tool post of a heavy-duty lathe. Contouring of the face, machining of the rim and boring of the hole already have been done. The hole is now being finished by a "floating" tool. Note the universal joint in its shank to provide the "float"



Fig. 2. (Right)—Operation of facing and boring the end of the air flasks preparatory to fitting to it its end bulkhead



Submarines *in the Making*

■ MODERN naval torpedoes are much more than mere projectiles. They are to all intents and purposes small high-speed submarines, completely equipped with their own turbine propelling engines and automatic depth-control mechanism. Although ordinarily they are launched from their mother craft through a tube by a puff of compressed air, this is merely to give them their initial "push" in the desired direction.

Thereafter they are "on their own." Their air-driven propellers whirl into action as soon as they are launched and their diving fins quickly level them off at predetermined depth as they race toward their target at such speed as to make it next to impossible to dodge them or sink them—even though their intended victim should detect them enroute.

Each torpedo costs thousands of dollars and is made up of hundreds of carefully made parts ranging from minute details of the delicate control instruments to massive thick-walled pressure reservoirs. The latter can be compared to the high-pressure boilers of a surface craft for in them com-

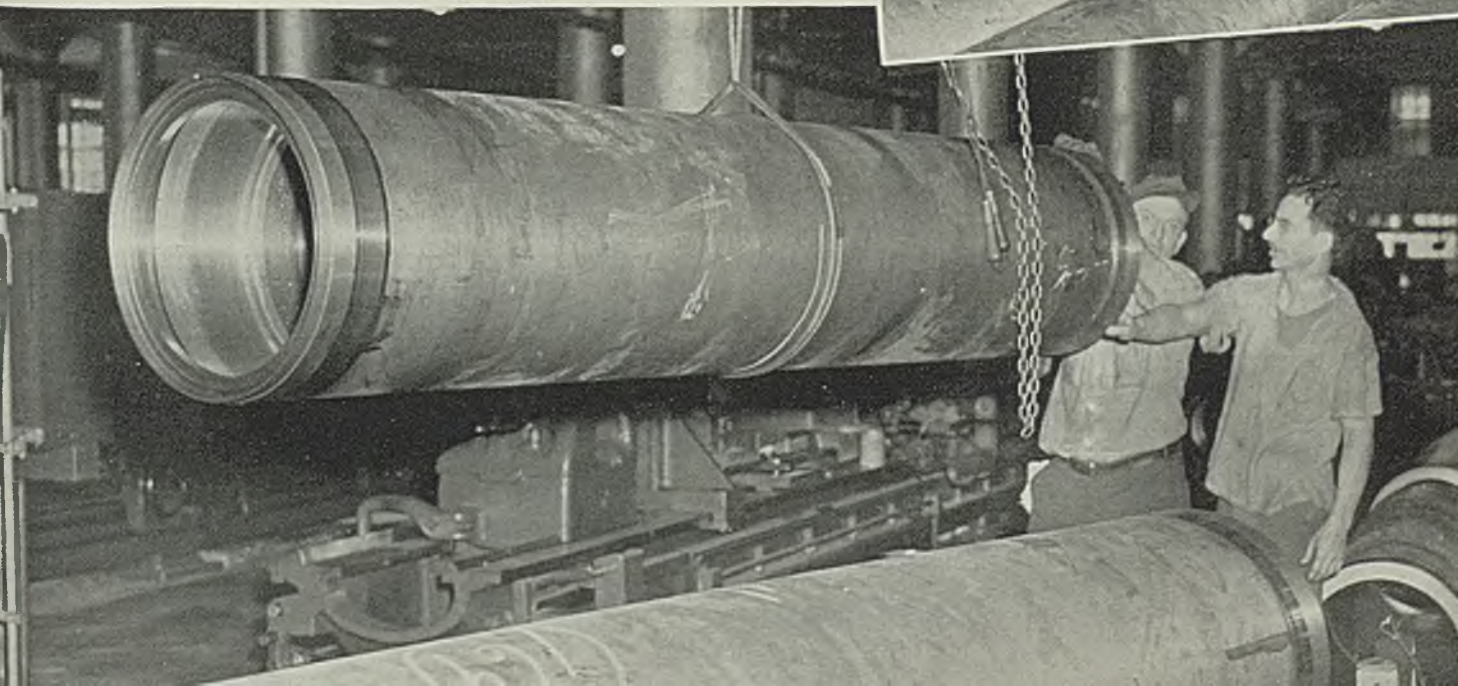
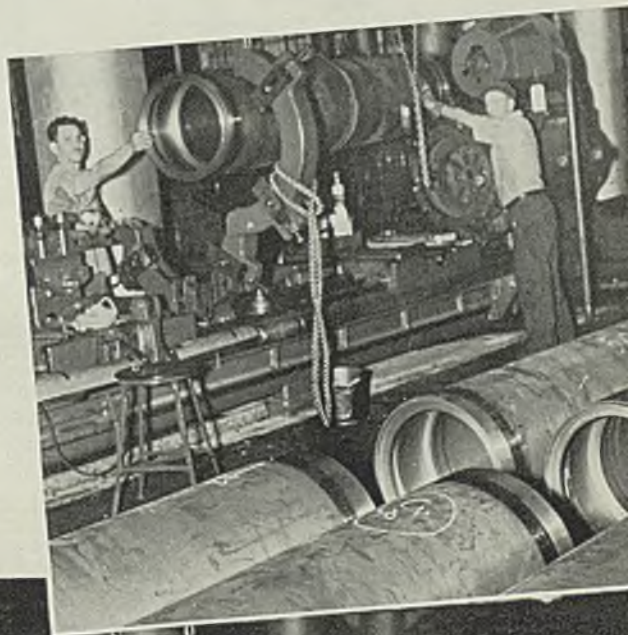
pressed air for driving the turbines is stored at a pressure of 2500 pounds per square inch.

Through the courtesy of the National Defense Advisory commission, photographs showing various steps in the making of these so-called "air flasks" are presented here as they are now being carried out on a 24-hour-a-day schedule at the United States Naval Torpedo station at Alexandria, Va. This work is similar to that on tubes for large caliber guns—both as to the shape and size of the forgings and as to the big machine tools used in finishing them. Like guns, these flasks start as hollow forgings made from specially processed steel. Precision machining operations are necessary to finish them for use.

Fig. 3. (Below, opposite page)—With dummy bulkhead in place to support the hollow section at its outer end, outside of an air flask is here being given a fine finish to close limits using a large roll-grinding machine. This ground finish eliminates tool marks and other surface blemishes which might develop into cracks under high pressure. Also it reveals any structural flaws in the forging which might escape detection

Fig. 4. (Right)—Despite their great size and weight, these air flasks are precision jobs which must be handled with care to avoid damage

Fig. 5. (Below)—Special cradle trucks and overhead electric hoists are employed to shift the semifinished torpedo air flasks from one machine to another during the course of their manufacture. Photos by Palmer



Now Tubing

Modified spinning process holds important possibilities, for its extreme versatility ranges all the way from making shells to bed posts. Method and equipment are readily adaptable to mass production work. Tubing is not only shaped to desired contour but wall thickness is increased or decreased at any point at will—work is hardened and strengthened simultaneously

Fig. 1—These are typical shapes that can be produced by the new method described here

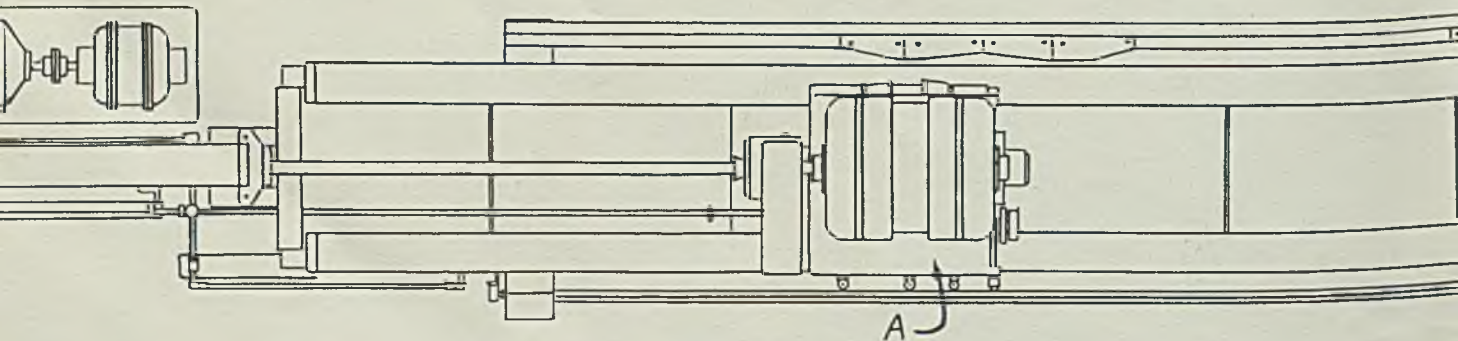
■ AN IMPORTANT development in tube-shaping methods is the recently announced Dewey process which not only reduces the diameter of metal tubes but also thickens or thins out the wall simultaneously. Low-carbon steel tubing can be strengthened and hardened as well as shaped in one operation.

Tubing is cold worked by rotating it between two forming wheels bearing on outside surfaces at diametrically opposite points. Position of these rollers is varied by a cam which causes them to shape the tube as desired. At the same time tension or compression is applied lengthwise of the tube, depending upon whether the wall is to be decreased or increased in thickness. It is this discovery that the wall thickness

can be increased or decreased as the material is cold worked that possibly is the most important feature of the Dewey process as it permits wall thickness to be changed at will simultaneously with the shaping operation.

Advantages of such a combination process are extremely important in fabricating many articles. An excellent example of its cost-saving possibilities is in production of musical instruments.

Practically all brass wind instruments, including saxophones, cornets, trumpets, trombones, etc., employ a tapered metal tube. Conventional practice involves many operations, starting from a V-shaped flat piece of metal which is formed by hand around a mandrel



SHAPED STRENGTHENED HARDENED

By New
Forming
Process

IN ONE OPERATION

and the edges notched with tongues extending below the lapped surfaces at the joint. After brazing, joint is pounded down flat so it is no thicker than other portions of the tube. Work is then spun as accurately as possible on a steel mandrel which work-hardens the material, requiring annealing. Piece is given finished sizing by placing it on an accurate steel mandrel and pressing a lead ring down over it. As the ring expands in forcing it toward the large end, it accurately sizes the tapered tube.

Contrasted with this, making a tapered tube by the Dewey process requires generally only a single operation. The important economies resulting are shortly expected to be extended to the manufacture of many kinds of musical instruments.

Metals of many types can be worked by the Dewey process. Possibly most important is the simultaneous shaping, strengthening, and hardening of electrically butt-welded steel tube. Due to the uniform lengthwise grain structure of such material, it is possible to obtain greater reduction with higher strength and hardness than with seamless tubing of similar material.

SAE 4130-X chromium-molybdenum steel tubing can be reduced to 60 per cent of its original diameter or

less. Ordinary SAE 1010 or 1015 electrically butt-welded steel tube can be reduced to 50 per cent of its original diameter or less. Tensile strength of this material when annealed, normally around 30,000 pounds per square inch, can easily be raised to 55,000 pounds per square inch, while hardness can be increased from 50 to 75 rockwell B.

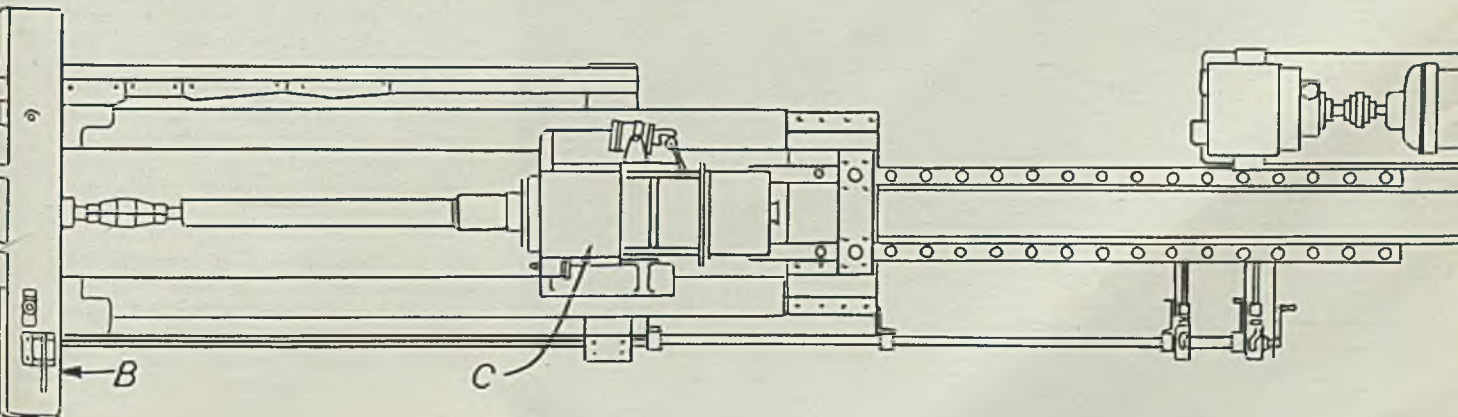
Other metals also are suitable for cold working by the Dewey process. In fact, the only limiting factor is that common to any cold-working process. The metal can be worked up to a point where embrittlement occurs. Because of this factor, cold working of certain metals is impractical. However, copper or aluminum tubing is easily reduced to 40 per cent of its original diameter or less. Ordinarily 7-30 brass is reduced to 60 per cent of its original diameter. Monel tubing can be reduced to 60 per cent of its original diameter.

Control of wall thickness is quite accurate and can be handled over a wide range. For instance, beryllium-copper tubing $\frac{3}{8}$ -inch in diameter of 20-gage wall thickness can be tapered down to $\frac{1}{8}$ -inch in diameter with original wall thickness maintained.

Thus the process is applicable to shaping of any metal tube that can be cold worked.

Fig. 1 shows a few of the shapes already made. An extremely wide range of tapered and shaped tubes can be produced suitable for chairs, table legs, lamps, musical instruments, displays, handles, fishing rods, golf clubs and many other articles where the process is particularly advantageous because it economically

Fig. 2—This is a plan drawing of the Dewey machine. A is main head which revolves the tubing being processed. B is head holding the two wheels which revolve against the tubing to spin it. C is the hydraulic tail fixture which places the tubing being worked under compression or tension



gives the shape desired. If the parts are relatively short, they can be duplicated easily a number of times on one length of tubing as shown at extreme left. Fig. 1.

As a high-production shaping method, speed of production and output are limited only by amount of work done on the metal and the temperature limits which must be maintained. If relatively little working is done, the operation can be handled at an extremely high rate since little heat will be produced. On the other hand, if considerable working of the metal takes place, a greater amount of heat will be developed in the metal and the production speed will correspondingly be reduced since it is undesirable to heat the metal above a certain point. Lubricating and coolant oil are employed to form an effective means of reducing the temperature of the materials, thus enabling comparatively high outputs to be obtained.

Accuracy of the method is equal to that obtained by swaging. Where extreme accuracy is essential, finish grinding will easily give the limits allowed with high output and low production cost still possible.

Shaping of tubes, in addition to being done to obtain ornamental or design effects, also may be employed to produce tubular structural members having greatest strength-to-weight ratio. In airplane work, for instance, struts for landing gear and internal bracing elements can be produced. Tapering both ends from the middle and reducing tube diameter to 60 per cent of the original while maintaining wall thickness has been found to give a net reduction of 25 per cent in weight of the piece without sacrificing strength. Such weight reductions are extremely important in aircraft, automobile, railroad and similar moving structures, and are easily obtained by the

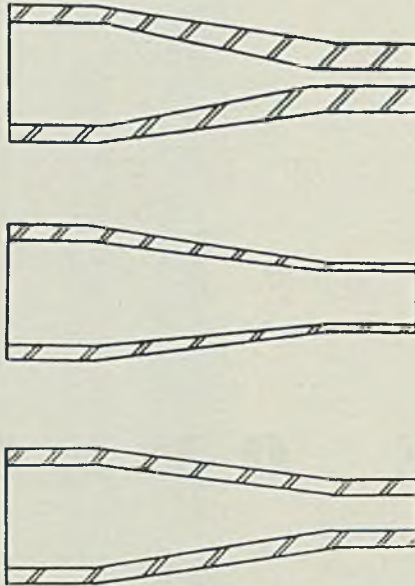


Fig. 3—Typical cross sections showing how walls are thinned or thickened at various diameters for different types of work. Note how easily a shell can be made—thus the importance of the process in armament production

Dewey process since it not only produces the most efficient structural shape but strengthens the part simultaneously.

An important advantage in aircraft work is reduction in amount of welding in building a structure. Tapering the diameter to 60 per cent of original gives a significant reduction in amount of welding which must be done at the ends in joining members. Also, ends of tapered members can be nested much easier than if full diameter were maintained. With four or sometimes six pieces coming together at one corner, joints become quite complicated unless the diameters are relatively small. Even then, some diffi-

culty may be encountered before it is possible to nest and weld the joints to distribute stresses properly.

Double tapered tubes, in addition to being advantageous as a beam, also afford efficient transmission of torque forces and so are useful in making torque tubes for automobiles, trucks and similar applications.

As shown in Fig. 3, wall thickness can be controlled easily to either decrease, increase, or retain the original thickness on the portions of reduced diameter.

Adapted to Hot and Cold-Working

Obviously, there are certain limits to the amount that the wall thickness can be increased, as this depends upon amount of metal available, in turn depending upon amount the diameter is reduced. However, an extremely wide range can be handled. Wall thickness can be decreased greatly where desired. Work has been produced with only 20-gage walls at a diameter of $\frac{1}{4}$ -inch.

Wall size is increased by applying pressure lengthwise the tube while the diameter is being decreased. In a similar manner, walls are thinned out by applying tension while tube is being worked. The ability of metal to flow in more than one direction as it is being cold-worked is an important characteristic utilized in this process.

As an example of what can be done, a 4-inch diameter tube with 8-gage wall is easily reduced to a diameter of 2 inches with 5/16-inch wall. This is done in one step with no necessity for annealing. Low-carbon electrically butt-welded steel tube in heavy gages is reduced to 50 per cent of its original diameter or less as compared with 60 per cent original diameter for seamless tubing. The more uniform grain structure of the butt-welded tubing may account for this difference in workability.

However, the method is not limited to cold-working. The material can also be worked hot and much greater reductions accomplished. For such work the tube is heated to a temperature of about 1200 degrees Fahr. at the point where it is being worked. Sufficiently concentrated and accurately controlled heating is possible with either electric induction or gas equipment.

Satisfactory operation of this process largely depends on the supporting ring which travels along the tube right next to the rollers. By furnishing full support to the un-

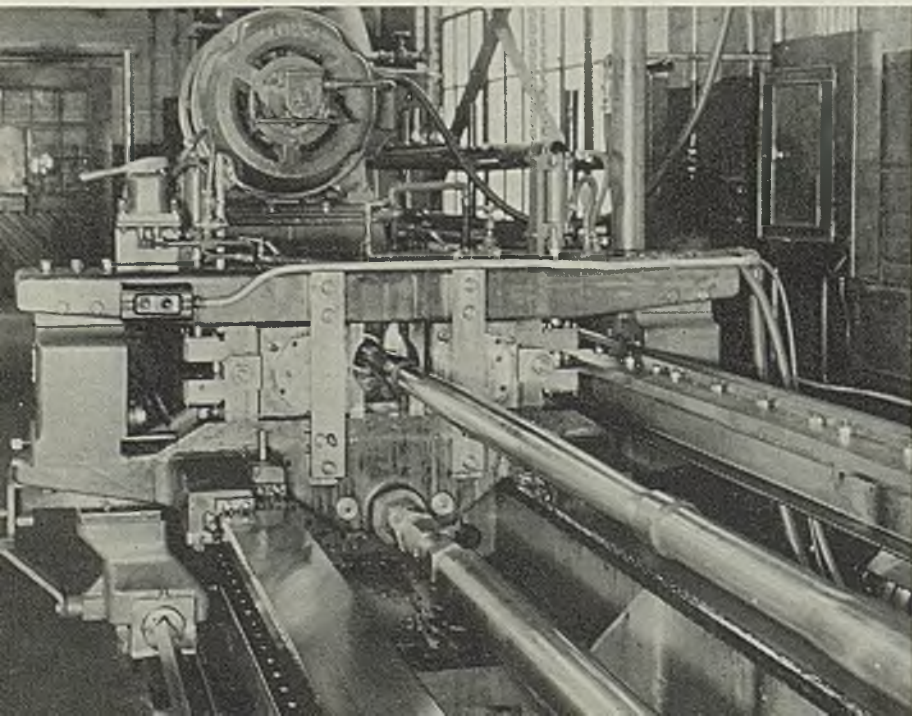


Fig. 4—Close-up view of machine diagrammed in Fig. 2 as seen from end opposite that shown in Fig. 5. Tubes 20 feet long having an 8-inch diameter and 8-gage wall can be handled with this unit

worked portion of the tube the ring prevents the tube from collapsing under the severe working stresses.

Fig. 2 is a simplified plan drawing of one of the present machines, a unit capable of handling tubes 20 feet long, 4-inch diameter, 8-gage wall. Heavier tube of smaller diameter can be formed where the reduction is not too great. Similar machines, either larger or smaller, are easily built to accommodate an extremely wide range of work. Figs. 4 and 5 are closeup views of various portions of the same unit diagrammed in Fig. 2. The machine rotates the tube and maintains either tension or compression longitudinally while passing the rollers in their fixture down the length of the tube.

Employs 50-Horsepower Motor

Tube is clamped in collets at A and C, Fig. 2. The clamp at C rotates freely but does not move lengthwise the machine. Opposite end of tube is clamped in a driving head at A arranged to move along the axis of the tube to provide for various lengths of tube and also to accommodate lengthening of the tube as its diameter is reduced. Head at A is connected to a plunger operating in a hydraulic cylinder at the extreme left of the machine. Here a motor drives an oil pump to supply the cylinder with oil under pressure regulated by valves to produce any desired amount of tension or compression on the tube. Also this equipment automatically maintains the tension or compression as the tube elongates during working.

Fig. 5 is a close-up view in which this driving head mechanism at A in plan drawing, Fig. 2, appears at the extreme left. This head also mounts the main motor which rotates the tube. A multiple gear set is provided so the tube can be rotated at speeds from 200 to 1160 revolutions per minute. Head can withstand a thrust of 12,000 pounds, employs a 50-horsepower motor to rotate the tube being worked.

Rollers which do the actual cold working are carried in a fixture at B, Fig. 2. Also see center of Figs. 4 and 5. This fixture slides up and down ways on the machine bed and is connected to a plunger in the hydraulic cylinder at extreme right, Fig. 2. The 21-foot ram is capable of developing 30,000 pounds pressure. Here a separate motor and oil pump with suitable valves are provided to force the fixture B down the

length of the tube at a feed infinitely adjustable up to a speed of 13 feet per minute. Rapid traverse is 35 feet per minute in forward direction, 70 feet per minute in reverse. Control is supplied at B so the operator has motion of fixture under instant control. See pushbuttons, levers, etc. in Figs. 4 and 5.

Fig. 4 shows fixture B as it appears from point C, Fig. 2. It reveals the shaft connected to the hydraulic mechanism which moves the fixture lengthwise the machine. The two rollers which shape the tube are not power-driven but are rotated by their frictional contact with the tube. They contact the tube at points diametrically opposite and are shown better in Fig. 5 than in Fig. 4.

The fixture carrying the rollers at B, Fig. 2, features a unique construction. As seen in the close-up, Fig. 5, as this head travels from C to A in working a tube, first part of the fixture B to contact portion of the tube is the neck or backup support plate which appears beneath the chain near center in Fig. 5. This backup plate furnishes support for the unworked portion of the tube while the rollers are contacting the adjacent portion. It will be noted the rollers immediately follow the backup plate. Each of the two rollers carried by the fixture are mounted on a block which moves in a horizontal slide, see Fig. 4. These two blocks are connected together through a rack-and-gear drive so they move in and out together. The cam carried on the backrail and seen in upper center of Fig. 2 and at extreme right in Fig. 4 moves both rollers in and out to produce the tube shape wanted.

Slides carrying rollers are moved in and out by a pin which contacts the cam. An air cylinder is connected to this pin which is movable vertically. By operating a hand valve, the

pin can be raised so it does not contact the cam, permitting the fixture carrying the rollers to be moved lengthwise the machine without rollers contacting the tube. Cam and cam rail are supported from the machine bed. The fixture B carries an outer auxiliary roller which contacts the back side of the cam rail to prevent transmission of twisting and other stresses to the bed of the machine.

The hydraulic drive which moves the roller fixture B has an extremely wide range of speeds available. In addition, the hydraulic equipment at the left end of the machine, Fig. 2, is capable of exerting tension or compression over a wide range of values. These two factors combined with speed of rotation and feed, as well as shape of cam and roller faces, are the variables involved in this work.

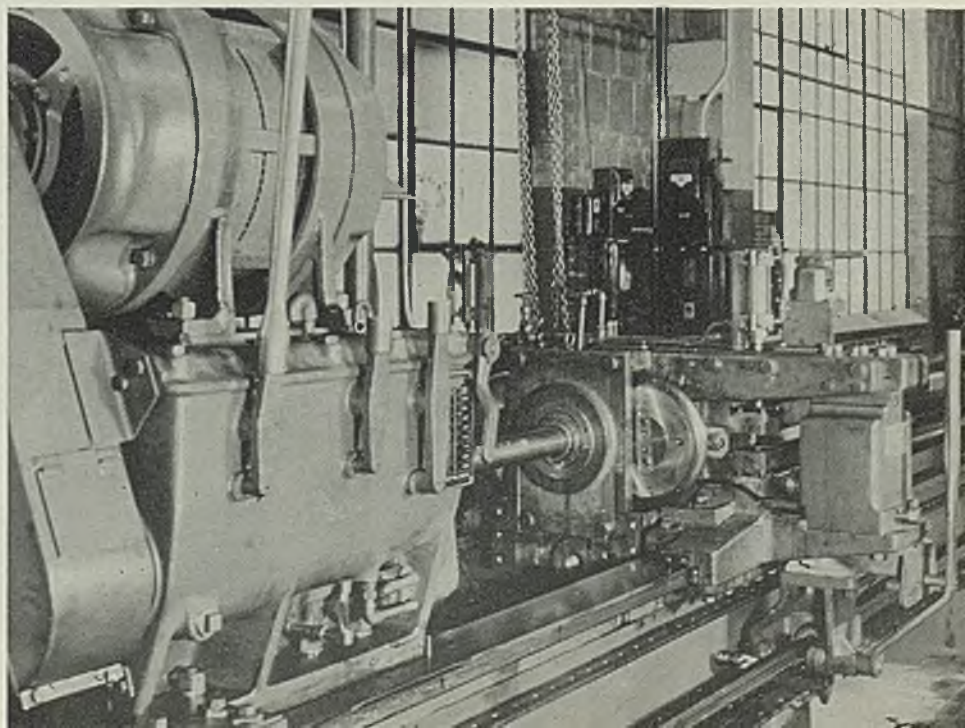
Shape of roller face is particularly important as the wall thickness of the resulting tube largely depends upon the combination of radii and angle of face employed. Where the face of the roller has a large radius, the tendency is to maintain the same weight of metal per lineal foot in the resulting tube, which means the tube wall is thickened as the diameter is decreased. Of course, the tube is held under compression whenever the wall is thickened.

When tube wall is to be thinned out, roller faces are almost at right angles to the axis of the tube, a small radius being employed. This acts to make the metal in the tube flow around a sharp corner, severely working the material. It is under these conditions that maximum thinning action occurs, combined, of course, with tension being placed on the tube.

Roller design is largely a cut-and-try proposition at the present time

(Please turn to Page 56)

Fig. 5—Close-up view of driving head mechanism at A in plan drawing, Fig. 2. It also mounts the main motor which, by means of a multiple gear set, rotates the tube from 200 to 1160 revolutions per minute. Back-up plate, beneath chain near center, furnishes support for unworked portion of tube while rollers are contacting adjacent portion



What! Floor Space for Riveting?

How About Gang Riveting . . .



**One Company Saved the Cost
of a Plant Expansion Program**

Heading some 6000 to 10,000 rivets per day, an improved machine for multiple-gang flush riveting on flat surfaces produces uniform and smooth appearing work. In one stroke, it will head 10 to 16 flush-type rivets along a straight line. Its principle of operation is the same as that of any press

■ RIVETING is particularly vital to the aircraft industries at the present time, and interest is focused on a new range of work now being done by improved machines manufactured by General Engineering Co. Ltd., New York.

A universal machine for multiple-gang flush riveting on flat surfaces will head in one operation, in a single stroke, a number of flush type rivets—10 to 16—along a straight line and on flat sections such as attaching stiffening channel to section of skin. Interesting production results have been experienced doing flush riveting in gangs with these machines, 6000 to 10,000 rivets per day having been headed by an operator plus a helper placing rivets and handling sheets.

The regularity and smooth appearance of the sheet is much better than is possible by driving one rivet at a time. An indication of the soundness of principle and mechanical excellence of the machines is that they have been in operation for nearly two years in one plant, being in use 24 hours a day. This company has stated that in the course of a recent order for a large number of planes they would have had to build an addition to their plant if it had not been for the floor space saved over what would have been necessary if their large flat surfaces had been riveted with

pneumatic hammers instead of gang riveting machines.

The principle of operation is the same as in any press. Two anvils coming together the proper distance squeeze a flat-head rivet of the required thickness. A pressure pad consisting of two thin-edged rails on either side of the anvil holds the sheets firmly together while the head is being formed. The machine has sufficient rigidity and power so that the only limit to the number of rivets formed at one time is how many can be accommodated within the dimensions of the anvils. The anvils of one installation accommodate ten 5/32-inch flush-type rivets spaced 3/4-inch or sixteen 1/8-inch rivets spaced 1/2-inch. The upper and lower heads or anvils are quickly replaceable by means of two socket-head screws on each. This makes it possible to use the machine for a wide combination of rivet patterns and variations in shape of riveted parts. Only a few minutes is required for changing setups. It also is possible to replace the riveting heads with heads for punching or press-countersinking single holes or gangs of holes. Quite heavy forming and punching can be done as the machine will develop about 50 tons pressure over the last 1/4-inch of the stroke.

Another interesting feature is that no adjustment of the closing gap between riveting anvils is necessary, as the machine forms the proper size head automatically, regardless of

the rivet grip. This is a great advantage on assemblies where different sizes of rivets or where changing combination of sheet thicknesses may be present. This control is accomplished by means of an electrical type limit switch operated by means of the deflection of the pressure pad as the rivet head is formed. The air valves are actuated by electric solenoids, and when the foot control is depressed the solenoid opens the air valve. The pressure pad remains stationary after it has squeezed the sheets together, as the lower riveting anvil continues its upward motion. It continues to the point where the proper size head is formed. At that point electrical contact is made by a precision limit switch and the air is reversed. The detail design of this feature is such that in heading 100,000 rivets the height of the head will not vary more than 0.005-inch. A handle selector makes it possible to change from the proper size head for one rivet diameter to that for another.

A handle control is also provided for changing the total travel of the ram. The ram has two ranges—a short working and a long loading range of travel. A third handle controls the speed of the ram. The ram can be inched up or down, or the up or down cycle can be speeded up to take less than a second.

Power is supplied by an air cylinder connected to a toggle. Air at 80 pounds minimum pressure is required, and the machine will consume 5.1 cubic feet of air per minute operating at 10 strokes per minute. The bottom head moves up and down 3/4-inch with the hand lever in one position. This is the amount most satisfactory for general riveting. This 3/4-inch can be varied by a minor alteration inside

From *Sheet Metal Industries*, November, 1940.

Deep drawing qualities like these

MAKE PRODUCTION EASIER



WHEN you want the corrosion resistance of Stainless Steel—but are stopped by the apparent difficulties and cost of deep drawing—remember that you can do the job more easily with Carpenter Stainless Strip.

For example, the difficulty of deep drawing the parts of this cream separator would bar any Stainless Steel except the very best. Carpenter Stainless Strip does the job because of its uniform dead-soft temper and freedom from hard spots. Deep drawing, bending or forming is made easier by these qualities—which pave the way to increased output.

The satin-smooth finish of Carpenter Stainless Strip reduces finishing time to a minimum.

To help you fabricate Stainless Strip, Carpenter has amassed a fund of valuable information on tooling, drawing compounds, polishing and buffing procedure, etc. This information is available from your Carpenter representative. Consult him about your Stainless problems.

THE CARPENTER STEEL CO., Reading, Pa.



Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

the machine. When riveting work has high obstructions which must be cleared to load the work, the lever may be pulled to the other position. Operating the foot pedal then provides a 3/4-inch ram travel but the ram may be stopped at the 1/4-inch opening or at any other point if desired to start a riveting operation by means of the speed control lever.

The frame of the machine is a welded steel plate box section with lateral stiffeners where required. A chamber is separated from the part of the frame which houses the air valves and toggle mechanism by an air-tight bulkhead. This air-tight section serves as a reservoir, feeding the cylinder with a full head of air. This makes the speed of the cylinder operation nearly independent of the size of piping to the machine and the distance from the compressor.

The throat or reach of the machine is 36 inches and the gap 15 1/2 inches. The riveting height is 44 1/2 inches from the floor, and the machine requires a floor space of ap-

proximately 30 x 80 inches exclusive of the work racks mentioned below.

It has been found with this system of riveting that work is best handled by setting up on either side of the machine large tables with rollers spaced about a foot apart on their tops and at the same height as the riveting anvil. If stiffeners are being riveted to a panel skin, for example, the procedure would be to have the holes already in the skin and dimpled, and the holes in the stiffener transferred from the skin and dimpled or machine-countersunk. The parts would then be temporarily assembled in the regular manner by use of screws or patented clips. These operations all precede placing the temporary assembly on the roller feed tables for the gang riveter. Then one operator can slide quite large assemblies back and forth under the riveting anvil without a helper. A helper is of assistance in putting work onto the roller table and placing rivets.

Otherwise the machine requires

no installation work except connection to the air line and 110-volt power outlet. A silencer for the exhausted air is provided which makes the machine almost silent in operation.

The anvils or heads can be rotated on their axis. This is sometimes easier than swinging the work and provides a means of riveting short pieces placed transverse to a long strip such as ribs on ailerons or flaps. A means is provided for quickly locking the head at any angle or rotation.

Spatter Preventative Now Water Soluble

■ A water soluble easily removed material called Spatter Off, which prevents spatter from adhering to welded parts adjacent to the weld area is being distributed by Universal Power Corp., 4300 Euclid avenue, Cleveland. It is especially recommended for use where welded work is to be galvanized or left in an unpainted condition.

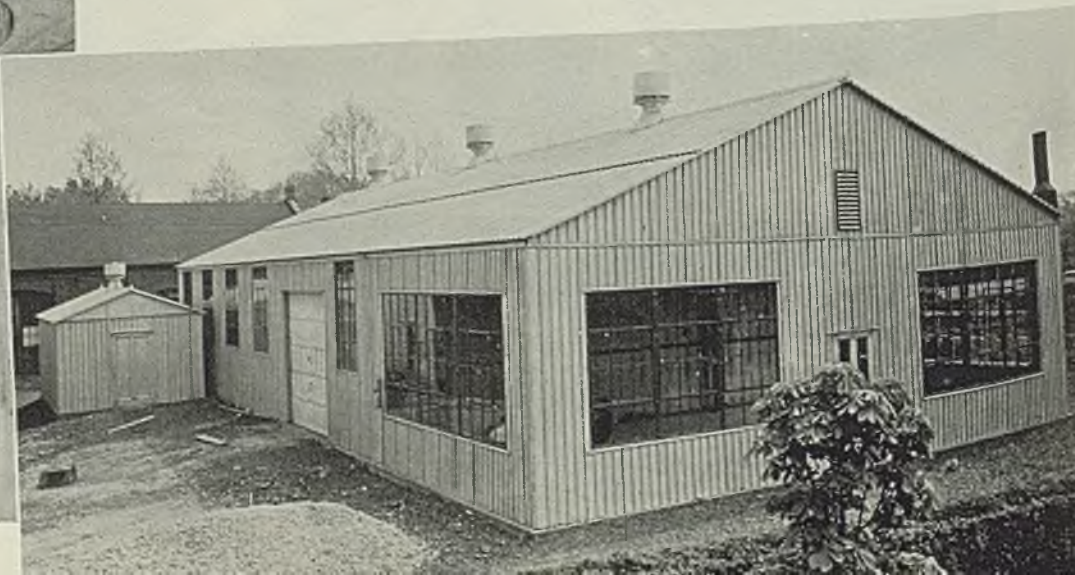
Insulated Steel Building Reduces Operating Costs

■ FORCED to expand its facilities, McKenna Metals Co., Latrobe, Pa., had the modern 40 x 60-foot steel building shown in the accompanying illustration constructed to

house its requirements. The building, which consists of a process department and laboratory, was erected and insulated by Blaw-Knox Co., Blawnox, Pa. Outstanding in this addition is the type of insulating material used. Both walls and ceiling of the laboratory are insulated and the manufacturing section is protected by an insulated roof. In the case of the walls and roof, Thermotite construction was employed. The insulating material in this construction is a rigid board of 1-inch cross section with an insulating value equivalent to a brick 12 inches thick. This is covered and

sealed in with galvanized steel sheets, fabricated in panels, assuring weather tightness and fire safety.

In the case of the laboratory ceiling, an adaptation of this construction was used. The insulating material was the same, but is covered with steel sheeting on only the visible side of the ceiling, each board having been cemented in a steel pan with the edges of the sheet lipped over the insulator. The illustration at the left shows the ceiling panels being installed. Some of the advantages of this building are: Dust will not adhere readily to steel walls and the insulation will facilitate temperature control, reduce heating costs and prevent "sweating." The building was completed in 30 days.



Check These Link-Belt Features

FOR EFFICIENT BELT CONVEYOR OPERATION

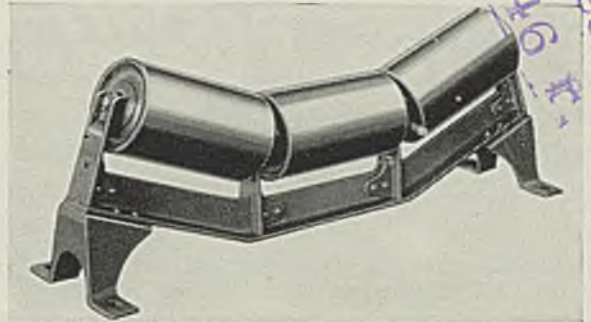
1. Anti-Friction Efficiency. Roller bearings take high radial and thrust loads.

2. Strength and Simplicity. Riveted frame, strong brackets and sturdy rolls make a trouble-free assembly. No bolts or nuts to work loose.

3. Ease of Lubrication. High-pressure grease system is highly accessible and bearings are protected by labyrinth seals which retain grease and keep out dirt.

4. Belt Protection. Idlers are smooth with rounded edges. Narrow gap between rolls prevents pinching.

5. Accurate, Balanced Rolls. Accurate machining assures perfect alignment of bearings and uniformity of parts in the complete idlers.



Heart of the efficient belt conveyor of today is the idler. To this all-important element Link-Belt has given continuous attention as a result of which present Link-Belt designs offer the most in dependability and low service cost.

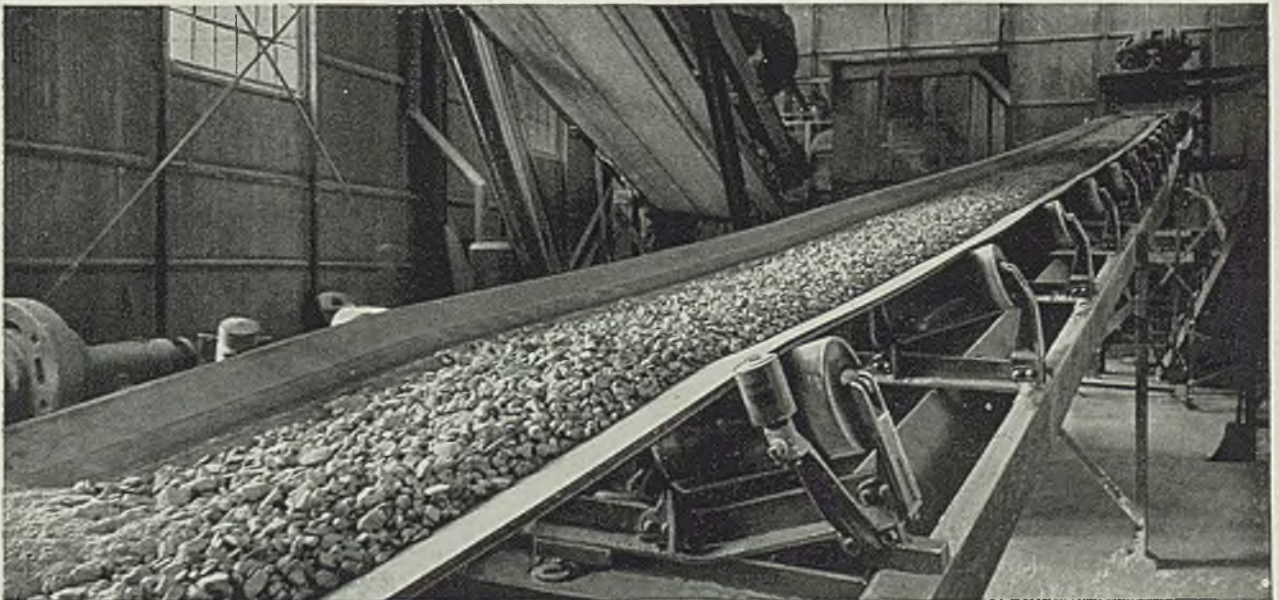
Get information now on better belt conveyor equipment—whether for modernization or new installation needs.

LINK-BELT COMPANY

The Leading Manufacturer of Equipment for Handling Materials and Transmitting Power

8171-E

Indianapolis Chicago Philadelphia Atlanta Dallas
San Francisco Toronto Pittsburgh Detroit Cleveland
Other offices and warehouses located in all principal cities



LINK-BELT

A TYPE
FOR EVERY
SERVICE



BELT CONVEYOR EQUIPMENT

IDLERS • TRIPPERS • BELTS • PULLEYS • BEARINGS • TAKE-UPS • DRIVES

Broaching

M A Y B E Y O U R

■ PROBABLY no method of machining ever developed so far so fast as has broaching within the past 15 years. As was pointed out in a previous article, in the Dec. 9 issue of STEEL, this is one of the oldest machining methods, yet one of the newest production processes. In the present article, one of the purposes is to show that through recent developments, this old-yet-new technique of metalcutting now means almost all things to all men concerned with shop practice.

Even though it is primarily a mass production process, facilities have been introduced which make broaching practical and economical on small lots and even on single pieces. Although most commonly thought of as a means for converting round holes to shapes other than round, it now is becoming recog-

nized as a highly effective method for "making round holes rounder"—and smoother. Developed originally for "straightline" machining, broaching along spiral paths now offers a solution to vexing problems of long standing.

Surface broaching today is being done in machines which a few years ago were thought of only in connection with hole broaching. Hole broaching, on the other hand, is being done very efficiently in vertical machines whose designers were thinking in terms of surface broaching when they originally engineered them. Such a recital of broaching paradoxes might go on and on. Because of unorthodox but at the same time thoroughly sound thinking, coupled with unceasing, restless engineering activity of broaching engineers—on machines, tools and methods—the honor

Fig. 1—By means of a fixture which indexes transversely, 65 teeth are cut in automotive jack ratchet bars by means of a broach which cuts only five teeth per stroke. This method was engineered by American Broach & Machine Co.

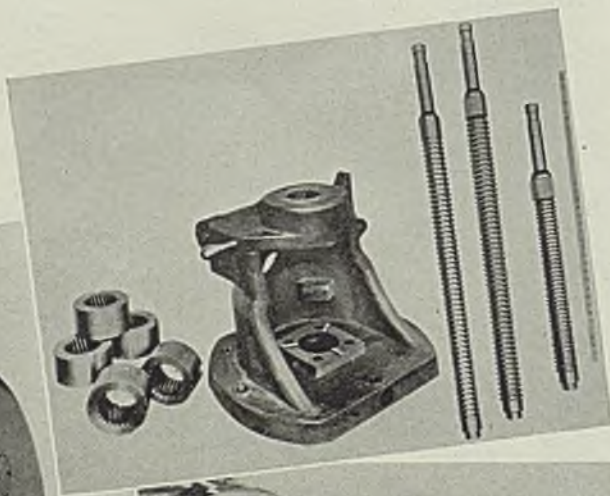
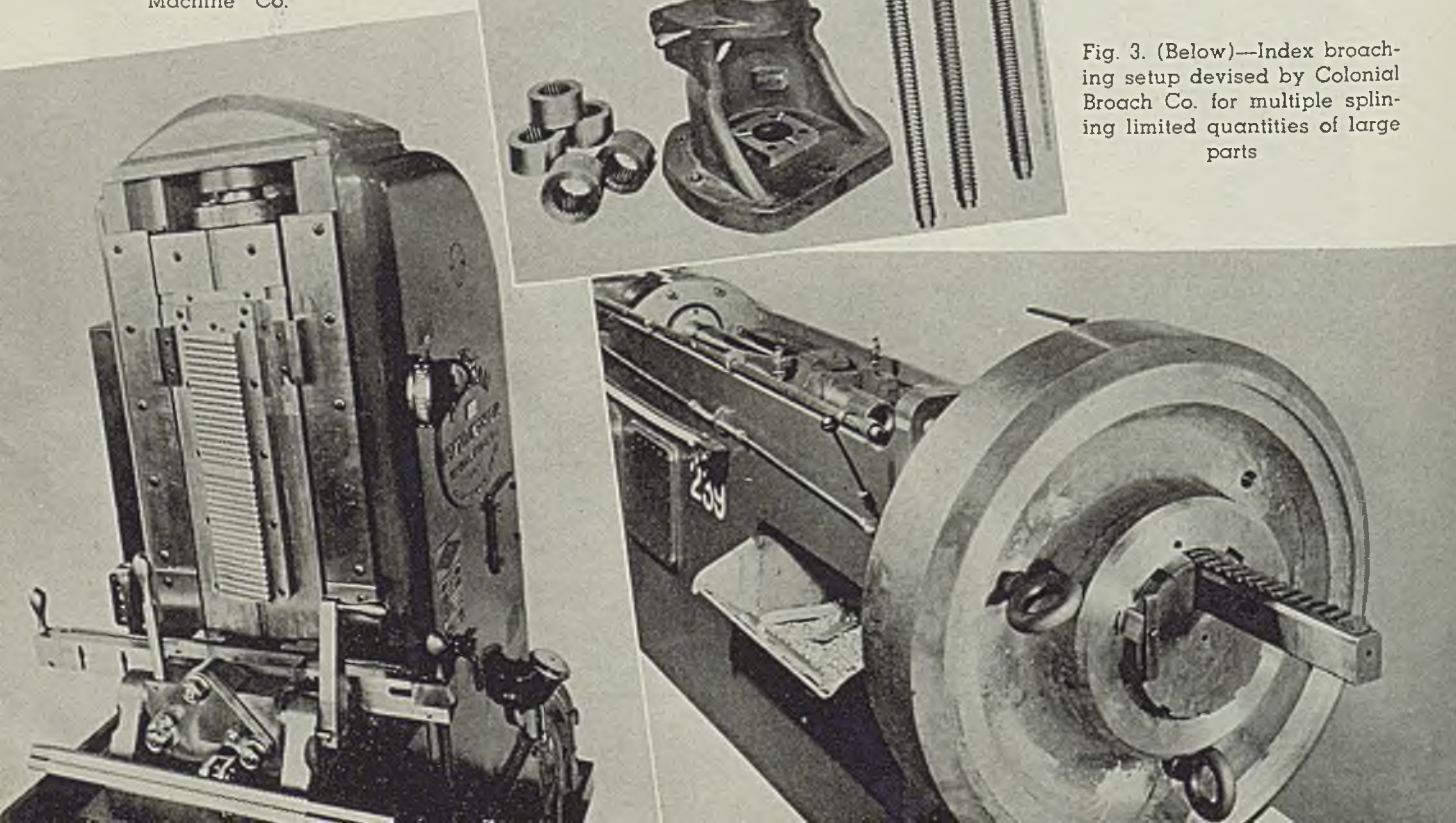


Fig. 2. (Left)—National Broach & Machine Co. tools and fixture for accurate broaching of helical teeth in internal gears shown herewith

Fig. 3. (Below)—Index broaching setup devised by Colonial Broach Co. for multiple splining limited quantities of large parts



A N S W E R

By Guy Hubbard

Machine Tool Editor

Many a traditionally "slow job" involved in arms manufacture is about to be licked by broaching. "Internal helical gear teeth are broached successfully—why, then, cannot rifling be done in some similar manner?" "It can, and will be," is the confident reply of broaching engineers. Same is true of breech ring mortising. That always has taken hours. Broaching cuts it down to a matter of minutes—thus smashing another bottleneck

roll of broaching achievement grows longer and constantly more interesting almost day by day.

Some of the toughest problems in armament production are being, and will be, solved by broaching methods — thereby uprooting traditions, some of which date way back to Eli Whitney's time. Rifling is one of the oldest and toughest of these problems. Broaching tools and technique now being perfected already have this thing licked as far as larger calibers are concerned, and certain things which I have seen lately—but about which I am not at liberty to write—lead me to predict that very soon broaching will be recognized as the answer to the problem of rifling the barrels of small arms on a quantity production basis.

Another bottleneck which has existed in gun production ever since muzzle loaders became obsolete, has been mortising of breech rings. In artillery parlance, the breech ring is the massive steel block, into which the barrel of the gun is screwed. In the case of anti-aircraft guns, field pieces and even some of the heavier guns, this so-called breech ring not only is bored longitudinally so that the shell can be slid into the breech, but also is mortised transversely to

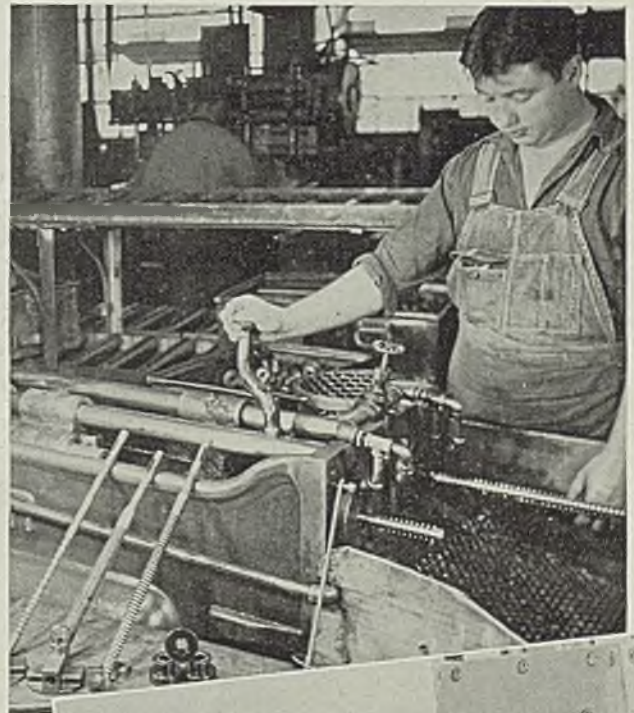
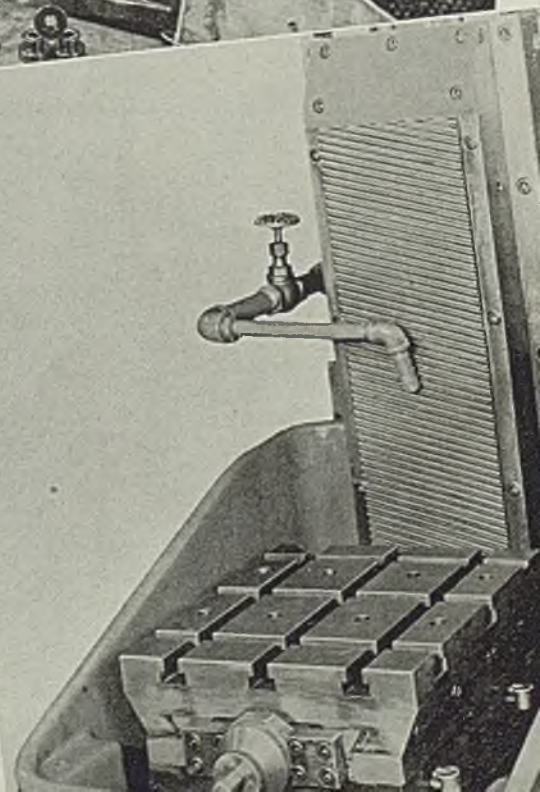
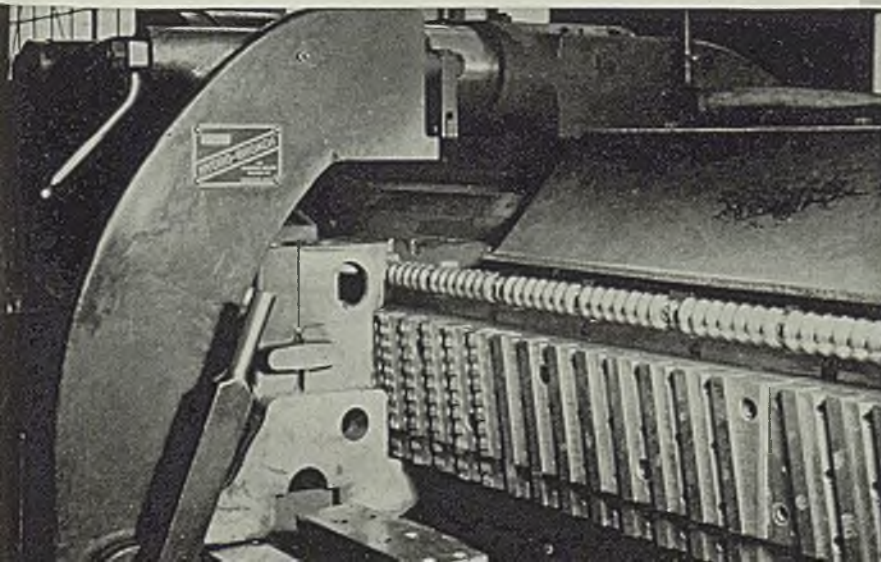


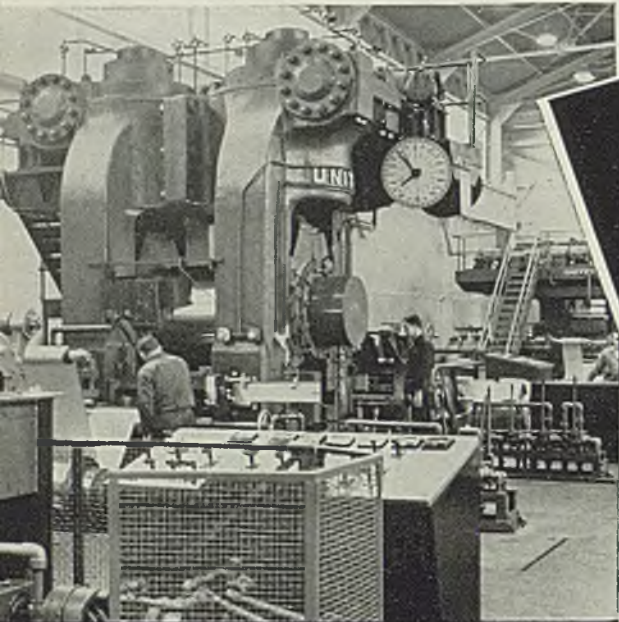
Fig. 4. (Below)—National Broach & Machine Co. sectional type Naloy surface broaches operating on cylinder blocks in Cincinnati Hydro-Broach machine

Fig. 5. (Right)—Foote-Burt vertical hydraulic broaching machine with "utility table" for short run work

Fig. 6. (Above)—Oilgear horizontal machine broaching multiple splines in washing machine clutches at Maytag Co.



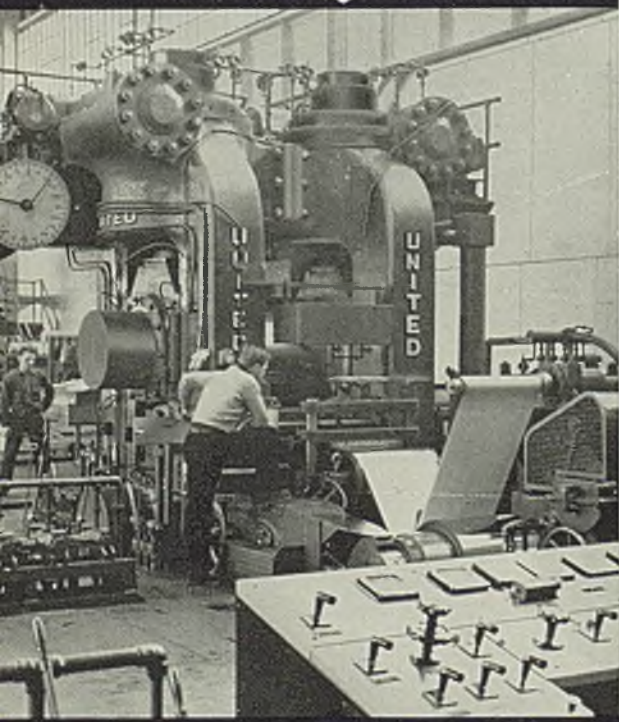
ROLLING STAINLESS



REVERSING COLD MILL ↑

2-HIGH TEMPER PASS MILL →

REVERSING COLD MILL ↓

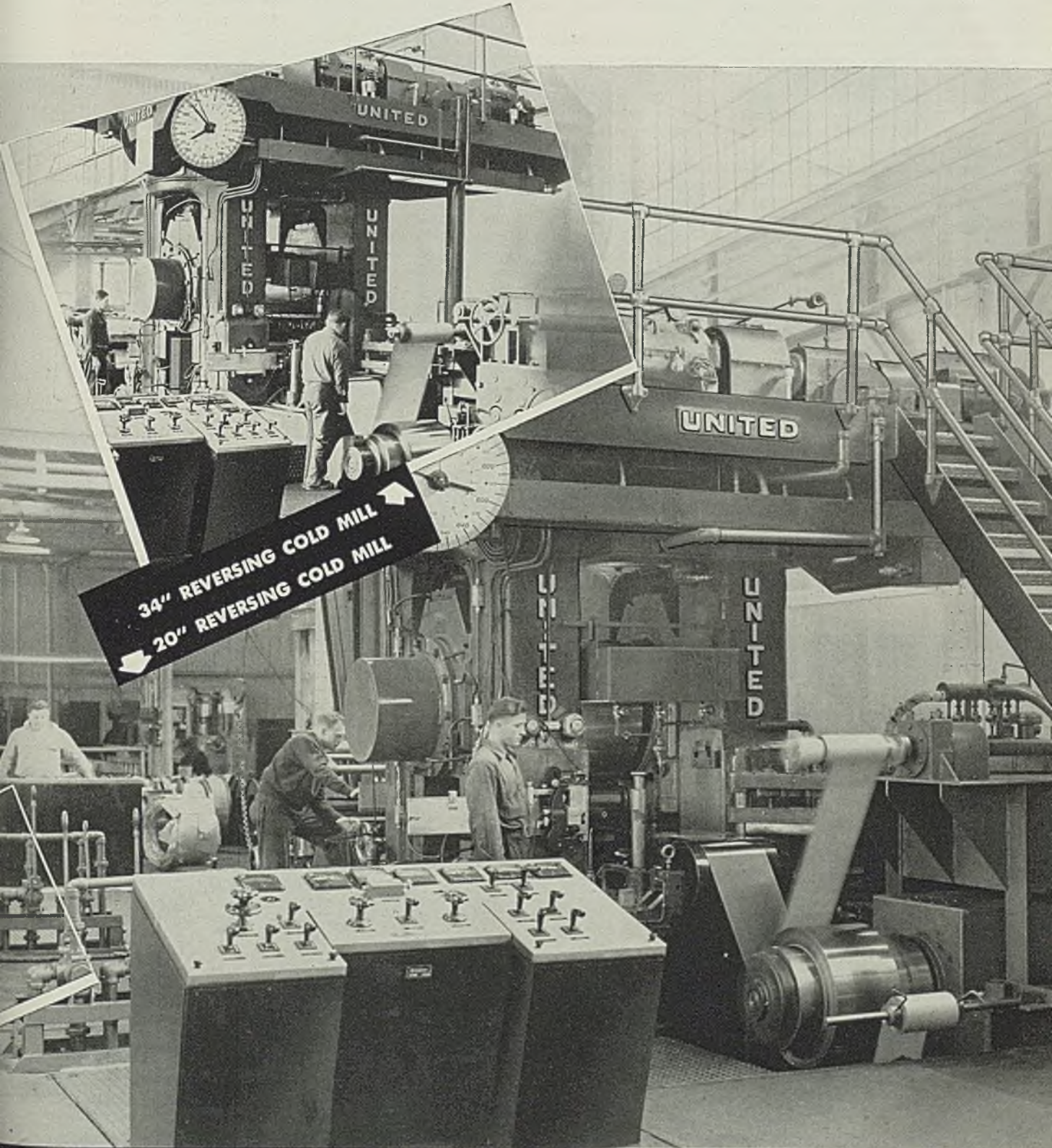


THESE MILLS ARE NOW
IN DAILY PRODUCTION

*Rolling
Stainless Steel
Strip*

UNITED
ENGINEERING and FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA

ON UNITED MILL



34" REVERSING COLD MILL
20" REVERSING COLD MILL

accommodate the sliding block by means of which the breech of the gun is quickly and effectively opened and closed.

This mortising always has been done by tedious toolroom methods—each one requiring several hours, which was all very well when there was nothing very pressing about the delivery date on the gun. When the emergency arose, however, this received very prompt attention by broaching engineers and ordnance experts. They now have the situation well in hand, which means that time required for this operation will be reduced from a number of hours to about that same number of minutes. This constitutes a major achievement toward boosting production, especially in connection with the anti-aircraft program, over which there has been considerable concern lately.

In selecting practical examples of diversified broaching practice for presentation in this article, no effort has been made to select ordnance items. It is the belief of the writer that the interests of the armament program can best be served in an article of this nature by avoiding traditional setups on armament items and by inspiring new thinking in connection with production of such parts by show-

ing how similar parts are now being manufactured successfully in "civil life" by what conservatives might choose to call "unorthodox methods." The old adage, "It can't be done that way, because it never has been done that way," has no place in broach engineering thinking.

And so we come to Fig. 1, which depicts an ingenious method for cutting the teeth in ratchet bars of bumper-type automotive lifting jacks, a setup engineering by American Broach & Machine Co. on one of that company's three-way hydraulic broaching machines. The work, samples of which are shown resting on the table of the machine in front of the holding fixture, is loaded two at a time into this fixture. Then the operator tilts the fixture forward into broaching position, clamps the work, and pulls the lever which brings down the ram and broaches the first 13 teeth in the racks.

When the ram reaches the bottom of its stroke, the operator tilts back the fixture and unclamps the work. Then he reverses the ram and while it is returning to "ready" position, he indexes the work laterally to bring another section of the blanks into broaching position, and the cycle is repeated. In fact,

the cycle recurs five times in succession—there being 65 teeth in the full rack.

In this manner, the rather long work is handled in a machine of medium size with a relatively inexpensive broach. Despite the repetitive work required on each pair of bars, 130 completed pieces per hour are turned out.

Spiral work already has been mentioned. Now, through courtesy of National Broach & Machine Co., we present Fig. 2 which shows typical examples of this kind of work and successful equipment for broaching it as engineered and built by this company. These internal helical gear tooth broaches, as illustrated, can be used either in connection with ball bearing face plates which allow the work to revolve as cuts are being taken, or they can be used with a ball bearing pull-head in combination with a spiral guide bushing such as shown in place in the fixture at the center of the illustration.

How To Get Exact Helical Lead

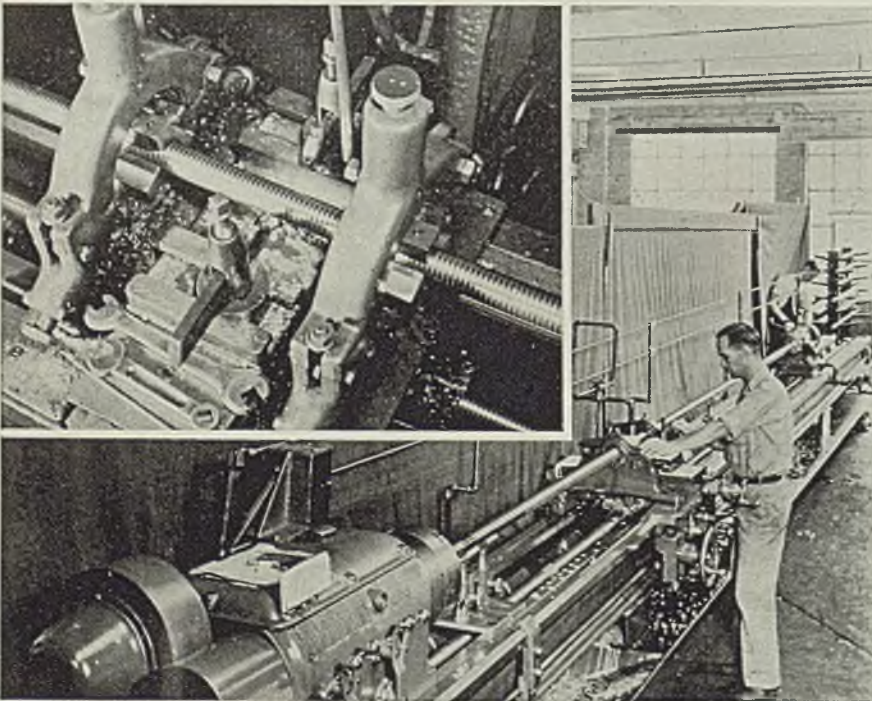
Although nearly 90 per cent of all helical broaching is being done without the use of guide bars or guide bushings, such equipment is advantageous. With a ball bearing face plate allowing free rotation of the work, the thrust due to the helix angle on the broach causes the work to rotate so as to reproduce the lead exactly. In certain cases where the helix angle is extreme, there is a tendency to get a slightly different lead at the extreme end of the work until the sides of the broach tooth have entered sufficiently to cause correct rotation. This error is easily eliminated by leaving some extra length on the work—say about $\frac{1}{8}$ -inch—which later is machined off.

Fig. 3, like Fig. 1, presents another example of a large piece of work being handled in a machine of medium size by means of simple, low-cost tooling. The part, which is required only in limited quantities, is a blank of a Cone-type, area-contact worm wheel. It is of high tensile bronze and has a bored hole $11\frac{1}{2}$ inches in diameter in which 10 equally spaced splines 1-inch deep by $1\frac{3}{4}$ inches wide must be cut. These splines, which are about 15 inches long, must be held to tolerances of plus or minus 0.0005-inch both as to width and total accumulated error.

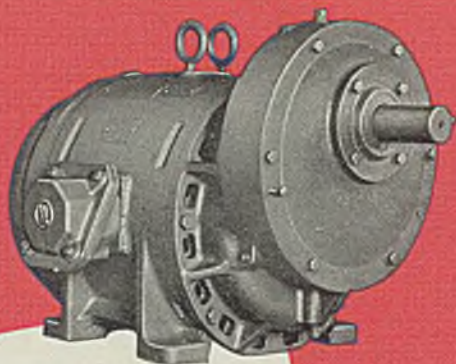
The job is handled in a standard Colonial universal horizontal broaching machine with a precision index plate mounted on its face plate. Two comparatively short pull broaches are used, one for roughing (which is shown in action) and another for finishing—each spline being completed before indexing to the next one. It is obvious that to do this

(Please turn to Page 64)

Chasing a 300-Foot Thread

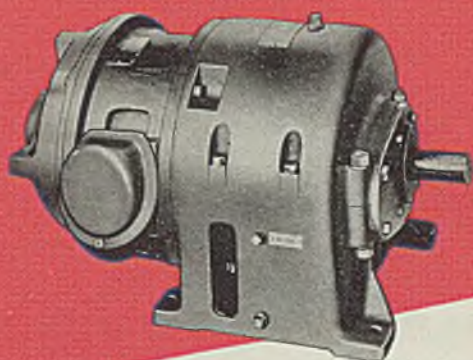


■ At Monarch Machine Tool Co., Sidney, O., Acme threads on lathe lead screws up to $188\frac{1}{2}$ inches long are now finish chased with but a single tool grind, and yet maximum error is being held to within 0.0005-inch per 12 inches of lead, speeding up production of lead screws in line with demands for industrial and defense needs. The finishing time required is reduced 50 per cent. Photo courtesy Carboloy Co. Inc., P. O. Box 239 R. Pk. A., Detroit



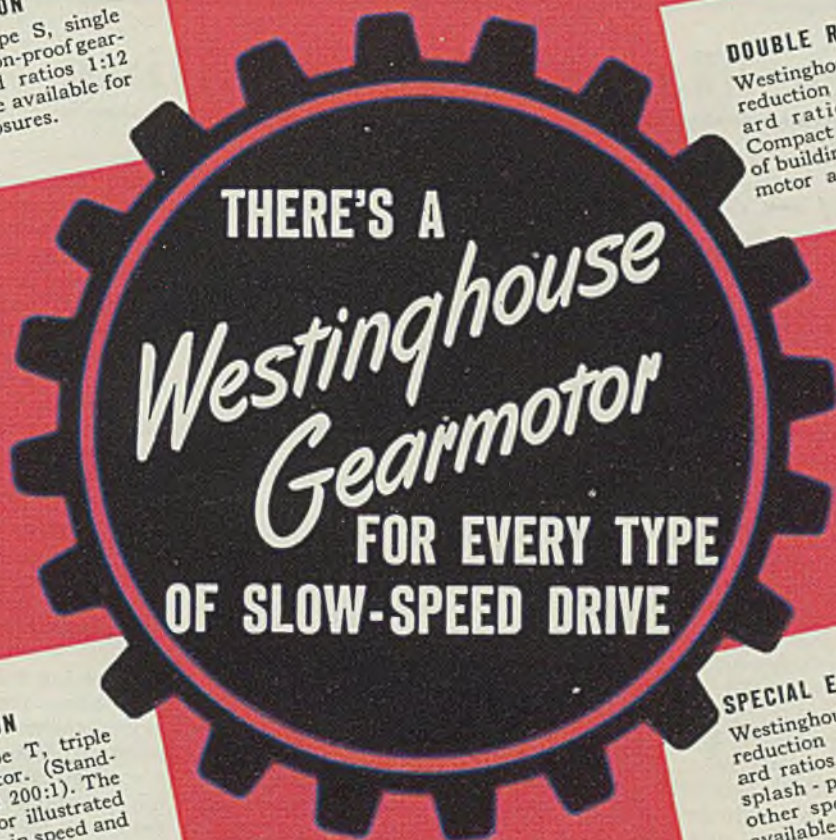
SINGLE REDUCTION

Westinghouse Type S, single reduction, explosion-proof gearmotor. (Standard ratios 1:12 to 5:1). This type available for all types of enclosures.



DOUBLE REDUCTION

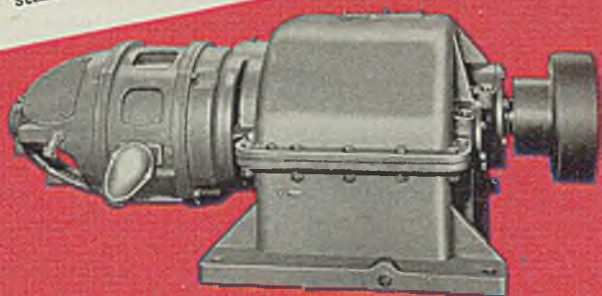
Westinghouse Type D, double reduction gearmotor. (Standard ratios 5.6:1 to 10.0:1). Compact design is the result of building reduction gears and motor as one complete unit.



THERE'S A
Westinghouse
Gearmotor
FOR EVERY TYPE
OF SLOW-SPEED DRIVE

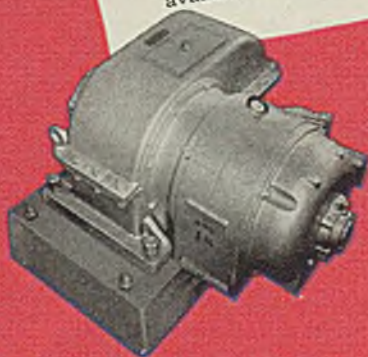
TRIPLE REDUCTION

Westinghouse Type T, triple reduction gearmotor. (Standard ratios 40:1 to 200:1). The wound rotor motor illustrated here, is adjustable in speed and starts easily under load.



SPECIAL ENCLOSURE

Westinghouse Type FD, double reduction gearmotor. (Standard ratios 10:1 to 40:1). This splash-proof enclosure and other special enclosures are available throughout the line.



WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, EAST PITTSBURGH, PA.

4-07134

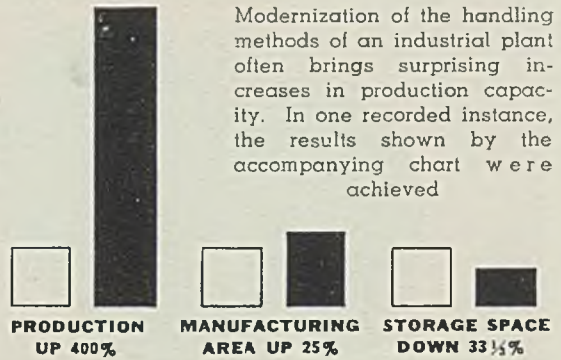
Westinghouse

GEARED DRIVES





Smart Management



Modernization of the handling methods of an industrial plant often brings surprising increases in production capacity. In one recorded instance, the results shown by the accompanying chart were achieved

Watches Materials Handling

The principles of any efficient handling setup, as explained in this second article of a series on materials handling fundamentals, can be grasped easily and will help any man arrive at lower handling costs in his own plant. The significance of keeping machine time and operator time productive; of eliminating lost motion in hand feeding; of reducing setup time; of efficient scrap disposal—all are detailed

(Concluded from Last Week)

■ THE VALUE of knowing costs is illustrated by a shop which utilized cranes and conveyors in many manufacturing departments as well as in the stockroom. For material movement between departments as well as those which were beyond the reach of crane and conveyor, hand trucking was employed. During a period of business expansion, the curve of production climbed upward steadily. Closely paralleling its rate of advance was the curve of trucking costs. As recovery continued, however, a point was reached where the latter curve skyrocketed. Trucking costs were out of hand. These curves thus gave management prompt warning that something was wrong and permitted doing something about it before it was too late.

Investigation quickly showed that trucking lines were badly clogged by too heavy traffic. Despite overtime trucking and the addition of more truckers to the payroll, the floor work had simply grown beyond the safe limits of hand-trucking loads and hand-trucking speeds. Power-truck handling easily removed the bottleneck.

Even in those rare cases where accurate handling-cost information is available, any conclusions that one might be tempted to draw from this information should be checked

Abstracted from *Material-Handling Handbook*, published by The Industrial Truck Statistical association, 208 South LaSalle street, Chicago.

by direct observation of the handling operations themselves.

In undertaking to discover whether present methods are efficient or whether better ones can be devised, it will be found that this work is closely analogous to time and motion studies as many of the principles are common to all three. Some of the most important ones are pointed out here.

Keeping Machine Time and Man Time Productive: Elimination of lost time of productive machinery and machine operators undoubtedly comprises the greatest opportunity for increasing manufacturing efficiency by better handling. This fact is most apparent in the heavy industries where production flow consists of one or at most a few heavy streams of material between relatively few different processes, each performed by large expensive machinery. Here a single delay cannot go unnoticed and always elaborate precautions are taken against such a possibility.

Elsewhere the problem is to discover the individually small but collectively large delays that remain unseen until revealed by a systematic search. They may arise from slow delivery of work from the storeroom or from the preceding manufacturing department, which better handling can overcome.

Eliminating Lost Motion in Hand Feeding: Where material is hand fed into a machine by the operator, delays may arise from lost motions on his part due to the manner in

which the work reaches him. Often it is not placed in the most convenient position. The container employed may require him to reach and stoop lower and lower as he empties it to the bottom. If he also puts finished material into another container it may be that he again makes unnecessary motions.

Wherever a skilled worker devotes part of his time to ordinary handling jobs, the cost is likely to be high, and it is almost certain to be buried and unseen with even the more modern systems of cost finding. Such costs will not appear in checking-cost account, and their existence in most cases can be discovered only by personal observation.

Reducing Setup Time: Delays also may arise from circumstances peculiar to the manufacturing process itself, which can be reduced by better methods of handling. A common example is the punch or forming press using a die that is beyond the limits of safe and quick manual handling. Another is the draw bench wire mill where the delivery of wire in longer lengths reduces the number of times die needs to be rethreaded. Still another is the heat treating furnace which need not be cooled and work is delivered and removed by modern handling methods.

Other typical applications in which handling has reduced setup or process time are in delivering larger coils of strip to the cold mill, permitting more continuous operation and in delivering the large stacks of sheets to punch presses which in conjunction with automatic height maintaining equipment greatly facilitate feeding operations.

Good Practice in Store and Stockrooms: The raw material storeroom and stockroom are other places where opportunities for improvement of materials handling methods may be found. These are places, above all others, in the entire plant,

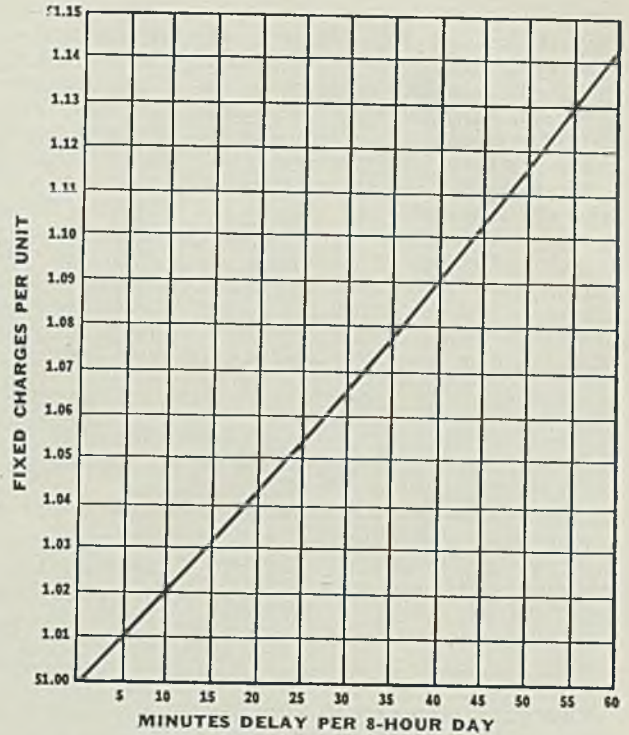
where no rehandling of any individual pieces should be necessary. All materials should be in unit loads for power-truck handling and for tiering to roof where desired.

Efficient Scrap Disposal: Here is another source of possible savings in direct handling costs. While the amount of tonnage may be relatively small, the cost per ton is certain to be excessive if scrap is handled manually. Also, handling scrap in a small plant, when added to the work involved in the main flow of production, may be found sufficient to justify the adoption of power trucking when either considered alone might not.

Plant Service Work: A class of work that actually is handling but not always so considered consists in transporting tools from the machine shop or electric department to various places in the plant for maintaining machinery or for emergency repair work. By keeping such equipment set up on skids, pallets or trailers, it can be ready for rush trips by truck or tractor wherever needed. The same result is gained by keeping the equipment on a truck maintained solely for the purpose when volume of such work warrants.

Similarly, shifting machinery to conform to changes in plant layout or to and from the shops for repairs also may be classified properly as materials handling and is a type of work well within the capacity of industrial trucks in many

Production delays always increase unit production costs. The machine cost per unit of production, and, in fact, all fixed charges per unit, increase in the ratio indicated by this curve. The same is true of any other costs which are proportional to time



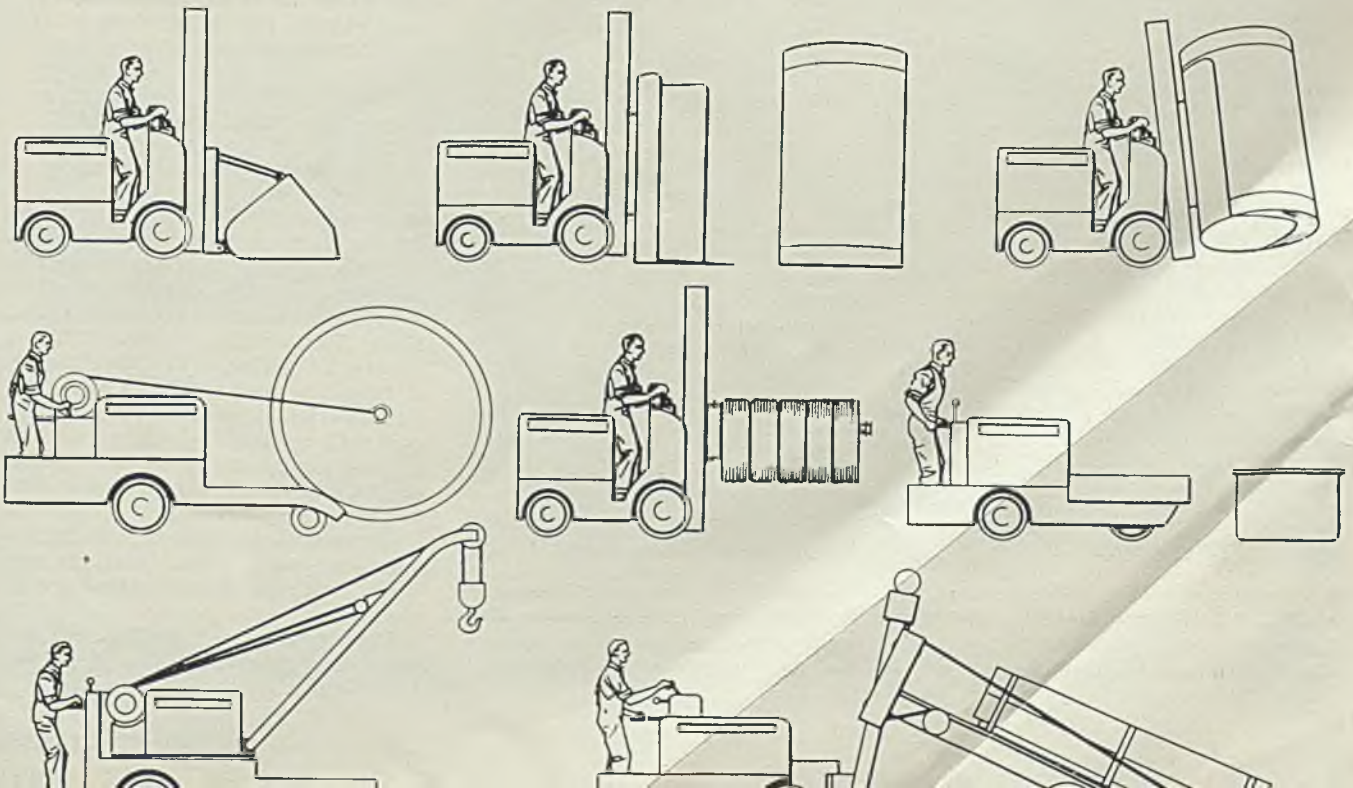
plants. In such cases, both time and cost are much lower than when manual handling is attempted. Some plants regularly mount all their machines on runners or legs to facilitate pickup by fork truck.

Relation to Layout: Materials handling is closely related to plant layout since both share the common purpose of simplifying the flow of work through the plant. In fact,

rapid low-cost handling aids greatly in permitting rerouting at any time without building alterations and removes many former restrictions on layouts. Layout of machines and processing lines for most efficient flow of material aids materials handling and vice versa. This factor is receiving more and more attention.

Safety: Efficient handling is closely related to safety engineering. Often the accident record of a plant will afford useful information not merely to aid in correcting handling hazards themselves, but also point to possibilities of improving handling methods in general. In handling

Special systems evolved from the fundamental systems shown last week apply the principles of the unit load and self-loading to the handling of materials which may not be adapted to skids or pallets or may constitute power-handling load in themselves. Some of them, illustrated here, are the scoop truck, roll handler, reel handler, ram, bosh, crane and articulated sheet handler



ding, as in other work, the right way is the safe way. There is no place where safety and efficiency are so intimately associated as in materials handling since the same effort which makes the handling of goods less costly also makes it safer.

Receiving and Shipping: Here is where it is possible not only to reduce direct handling costs but also to raise efficiency of these two departments in most plants. Any manufacturer who takes full advantage of modern unit packaging and handling methods can offer his customers the inducement of receiving goods packaged so they can be taken from incoming cars directly to storage or to the first process without manual handling—often affording a most important saving.

Use of skids, trailers and pallets has gone far to eliminate needless handling and rehandling of materials. Yet with the principal exception of tinplate, carloading and unloading largely remain slow, costly, manual operations.

Packaging either on skids or pallets is all that is necessary to free carloading and unloading from the limitations of manual handling as both operations can be handled efficiently by fork truck if the work is on pallets. In most cases it will be found that pallets are preferable because they are cheaper, 2 x 2-inch battens giving ample under-clearance for fork-truck handling. Adoption of pallet shipping rarely

increases packaging costs materially and sometimes reduces them. For crates and boxes, addition of 2 x 2-inch battens is all that is necessary. In many cases the loads need only be paper-wrapped and steel-strapped or wired to the pallet, thus saving the cost of boxes and other containers. If fork-truck handling is assured at transfer points and at destination, the dropping, turning on side, use of hooks and other abuse incidental to manual handling need no longer be considered. Thus the cost of packing itself may be reduced. This will be in addition to the savings afforded by increased efficiency in handling operations.

Shaping Tubing

(Concluded from Page 43)
as the many variables involved act differently with each different metal. Even changing the alloy content of a steel tube gives different working characteristics.

Output of a machine such as described can be extremely high. As long as ratio between speed at which the tube is rotated and lineal feed of the roller fixture is maintained, the speed of operation can be increased up to where the temperatures developed in working the tube approach the critical range of the metal. In some metals, cold-working results in embrittlement, which would be a limiting factor on speed in that case. However, with rapid-

return traverse, quick-operating collet chucks and mechanical handling devices provided to take the work to and away from the machine, output of the machine would be extremely high and unit cost quite low.

It has been found that aluminum, brass, copper and similar comparatively soft materials can be worked easily with a stationary tool and without the rollers. On steel and harder metals, however, and on those metals where a surface scuffing action occurs, the rollers are necessary. Also a stationary tool has so much friction in working steel that the metal would overheat rapidly. Even with as soft metals as aluminum, brass and copper, rollers are employed as their use produces a much smoother surface than stationary tools. In fact, the rollers have somewhat of a burnishing action.

Operating a Dewey machine such as that described is quite simple once the experimental work has been done to determine the setting of the various controls. With the settings known, a cam of the desired contour is clamped on the cam rail, the tension or compression adjusted at the left end of the machine, Fig. 2, the feed of the rollers adjusted at extreme right, Fig. 2, and the speed at which the tube is rotated selected on the head at A. Then the work simply is clamped in the collets at each end and the machine started.

One pass of the rollers handles the most complicated shaping job. As mentioned before, the fixture B carrying the rollers can be returned from A to C, Fig. 2, without contacting the cam by operating an air valve to lift the pin which contacts the cam. Also, remote control of the feed is provided on the roller fixture so the machine can be operated at high speed, yet close control maintained at each step.

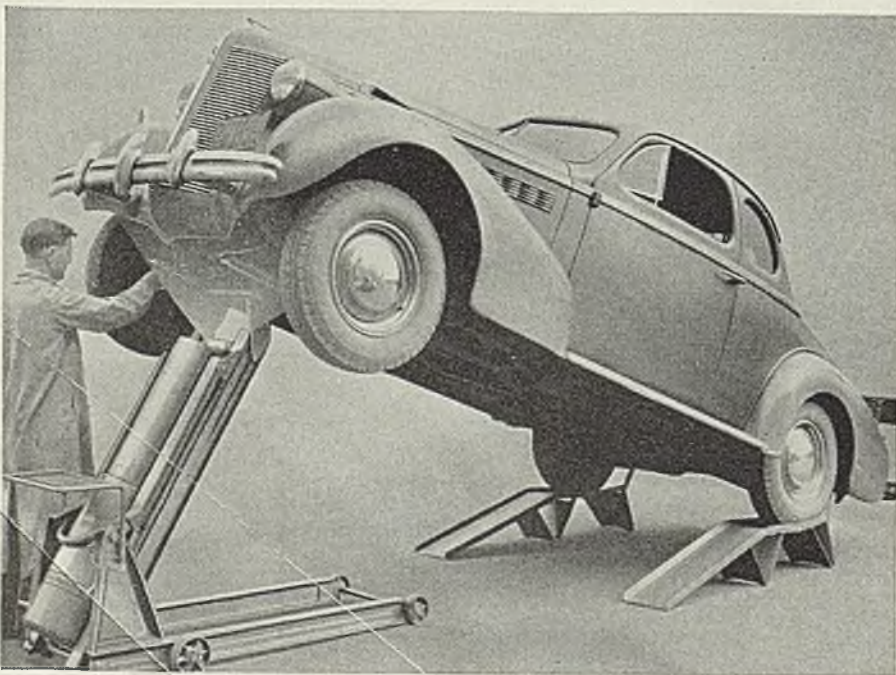
New Booklet Tells How To Apply Capacitors

■ A new 28-page booklet, "Application Data 49-065," which fully explains capacitor application on distribution circuits is announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Containing theory, formulae, tables and charts, it tells how and where to apply capacitors when voltage drop is the controlling factor—where current carrying capacity is the controlling factor and where higher power factor is the requirement.

Complete discussions of fundamentals, costs, sizes, locations and other elements of application are included.

The booklet is fully indexed for easy reference. Copies may be obtained upon request.

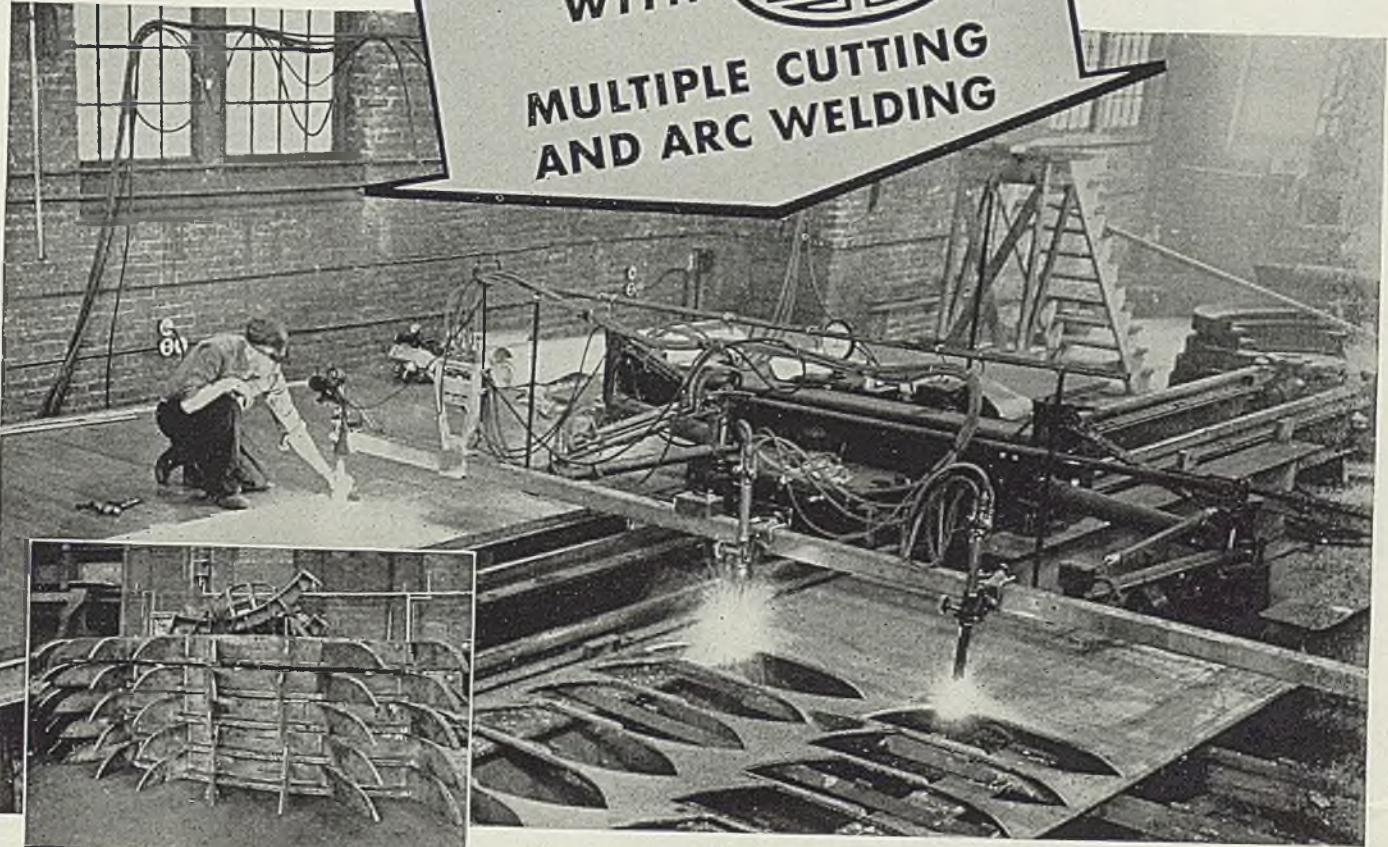
Illuminates as it Lifts



■ Operating from a regular air hose, the hydro-pneumatic one-end lift recently introduced by Kellogg-American, division of American Brake Shoe & Foundry Co., Rochester, N. Y., not only lifts but also illuminates the end of the car that is raised. It wheels easily to the job, and can be locked safely on a column of oil at any height

FASTER PRODUCTION
GREATER ACCURACY— **LOWER COSTS**

WITH **AIRCO**
MULTIPLE CUTTING
AND ARC WELDING



Shop assembly of weld fabricated turbine parts.



Weld fabricated sub-assemblies of ribs and bracing structure.

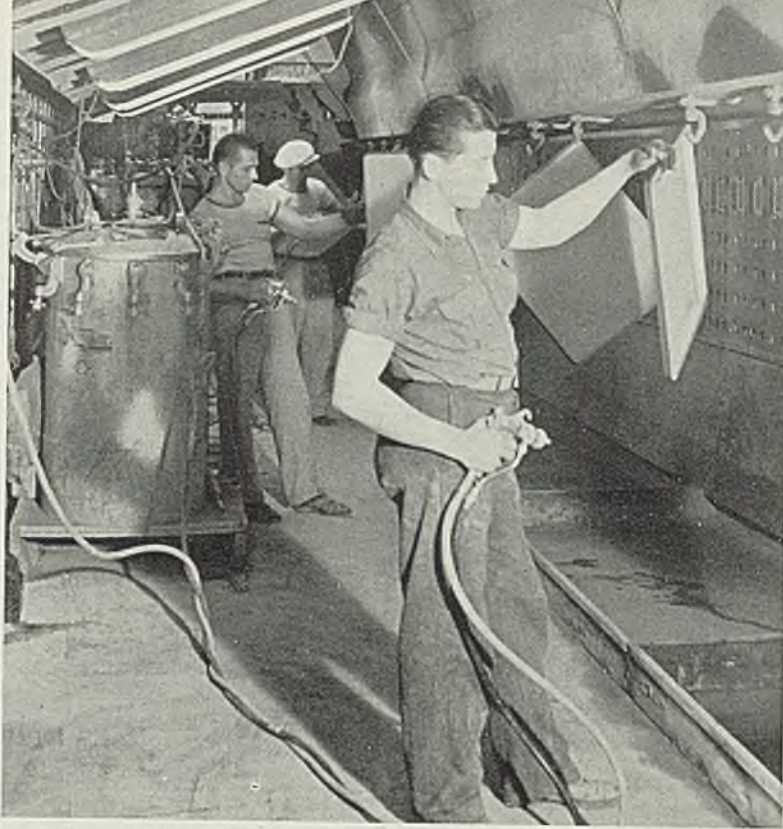
These three outstanding results — so necessary in maintaining today's production peaks — were attained by the S. Morgan Smith Company in fabricating several important parts of a 74,000 h.p. hydraulic turbine, the speed ring assembly of which is shown here. These particular parts weighed 372,000 pounds. Using an Airco No. 20 Travograph, multiple shape cutting of the steel parts speeded up production considerably. Cutting was so accurate that the close fits obtained decreased assembly time.

When quantities of parts are required — whether large or small — the proper machine in Airco's complete line makes welded construction more profitable. The practical assistance given by members of our Applied Engineering Department assures customers of the most economical results from Airco Gas Cutting Machines. Write for full details.

AIR REDUCTION

General Offices: 60 EAST 42nd ST., NEW YORK, N. Y.
DISTRICT OFFICES IN PRINCIPAL CITIES

AIRCO *Anything and Everything for* **GAS WELDING or CUTTING and ARC WELDING** **WILSON**



Inside view of the Plenum chamber: Here operators spray ware on a conveyor running through the chamber. The intake air is put through fiber-glass filters at the top of the chamber. Adequate light is furnished by fluorescent lamps

“Shrinking” Costs with Automatic Porcelain Enameling

... Let a machine solve your porcelain enamel application problems as this manufacturer did

Covering approximately 35,000 square feet of floor space, this recently modernized porcelain enameling plant features much advanced practice. Automatic equipment conserves enamel, reduces handling costs and cuts rework

■ **COMPLETION** of a large addition to the porcelain enamel shop of Davidson Enamel Co., Clyde, O., is one of the latest outstanding installations in the porcelain enameling industry.

This plant, primarily devoted to the production of pressed steel plumbing ware, is now in operation and ranks with some of the most modern in the country in design, layout and equipment. This new installation is housed in a new, modern well-lighted building with about 35,000 square feet of floor space. The extreme left-hand side of the building is allotted for the storage of semifinished raw shapes and pickling.

Ware which requires finishing operations is transferred to the adjoining welding and metal-finishing department. This department houses

modern welding fixtures, torches, buffers and portable electric gun welders used to complete the articles before they are taken to the pickle room for cleaning.

The pickle room is one of the largest in the porcelain enameling field and has 10 tanks 5 x 12 feet, including double cleaner tanks, double acid tanks and a nickel dip tank in addition to the regular rinse, alkali and dryer tanks. The pickle room is ventilated by means of a hood and three large propeller-type fans, the volume of air being controlled by manually operated dampers. To eliminate the familiar pickle room condensation, especially noticeable in colder seasons, the outside air being brought into the pickle room is heated by means of steam coils mounted in the building walls. The huge pickle baskets designed to

receive the various large pieces and two overhead electric traveling hoists complete the equipment used in the pickle room.

Pickled ware is stored just outside of the pickle room. At this location there is also a portable dip tank placed immediately under an overhead conveyor, which is reversible in direction. The dippers are supplied from this pickled ware bank and hang the dipped-ground-coat ware on the conveyor which travels along the outside of the ground-coat spray booths and enters into the ground-coat dryer.

After the ware has made its trip through the dryer, it enters the ground-coat spraying chamber where the pieces are black edged directly on the chain. This chain then carries the pieces alongside the furnace chain where it is transferred and allowed to go through the furnace. This conveyor can be reversed in direction, and with this flexibility the larger ware such as bathtubs, which cannot be readily dipped, is sprayed. Pickled bathtubs are placed on this same conveyor, but this time enter the

ground coat spraying chamber first, where they are sprayed with ground coat, then enter the dryer and return along the outside of the spraying chamber and are brought parallel to the furnace chain for transfer.

When the pieces emerge from the furnace, they are taken off the furnace chain and placed on the cover-coat conveyor. This carries the pieces to the inspectors and to the banks prior to cover-coat operations.

Automatic Booths Save Enamel

Flatware, such as table tops, to be finished in ground coat is trucked to an automatic Binks spray-conveyor machine. This setup consists of three booths with automatic reciprocating spray guns. These guns have a 48-inch stroke and are automatically cut off at the end of each stroke, thereby effecting a large saving in enamels. All three of these booths are of the down-draft dry type which keeps enamel particles from accumulating around the top of the booths. This prevents contamination of pieces entering the unit.

The entire 3-unit booth is enclosed completely by a plenum chamber into which filtered air is blown, 10 per cent in excess of the volume removed by the spray booth exhausts, thereby keeping the room proper under positive pressure and eliminating the infiltration of dust and dirt-laden air.

Flatware is placed on a cable conveyor and is carried under the reciprocating guns, after which it enters an adjoining gas-fired flatware dryer. These pieces are removed from the cable conveyor by the brushing operators, who perform the necessary brushing operations and then hang the ware on the cover-coat overhead conveyor which brings the pieces to the furnace chain for firing.

Coming back again to the banked ground coat, all pieces other than flatware are placed on the overhead conveyor, which carries the pieces into the cover-coat spray chamber. Both the cover-coat spray booth and the ground-coat spray booth are grouped together. Both spraying chambers are Binks vitreous-enamel floor type, equipped with the new Binks Dynaprecipitor units for reclaiming the enamel. The entire

Upon leaving the ground coat spraying chamber, the ware is carried alongside the furnace chain where it is transferred and allowed to go through the furnace, entrance of which is shown at right above

Table tops to be finished in ground coat are trucked to this automatic Binks spray-conveyor machine. It consists of three booths with automatic reciprocating spray guns which are cut off at the end of each stroke

spraying unit is enclosed by an air-conditioned plenum chamber made of sheet metal and glass, into which filtered air is forced. Gas heaters are installed in the air-intake ducts for tempering the outside air during cold weather, the temperature being automatically controlled.

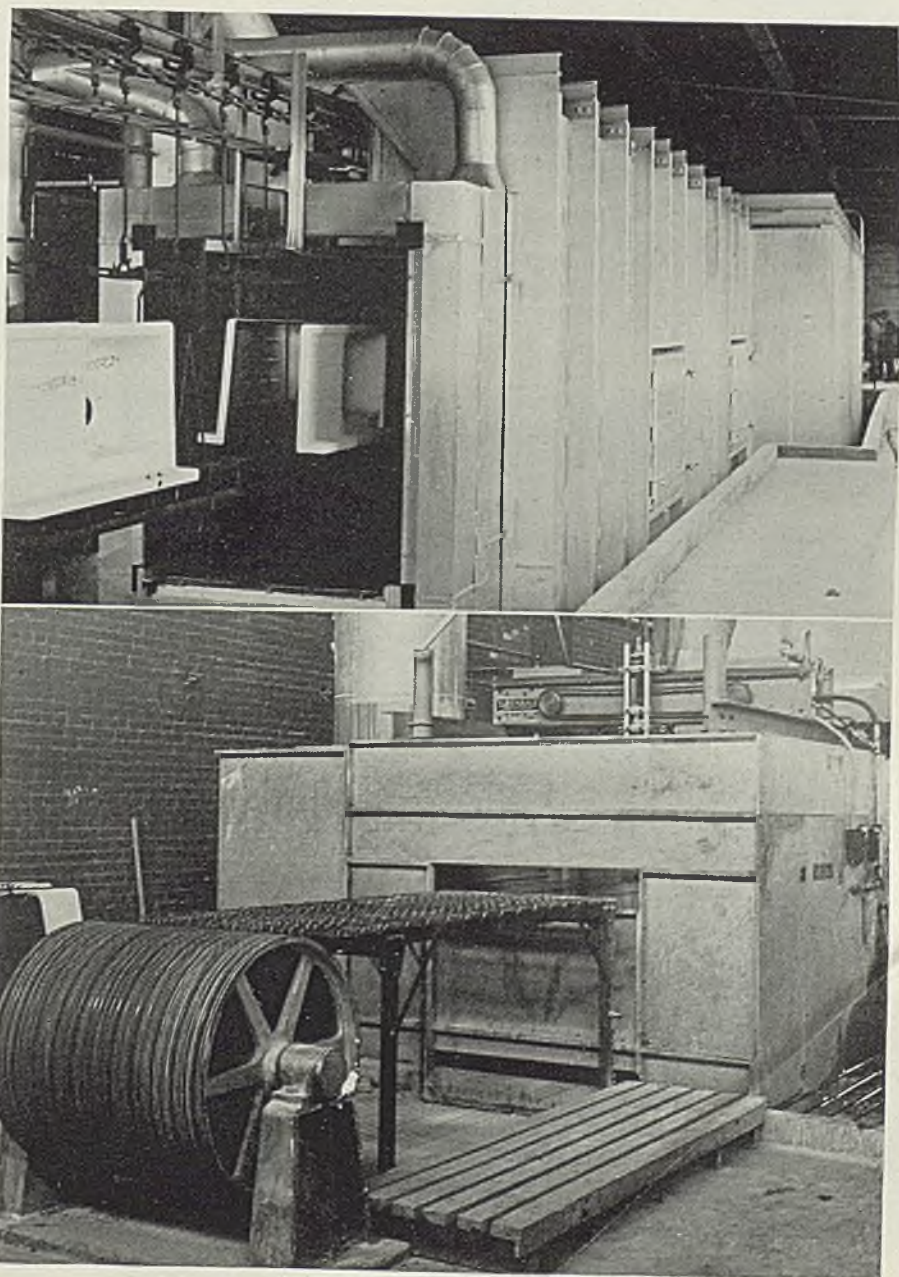
The ground-coat and cover-coat units are separated by a steel-and-sash partition through the plenum chamber. The ground-coat unit is 30 feet long and the cover-coat unit is divided so that 20 feet are used for regular cover-coat spraying while the remaining 10 feet are used for acid-resisting cover-coat spraying. Both units are equipped with several 60-gallon pressure-feed enamel storage tanks enabling the sprayers to work continuously.

After pieces are sprayed with cover coat while on the chain, they are taken into the Ferro design double-U type ground-coat and cover-coat dryers. This dryer is built

of 4-inch rockwool insulation and is 50 feet long, with each section 12 feet 9 inches wide. A dust-tight sheet-metal partition separates the two sections. Each section is heated with a 2,000,000-B.t.u. heater fully equipped with automatic temperature control and electric ignition and maintains a temperature of 425 degrees Fahr. Each dryer has an air seal at the front openings and includes heat-supply ducts, recirculating ducts and exhaust fans for venting the ovens. Chain speed is variable from 6 to 10 feet per minute, making the average time in the dryer from 9 to 15 minutes.

After the ware leaves the cover-coat dryer, it is brought to the brushers who remove the sprayed parts, perform the brushing operations and replace them on the same chain which carries it to the furnace for firing.

The furnace installed is of the



Ferro straight-through type, designed with a 35-foot heating zone. The entrance end or preheat zone is 35 feet long and the exit or cooling zone is 25 feet long. One of the features is the checker brick work in the side walls of the cooling zone. Hot ware emerging through this cooling zone gives up its heat to the air passing in the checker work. This hot air is drawn out by a fan and supplies heated air to the five oil burners firing the furnace, thus promoting fuel economy.

A patented dirt-proof slot seal is another added feature installed on

this furnace to reduce the possibility of scale or dirt falling onto the ware. The furnace is equipped with 300 feet of Webb No. 458 drop-forged chain with a variable speed of 12 to 16 feet per minute. A set of specially designed alloy burning fixtures to support bath tubs and sinks and a set of flexible burning fixtures which can be readily changed for the burning of table tops and other various shapes is part of this furnace conveyor. Both ends of the furnace are equipped with air seals to reduce heat losses at the door openings.

Lighting of this enamel shop also serves to demonstrate the consideration given to the element of efficiency.

Six fluorescent lamps burn continuously day and night in the inspection department enabling inspectors to see the ware under the same degree of lighting at all times. This ultra-modern lighting is used at other vital points in the plant such as the spraying chambers and dipping departments.

Besides the above mentioned items, Davidson Enamel Co. is porcelain enameling its own Veos tile.

Stove Manufacturer Saves One Hour Per Day by Simplifying Job

■ SIMPLIFICATION of a job usually results in added economy and increased output. This is emphasized in the case of an Illinois stove manufacturer who now can accomplish in 7 hours what formerly took 8 hours to do.

This manufacturer ships stoves in wooden crates, and parts as well as accessories are placed in cartons and strapped to a side member of the crate. The longer of the two

cartons is held in position with three steel straps, while two straps are employed to keep the smaller package in place.

Formerly the operator kept his strapping tools on a shelf over the packing bench. As he placed the two cartons on the crate member, he reached for the tools, pulled the strap from a reel and applied the seals before the actual strapping operation was begun. Frequently the

strap would overrun the reel with its consequent loss of time. Thus by simplifying this job with the use of correct equipment the operator increased his output by 12½ per cent.

The first step in simplification was to change to a strapping tool which combined the tensioning, sealing and cutting operations. Then, equipped with an automatic seal feed, the tool eliminates the necessity of individually placing the seals on each strap. Too, the number of packs are counted quickly as the magazine holds only 100 seals. This means that 100 straps can be applied before it is necessary to reload.

Worked in Any Position

For greater efficiency, the automatic seal-fed strapping tool is mounted on a standard and held in position with a sliding arm so the tool can be placed in any position on the cartons. The tool is perfectly balanced, thereby eliminating the necessity of lifting it between operations.

The next step was to get rid of the reel by mounting a coil of strap in a tray fastened to the ceiling with a safety chain and hoist. Now the strap is fed through the guide tube in the center of the coil and, as there is no pulling against a brake, there is no possibility of an overrun of the strap which is out of the way and in back of the operator. At the end of the operation the end of the strap is permitted to fall from the tool and is readily available for the next application.

This simplification project was quickly accomplished with standard equipment and a study of the operations involved. With less fatigue, the operator now saves one hour each day.

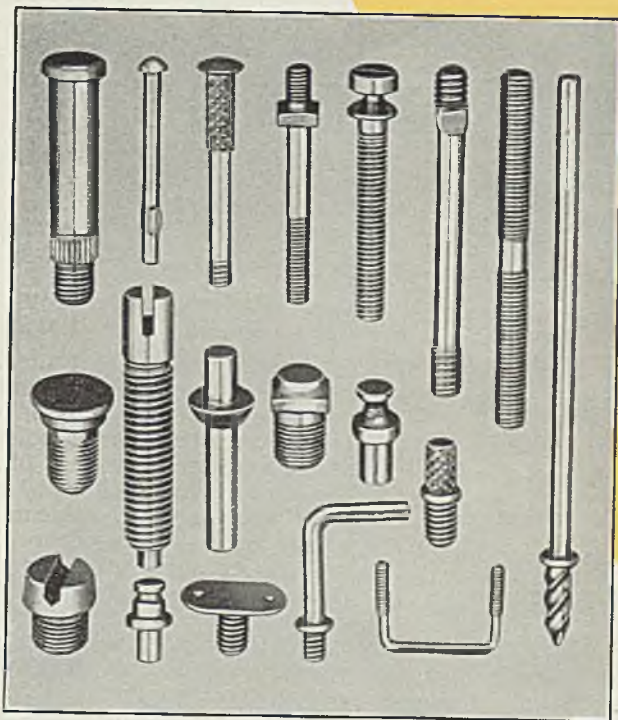
Showing strapping operation after the improved equipment was installed. Note, operator reaches behind him to get the strap for feeding into the tool. Photo courtesy Acme Steel Co., 2840 Archer street, Chicago



Are You

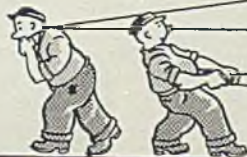
IN A SPOT

WITH YOUR GADGET PROBLEM?



If your small metal parts requirements have become a major problem—if their costs are climbing and their delivery bogged down, call on Townsend Company and learn how simple it is to lick this nerve wrecker. Perhaps those expensive screw machine products can be replaced by Townsend Gadgets that will do the job as well and at a fraction of the cost. Perhaps that "impossible" part can be a simple Townsend Gadget. And bear in mind that Gadgets by the millions are our ordinary daily production job—delivery need no longer be your problem.

LET GAD AND
JET PULL YOU
THROUGH



TOWNSEND COMPANY

NEW BRIGHTON (*Pittsburgh District*) PENNSYLVANIA
SINCE 1816

SOLID AND TUBULAR RIVETS—SPECIAL WIRE NAILS—HEADED METAL PRODUCTS—AND WIRE SPECIALTIES—IN ALL METALS

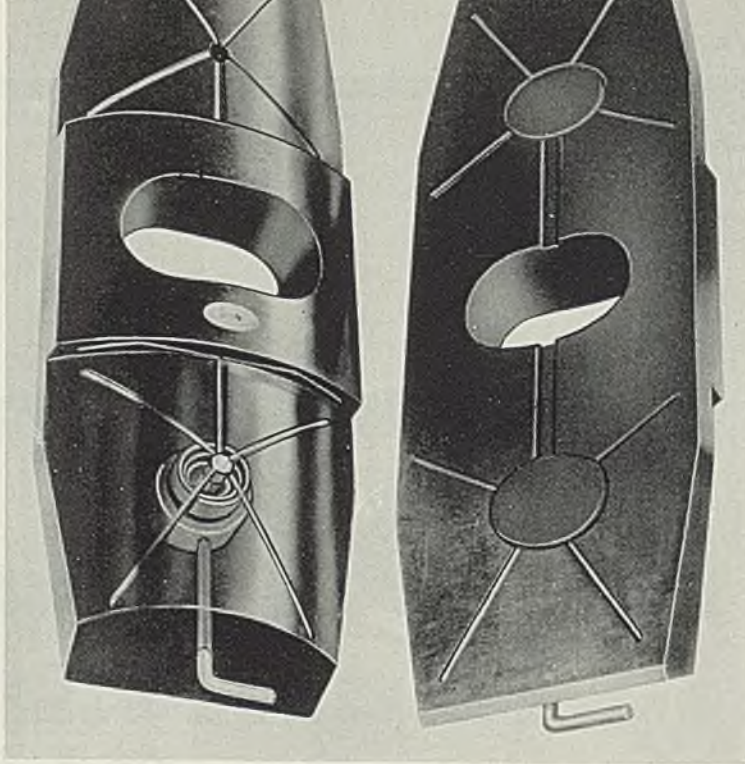


Fig. 1. (Left)—phantom view of compression spring and button in slipper. Right, buttons are held flush with surface of slipper by locking pins, which are withdrawn after making the installation

SLIPPER BEARINGS

■ ANOTHER important advancement in the operating efficiency of universal couplings has been made possible by a new nonmetallic slipper bearing developed by Thomas L. Gatke, president, Gatke Corp., 228 N. LaSalle street, Chicago. Fig. 2 is a cross section of a universal coupling which has been used until the slippers are considerably worn.

When the slippers are new and properly fitted, the slipper conforms accurately to both socket and spade, with only sufficient clearance for free movement and lubrication. As the spade turns, it bears against one half of each slipper, and in so doing turns the socket. As the coupling revolves, the slipper turns in the socket and the spade slides, on the slipper. Wear occurs between the slipper and the socket, as well as between the slipper and the spade.

When the parts are properly fitted, the broad side of the spade bears against the slipper, and the tremendous operating pressures are distributed over large areas, but as wear creates looseness, these conditions are no longer maintained: (1) Wear between slipper and socket

Dense wear-resisting molded fabric slipper bearings are designed with pressure springs to hold slippers in continuous full-length engagement with socket and thus take up looseness caused by wear.

and wear between slipper and spade permits the spade to turn farther in relation to the slipper before pressure is submitted to the socket. The spade no longer contacts a large section of the slipper, but only engages it near the end. (2) At the same time, the spade moves farther away from the idle end of each slipper, and that end of the slipper may leave the socket and follow the spade, as shown in the cross section. Only a small part of the working end of the slipper engages the socket to transmit the great driving pressure from the spade.

Materials used in Gatke fabric slipper bearings have been devel-

oped especially to meet the severe service encountered in universal coupling operation. Special tough fabrics have been developed. Special molds have been perfected for molding slippers to the finished size in order that the severe wear might be borne by the dense wear-resisting molded surfaces. The special fabrics are assembled in the molds so as to produce structures combining great shock-absorbing resilience with tremendous strength. Molding processes were originated that apply correct pressures in the same direction pressures are applied to the slippers in service. These and countless other developments perfected over a period of years have produced entirely new quality in slipper bearing performance.

The dense molded surface gives tremendous wear resistance, resulting in long service before wear develops excessive looseness. The degree of resilience afforded by the special Gatke fabrics enables the slipper to conform to the socket and the spade, thus distributing pressures and reducing localized wear. The structure withstands terrific

pressures without being permanently deformed.

Even when grease is thrown out, the socket and spade are neither scored nor excessively worn; the great expense of maintaining these parts is eliminated. The resilience of the special fabric absorbs shock.

On large blooming mills where great shocks and frequent reversing make slipper service most difficult, a set of fabric slippers is still in service after three years of continuous operation. On this same application metal slippers originally used gave only two or three months' service, with occasional failures in a few days' time. Other successful applications cover about every type of mill where universal couplings are used.

Of perhaps even greater advantage than the extended wear life is the fact that the use of these fabric slipper bearings avoids wear and scoring of companion parts, eliminating the great maintenance expense. This is a factor of major importance, particularly today when demands on machine shops are so great. Another advantage about which users have commented is the elimination of deafening noise, pounding, slapping and vibration.

Despite the years of extensive development work, however, and the marvelous achievements attained, a few failures have been experienced due to improper fitting. When clearances are too small, expansion caused by temperature changes may result in loss of lubrication and short life of the slipper. Even in

such cases, however, sockets and spades have not been damaged.

When clearances are too great, the free, or inactive ends of the slippers may follow the spade away from the socket, and when no longer completely engaged with the socket, the slipper may be broken by the spade in reversing or taking up the load.

The new Gatke slippers overcome these defects. The self-aligning action comes from pressure springs which hold the slippers in continuous full-length engagement with the socket. See Fig. 3. The compression springs are seated in the slipper and bear against large circular disks or buttons, which are fitted into the slipper and bear against the spade. Each spring exerts a pressure many times the weight of the slipper for which it is designed—sufficient pressure to hold the slipper in continuous, full-length engagement with the socket.

The self-aligning feature eliminates the need for critically accurate clearances and makes the application of self-align slipper bearings practically foolproof.

Pressure of the slippers against the socket sets up an excellent condition for effective lubrication. The grease, even at the inactive end of the slipper is held in and continuously spread. Heavy reversing loads, therefore, are borne by well-lubricated slipper and socket surfaces. Grease slinging and the undesirable conditions it creates are avoided.

Since the slipper is continuously engaged with the socket, there is no

chance for breakage by reversing motion of the spade. Keeping the slipper in full length contact with the socket affords full bearing engagement between slipper and socket. The degree of resilience which is characteristic of the special fabric enables the slipper to conform with the spade. Thus the great driving pressures are distributed over maximum bearing surfaces and the destructive effect of great pressures concentrated on limited bearing areas is avoided.

Furthermore, the pressure springs take up looseness caused by wear and permit slippers to be worn to a far greater degree before replacement than has been possible heretofore.

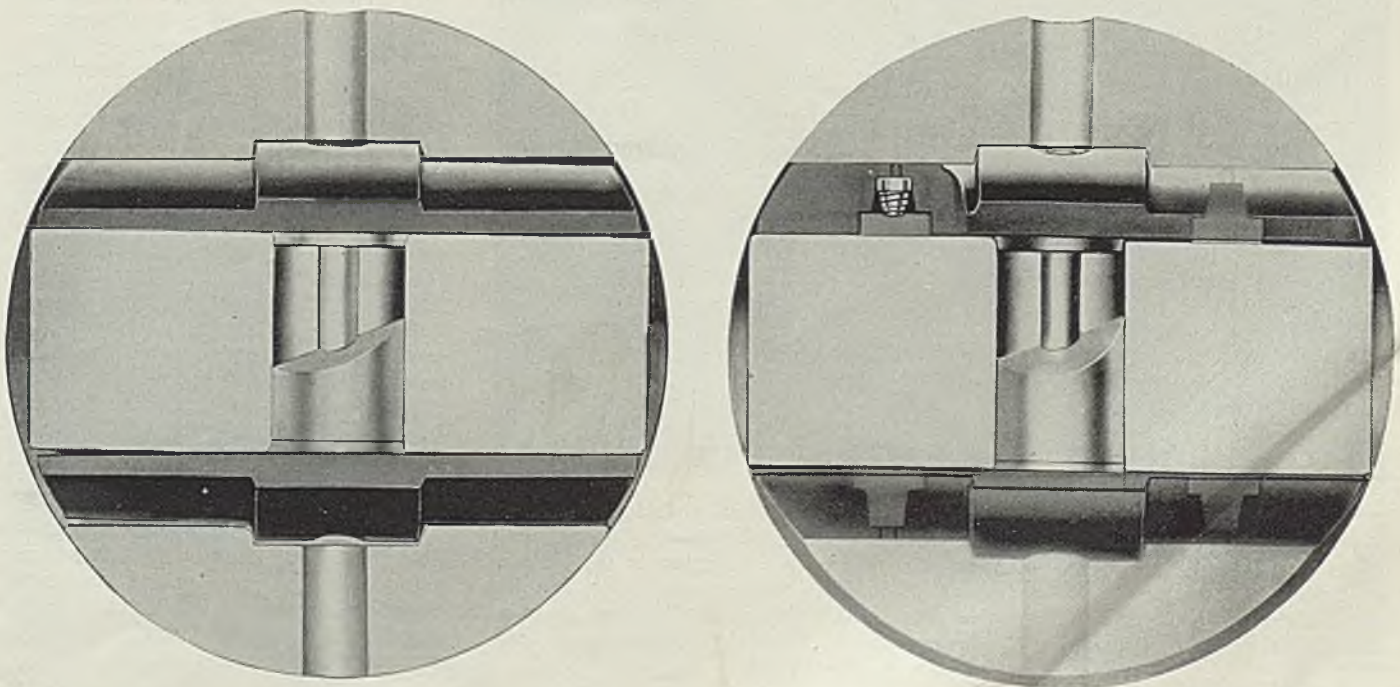
Installation of the new slipper bearings is extremely simple. A tapered steel locking pin inserted through a hole in the end of the slipper compresses the spring and holds the button flush with the flat surface of the slipper—otherwise installation is the same as for an ordinary slipper.

After the slipper is installed, the locking pin is simply pulled out, releasing the spring and putting the self-aligning action into operation.

When changing rolls or dismantling the coupling for any purpose, re-inserting the locking pin compresses the spring and locks the button flush with the slipper surface.

Gatke self-align slipper bearings are made for all types and sizes of universal couplings and may be used to replace other slippers without changes of mechanical parts.

Fig. 2. (Left)—Cross section of universal coupling showing position of slipper bearings after wear has developed considerable looseness. Spaces between inactive end of slippers and socket are exaggerated. Fig. 3—Cross section of universal coupling assembly showing how compression springs in the newly designed slipper bearings hold the slippers continuously aligned in full length contact with socket



Broaching May Do It

(Concluded from Page 62)

job complete in one operation would call for a large and expensive multiple spline broach and a machine of unusual size and power. This combination would be justified only by a very large number of parts to be machined, as might now be the case if this gear blank happens to fit in somehow in the defense program.

Turning from small run work to quantity production, we present Fig. 4 which depicts a cylinder block setup in a Cincinnati Hydro-Broach. In this case, quantities involved justify highly developed special tooling for broaching several surfaces at one pass. These Naloy broaches, produced by National Broach & Machine Co., machine surfaces for inspection plates tappet covers and also the half-round groove for cylinder block support. These tools not only are made up in sections, but also—in the case of

slabbing broaches—they have individually removable, inserted teeth very similar in design and in locking system to those employed in large, heavy-duty milling cutters. Round broaches, in a setup such as this, have double life. The sections can be turned over after one side becomes dull or unduly worn, thus presenting an entirely fresh set of cutting teeth to the work.

Mention was made at the beginning of this article of modern facilities which make broaching practical and economical on small lots and even on single pieces. Fig. 5 reveals what the Foote-Burt Co., which was a pioneer in surface broaching, now has to offer in this unusual field. It is one of their single slide vertical hydraulic machines equipped with what they call their "utility table" and a wide, flat broach.

Through the use of simple locating blocks and clamps or universal vise which can easily be set up on this cross slotted table, a surpris-

ing variety of work—such as squaring or "angling" rods, bars, castings, forgings, etc.—can be handled easily, quickly and effectively. The graduated screw serves to advance the table for the required amount of cut—which usually means advancing the work until it contacts the lower end of the broach.

Recently the writer had an opportunity to watch one of these machines in action in a large machine tool plant. Within 15 minutes, he saw it perform at least three entirely different operations with utmost neatness and dispatch. This same machine can of course be tooled up for repetitive large production broaching should occasion require.

Simple Setups Allow Quick Change

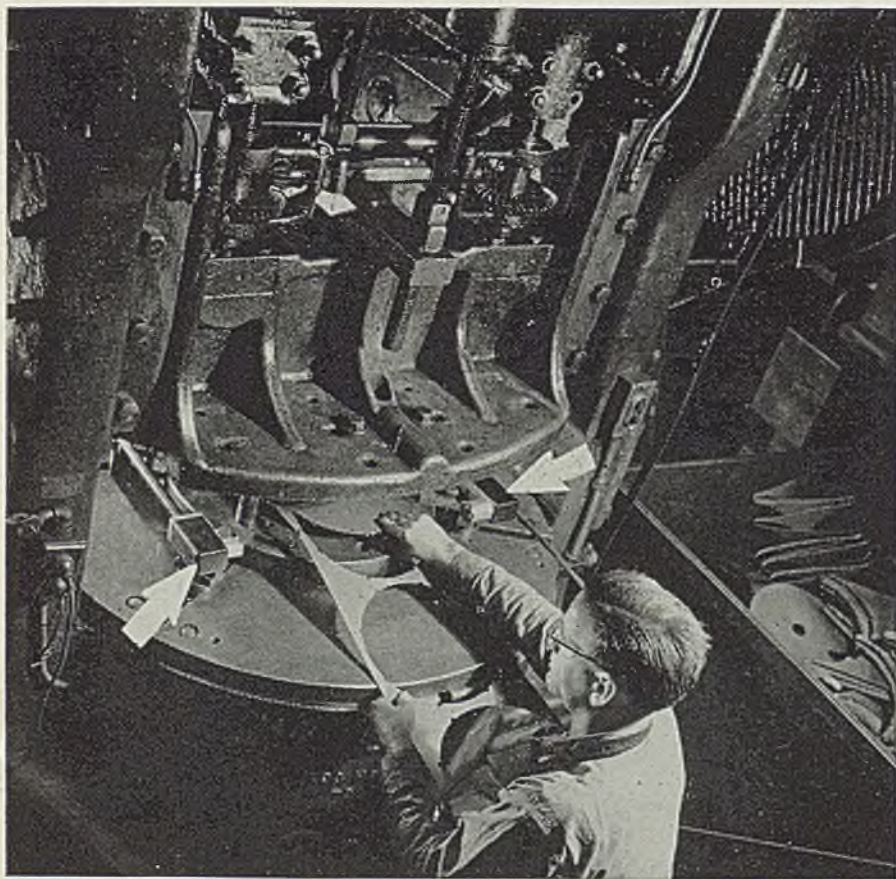
The place which broaching now holds in big run work is well exemplified by Fig. 6, which is a familiar scene in the plant of the Maytag Co., Newton, Iowa. The job being done when the photograph was taken was the cutting of six splines in clutches for washing machines—samples of this work being shown in the foreground. Using faceplate fixtures, this Oilgear dual-type machine handles these parts—which are of SAE X-1315 steel—at the rate of one every 7.2 seconds. Broaches are pulled at the rate of 81 inches per minute.

No sooner is one job off this machine than another is on, changeovers being effected very quickly. Broaches used on various other production jobs are shown in the foreground. All of these have key-type puller ends, the most common type of design and the type generally recommended for general purpose use.

Incidentally, a wide variety of standard broaches such as these are now available "out of stock" and at very reasonable prices. These include round, square and hexagonal broaches; keyway broaches; four, six and ten spline broaches; involute spline broaches and SAE serration broaches—with various kinds of puller ends.

A lot of money can be saved, and a lot of future headaches avoided, if this is borne in mind when the product to be manufactured is in the design stage. The time for designers to take a look in the standard broach catalogs is while the part to be broached is "on the board." It is very easy then to design it so that stock broaches can be used in its production. It is not so pleasant to have a hard boiled production man come around several weeks afterward—when it is too late for anything but regrets—to point out how the drawings should have been made so that standard broaches could have been used, and what great savings would thus have been effected.

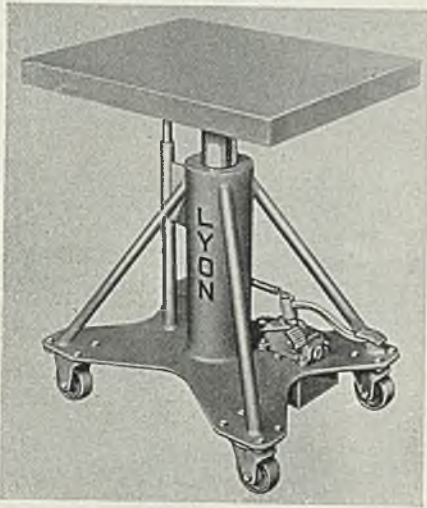
Saving Fingers with a Beam of Light



■ With the incorporation of a Phototroller on their machines, operators of punching presses and similar machines need no longer worry about losing any of their digits in their haste to keep production at a fast pace. Referring to the illustration, the unit is installed in a position so that if the worker reaches too far into the machine, he will break a beam of light and automatically prevent the machine from starting. Its response is instantaneous. Courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Elevating Table

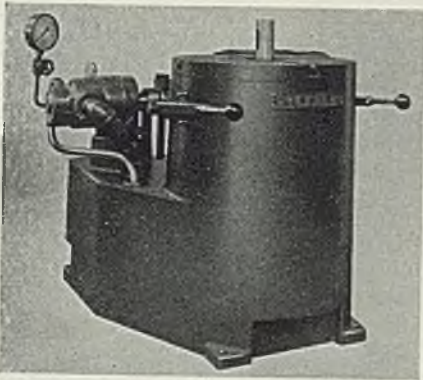
■ Lyon Iron Works, 586 Madison street, Greene, N. Y., has introduced a hydraulic elevating table for mov-



ing dies in and out of presses or storage spaces, or for lifting or supporting overhanging work on drill presses or other machines. Its table is elevated or lowered by a foot pedal. To prevent it from swiveling, the table is guided. The base of the unit is the same size as the table. This allows the table to be pushed up close to the machine. Stability is provided by locating casters at the extreme corners of the base. Truss tubes run from the center column to the base directly over casters, transferring the load to the point where it should be carried. The table has a capacity of 2000 pounds and measures 24 x 30 inches. It elevates to a height of 42 inches.

Pull-Type Press

■ Greenerd Arbor Press Co., Nashua, N. H., announces a No. H70P 30-ton pull type hydraulic press for pulling jobs. It has a 24-inch working table, 2 7/16-inch

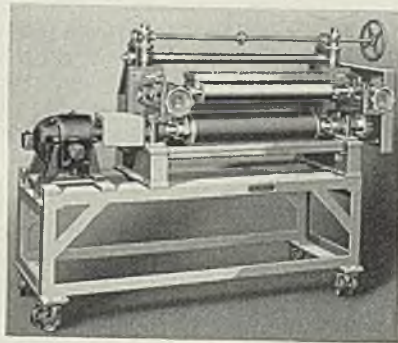


diameter ram and develops a maximum pressure of 30 tons. The working table is 34 inches from the floor, and the ram is controlled by

two handles. Release of either one stops the press. The speed of the ram is 138 inches per minute. Its working speed at 15 to 30 tons pressure is 38 inches per minute. The press is operated by a 10 horsepower, 1200 revolutions per minute motor and starter for 220/440/550 volt, 2 or 3 phase, 50 or 60 cycle current as standard equipment.

Coating Machine

■ Chas. E. Francis Co., Rushville, Ind., announces a new coating machine for applying draw compound to steel sheets preparatory to shaping or forming. It consists of two corrugated rubber coating rolls for coating the sheets on both sides. A doctor or scraper roll is used in conjunction with each coating roll, not only to govern the thickness of spread but also to form a roll crotch to hold the compound. The lower coating roll can be adapted to pick up its supply of mixture from a stationary or adjustable pan. Calibrated



adjustments are used for governing the spread, as well as for adjusting the opening between the rolls for thickness of metal. The machine's drive is provided by a direct connected geared-head motor. If desired, the machine is furnished on a welded steel stand mounted on casters, as illustrated. It can be had in any width—in regular or extra heavy construction, bench or floor models, and for single or double coating.

Socket Meter Troughs

■ Square D Co., 6060 Rivard street, Detroit, has added to its service equipment a line of standardized socket meter trough, designated as Nos. 3 and 3A. Individual covers for each meter position permit work on any one meter without disturbing the others. Solderless connectors on the line side will take up to No. 3/0 wire and on the load side up to No. 4/0. Number 3A troughs are provided with disconnects on the load side. This is done by backing out the screw. Since this is done when the meter is not in place, no current is broken by the screw when disconnecting or connecting. Number 3 troughs are

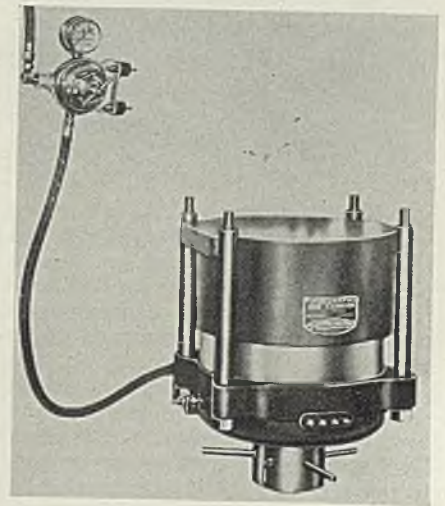


identical to No. 3A except that they are not provided with disconnect means.

Both types of troughs are furnished either with or without busses, in outdoor or indoor types, and in steel or aluminum construction.

Pneumatic Die Cushion

■ Dayton Rogers Mfg. Co., 2830 South Thirteenth avenue, Minneapolis, has introduced a new model D universal pneumatic die cushion. It also is now made in seven sizes, from 6 to 14 inches, have drawing capacities for deep drawing work from 2 to 8 inches, and can be used with or without surge tank reservoirs. Each cushion is supplied with a combination reducing regulating control valve and pressure gage. The die cushion may be

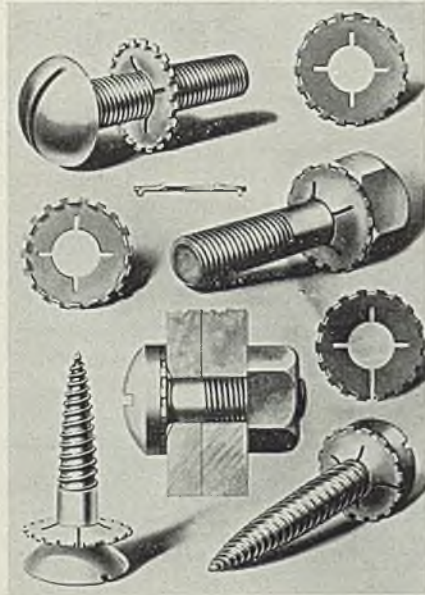


mounted directly to the bottom side of the bolster plate, for all draw ring and pressure pad control operations, or they may be spaced away from the bolster plate to allow blanks or slugs to pass through the punch press bolster plate. The correct height of the pin pressure pad is predetermined and maintained by the hand wheel. The cylinder and piston is inverted on the section which serves as a pin pressure pad, making it possible to drop the pin pressure area to the maxi-

imum of the drawing stroke by releasing the air pressure and shutting off the supply so the pin plate stands out of the way for blanking and piercing operations. The design of the cylinder section automatically shields the cushion proper so no pierced slugs and other loose parts can come in contact with it.

Lock Washer

■ Mechanical Laboratories Inc., 128 Chatham street, Pittsburgh, announces a Pre-Fixed lock washer which can be used on any type of screw. It is adapted to be assembled with a standard threaded fastener before it leaves the factory by a simple press operation. It consists of a bored disk with radial slits spaced circumferentially of the hole. The hole is slightly smaller than the maximum diameter of the shank of the fastener to which it is to be



applied. The washer is assembled with the fastener merely by pressing it on the shank. The radial slits provide deformable tongues extending inwardly from the washer which are bent out of their original plane as the washer is forced on the screw, and thereby engage the shank with such force as to prevent the removal of the washer. The washer also is provided with teeth or projections to engage the underside of the head of the fastener when it is screwed home.

Circuit Breaker

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced a new Quicklag circuit breaker for protecting lighting appliances and motor circuits in factories. It combines in a single unit a co-operative magnetic and a thermal trip and is available in ratings of 15 to 35 amperes, single pole only, 250 volts alternating current

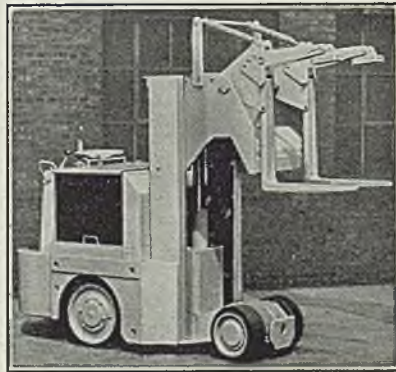
and 125 volts direct current. The combination of the Bi-metal thermal and magnetic trip actions gives



the new device the advantage of instantaneous trip on short circuits combined with the advantage of time-delay for momentary overloads such as those caused by motor inrush currents. Its size is smaller per watts capacity than that of any similar circuit breaker. Calibration is permanent and is sealed against tampering. Contacts are low resistant and tests show that even after years of service, they remain so. The operating mechanism gives a quick make and break, and arcs resulting from heavy current interruptions are quickly snuffed out by the De-Ior. grid assembly. To facilitate connections, solderless terminals are embodied. Automatic operation is indicated by the handle position, which has a central tripped position. Current ratings are clearly marked on the operating handle, which is trip-free. Case is of molded Micarta and the handle is of heavy duty Moldarta. The latter moves in grooves that prevent tampering.

Fork Truck

■ Mercury Mfg. Co., 4118 South Halsted street, Chicago, announces a new fork type truck with automatic clamps for handling tin plate

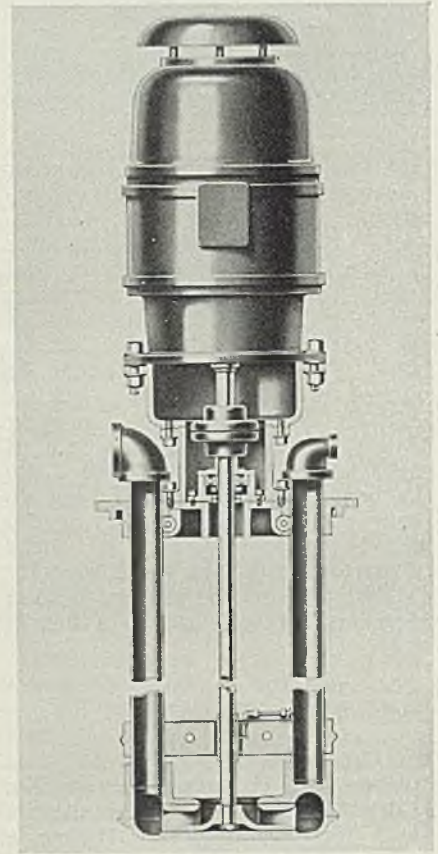


and loose stacks of sheet metal. It is a 2-wheel drive, 4-wheel steer machine with horizontally disposed wheel type steering control. The

truck, having a capacity of 4000 pounds and loads up to 36 inches in length, is powered with heavy duty double reduction drive axle assembly. The travel controller is a double unit mechanical contactor, providing four speeds in either direction and having separate manual control handles for travel direction and speed selection. The hoist mechanism is actuated hydraulically.

Centrifugal Pumps

■ American Manganese Steel division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., has introduced new designs to its line of centrifugal pumps. At present



the company is in production on five different designs, two of which types A and T are horizontal pumps, available in all sizes from $\frac{3}{4}$ to 6 inches. A sectional view of the type SW of the new vertical shaft pumps is shown. Motor, coupling, thrust bearing and housing are supported by a reinforced plate which serves as a structural member and the strut serves as a conduit for lubricating the lower bearings. Other features include inverted intake in place of side or bottom openings, liberal and simple slippage seal adjustment and split yoke bearing supports which are replaceable without dismantling. Either open or shrouded impellers are available of either multivane or 2-vane trash type.

Record Steel Scarcity

As Present Year Ends

Outweighs all other considerations. Threatened famines held off so far. Cross shipments gain. Defense orders increase. Plate deliveries bad.

Demand

Brisk for holidays.

Prices

Some adjustments upward

Production

Down 15 points to 80.

■ NEVER since the World war has scarcity of steel at the end of a year been so pronounced as now. This transcends all other factors of production, shipments, sales and prices. Industry would feel more encouraged if at least some relief were in sight. Even subsidiary fabricating companies of parent steel makers, such as shipbuilders, cannot get sufficient steel, particularly plates, from their home supply source.

Industry concedes that Washington-imposed priorities may be nearer, though there is question whether probable confusion from a new set-up would be compensated for by greater benefits. Increasing proportion of orders are for defense fresh off architects' drawing boards. Thus a maker of bolts and nuts who three weeks ago was working at 80 per cent now goes at 100 per cent because of defense orders.

It is encouraging, however, that threatened famines in coke and pig iron these several months, have been staved off, which may set an example for the industry generally. It may still be merely a question of proper distribution as to consumers, districts and periods of time.

Methods of distribution come more into the limelight. An Ohio fabricator of structural steel has just sold 7000 tons for two projects in New York city; another Ohio fabricator has sold into the Chicago district; Chicago, in turn, has sold into the East. Cross shipments add to price, but that is of little consideration now.

Delivery periods as respects various products are widening. Whereas steel sheets are delivered in ten weeks wide plates often specify 20 to 24 weeks. Many sales are now made for what will prove third quarter delivery. Steelmakers are more careful than ever on sales for second quarter or beyond to specify "prices at time of shipment."

By some this is interpreted as an innate belief of steelmakers that prices will be higher. Contributing to this is the fact that CIO wage contracts expire in February and may be renewed at higher levels, though Washington and industry are committed if possible to unchanged prices. Where adjustments in extras and discounts are made they are invariably higher. Certain stove bolts, cap screws and set screws have thus been advanced 5 per cent.

Steel ingot production last week declined 15 points to 80 per cent of capacity, which compares with 75½ per cent for Christmas week of last year.

The pig iron market generally has by now accepted the \$1 per ton advance, though on rare occasions sales are being made at old levels. For many producers and agents sales have increased. Shipments this month promise to be equal to, or better than, November.

Just before the holidays galvanized sheet production reached 84 per cent, up 1 point and the highest in several years. Zinc producers estimate production will balance consumption in first half 1941, relieving tension for galvanizers.

Despite assertions that Lake ore carrying capacity is sufficient Pittsburgh Steamship Co. will build two record large ore carriers, to be ready for service in 1942. More steelmakers announce plans to increase ingot and allied capacities.

Scheduled automobile production for the week ended Dec. 28 is 82,545 as against 89,365 for the corresponding week of 1939. The decline for the holiday week is to be 42,805 tons.

Sales of fabricated structural steel for the year will have been approximately 1,475,000 tons, according to STEEL's compilations of orders for 100 tons or more.

This is about 325,000 tons above last year. A study reveals that about 17 per cent each went into industrial buildings, bridges and manufacture and servicing of aircraft, while 14 per cent went into engineering, such as dams, and 12 per cent into shipbuilding. Remaining entered direct armament, railroad work, public buildings and residences.

Operating rates in steel districts last week dropped as follows: Pittsburgh, 20 points to 75; Chicago, 18 points to 79½; eastern Pennsylvania, 13 points to 82; Youngstown, 13 points to 78; Wheeling, 22½ points to 76; Cleveland, 14½ points to 72; Buffalo, 15 points to 78; Birmingham, 16 points to 84; New England, 10 points to 90; Cincinnati, 14 points to 73; St. Louis, 8 points to 79½ and Detroit, 14 points to 76.

Rises in scrap brought STEEL's scrap composite up 9 cents to \$21.46 and partly accounted for iron and steel rising 11 cents to \$38.43, the rest due to pig iron. Finished steel was unchanged at \$56.60.

COMPOSITE MARKET AVERAGES

	Dec. 28	Dec. 21	Dec. 14	One Month Ago Nov., 1940	Three Months Ago Sept., 1940	One Year Ago Dec., 1939	Five Years Ago Dec., 1935
Iron and Steel....	\$38.43	\$38.32	\$38.28	\$38.08	\$37.93	\$37.42	\$33.31
Finished Steel ..	56.60	56.60	56.60	56.60	56.60	56.50	53.70
Steelworks Scrap..	21.46	21.37	21.37	20.72	20.05	17.88	13.17

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material	Dec. 28,	Nov.	Sept.	Dec.	Pig Iron	Dec. 28,	Nov.	Sept.	Dec.
	1940	1940	1940	1939		1940	1940	1940	1939
Steel bars, Pittsburgh.....	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh.....	\$25.34	\$24.34	\$24.34	\$24.34
Steel bars, Chicago.....	2.15	2.15	2.15	2.15	Basic, Valley.....	23.50	22.50	22.50	22.50
Steel bars, Philadelphia.....	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia	25.34	24.34	24.34	24.34
Iron bars, Chicago.....	2.25	2.25	2.15	2.15	No. 2 foundry, Pittsburgh.....	25.21	24.21	24.21	24.21
Shapes, Pittsburgh.....	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago.....	24.00	23.00	23.00	23.00
Shapes, Philadelphia.....	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham....	19.38	19.38	19.38	19.38
Shapes, Chicago.....	2.10	2.10	2.10	2.10	Southern No. 2 del. Cincinnati..	23.06	23.06	23.06	23.06
Plates, Pittsburgh.....	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.)..	26.215	25.215	25.215	25.215
Plates, Philadelphia.....	2.15	2.15	2.15	2.225	Malleable, Valley.....	24.00	23.00	23.00	23.00
Plates, Chicago.....	2.10	2.10	2.10	2.10	Malleable, Chicago.....	24.00	23.00	23.00	23.00
Sheets, hot-rolled, Pittsburgh...	2.10	2.10	2.10	2.10	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	30.34
Sheets, cold-rolled, Pittsburgh...	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh....	24.17	23.17	23.17	23.17
Sheets, No. 24 galv., Pittsburgh...	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	105.33
Sheets, hot-rolled, Gary.....	2.10	2.10	2.10	2.10					
Sheets, cold-rolled, Gary.....	3.05	3.05	3.05	3.05	Scrap				
Sheets, No. 24 galv., Gary.....	3.50	3.50	3.50	3.50	Heavy melt. steel, Pitts.....	\$22.75	\$21.50	\$20.15	\$18.50
Bright bess., basic wire, Pitts...	2.60	2.60	2.60	2.60	Heavy melt. steel, No. 2, E. Pa...	19.75	19.75	19.70	17.60
Tin plate, per base box, Pitts...	\$5.00	\$5.00	\$5.00	\$5.00	Heavy melting steel, Chicago...	20.75	20.25	19.30	16.65
Wire nails, Pittsburgh.....	2.55	2.55	2.55	2.55	Rails for rolling, Chicago.....	25.00	24.55	21.40	19.85
					Railroad steel specialties, Chicago	24.25	23.25	21.65	19.60
Semifinished Material					Coke				
Sheet bars, Pittsburgh, Chicago...	\$34.00	\$34.00	\$34.00	\$34.00	Connellsville, furnace, ovens....	\$5.50	\$4.75	\$4.75	\$4.75
Slabs, Pittsburgh, Chicago.....	34.00	34.00	34.00	34.00	Connellsville, foundry, ovens....	6.00	5.75	5.75	5.75
Rerolling billets, Pittsburgh....	34.00	34.00	34.00	34.00	Chicago, by-product fdry., del...	11.75	11.75	11.25	11.25
Wire rods No. 5 to ½-inch, Pitts...	2.00	2.00	2.00	1.98					

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled	
Pittsburgh.....	2.10c
Chicago, Gary.....	2.10c
Cleveland.....	2.10c
Detroit, del.....	2.20c
Buffalo.....	2.10c
Sparrows Point, Md.....	2.10c
New York, del.....	2.34c
Philadelphia, del.....	2.27c
Granite City, Ill.....	2.20c
Middletown, O.....	2.10c
Youngstown, O.....	2.10c
Birmingham.....	2.10c
Pacific Coast ports.....	2.65c
Cold Rolled	
Pittsburgh.....	3.05c
Chicago, Gary.....	3.05c
Buffalo.....	3.05c
Cleveland.....	3.05c
Detroit, delivered.....	3.15c
Philadelphia, del.....	3.37c
New York, del.....	3.39c
Granite City, Ill.....	3.15c
Middletown, O.....	3.05c
Youngstown, O.....	3.05c
Pacific Coast ports.....	3.70c
Galvanized No. 24	
Pittsburgh.....	3.50c
Chicago, Gary.....	3.50c
Buffalo.....	3.50c
Sparrows Point, Md.....	3.50c
Philadelphia, del.....	3.67c
New York, delivered.....	3.74c
Birmingham.....	3.50c

Granite City, Ill.....	3.60c
Middletown, O.....	3.50c
Youngstown, O.....	3.50c
Pacific Coast ports.....	4.05c
Black Plate, No. 29 and Lighter	
Pittsburgh.....	3.05c
Chicago, Gary.....	3.05c
Granite City, Ill.....	3.15c
Long Ternes No. 24 Unassorted	
Pittsburgh, Gary.....	3.80c
Pacific Coast.....	4.55c
Enameling Sheets	
	No. 10 No. 20
Pittsburgh.....	2.75c 3.35c
Chicago, Gary.....	2.75c 3.35c
Granite City, Ill.....	2.85c 3.45c
Youngstown, O.....	2.75c 3.35c
Cleveland.....	2.75c 3.35c
Middletown, O.....	2.75c 3.35c
Pacific Coast.....	3.40c 4.00c

Plates.....	21.50	22.00	25.50	30.50
Sheets.....	26.50	29.00	32.50	36.50
Hot strip.....	17.00	17.50	24.00	35.00
Cold stp.....	22.00	22.50	32.00	52.00

Gulf ports.....	2.45c
Birmingham.....	2.10c
St. Louis, del.....	2.34c
Pacific Coast ports.....	2.75c

Steel Plate

Pittsburgh.....	2.10c
New York, del.....	2.29c
Philadelphia, del.....	2.15c
Boston, delivered.....	2.46c
Buffalo, delivered.....	2.33c
Chicago or Gary.....	2.10c
Cleveland.....	2.10c
Birmingham.....	2.10c
Coatesville, Pa.....	2.10c
Sparrows Point, Md.....	2.10c
Claymont, Del.....	2.10c
Youngstown.....	2.10c
Gulf ports.....	2.45c
Pacific Coast ports.....	2.65c

Tin and Terne Plate

Tin Plate, Coke (base box)	
Pittsburgh, Gary, Chicago.....	\$5.00
Granite City, Ill.....	5.10
Mfg. Terne Plate (base box)	
Pittsburgh, Gary, Chicago.....	\$4.30
Granite City, Ill.....	4.40

Bars

Soft Steel	
(Base, 20 tons or over)	
Pittsburgh.....	2.15c
Chicago or Gary.....	2.15c
Duluth.....	2.25c
Birmingham.....	2.15c
Cleveland.....	2.15c
Buffalo.....	2.15c
Detroit, delivered.....	2.25c
Philadelphia, del.....	2.47c
Boston, delivered.....	2.52c
New York, del.....	2.49c
Gulf ports.....	2.50c
Pacific Coast ports.....	2.80c
Rail Steel	
(Base, 5 tons or over)	
Pittsburgh.....	2.15c
Chicago or Gary.....	2.15c
Detroit, delivered.....	2.25c
Cleveland.....	2.15c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.			
Chrome-Nickel			
	No. 302	No. 304	
Bars.....	24.00	25.00	
Plates.....	27.00	29.00	
Sheets.....	34.00	36.00	
Hot strip.....	21.50	23.50	
Cold strip.....	28.00	30.00	
Straight Chromes			
	No. 410	No. 430	No. 442
Bars.....	18.50	19.00	22.50
			27.50

Structural Shapes

Pittsburgh.....	2.10c
Philadelphia, del.....	2.21½c
New York, del.....	2.27c
Boston, delivered.....	2.41c
Bethlehem.....	2.10c
Chicago.....	2.10c
Cleveland, del.....	2.30c
Buffalo.....	2.10c

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Foundry	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$25.00	\$25.50	\$24.50	\$26.00
Birmingham, Ala.	19.38		18.38	24.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50		25.00
Erle, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.00	25.50	24.50	26.00
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00			
Sharpville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00		24.50	
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

*Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	24.78		23.66	
Boston from Birmingham	24.12			
Boston from Everett, Mass.	25.50	26.00	25.00	26.50
Boston from Buffalo	25.50	26.00	25.00	26.50
Brooklyn, N. Y., from Bethlehem	27.50	28.00		
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	23.22			
Cincinnati from Hamilton, O.	24.24	25.11	24.61	
Cincinnati from Birmingham	23.06		22.06	
Cleveland from Birmingham	23.32		22.82	
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.69
Newark, N. J., from Birmingham	25.15			
Newark, N. J., from Bethlehem	26.53	27.03		
Philadelphia from Birmingham	24.40		23.96	
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	
Pittsburgh district from Neville Island		Neville base, plus 69c, 84c, and \$1.24 freight		
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	

	No. 2 Foundry	Malleable	Basic	Bessemer
St. Louis from Birmingham	23.12			22.62
St. Paul from Duluth	26.63	26.63		27.13
Over 0.70 phos.				

Low Phos.

Basing Points: Birdsboro and Steelton, Pa. and Buffalo, N. Y., \$29.50, base; \$30.74 delivered Philadelphia.

Gray Forge

Valley furnace	\$24.50	Charcoal Lake Superior fur.	\$27.00
Pitts. dist. fur.	24.50	Do., del. Chicago	30.34
		Lyles, Tenn.	26.50

+Silvery

Jackson county, O., base: 6-6.50 per cent \$29.50; 6.51-7—\$30.00; 7-7.50—\$30.50; 7.51-8—\$31.00; 8-8.50—\$31.50; 8.51-9—\$32.00; 9-9.50—\$32.50; Buffalo, \$1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus \$1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices	Ladle Brick (Pa., O., W. Va., Mo.)
	Dry press..... \$28.00
	Wire cut..... 26.00
	Magnesite
	Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk..... 22.00
	net ton, bags..... 26.00
	Basic Brick
	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa. Chrome brick..... \$50.00
	Chem. bonded chrome... 50.00
	Magnesite brick..... 72.00
	Chem. bonded magnesite 61.00
	Fluorspar
	Washed gravel, duty pd., tide, net ton \$25.00-\$26.00
	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail. 20.00-21.00
	Do. barge..... 20.00
	No. 2 lump..... 20.00-21.00
	Fire Clay Brick
	Super Quality
Pa., Mo., Ky.....	\$60.80
	First Quality
Pa., Ill., Md., Mo., Ky....	47.50
Alabama, Georgia.....	47.50
New Jersey.....	52.50
	Second Quality
Pa., Ill., Ky., Md., Mo....	42.75
Georgia, Alabama.....	34.20
New Jersey.....	49.00
	Ohio
First quality.....	39.90
Intermediate.....	36.10
Second quality.....	31.35
	Malleable Bung Brick
All bases.....	\$56.05
	Silica Brick
Pennsylvania.....	\$47.50
Joliet, E. Chicago.....	55.10
Birmingham, Ala.....	47.50

Ferroalloy Prices

Ferromanganese, 78-82%, carlots, duty pd. \$120.00	Do., ton lots 11.75c	Do., spot 145.00	Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb. 14.50c
Ton lots 130.00	Do., less-ton lots 12.00c	Do., contract, ton lots 145.00	Do., 2% 13.00c
Less ton lots 133.50	less than 200 lb. lots. 12.25c	Do., spot, ton lots.... 150.00	Spot 1/4c higher
Less 200 lb. lots 138.00	67-72% low carbon:	15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50	Silicon Briquets, contract carloads, bulk, freight allowed, ton \$74.50
Do., carlots del. Pitts. 125.33	Car- Ton Less loads lots ton	Do., spot 160.00	Ton lots 84.50
Spiegel Eisen, 19-21% dom. Palmerion, Pa., spot.. 36.00	2% carb... 17.50c 18.25c 18.75c	Do., contract, ton lots. 160.00	Less-ton lots, lb. 4.00c
Do., 26-28% 49.50	1% carb... 18.50c 19.25c 19.75c	Do., spot, ton lots.... 165.00	Less 200 lb. lots, lb. 4.25c
Ferrosilicon, 50%, freight allowed, c.l. 74.50	0.10% carb. 20.50c 21.25c 21.75c	Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c	Spot 1/4-cent higher.
Do., ton lot 87.00	0.20% carb. 19.50c 20.25c 20.75c	Do., ton lots 8.00c	Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.50c
Do., 75 per cent 135.00	Spot 1/4c higher	Do., less-ton lots.... 8.50c	Ton lots 6.00c
Do., ton lots 151.00	Ferromolybdenum, 55- 65% molyb. cont., f.o.b. mill, lb. 0.95	Spot 1/4c lb. higher	Less-ton lots 6.25c
Spot, \$5 a ton higher.	Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80	Chromium Briquets, contract, freight allowed, lb. carlots, bulk 7.00c	Spot 1/4c higher
Silicomanganese, c.l., 3 per cent carbon..... 113.00	Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots... \$1.23	Do., ton lots 7.50c	Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50
2 1/2% carbon..... 118.00	Do., less-ton lots.... 1.25	Do., less-ton lots.... 7.75c	Do., ton 108.00
2% carbon, 123.00; 1%, 133.00	20-25% carbon, 0.10 max., ton lots, lb. 1.35	Do., less 200 lbs.... 8.00c	35-40%, contract, carloads, lb., alloy..... 14.00c
Contract ton price \$12.50 higher; spot \$5 over contract.	Do., less-ton lots 1.40	Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. \$2.50	Do., ton lots..... 15.00c
Ferrotungsten, stand., lb. con. del. cars 1.90-2.00	Spot 5c higher	Do., smaller lots..... 2.60	Do., less-ton lots.... 16.00c
Ferrovandium, 35 to 40%, lb., cont... 2.70-2.80-2.90	Ferrocolumbium, 50-60%, contract, lb. con. col. f.o.b. Niagara Falls... \$2.25	Vanadium Pentoxide, contract, lb. contained \$1.10	Spot 1/4c higher
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric turn., per ton, c. i. 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage 75.00	Do., less-ton lots.... 2.30	Do., spot 1.15	Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. \$2.60
Ferrochrome, 66-70 chromi- um, 4-6 carbon, cts. lb., contained cr., del. carlots 11.00c	Spot is 10c higher	Chromium Metal, 98% cr., contract, lb. con. chrome, ton lots..... 80.00c	Do., under 100-lb. lots 3.00
	Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill..... 0.80	Do., spot 85.00c	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c
	Ferro-carbon-titanium, 15- 18% ti., 6-8% carb., carlots, contr., net ton \$142.50	88% chrome, cont. tons. 79.00c	
		Do., spot 84.00c	

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
							Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	...	5.05	...	4.05	...	...
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.60	3.22	3.75	8.40	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.45	....	3.65	8.40	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.23	4.30	4.64	3.20	3.80	8.70	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	...	5.00	...	4.42	...	...
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.75	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.40	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.53
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.49	4.49	6.09	3.99	....	5.54	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.50	3.55	5.88	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	3.50	5.95	5.95	3.85	3.85	5.50	4.20	....	5.25	....	6.60	....	....
Seattle	4.00	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.60	6.45	4.15	4.15	6.40	4.30	6.50	5.25	....	6.70	10.55	9.80
San Francisco	3.50	4.00	6.00	3.50	3.50	5.60	3.40	6.40	5.15	....	6.80	10.65	9.80

	—S.A.E. Hot-rolled Bars (Unannealed)—				
	1035-1050 Series	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	...
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	6.00	5.75	7.85
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 200-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Oreg.; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 800-4999 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at \$4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH	
	Gross Tons f.o.b. U.K. Ports	£ s d
Merchant bars, 3-inch and over	\$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.79c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	3.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	\$ 6.29	1 11 4

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

	£ s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	\$25.79 6 8 0(a)
Basic pig iron	24.28 6 0 6(a)
Furnace coke, f.o.t. ovens	7.15 1 15 0
Billets, basic soft, 100-ton lots and over	49.37 12 5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c 14 10 6
Merchant bars, rounds and squares, under 3-inch	3.17c 17 12 0 ††
Shapes	2.77c 15 8 0 ††
Ship plates	2.91c 16 3 0 ††
Boiler plates	3.06c 17 0 6 ††
Sheets, black, 24 gage, 4-ton lots and over	4.10c 22 15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c 26 2 6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c 23 15 0
Bands and strips, hot-rolled	3.30c 18 7 0 ††

(a) del. Middlesbrough. 5s rebate to approved customers. ††Rebate of 15s on certain conditions.

Sheets, Strip

Sheet & Strip Prices, Pages 68, 69

Pittsburgh—Sheet production continues steady, although the mills were down for the holiday and thus new bookings and shipments were lower last week than the preceding week. Releases have begun to come in a post-holiday rush, which is slightly better than expected. Galvanized sheet production is steady at 84 per cent.

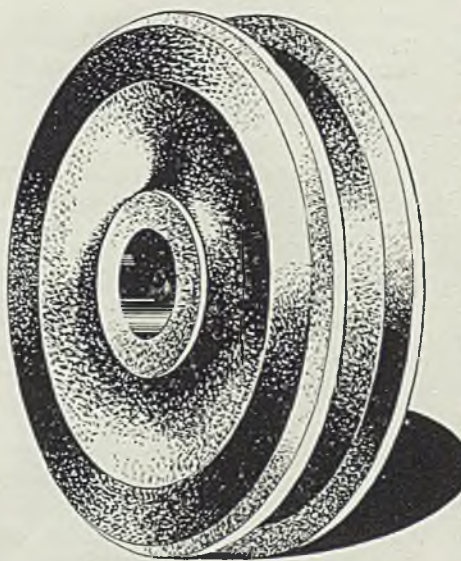
Cleveland—About ten weeks' delivery is a uniform experience among producers. Sales were remarkably good for the holidays, but showed some decline during the week. Producers often parcel out tonnage parsimoniously. Producers feel that automobile makers may switch largely to defense production by second quarter, 1941, thereby needing fewer sheets and strip, but they are confident of disposing of tonnages elsewhere.

Chicago—Sheet and strip orders showed no falling off as it was believed they would the last few weeks of December. Demand is holding up well, in spite of the holiday and deliveries are slightly more extended. All consuming lines show strength.

Boston—Backlogs of narrow cold strip is heavy, open first quarter capacity with most mills being limited. Incoming tonnage the final month was maintained close to the high November volume and in excess of shipments. Rerolling schedules are becoming increasingly confused and difficult, with buyers pressing for deliveries. More priority slips are appearing on additional finishes. Second quarter orders at open prices are appearing.

New York—Despite the holidays, sellers report continued strong pressure for sheets. Demand is greatly diversified, and while there is an increasing tonnage for defense needs, commercial requirements are heavier than normal. This is attributed principally to the desire of manufacturers to build up stocks because of extending sheet deliveries and the possibility that they will be called upon to divert more of their production to defense requirements as time goes on. The possibility of higher prices in second quarter also is a factor. Deliveries on most major grades run well into February, with some sellers, in fact, unable to take little new business for delivery in the first quarter. Producers generally are endeavoring to limit bookings to the minimum needs of regular customers.

Philadelphia—Mills are unable to make appreciable inroads into order backlogs. Orders equal or exceed shipments. Consumers not identified with defense work are anxious to build up inventories in anticipation of more stringent priorities.



Wrought steel crane wheels, as compared with cast wheels, have greater strength and toughness and adhesion to the rail. They insure a minimum of wear on the wheel and rail.

Standard's crane wheels reflect long experience in the manufacture of wrought steel products of all descriptions.

The quality built into every Standard wheel insures long life and economy.

CASTINGS • FORGINGS • WELDLESS RINGS • WROUGHT STEEL WHEELS

STANDARD STEEL WORKS

Division of THE BALDWIN LOCOMOTIVE WORKS
P H I L A D E L P H I A



February is generally the earliest delivery available in most sheet grades.

Buffalo — There is no letup in the brisk flow of sheet and strip orders for first quarter delivery. Backlogs are the heaviest in years and deliveries are extended eight to ten weeks. Mills report some consumers are placing orders in the priority class under the defense program so as to get quicker delivery.

Cincinnati—Sheet buyers are anticipating needs farther ahead and ordering in the last two months has averaged close to 150 per cent of mill capacity. As a result backlogs are growing and deliveries are further extended. Delivery problems thus far have not been acute and the holiday shutdowns were held to a minimum.

St. Louis—There is no slackening in demand for sheets and strip, and some users have been buying during the past several weeks in anticipation of possible preferentials and delayed deliveries in 1941. Warehouse buying is reported freer than heretofore, and large tonnages are being accounted for by the general manufacturing trade and defense contracts.

Birmingham, Ala. — Sheet bookings are somewhat off from the peak but substantial. Production continues around 85 per cent of capacity.

Toronto, Ont. — Sheets sales continue heavy with no lull for the holiday season. Current bookings are for delivery around the middle of next year, with no supplies available for spot shipment. Heavy buying is reported from electric equipment makers, most of these firms now working on war orders. The automotive industry is continually in the market and has large contracts covering needs well into the coming year.

Plates

Plate Prices, Page 68

Pittsburgh—Plate mills continue to turn down business which cannot conform to the delivery situation as it now stands. On heavy plate orders placed now, it is impossible to get delivery before April and in some cases, later than that. Light plate shipments are well into February. Backlogs continue to rise.

Cleveland — Deliveries on wide plates are 20 to 24 weeks ahead and the situation is probably the most congested of the entire steel list. One plate producer cannot furnish his shipbuilding subsidiary satisfactorily. A semi-obsolete plate mill, with small capacity, is being started up by an Ohio producer. Some orders placed now will not be delivered

until third quarter and at prices then prevailing.

Chicago—Near-capacity activity in the heavy construction industries is responsible for strength in steel plate demand. Orders and inquiries are both good, with orders running about even with production. As a result, minimum deliveries are lengthening and maximum shortening somewhat. Sheared plates are now available in five to six weeks, against four to eight recently. Wider plates have advanced from second quarter to third quarter delivery.

Boston—The lag in plate deliveries is expected to become intensified during first quarter with specifications for navy ships, already heavy, likely to be increased. In addition, more ship contracts have been placed with New England yards, some smaller builders taking submarine chaser awards, while 30 freighters for the British will be built by a Portland, Me., yard. Facilities for the latter are under way. Meanwhile miscellaneous demand is substantial and on the latter type of business deliveries are the most complicated, as few such consumers have covered materially ahead.

New York — While demand for plates is widely diversified, ship requirements loom heaviest at this time. This is due primarily to the likely release shortly of initial specifications for the 200 navy ships placed last September. However, there are also mounting requirements against ships previously let, both naval and merchant types. Still heavier needs are indicated as time goes on, with the British requirements for 60 merchant ships to be built in this country, the navy having recently placed contracts for more than a half billion dollars of construction and the United States merchant marine taking bids early in January on three inquiries for merchant ships.

Philadelphia—Mills are unable to accept all available plate business, including heavy export inquiries from South America. Average deliveries are little changed but are more extended in the case of some producers. Ten to 12 weeks are asked by some mills on wide plates. A large plate tonnage is expected to be involved in the Pennsylvania railroad's carbuilding program, expected to be announced soon.

Birmingham, Ala.—Plate production is moving ahead at top speed with large tonnages yet to be worked off and with steadily accumulating business to be carried over into the new year.

Toronto, Ont. — Demand for steel plates is sustained with all current orders going to the United States. Dufferin Shipbuilding Co., Toronto, which has just received a contract for building six mine sweepers for

the Canadian government, soon will be in the market for upwards of 1000 tons of ship plates. Boiler makers, working on war orders, are ordering larger quantities for early 1941 delivery.

Plate Contracts Placed

100 tons, 300,000 gallon elevated steel water tank, Camp Upton, Yaphank, N. Y., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plate Contracts Pending

177 tons, masonry plates, anchor bolts and accessories, Panama, schedule 4640, also includes pipe handrailing, bids Jan. 2, Washington.

Bars

Bar Prices, Page 68

Pittsburgh—The month's end sees a continuation of active bar business, which indicates December will be the heaviest month of the year, in spite of the holiday season and the normal letdown at the end of the year. Inventory periods will be relatively unimportant this year and will result in little interruption to production and shipments.

Cleveland — Holidays have not slowed demand appreciably. Monday of last week saw among the largest sales in a barmaker's history. Deliveries always slip farther behind and stabilization is not yet in sight.

Chicago—Situation for steel bars remains unchanged, decreased orders on account of the holiday being offset by the day's loss in production. In spite of this, orders are running well ahead of rollings, and deliveries are extending. Chief demand is for alloy grades.

Boston—Alloy bar demand continues heavy, direct buyers and secondary distributors specifying in good volume to meet increasing consumption and inventory replacement. While alloy specifications lead, orders for other finishes are stronger with deliveries lengthening. Consumers in more instances are placing protective orders for second quarter at open prices.

New York—The holiday and inventory season is having relatively little influence on bar demand, for, with deliveries on carbon bars well extended into March and later, there is considerable pressure not only to cover needs likely to develop by that time but to lay in stocks before an increase in prices is possibly announced for second quarter.

Toronto, Ont. — Consumers show keen interest in the bar market and orders are increasing rapidly. Building needs are taking large tonnages and orders now closed call for delivery as far ahead as next June. Tool and machinery builders are buying steadily, and difficulty is reported

in obtaining sufficient alloy steel to meet demands from this source.

Birmingham, Ala.—Bar buying is holding up exceptionally well. Merchant bars are comfortably booked and there is a steady and widely scattered demand for concrete reinforcing. Bars are being turned out at better than 85 per cent, according to unofficial estimates.

Philadelphia — Bar mill capacity is well absorbed for the next two months, with deliveries on some alloy material extended beyond first quarter. Orders were off moderately last week but this is believed temporary as most buyers are pressing for shipment of current needs and stock additions.

Buffalo — Mills are practically sold out for first quarter in all bar items and are endeavoring to keep regular consuming sources supplied. With more consumers inquiring, current buying is seen as an indication of a quickening of production for defense.

Seattle—Bethlehem Steel Co., Seattle, has the contract for about 3000 tons of mild steel bars and straps for wooden frame baulks or anti-submarine net floats for the navy. General contracts are held by the National Steel Construction Co. and Lake Washington Shipyards, Seattle.

Pipe

Pipe Prices, Page 69

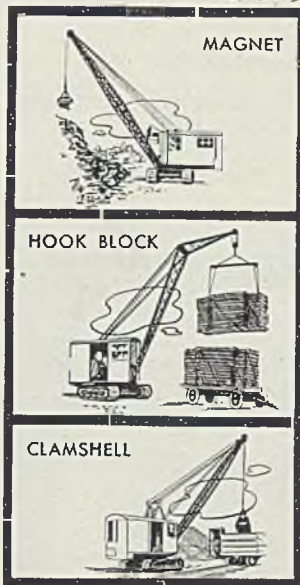
Pittsburgh—Standard pipe bookings continue heavy and shipments to consigned stocks are being made at capacity rate. It is now apparent that revival in oil country business after the first of the year will be normal and not as slow as had been expected. Railroad buying of pressure tubing is fairly good; mechanical tubing production is at peak. Releases from aircraft and automotive production lines are active.

Cleveland—Merchant pipe, seamless tubing, mechanical tubing continue in extremely brisk demand. Line pipe is slow and casings fair. Orders on books generally assure full operations for several months.

Boston—Prospects for first quarter tonnage on merchant steel pipe are encouraging despite a better than normal volume last quarter. Heating contracts for housing, shipbuilding needs and miscellaneous industrial expansions, the latter generally indirectly affected by the defense program, involve fair pipe tonnage. While mill prices are firmer, resale quotations are still mixed at some points, although stronger as a whole.

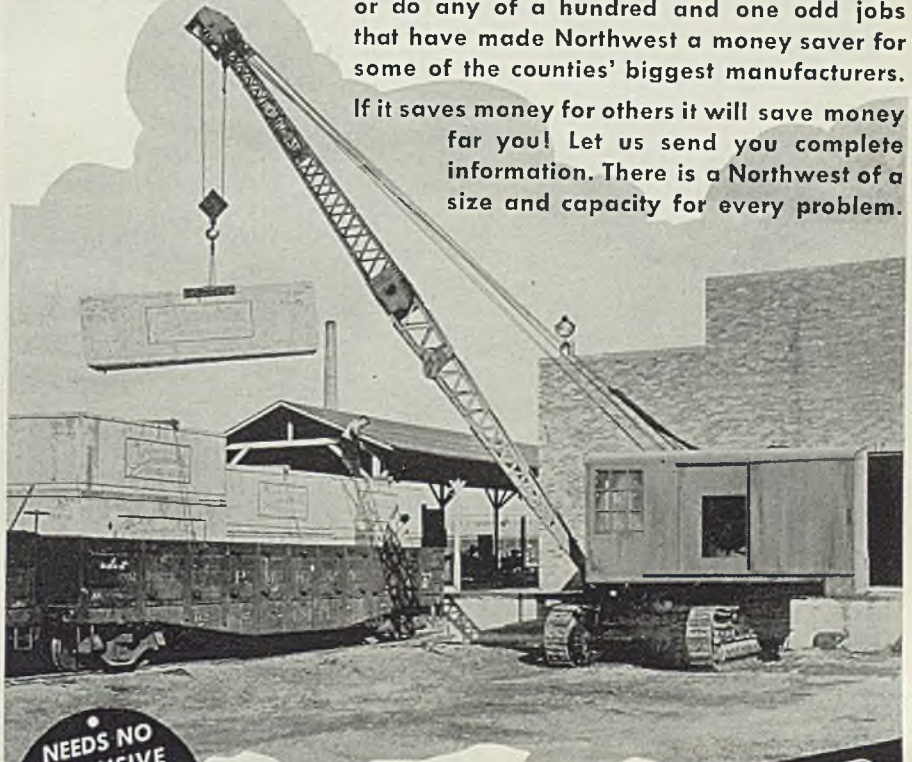
New York—Merchant pipe is moving much better than normally at this season of the year. Construc-

LOOK at THIS JOB!



No other type of machine could handle this problem so smoothly. A locomotive crane would need an extra track or have to work more slowly and more awkwardly from the end of the car. Expensive overhead equipment does not have the versatility or reach. Here the Northwest Crawler can travel backward and forward with the load. Spotting time is reduced. There is no switching necessary and when loading is completed the Northwest moves off to any other part of the yard to handle coal, scrap, bulk materials, set steel or do any of a hundred and one odd jobs that have made Northwest a money saver for some of the country's biggest manufacturers.

If it saves money for others it will save money far you! Let us send you complete information. There is a Northwest of a size and capacity for every problem.



NEEDS NO
EXPENSIVE
TRACKS OR
OVERHEAD
EQUIPMENT

NORTHWEST

THE CRANE THAT GOES ANYPLACE

NORTHWEST
ENGINEERING COMPANY
1805 Steger Bldg., 28 E. Jackson Blvd., Chicago, Ill.

Built in a
range of 18
sizes—4½ to
40 tons capacity

tion requirements, while down, are nevertheless well above the average for late December, and requirements for mechanical and boiler tubing are expanding. Most leading sellers are confining sales to their regular customers.

Seattle—The outlook for first quarter is promising, with cantonment and housing projects requiring important tonnages. Spokane has called bids Jan. 9 for about 925 tons of 4 to 12 in. cast iron bell and spigot water pipe.

Cast Pipe Placed

450 tons, various sizes, Panama, sched-

ule 4596, class 2, to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

925 tons, 4 to 12 in. bell and spigot; bids to C. T. Bogert, purchasing agent, Spokane, Wash., Jan. 9.

100 tons, 6-inch, cement-lined, Panama, schedule 4658, bids Jan. 3, Washington.

Wire

Wire Prices, Page 69

Pittsburgh—Shipments last week managed to gain slightly over incoming orders in spite of the holiday period. Tightness continues in

wire rods with local wire drawing companies unable to obtain enough alloy rods to supply their orders.

Cleveland—Wire rod makers explain shortages as due to expansion of own demands and those of outside customers at the same time. Tendency is to keep plenty of rods for own use. Buying in the holiday week was unusually brisk.

Chicago—Sales and inquiries for wire and wire products are steady, except for the slight dip because of the Christmas holiday. Demand is widespread, with a substantial portion of the output going into national defense production.

Boston—Wire mills enter the new year with large backlogs, being sold practically through first quarter on some products and taking some tonnage for second quarter shipment at open prices. While there is some lull in new buying over the holidays, this is considered to be temporary.

Rails, Cars

Track Material Prices, Page 69

Activity by railroads in placing cars and locomotives continues, although in moderate volume. Car awards in 1940 exceeded those in any entire year since 1929. Indications are the year's total will reach at least 67,000 units.

Foreign buying continues to appear, the Russian government buying 100 cars and the Sao Paula-Parana railroad in Brazil a freight locomotive.

Car Orders Placed

Atlanta & West Point-Western Railway of Alabama, two baggage-express cars, to American Car & Foundry Co., New York.

Carnegie-Illinois Steel Corp., eight flat cars to Pressed Steel Car Co., Pittsburgh, and one flat car to Greenville Steel Car Co., Greenville, Pa.

Duluth, Missabi & Iron Range, 100 fifty-ton gondolas, to American Car & Foundry Co., New York.

Elgin, Joliet & Eastern, 1250 freight cars, with 350 gondolas to General American Transportation Corp., Chicago, 150 gondolas and 200 box cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill. 300 box cars to American Car & Foundry Co., New York, and 250 hopper cars to Ralston Steel Car Co., Columbus, O.

Russian government, 100 air-dump cars to Pressed Steel Car Co., Pittsburgh.

Union Pacific, 2000 fifty-ton box cars and 300 automobile cars, to own shops.

Utah Copper Co., 100 hundred-ton ore cars and 15 air-dump cars, Pressed Steel Car Co., Pittsburgh.

Wabash, five 70-ton steel covered hopper cars, to American Car & Foundry Co., New York.

Locomotives Placed

American Steel & Wire Co., one 660 horsepower diesel-electric switch engine, to

Here's a Tax You Can Cut —the floor hazard tax

Unsafe floors are a source of occupational deaths and injuries for which American industry yearly pays staggering sums. There are claims paid, medical expense, the cost of insurance overhead, and the loss of investment in the time of skilled and specially trained workers.

These expenses are a tax against profits, but fortunately this tax can be materially reduced by making hazardous floors, platforms, runways and stair treads safer with Inland 4-Way Floor Plate.

Whether wet or dry, Inland 4-Way Floor Plate gives full traction in all directions to feet and wheels. It drains readily and it is easily cleaned. Also, it is structurally strong, long wearing and fireproof. Write for the Inland 4-Way Floor Plate Catalog. It will show how you can reduce the floor hazard tax.

INLAND STEEL CO.

38 S. Dearborn Street, Chicago

Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati

SHEETS • STRIP • TIN PLATE • BARS
PLATES • FLOOR PLATES • STRUCTURALS
PILING • RAILS • TRACK ACCESSORIES
REINFORCING BARS

INLAND 4-WAY FLOOR PLATE



Baldwin Locomotive Works, Eddystone, Pa.
 Canadlan Car & Munitions, Ltd., two 600-horsepower diesel-electric switch engines, to General Electric Co., Schenectady, N. Y.
 Central of Georgia, one 1000-horsepower and two 600-horsepower diesel-electric switch engines, to Electro-Motive Corp., La Grange, Ill.
 Inland Steel Co., one 600-horsepower diesel-electric switch engine, to Electro-Motive Corp., La Grange, Ill.
 Patapsco & Black Rivers, two 1000-horsepower diesel-electric switch engines, to Baldwin Locomotive Works, Eddystone, Pa.
 Philadelphia, Bethlehem & New England, two 600-horsepower diesel-electric switch engines, to Electro-Motive Corp., La Grange, Ill.
 Sao Paulo-Parana Railroad of Brazil, one 2-8-2 type freight locomotive, to Baldwin Locomotive Works, Eddystone, Pa.
 Union Pacific, ten 1000-horsepower diesel-electric switch engines, to Electro-Motive Corp., La Grange, Ill.

Car Orders Pending

Union Pacific, 300 flat cars and 50 mill gondola cars, bids asked.

Buses Booked

Twin Coach Co., Troy, O.: Thirteen 35-passenger for Trenton Transit Co., Trenton, N. J.; ten 27-passenger for Wichita Transportation Co., Wichita, Kans.; eight 42-passenger for Youngstown Municipal Railway Co., Youngstown, O.; two 43-passenger and four 33-passenger for Inter-City Coach Co., Massillon, O.; ten 31-passenger for Motor Transit Co., Jacksonville, Fla.; four 31-passenger for Kahului Railroad Co., Maul, T. H.; four 33-passenger for Valley Motor Transit Co., East Liverpool, O.; two 27-passenger for Peoples Transport Corp., Muskegon, Mich.; two 31-passenger for El Paso Electric Co., El Paso, Tex.

Shapes

Structural Shape Prices, Page 68

Pittsburgh—Inquiries are almost entirely from the defense program and are coming in at a rate about equal to shipments. Mills report backlogs have not begun to recede, particularly in heavier sections, although lighter shapes are being delivered on schedule.

Cleveland—An Ohio fabricator has booked 7000 tons or more for two projects in New York city, show-

Shape Awards Compared

	Tons
Week ended Dec. 28	44,039
Week ended Dec. 21	34,296
Week ended Dec. 14	32,761
This week, 1939	14,777
Weekly average, year, 1940	28,414
Weekly average, 1939	22,411
Weekly average, Nov.	23,153
Total to date, 1939	1,165,386
Total to date, 1940	1,477,538

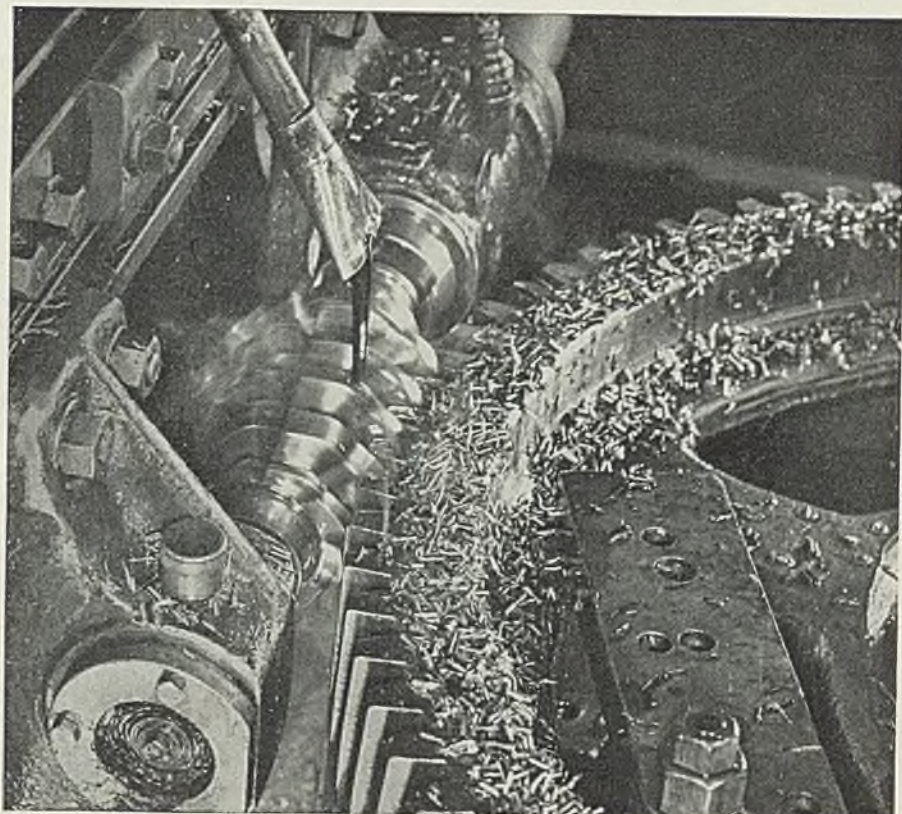
Includes awards of 100 tons or more.

ing the trend for selling into distant territories. Others report selling into Chicago, with Chicago in turn selling into the East. Inquiries are somewhat lighter. Fabricators are handicapped by inability to get plain material, though fabricating capacity seems sufficient. Ohio state highway work is taking several small lots. Much steel will go into airplane motor testing laboratories at the Cleveland airport. Deliveries are three to four months. One fabricator who was eight months behind has been catching up by working night shifts.

Boston—Volume of pending esti-

mated structural steel is heavy. Bridges account for close to 20,000 tons; shipyards, 25,000 tons, and miscellaneous shop additions several thousand tons additional. It is becoming evident industrial expansions in connection with defense contracts will be heavier and more numerous during first quarter than expected. At least six hangars for erection in New England have been bid.

New York—With some slackening in demand structural fabricators have heavy backlogs and are operating at high rate. Considerable work in hands of engineers



When we **CUT** *we* **CUT...**

... accurately to an unexcelled precision. Modern engineering, skilled craftsmen and the most up-to-date gear cutting machines combine with fine materials to make Horsburgh & Scott gears the finest made. From an ounce to 20,000 pounds... here's one source for all gears and gear products with precision plus features.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

for early bidding promises resumption of activity soon.

Structural steel orders booked in November were below the average for the year but material fabricated and shipped was far above the average. Bookings in November were 129,257 net tons, compared with 235,146 tons in October and 99,316 tons in November, 1939. Shipments were 136,827 tons in November, 144,123 tons in October and 128,231 tons in November, 1939. Tonnage available for future fabrication totals 638,155 tons.

Philadelphia — Structural shapes are relatively quiet as concerns new business but fairly large tonnages

are in prospect for miscellaneous industrial work, large part of which is identified indirectly with defense. Largest recent award is 2500 tons for duPont chemical plant at Morgantown, W. Va.

Shape Contracts Placed

12,000 tons, plant building, Consolidated Aircraft Co., Los Angeles, to Fort Pitt Bridge Works, Pittsburgh.

7000 tons, elevated highway and bridge, New York, to Mt. Vernon Bridge Co., Mt. Vernon, O.

4000 tons, shipyard extensions, New York Shipbuilding Co., Camden, N. J., to Lehigh Structural Steel Co., Allentown, Pa., through Merritt-Chapman & Scott, New York.

2829 tons, includes 1829 tons, open-hearth building and 1000 tons, furnace bindings, Wisconsin Steel Works, International Harvester Co., Chicago, to American Bridge Co., Pittsburgh.

2600 tons, assembly shop, Hunters Point, Calif., for navy, to American Bridge Co., Pittsburgh.

2500 tons, chemical plant, Morgantown, W. Va., for du Pont, to R. C. Mahon Co., Detroit.

2500 tons, airplane repair shop, Hill Field, Ogden, Utah, for war department, to American Bridge Co., Pittsburgh.

2500 tons, shop, gun director units, General Electric Co., Pittsfield, Mass., to American Bridge Co., Pittsburgh, through Stone & Webster Engineering Corp., Boston.

980 tons, shell loading plant, war department, Ogden, Utah, to Omaha Steel Works, Omaha, Neb.

930 tons, public schools, Nos. 156 and 147, Laurelton and St. Albans, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa., through Depot Construction Co., New York.

850 tons, Atlantic avenue improvement, contract 6, Brooklyn, N. Y., for Long Island railroad, to American Bridge Co., Pittsburgh.

700 tons, plant for machine guns and other armaments, Houde Engineering Corp., Cheetowaga, N. Y., to the R. S. McMannus Steel Construction Co. Inc., Buffalo.

500 tons, railroad crossing elimination, Mt. Kisco-Katonah, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through Andrew Gallow Inc., Bronx, N. Y.

500 tons, public school No. 40, Jamaica, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., through Caristo Construction Co., New York.

400 tons, bridge, Dauphin county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, extensions to steel and bearing works; for Timken Roller Bearing Co., Canton, O., to American Bridge Co., Pittsburgh.

375 tons, hangar, Hillsgrove, R. I., to Phoenix Bridge Co., Phoenixville, Pa.

350 tons, addition tank and plate shop, Allis-Chalmers Mfg. Co., West Allis, Wis., to Worden-Allen Co., Chicago.

321 tons, buildings, R. R. Donnelley & Sons, Crawfordsville, Ind., J. L. Simmons, Indianapolis, contractor, to Central States Bridge & Structural Co., Indianapolis.

270 tons, aircorps hangar, Fort Dix, N. J., to Morris Wheeler & Co., Philadelphia.

250 tons, landplane hangar and shops, Baltimore, for city, to American Bridge Co., Pittsburgh.

250 tons, addition 90-A, Union Carbide Co., Niagara Falls, N. Y., to the Lackawanna Steel Construction Co., Lackawanna, N. Y.

221 tons, piling, Hawaiian Dredging Co., to Bethlehem Steel Co., Bethlehem, Pa.

220 tons, hangar and repair shop, municipal airport, Baltimore, to American Bridge Co., Pittsburgh, through Lacchi Construction Co., Baltimore.

215 tons, plant extension, Lebanon Steel Co., Lebanon, Pa., to A. B. Rote Co., Lancaster, Pa.

205 tons, Big Sioux river bridge, Union county, S. D., to Des Moines Steel Co., Des Moines, Iowa.

200 tons, addition, Ingersoll Steel & Disc division, Borg-Warner Corp., Pullman, Ill., Enjay Construction Co., Chicago, to United Iron & Wire Co., Chicago.

165 tons, factory building, Clearing Machine Corp., Chicago, to Gage Structural Steel Co., Chicago.

150 tons, Seattle naval reserve armory

Direct Subway Entrance to all Points of Interest

New York's Popular

HOTEL

LINCOLN

44th to 45th Sts. at 8th Ave.

OUR CHOICEST ROOMS from \$3

1400 ROOMS each with
Bath, Servidor, and Radio.
★ Four fine restaurants
awarded Grand Prix 1940
Culinary Art Exhibition.

MARIA KRAMER
PRESIDENT

John L. Horgan
Gen. Mgr.

HOTEL EDISON
SAME OWNERSHIP



IN THE CENTER OF MID-TOWN NEW YORK

and other projects, to Standard Steel Fabricating Co., Seattle.

150 tons, extension to steel storage warehouse, Pugeh Sound navy yard, to Isaacson Iron Works, Seattle.

140 tons, state bridge, Medford, Wis., to Wausau Iron Works, Wausau, Wis.

138 tons, state bridge, Wyocena, Wis., to Clinton Bridge Works, Clinton, Iowa.

125 tons, storage building, Corning Glass Co., Wellsboro, Pa., to the Bethlehem Steel Co., Buffalo.

100 tons, three steel observation towers, Fort Dix, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, prefabricated truss span, Alaska Road Commission, to Des Moines Structural Steel Co., Des Moines, Iowa.

Shape Contracts Pending

13,500 tons, bridge, Thames river, New London-Groton, Conn.; Harris Structural Steel Co., New York, low on one alternate; American Bridge Co., low on second.

5700 tons, 70 standard ammunition magazines, La Porte, Ind., for government.

4500 tons, assembly shop, Louisville, Ky., for navy.

4500 tons, three warehouses, general depot, Columbus, O., for war department.

1700 tons, two warehouses, Jeffersonville, Ind., for war department.

1500 tons, welding slabs, Philadelphia, for navy.

800 tons, factory building, for Fedders Mfg. Co., Buffalo, N. Y.

700 tons, extension to South Meadow station, for Hartford Electric Light Co., Hartford, Conn.

650 tons, airplane hangar, Cleveland, for government.

625 tons, building, for Hamabe Realty Co., Maspeth, N. Y.

600 tons, administration building, for Central Catholic high school, Allentown, Pa.

550 tons, CC-2 plant, project 6659, Niagara Falls, N. Y., for government.

525 tons, bridge over Hudson river, Mechanicville, N. Y., for Rensselaer and Saratoga counties, New York.

510 tons, clothing impregnation plant, Edgewood, Md., for government.

475 tons, shipway crane runways, for Sun Shipbuilding Co., Chester, Pa.

450 tons, plant addition, R. & H. Chemical Co. division, du Pont, Niagara Falls, N. Y.

350 tons, state highway bridge, Livingston County, New York, Bero Engineering & Construction Corp., North Tonawanda, N. Y., low.

300 tons, chemistry building, for University of Pennsylvania, Philadelphia.

260 tons, state bridge, route SA-5, section 36-F, Murphysboro, Ill.

225 tons, amusement buildings, for Carl Lertzman, Lorain, O.

215 tons, bottle storage building, for National Brewing Co., Baltimore.

200 tons, 283-foot state bridge Asotin county, Wash.; Henry Hagman, Cashmere, Wash., contractor.

190 tons, Ohio state project 334, Portage county; bids Dec. 27.

165 tons, including equipment, four traveling gate hoists, two each Watts Bar and Cherokee dams; bids Jan. 7, Tennessee Valley Authority, Knoxville; also 86 tons galvanized structural steel for switch structures, Pickwick dam, Jan. 2.

160 tons, extension to cast house, No. 3 open hearth building, for Midvale Co., Philadelphia.

155 tons, state bridge, route FA-144, sec-

tion 19-F, Cache, Ill.

150 tons, storage building, Iona Island, N. Y., for navy.

150 tons, Ohio state bridge, Trumbull county; bids Dec. 27.

145 tons, bridge over Grande Ronde river, Lewiston, Wash., for state.

140 tons, Tower road grade separation, Winnetka, Ill., for Cook county.

125 tons, plant addition, Chisholm & Rider, Niagara Falls, N. Y.

100 tons, shapes and bars, highway project, Wolcott-Morrissetown, Vt.; Lambert & George, Montpelier, Vt. low; bids Dec. 20.

Unstated, 300 steel towers for transmission line; bids to Bonneville Project, Portland, Jan. 3, also five 185-foot towers, Dec. 27.

Unstated, army air bases in Alaska; bids to quartermaster, Seattle, Dec. 25.

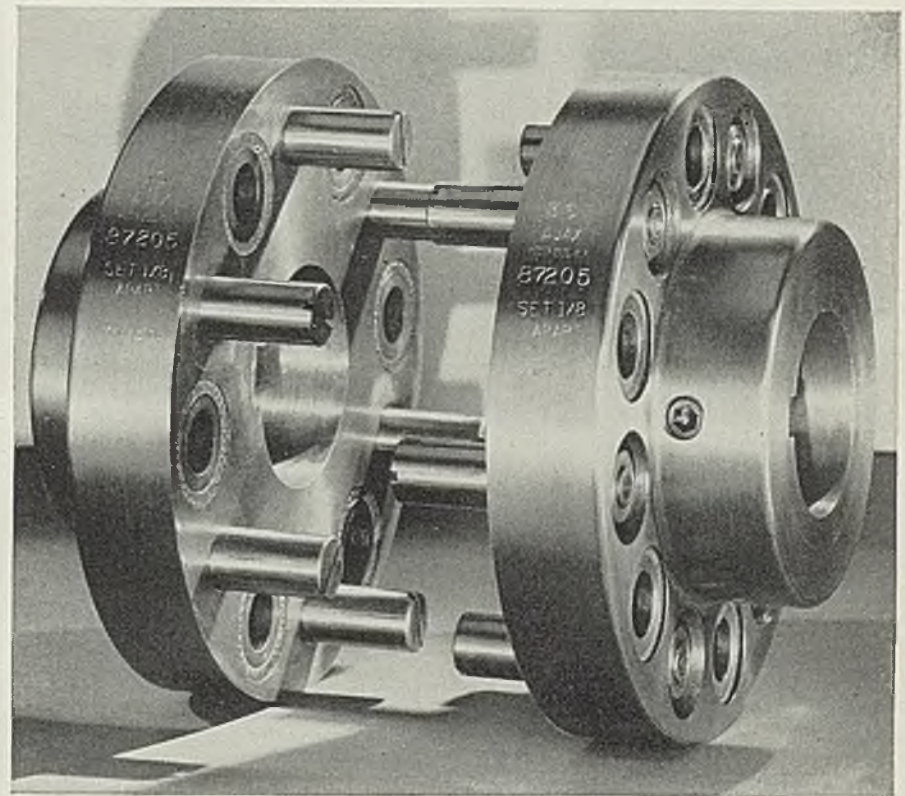
Unstated, gate frames and struts for Minidoka power plant, Idaho; bids to Denver Jan. 2.

Unstated, state bridge John Day river, Oregon; Averill & Corbin, Portland, low.

Tin Plate

Tin Plate Prices, Page 68

Pittsburgh — Tin plate market is quiet and production is unchanged. Holiday shutdowns cut last week's tonnage and shipments were slightly heavier than production. The rate remains steady at 48 per cent of capacity on a daily basis, while the week's output approximated 35



Why the Principle of AJAX FLEXIBLE COUPLINGS provides

the Right Hook-up for Power



The distinguishing feature of Ajax couplings is the simple manner in which rubber bushed bronze bearings provide maximum rigidity with maximum flexibility. Result—resilient flexible protection against unavoidable misalignment . . . positive drive . . . no noise . . . no backlash . . . no lubrication . . . free end float, dielectric insulation . . . long trouble-free performance. Write for new Data Book.

AJAX FLEXIBLE COUPLING CO.
 MAKERS OF FLEXIBLE COUPLINGS SINCE 1920
 4 English Street Westfield, New York
 Sales Offices in All Principal Cities . . . See Your Telephone Book

Behind the Scenes with STEEL

\$ \$ \$ \$ \$

■ This is the week the bills start drifting in to remind us of the swell time we had last week.

Louie Loses

■ We thought the recent November 6 fiasco had just about killed all interest in elections everywhere but not so in Weirton, W. Va. All the boys and gals who work for Weirton Steel turned out 97 per cent strong to elect their employe representatives and election day was Friday the 13th to boot. There was much electioneering and one sign we noticed read: *For 48 Cold Mill Representative—Vote for Tack Plate Louie, Check No. 3675.* Tack Plate Louie and Mr. Willkie now have something in common, though, because Frank "Pop" Reed got the job on a why-change-horses platform.

Definition

■ "The Greeks had a word for it," says T. Harry Thompson, "and the word is 'Scram'."

Wood And Steel

■ From the patent office we learn that wood is one of the best partners steel ever had. Take the lowly railroad tie. Well over 2500 ambitious inventors, who would undo the "tie that binds" with more "modern counterparts" have applied for patents. But, say the experts, cheapness, elasticity, resistance to shock, and ease of replacement keep the steel rail married to its creosoted mate.

More Research

■ And from the interesting laboratories of Harvard U. comes word of new tests in which "guinea-pig liars" were submitted to the ordeal of photographing their corneas. This was to determine whether or no a "shifty gaze" was characteristic of confirmed fibbers. "People that lie," summarized the pros, "in 75 per cent of the tests had a steadier gaze than those who told the truth." Now, the next time you tell the little woman, after

a late game of poker, that you were working overtime, etc.—be sure you have that "shifty look" in your eyes, so she'll know you're telling the truth. Of course, if that doesn't work, you have recourse to "Alibi, Incorporated," that wonderful new firm that concerns itself with professional falsehoods for tired and slightly wayward business men.

On The Average, Maybe

■ We notice in *Sales Management* that every salesman is responsible directly or indirectly for the livelihood of 300 people—including himself, of course.

There Are Sardines!

■ "Are you going to let big American Can log-roll us credulous sardine-lovers into the belief that a sardine is just a figment?" shouts F. B. Head of General Cable. "Not so," he says, "and whoever heard of a figment sandwich, anyway!" We must admit we've been taken for a sucker (get it?) because *Webster's* has this to say about our friend, the sardine: "1. The young of the pilchard (*Sardinia Pilchardus*) when of a size suitable for preserving for food. 2. Any of various small fishes resembling the true sardine or similarly preserved for food." So, we really must add our shame to that of Reader Head on that soulless corporation for not telling the whole story.

A B C Stuff

■ "To secure energy from matter," says *Invention* (a British magazine), "is a fairly simple process. A slow neutron knocks a uranium nucleus and the faster neutrons disintegrate other uranium nuclei, which are self-accelerating." Oh yes, very simple indeed.

Mr. Hitler, Please Note

■ To those itching for a war, a timely German proverb: "A great war leaves the country with three armies—an army of cripples, an army of mourners, and an army of thieves."

SHRDLU.

per cent of capacity. The hot mill rate is running considerably below cold mills.

Reinforcing

Reinforcing Bar Prices, Page 69

Pittsburgh—There is definite indication that tonnage for housing will be considerably heavier after the first of the year. Sellers here believe the first phase of the defense program has passed, the construction work on new buildings for the program. Although construction is still to be done on most of these jobs, the actual bar buying is completed. Numerous new tonnages, most of them fairly large, are coming directly from the defense program, however. New highway bridge work is active, notably in the eastern sections of the country.

Cleveland—Inquiries are lighter, though much work is on drawing boards. Most numerous are lots for Ohio state highways. In some cases bids have been readvertised, consumers not being reconciled to higher prices prevailing.

Chicago—Considerable easing in orders for reinforcing bars and other material has been noted here, although numerous projects are up for figuring, notably jobs in connection with national defense construction. The mill situation is not as tight as for some other products. Local business is mostly for small lots, involving less than 100 tons each.

Boston—Housing and bridges account for most reinforcing steel estimates. Buying is generally in small lots with some additional tonnage placed for training camp sites. In Maine several armories are up for bids, taking a fair tonnage. Industrial and miscellaneous buildings also contribute to fairly well sustained total volume.

Seattle—Small tonnages are numerous and are adding to backlogs of rolling mills, now operating at capacity. Prospects indicate continued activity in first quarter. Considerable business is pending, includ-

Concrete Bars Compared

	Tons
Week ended Dec. 28	1,174
Week ended Dec. 21	13,096
Week ended Dec. 14	5,261
This week, 1939	4,780
Weekly average, year, 1940	9,661
Weekly average, 1939	9,197
Weekly average, Nov.	11,748
Total to date, 1939	478,227
Total to date, 1940	502,356

Includes awards of 100 tons or more.

ing about 1000 tons for a 1400-foot pier at the navy yard and probably 500 tons for other projects at the same yard.

Philadelphia—Difficulty in obtaining early delivery is a factor in holding the 2.15 cents base steady in most instances. Mill backlogs are substantial but orders and inquiries are somewhat lighter.

Reinforcing Steel Awards

350 tons, dormitories, A. & M. college, College Station, Tex., to Mosher Steel Co., Dallas, Tex., through W. S. Belows Construction Co. Houston, Tex.

250 tons, administration building, torpedo station, Newport, R. I., to Concrete Steel Co., New York, through O. D. Purrington Co., Providence, R. I.

250 tons, plant, Danly Machine Specialties Inc., Cicero, Ill., Kalsner-Ducett Co., Chicago, contractor, to Ceco Steel Products Corp., Chicago.

124 tons, Lake Forest hospital, Lake Forest, Ill., Nielsen-Thorvald Co., Chicago, contractor, to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, Panama, schedule 4593, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, flood wall, project W 559-Eng-5288, United States engineers, Muncie, Ind., to Truscon Steel Co., Youngstown, O., Hart & Hart, Columbus, Ind., contractor.

Reinforcing Steel Pending

1250 tons, foundations, bridge, Thames river, New London-Groton, Conn.; A. I. Savin Construction Co., Hartford, Conn., low.

750 tons, U. S. army warehouses, Columbus, O.; bids Dec. 27.

375 tons, state spans, King county, Washington; A. W. Stevens Construction Co., Mt. Vernon, Wash., contractor.

270 tons, highways, Muskingum county, Ohio; bids Dec. 27.

200 tons, housing project, Cairo, Ill., Henke Construction Co., Chicago, low.

190 tons, highway, Natchez Trace parkway, Choctaw county, Mississippi; bids Jan. 9, Federal Works Agency, Florence, Ala.

153 tons, various buildings, Camp Grant, war department, Rockford, Ill.

138 tons, project 336, Trumbull county, Ohio; readvertised third time; bids Dec. 27.

125 tons, Blue Ridge parkway, Nelson-Rockbridge counties, Virginia; bids Jan. 9, district engineer, public works administration, Washington.

Pig Iron

Pig Iron Prices, Page 70

Pittsburgh—Although no formal announcement has been made, consumers generally expect the \$1 increase to be effective on all pig iron in this territory. As yet there has been virtually no buying for first quarter. Consumers are fairly well covered at the moment, and producers indicate they have no desire to sell iron unless forced to do so.

Cleveland—Apparently most sales are at the higher price, or on the level of \$24 for key descriptions. Rarely sales are reported at old levels, but these are not regarded as

representative. December shipments will be fully equal to November, perhaps better. Some find sales increasing; others expect no concerted buying until late January. Usual year-end let-up in business is absent this year. There is still enough iron where it is distributed equitably. Announcements of several new furnaces to be built eases tension somewhat.

Chicago—Developments tend to indicate that shortly the \$24 price for iron will be fully established. It is doubtful if any \$23 iron can be obtained now, several sellers being out of the market and accept-

ing no contracts. In numerous instances, furnaces have not decided on price policy. Slowness in taking action is believed due to the fact that most buyers were well covered before the advance and furnaces have little iron to dispose of currently. Coke remains tight, and deliveries running behind.

New York—Most pig iron sellers in the east have still to take definite action with respect to first quarter prices, and others have relatively little tonnage for delivery in that period. Fortunately for consumers, however, most are fairly well protected, either by virtue of

An idea that bore fruit

The history of this organization is a success story.

It is built upon the idea that, in this competitive age at least, a good product alone can seldom constitute the sole foundation of a successful enterprise.

While we bid for your custom primarily because of our recognized ability to produce high quality lead and zinc, we also endeavor to conduct our business in a manner that will foster a spirit of lasting friendship between ourselves and our customers.

ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK, N. Y.



THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

stocks on hand or on order. This is especially true of larger consumers. Meanwhile, deliveries are heavy, with some sellers predicting that the movement this month will be the heaviest of the entire year, notwithstanding influences of the holiday and inventory season.

Philadelphia—Pig iron prices are still somewhat mixed with base quotations at some eastern points unchanged but little or no tonnage being offered. Where iron is available an increase of \$1 over the previous market is being asked and some moderate tonnages are being booked. Both Swedeland and Birdsboro bases reflect this increase. Southern iron is being sold here for first quarter at unchanged prices.

Pig iron stocks of gray iron foundries in the local federal reserve district increased 17.5 per cent during November, according to reports to the industrial research department, University of Pennsylvania. Increase over a year ago was 13.8 per cent. Scrap stocks last month were 23.4 per cent smaller than a year ago, while coke supplies showed moderate gains over the preceding month and year. Production of gray iron castings was off 7.9 per cent in November, caused by the shorter month, but was 10.8 per cent ahead of the 1939 month.

Cincinnati—Pig iron shipments this month established a new peak for the year, melters desiring larger inventories and also intent on getting out tonnage on contract. Some furnaces are virtually out of the market but so far show intent to supply established customers on actual needs.

St. Louis—Shipments of pig iron during December, according to preliminary reports, will exceed those of any month this year, and represent the highest December total of record. All classes of melters appear desirous of getting in all quotas due on 1940 contracts as insurance against possible delays from any cause during the next few months. The melt has exhibited no signs of slowing down, and present backlogs and prospective orders of both mills and foundries indicate that the pace may be even more rapid subsequent to the holidays.

Birmingham, Ala.—Seventeen district blast furnaces are pouring iron in an effort to keep pace with demand. Merchant melters report a consistency of business and considerable improvement in shipping instructions.

Toronto, Ont.—Merchant pig iron sales are above 5000 tons weekly, with indications pointing to increase of at least 25 per cent for the coming year. During the current year iron sales were 100 per cent over the 1939 level, and the daily melt is increasing steadily. Pro-

ducers have opened books for first quarter and contracts are fairly heavy.

Scrap

Scrap Prices, Page 72

Pittsburgh—Strong tone continues in scrap. Mill quotation on No. 1 steel remains unchanged at \$23 top. Other grades are active, and with railroad lists scheduled to close this week and next, it is probable that prices may be slightly higher than last month. Inquiries have come in from various consumers, indicating active buying will be done shortly on railroad specialties, and the chief buyer of railroad steel in this territory is known to be actively in the market to secure all available tonnage.

Cleveland—Railroad lists closing early in January are looked to as a factor in renewed activity. Buying has been at a minimum but is expected to become more active. Prices are strong on most grades but are unchanged.

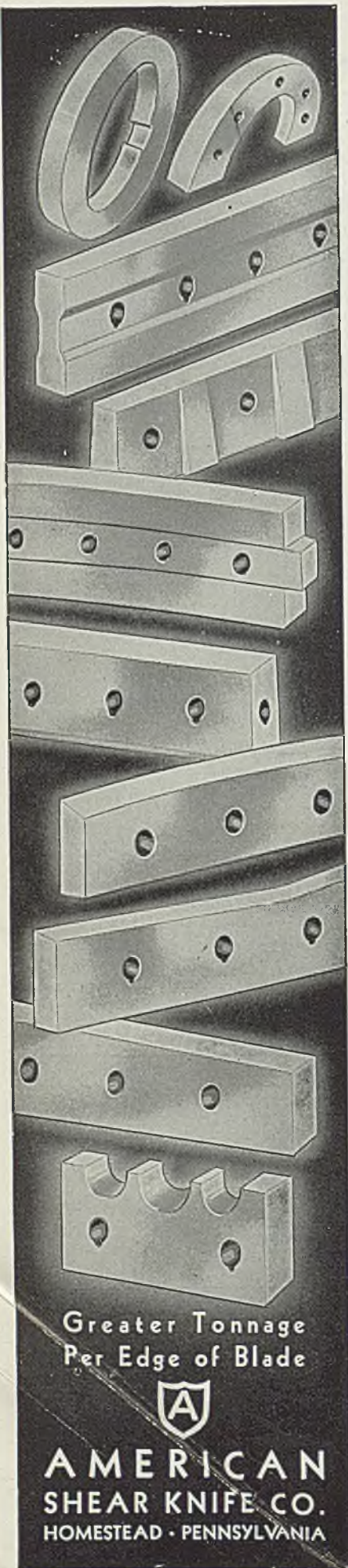
Chicago—Although trading is almost at a standstill, due partly to the holiday, price undertone is strong. No. 1 heavy melting steel still is in the \$20.50 to \$21 range, and some specialties have moved upward, as supplies are scarce. Mill buying is absent, and dealers are not interested in selling.

Philadelphia—Scrap prices generally are strong with No. 1 heavy melting steel up 50 cents. This is the first increase in this grade since the middle of September. Buying is moderately active though some consumers profess to be attempting to limit purchases in anticipation of government action with regard to prices. Blast furnace grades are also higher with continued strength in cast grades.

Buffalo—Iron and steel scrap dealing is confined to negligible sales as dealers and consumers continue to manifest considerable anxiety over ultimate developments from Washington conferences over prices. While buying is light, dealers are shipping against recent sales with substantial tonnage contracted for on the basis of the prevailing range of \$22 to \$22.50 a ton for No. 1 heavy melting steel.

Detroit—Despite a week of comparative inactivity because of the holiday, scrap prices have advanced for the third time in eight days. Much of the advance is ascribed to sentimental pressure, rather than actual purchasing. The speculative influence also has shown its effect.

Cincinnati—Curtailed activity in iron and steel scrap, solely because of the holiday, probably deferred a price increase. Most items exhibit greater strength and restraining ef-



Greater Tonnage
Per Edge of Blade

A

**AMERICAN
SHEAR KNIFE CO.**
HOMESTEAD · PENNSYLVANIA

fects of the holiday letdown and attempts at stabilization seem destined to be overcome. Material attracted by present prices is barely adequate for mill and foundry demands, some interests complaining that wanted grades are not procurable in usual quantities.

St. Louis—Steel and iron scrap is strong with advances of 25 cents to \$1 affecting virtually all grades. No. 2 heavy melting steel was marked up another 25 cents to \$18 to \$18.50. Steel specialties were all higher, and malleable and cast grades were also lifted. There has been a good volume of scattered buying by all classes of melters, and considerably more material would be taken if it were available at figures within buyers' view.

Birmingham, Ala.—Scrap continues exceptionally active. Large tonnages are moving, especially heavy melting, No. 1 cast and miscellaneous items. The market is tending definitely upward again.

Seattle—Increase in domestic consumption is maintaining activity, notwithstanding elimination of export buying. Rolling mills and foundries are purchasing in heavy volume and have absorbed remaining export stocks. Mill prices are steady at \$15 and \$14 respectively for No. 1 and No. 2 heavy melting steel.

Toronto, Ont.—Steel and iron scrap is increasingly active. Both dealers and consumers are showing more interest and endeavoring to increase supplies. Offerings to dealers improved with the clearing of roads in rural districts, but supplies still fall far short of meeting all consumers' demands. Prices are firm with indications of early advances in steel grades.

Warehouse

Warehouse Prices, Page 71

Cleveland—Retail sales are often running better than in November. Sales during the holiday week were better than expected and much larger than normal, skeleton staffs on the job having been swamped with orders. Prices are no longer a consideration.

Chicago—Normal seasonal slowing up of business and the Christmas holiday jointly served to reduce warehouse steel orders last week. Continued easiness is anticipated until after the first of the year, when inventory taking will have been completed. In spite of this, sales and inquiries are at a high level and orders are well diversified.

Boston—Heavy diversified demand for steel out of warehouse continues, most jobbers having experienced the best quarter in recent years. Prices are also firmer, shad-

ing being the exception rather than the rule on even the more traditionally weaker products.

Philadelphia—Warehouse business is affected little by the season and sales are better maintained than for several years, holding close to November volume. Galvanized sheet prices have been advanced to 4.90c for one to nine bundles, 4.75c for ten to 24 bundles and 4.65c for 25 to 49 bundles, an increase of 15 cents per 100 pounds on the smallest quantity. Other warehouse prices are expected to be continued for first quarter, although some sheet grades may be revised.

Buffalo—With yearend tapering tendencies completely erased, warehouses expect December sales to exceed the peak level of November.

Cincinnati—Year-end slackening in warehouse sales was less than usual, and a quick rebound in volume is expected. In proportion to normal demands, sales of structurals and plates has been a surprising feature. Increased activity in bars and cold-finished sheets has likewise been a big factor in recent high-tonnage levels.

St. Louis—The year is winding up with demands for steel from store as numerous as at any time since the upswing began last spring. Requirements are well diversified, but relatively the most active items are

sheets, strip, merchant bars, special steels and wire products. Movement of galvanized to the rural areas has passed its seasonal peak.

Steel in Europe

Foreign Steel Prices, Page 71

London (By Cable)—The year ends with steel and iron production in full swing in Great Britain, to meet war requirements. Distribution is strictly controlled, severely restricting normal commercial business. The situation in raw and semifinished materials is satisfactory, assisted by substantial importations from the United States and the Dominions. Tin plate production is at a high rate for domestic and export shipment, with good inquiries from South America and the British colonies. Sheet and galvanized output is practically all earmarked for home consumption.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 69

Cleveland—Producers who three weeks ago operated at 80 per cent, now are at 100 per cent. Specifications during December are considerably ahead of November. Govern-

JESSOP RAPID FINISHING STEEL

For Sustained Accuracy
ON LONG CUTS

For fast, finishing cuts requiring extreme accuracy and a smooth finish, JESSOP "Rapid Finishing" semi-high speed steel has no superior. "Rapid Finishing" is a high carbon-tungsten-chromium steel which retains a very keen, hard edge for long periods of service . . . assuring sustained accuracy on long turning and boring jobs, or on automatic machine work where thousands of parts must be finished to identical size.

JESSOP "Rapid Finishing" steel is highly recommended for boring tools for large gun barrels, precision tools, forming tools for automatic machine work, roll turning tools, and similar applications. Costs approximately 40% less than high speed steel. A Jessop engineer will gladly show you how "Rapid Finishing" steel can be used to advantage in your shop. Send for him today. JESSOP STEEL CO., 584 Green St., Washington, Pa.



1901 CELEBRATING OUR 40TH ANNIVERSARY 1941

Jessop Steels of America

CARBON-HIGH SPEED SPECIAL ALLOY
STAINLESS and COMPOSITE STEELS





ment business is just appearing and promises to increase. Producers see the same good volume at least six months ahead. Producers report the best business in ten years. Slight changes in discounts on stove bolts, cap and set screws are effective Jan. 1.

New York—Bolt and nut business continues at the most active rate since possibly early in 1937. Requirements are highly diversified and are in sufficient volume to force production along the eastern seaboard almost to capacity. Structural requirements are holding up exceptionally well considering the season, due to open weather conditions which have made it possible to go ahead with much building required for defense purposes. Shipyards and railroad equipment builders are also taking particularly sizable amounts.

Nonferrous Metals

New York—Copper and brass mill product prices advanced ¼-cent Thursday due to higher manufacturing costs. This move generally was unexpected and was not followed immediately by all fabricators, some merely withdrawing from the market. The price stabilization section of the national de-

fense advisory commission immediately summoned representatives of the industry for an informal conference to consider the entire price situation.

Copper—No move was made to revise electrolytic copper prices which held at 12.00c, Connecticut, in the producers' market, 12.50c in the custom smelters' market, and 12.25c to 12.50c in the brokers' market. Sales were restricted by limited supplies as well as seasonal factors. Actual consumption of domestic copper by fabricators declined to 91,682 tons from 102,752 in October but use of foreign copper probably lifted operations to full capacity.

Lead—Due to the well-bought position of consumers as well as the well-sold position of producers, trading was quiet last week. Availability of large supplies of foreign metal, tended to hold prices at the 5.35c, East St. Louis, level.

Zinc—Lack of zinc in the first quarter of 1941 may curtail brass production which reflects fully tightness of the market. Prime western held at 7.25c, East St. Louis.

Tin—Prices held unusually steady at 50.10c for Straits spot. Arrivals continue to flow into this country at a rate equal to about twice that of consumption. Hence, another month's supply has been added to this country's reserves.

Nonferrous Metal Prices

Dec.	Copper			Strait's Tin, New York	Lead	Lead East	Zinc	Alumi- num	Anti- mony Amer.	Nickel Cath-	
	Electro, del.	Lake, del.	Castling.								
21	12.00	12.00	12.12½	50.10	50.10	5.50	5.35	7.25	17.00	14.00	35.00
23	12.00	12.00	12.12½	50.10	50.10	5.50	5.35	7.25	17.00	14.00	35.00
24	12.00	12.00	12.12½	50.10	50.10	5.50	5.35	7.25	17.00	14.00	35.00
25	Holiday										
26	12.00	12.00	12.12½	50.10	50.05	5.50	5.35	7.25	17.00	14.00	35.00
27	12.00	12.00	12.12½	50.10	50.05	5.50	5.35	7.25	17.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets	
Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	8.75
Zinc, 100 lb. base	12.50
Tubes	
High yellow brass	22.23
Seamless copper	21.37
Rods	
High yellow brass	15.01
Copper, hot rolled	17.37
Anodes	
Copper, untrimmed	18.12
Wire	
Yellow brass (high)	19.73

OLD METALS

Nom. Dealers' Buying Prices
No. 1 Composition Red Brass

New York	8.00-8.25
Cleveland	8.62½-9.12½
Chicago	8.25-8.50
St. Louis	8.37½

Heavy Copper and Wire

New York, No. 1	9.62½-9.87½
Cleveland, No. 1	9.37½-9.87½
Chicago, No. 1	9.62½-9.87½
St. Louis	9.37½-9.50

Composition Brass Turnings

New York	7.62½-7.87½
Light Copper	
New York	7.62½-7.87½
Cleveland	7.37½-7.87½
Chicago	7.62½-7.87½
St. Louis	7.37½-7.50

Light Brass

Cleveland	4.12½-4.37½
Chicago	5.50-5.75
St. Louis	4.87½

Lead

New York	4.60-4.70
Cleveland	4.00-4.25
Chicago	4.50-5.00
St. Louis	4.00-4.25

Zinc

New York	5.25-5.50
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum

Misc. cast, Cleveland	9.25-9.50
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.25
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.25
Standard No. 12 aluminum	15.25-16.00

Activities of Steel Users, Makers

■ AUBURN Central Mfg. Corp., Connersville, Ind., will establish a new division, Aircrafts Parts division, to be devoted exclusively to manufacture of aircraft parts or subcontracting work for various large aircraft firms who are filling national defense contracts. Additional new equipment will be purchased.

Aeronautical Mfg. Corp. has moved its offices and factory to 377 Fourth street, Niagara Falls, N. Y.

Metalitor Corp., 116 Walker street, New York, will move its offices to 205-209 West Nineteenth street, Jan 1.

George R. Borrman Steel Co., steel distributor of Oakland, Calif., has purchased the business of Pacific Steel Sales Co. Ltd., Oakland.

Metaplast Corp., New York, will move from 244 Fifth avenue to new quarters at 205-209 West Nineteenth street, Jan. 1.

Kondu Corp., Erie, Pa., which has been organized by John J. Prehler and William C. Prehler, has purchased the threadless fitting business heretofore operated by the Kondu division of Erie Malleable Iron Co.

Geometric Tool Co., New Haven, Conn., has appointed Penn General Supply Co., Pittsburgh, distributor of its products in western Pennsylvania, southeastern Ohio and northwestern West Virginia.

Under a license agreement with Glenn L. Martin Co., Baltimore, Andrews & Perillo Inc., Long Island City, N. Y., will manufacture and market the Martin rivet sorter. Production will start soon.

Vulcan Rail & Construction Co., Maspeth, New York, has moved into its new office building and plant at 59-30 Fifty-fourth street, Maspeth. The company has also increased capacity at its plant at 365 Marshall street, Benwood, Wheeling, W. Va.

Hobart Bros. Co., Troy, O., has appointed A. C. Harvey Co., Allston, Mass., distributor of its line of multi-range arc welders. The Harvey company will collaborate with Leo Gordon of the New England distributing office.

Rahn-Larmon Co., specializing in manufacture of heavy duty lathes, will change its corporate name to Nebel Machine Tool Co. Plans also call for a new plant, to add 25,000 square feet of floor space. Officers

are: F. T. Nebel, president and treasurer; C. K. Nebel, vice president, and O. M. Dock, secretary.

Wm. B. Scaife & Sons Co., Oakmont, Pa., will change its name to Scaife Co., effective Jan. 1. This change was made merely to simplify the name and in no way affects the corporate structure or management of the company.

Lindberg Engineering Co., Chicago, has established a new office in the K. of P. building, Indianapolis, to serve Indiana, southern Ohio, Kentucky and Tennessee. Ralph W. Stahl, the past year and a half service engineer for the company, has been made manager of the Indianapolis office.

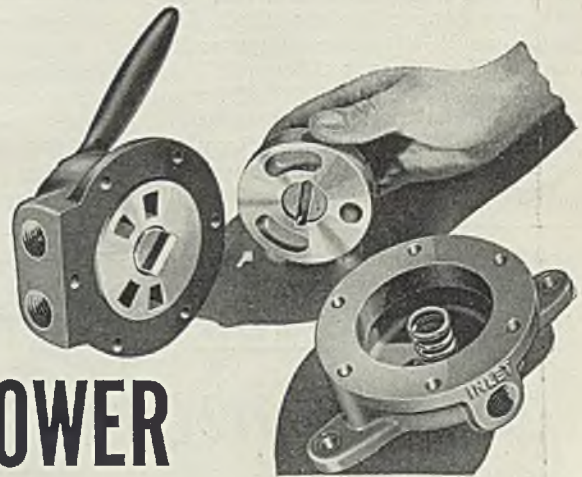
Hamilton Foundry & Machine Co., Hamilton, O., is about to celebrate its golden jubilee year, having been founded in 1891. The plant consists of four individual foundry units, four and a quarter acres under one roof, with 18 acres of yard area. Peter E. Rentschler is president.

Alabama By-Products Corp., Bir-

mingham, Ala., has contracted with the Koppers Construction Co., Pittsburgh, for constructing a battery of 25 Becker type by-product coke ovens at Tarrant, Ala. This will increase the coal consumption of the company 400 to 600 tons per day, and step up coke output 300 to 400 tons daily, or 120,000 to 150,000 tons per year. Complete facilities at the Tarrant plant will thereupon become 174 ovens, capable of carbonizing over 1,000,000 tons of coal annually, with a coke yield of 600,000 to 700,000 tons. The work will require 10 to 11 months, states J. W. Porter, president, Alabama corporation.

■ Manufacturers of ferroalloys reported considerable decrease in production in 1939, compared with 1937, according to the census of manufactures for 1939. Total production in 1939 was 783,615 gross tons, compared with 931,652 tons in 1937. Value in 1939 was \$63,738,321; in 1937 it was \$82,642,123. Of the 1939 output 525,416 tons were made in blast furnaces and 258,199 tons in electric furnaces. Classified by kinds the 1939 production included 412,612 tons of ferromanganese and spiegeleisen, 293,631 tons of ferro-silicon and 77,372 tons of other ferroalloys.

STOP WASTE OF AIR POWER



Simple disc-type design, with the bronze disc ground and lapped to make a perfect seal with the seat, does away with packing, prevents leakage and waste of air power. No packing means no packing maintenance troubles.

Hannifin air control valves give positive and accurate control for any type of air operated equipment. Made in 3-way and 4-way types, hand and foot operated, manifold, spring return, heavy duty rotary, electric and special models. Write for Valve Bulletin 34-S.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue • Chicago, Illinois

HANNIFIN "Packless" VALVES

AIR CONTROL

Safety Council Makes 234

Awards for Accident Prevention

■ AWARDS for outstanding accident prevention records in the industrial safety contest sponsored by the National Safety Council, Chicago, were presented 234 participants recently.

With 1202 organizations enrolled, the competition was divided into sectional contests based on type of industry: Chemical, metals, rubber, public utilities, marine and paper and pulp. Participants reported their employes worked an aggregate of 2,313,301,469 man-hours in the year with injuries averaging 9.51 per million man-hours.

Thirty-one participants in the metals safety contest were awarded trophies. Winners in the steel mills division were: South Chicago works of Republic Steel Corp., Cleveland, 3,322,260 man-hours with four reportable injuries; E. G. Brooke Iron Co., Birdsboro, Pa., 453,528 man-hours, no reportable injuries.

No reportable injuries for the periods indicated enabled the following to win trophies in the rolling, finishing and fabricating division: Niles, O., works of Republic Steel Corp., 1,530,394 man-hours; Bethlehem Steel Co., Coatesville, Pa., 725,391 man-hours; Laclède Steel Co., Madison, Ill., 611,560 man-hours; Republic Steel Corp.'s Dilworth Porter division, Pittsburgh, 395,504 man-hours; Steel and Tubes division, Brooklyn, N. Y., works of Republic Steel Corp., 338,279 man-hours.

Republic's Union Drawn Steel di-

vision of its Hartford, Conn., works, 243,608 man-hours; Pullman-Standard Car Mfg. Co., Hammond, Ind., 239,407 man-hours; Los Angeles works of Truscon Steel Co., Youngstown, O., a Republic subsidiary, 230,500 man-hours; General Cable Corp., Los Angeles, 175,806 man-hours; Joseph T. Ryerson & Son Inc., Buffalo, 175,213 man-hours.

Union Drawn Steel division of Republic's Hamilton, Ont., plant, 144,006 man hours; National Radiator Co., Lebanon, Pa., 77,735 man-hours; and Joseph T. Ryerson & Son Inc., Milwaukee, 75,266 man-hours.

Foundries Recognized

In the foundry division the following were awarded trophies for absence of reportable injuries for the indicated periods: Haynes Stellite Co., Kokomo, Ind., 570,173 man-hours; Perfect Circle Co., New Castle, Ind., 492,221 man-hours; National division of James B. Clow & Sons, Birmingham, Ala., 448,679 man-hours; Central works foundry of American Rolling Mill Co., Middletown, O., 170,243 man-hours; and American Rolling Mill Co.'s Sixth avenue, Ashland, Ky., foundry, 120,875 man-hours.

Trophy winners in the heavy machine shop division, with no reportable injuries for the period specified: Whiting Corp., Harvey, Ill., 1,605,995 man-hours; Shoe Hardware division of United Rubber Co., at Waterbury, Conn., 938,930 man-

hours; and Caldwell Moore plant, Link-Belt Co., Chicago, 434,575 man-hours.

Light machine shop division trophy winners, with no reportable injuries: Mine Safety Appliances Co., Pittsburgh, 1,340,388 man-hours; Boston Gear Works Inc., North Quincy, Mass., 1,122,182 man-hours; Westinghouse Electric & Mfg. Co.'s X-Ray Co., Long Island City, N. Y., 1,010,029 man-hours; Dictaphone Corp., Bridgeport, Conn., 1,002,076 man-hours.

Pressed Steel division of Truscon Steel Co., at Cleveland, 761,680 man-hours; Ilg Electric Ventilating Co., Chicago, 552,979 man-hours; Perfect Circle Co., Tipton, Ind., 227,292 man-hours; and Kester Solder Co., Chicago, 191,426 man-hours.

Certificates of merit were also awarded participants with excellent records in safety. In the steel mills division the following received certificates: Republic Steel Corp.'s Warren, O., works, second place for 10,738,064 man-hours with 17 reportable injuries; Carnegie-Illinois Steel Corp., Farrell, Pa., third place for 4,899,717 man-hours and 10 injuries.

South Chicago works of Youngstown Sheet & Tube Co., Youngstown, O., received second place rating for 1,129,708 man-hours worked with one reportable injury; and the Hamilton division of American Rolling Mill Co. at New Miami, O., third place for 849,032 man-hours worked with one reportable injury.

Rolling Mill Records

Merit certificate winners in the rolling, finishing and fabricating division: Youngstown works of Truscon Steel Co. won second place with 3,579,865 man-hours, one reportable injury; and Aluminum Co. of America's New Kensington, Pa., works, 14,330,178 man-hours with 18 injuries, won third place.

Central Foundry Co., Holt, Ala., was given third place for 1,721,486 man-hours with two reportable injuries in the foundry division.

Heavy machine shop division certificate of merit winners: Gilbert & Barker Mfg. Co., Springfield, Mass., second place for 2,226,477 man-hours with one injury; United Shoe Machinery Corp., Beverly, Mass., third place for 6,117,920 man-hours and 7 injuries; and Challenge Machinery Co., Grand Haven, Mich., 239,845 man-hours with one injury for third place.

Light machine shop division winners: Westinghouse Electric & Mfg. Co.'s Lamp division, Bloomfield, N. J., second place for 6,547,660 man-hours, one injury; and Newark, N. J., works of Westinghouse Electric & Mfg. Co., third place for 3,834,096 man-hours and two reportable injuries.

CAN YOUR PLANT HANDLE

more work?

● To keep pace with orders and production backlogs, firms today are letting contract work.

● You cannot contact all of these prospects personally, but your advertisement in the "Contract Work" section of STEEL will keep more than 60,000 men in the metal producing and metalworking industries informed of your readiness to help. Thus when they have work to let, you'll come into consideration for your share.

● Rates are moderate. Send your advertisement today to STEEL, Peason Bldg., Cleveland.

1700 Tons of Steel in 320 Miles Turnpike Fence

■ Pittsburgh Steel Co., Pittsburgh, has erected more than 320 miles of heavy gage welded-joint fence and eight miles of chain link fence along the Pennsylvania turnpike between Pittsburgh and Harrisburg, including the interchanges where traffic enters and leaves the highway. The contract included 995 tons of wire fabric and top strand wire and 705 tons of steel posts, gates and fittings. Galvanizing required 128 tons of zinc.

While the highway pursues a relatively level grade the boundary of the right-of-way follows the general contour of hills and valleys, requiring a type of fence capable of following these grades without slippage of stay-wire spacing.

Equipment

Seattle—Heavy construction machinery and electrical equipment are moving in good volume. General Electric Co. has the contract to furnish six 50-ton oil circuit breakers, low at \$301,080, and Railway & Industrial Engineering Co., Greensburg, Pa., low at \$114,500, for disconnecting switches, all for Coulee power house. S. Morgan Smith Co., York, Pa., is low to United States engineer, Bonneville, at \$2,869,100 for four turbines for Bonneville powerhouse and Woodward Governor Co., Rockford, Ill., low at \$258,820 for furnishing governor equipment. Denver has called bids Jan. 6 for testing equipment for Coulee, No. 1460-D, and Jan. 30 for main and control equipment, heating distributing equipment and other items for Coulee power house, Spec. No. 946. General Electric Co. is low at \$520,028 to Bonneville project for 25,000-kva transformers for Covington substation. Bremer-ton, Wash., housing authority, will open bids Jan. 7 for furnishing refrigerators and gas ranges for 600-unit Westpark project. Montgomery Elevator Co., Moline, Ill., is low at \$24,643, for installing an electric freight elevator at Puget Sound navy yard. Pierce county, Washington, will receive bids Dec. 30 for four full diesel motor graders.

Ferroalloys

Ferroalloy Prices, Page 70

New York—Little letup is noted in movement of ferroalloys, notwithstanding the holiday season. Some sellers believe December shipments will actually exceed those of any other month this year except June and July, when price advances in a number of the alloys imparted particular stimulus to deliveries.

Ferromanganese is holding unchanged at \$120, duty paid, Atlantic and Gulf ports, and domestic spiegeleisen at \$36, Palmerton, Pa., for 19 to 21 per cent material, and \$49.50 for 26 to 28 per cent.

Defense Awards

(Concluded from Page 33)

Republic Steel Corp., Cleveland, bar steel, \$5279.50.
Rockbestos Products Corp., New Haven, Conn., electric cable, \$99,248.80.
Scrimgeour, Wm., Washington, knives, spatulas, \$5059.
Seattle Chain Mfg. Co., Seattle, chains, \$6006.
Shipley, W. E., Machinery Co., Philadelphia, boring, drilling and milling machine, \$59,700.
Square D Co., Kollsman Instrument division, Elmhurst, N. Y., climb indicators, \$194,616.
Stetson-Ross Machine Co., Seattle, wood-working machine, \$11,875.
Taylor Instrument Co., Rochester, N. Y., aneroid barometers, \$8415.
Thwing-Albert Instrument Co., Philadelphia, pelorus-drift sight heads and bases, \$72,700.

Timken Roller Bearing Co., Steel & Tube division, Canton, O., molybdenum alloy steel tubing, \$19,061.44.
Traller Co. of America, Berkeley, Calif., semi-trailers, \$6405.60.
Thompson, Henry G., & Son Co., New Haven, Conn., hacksaw blades, \$66,374.89.
United Aircraft Corp., United Airport division, East Hartford, Conn., material to rebarrel cylinders, \$269,247.50.
United States Gypsum Co., Chicago, steel expanded metal, \$16,416.39.
Ulmer, Theo. C., Inc., Philadelphia, combination vises, \$5416.
Vandyck Churchill Co., Philadelphia, boring mill machine, \$50,328.
Wallace, R., & Sons Mfg. Co., Wallingford, Conn., silver-plated ware, \$23,421.18.
Warner & Swasey Co., Cleveland, turret lathes, \$34,500.
Waukesha Motor Co., Waukesha, Wis., aircraft engine, \$23,653.60.
Welsh Mfg. Co., Providence, R. I., screw-drivers, \$8412.30.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., machine tools and other equipment at Jersey City, N. J., \$295,000; turbine blading and welding sets, \$68,960.70.
Worthington Pump & Machinery Corp., Harrison, N. J., turbine driven pumps, \$133,014.

Construction and Enterprise

Ohio

AKRON, O.—C. M. Wilkinson Co., Tower building, plans one-story factory, to cost \$40,000 or more.

ASHTABULA, O.—Reynolds Metals Co., Louisville, Ky., is considering re-

opening a plant here owned by Empire Sheet & Tin Plate Co., idle since 1930, on which it has an option, for rolling alumi-

num into sheeting for airplane covering and manufacture of other specialty parts. Reynolds is building a \$16,000,000 plant at Sheffield, Ala., to produce 60,000 tons of ingots annually.

CINCINNATI—Ilseco Copper Tube & Products Co. will erect a new factory building.

CLEVELAND — Cleveland Republic Tool & Gage Corp., 515 East Ninety-third street, recently incorporated, is increasing plant space. Some new machinery is being installed. Joseph G. Luks is head

■ Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 79 and Reinforcing Bars Pending on page 81 of this issue.



The real test of a wire rope is on the job. There is where quality counts... there is when claims give way to facts... and there is where "HERCULES" (Red-Strand) Wire Rope has proved, and continues to prove, its exceptional value

Furnished in both Round Strand and Flattened Strand constructions — in either Standard or Preformed Type.

A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS
5900 KENNERLY AVENUE
ST. LOUIS, MISSOURI, U. S. A.

NEW YORK • 90 West Street
CHICAGO • 810 W. Washington Blvd.
DENVER • 1554 Wazee Street

FRANCISCO • 520 Fourth Street
PORTLAND • 914 N. W. 14th Avenue
SEATTLE • 3410 First Avenue South

of the new organization.

CLEVELAND — American Coach & Body Co., 9503 Woodland avenue, is increasing its facilities by erection of an addition, comprising 6000 square feet. H. L. Vokes Co., 5300 Chester avenue, is contractor.

COVINGTON, O.—Village, George Hollopeter, mayor; Levi Rhoades, clerk, is considering new sewage treatment plant and equipment. Burgess & Niple, 568 East Broad street, Columbus, O., consulting engineers.

ELYRIA, O.—Ridge Tool Co., North Ridgeville, O., is having plans prepared for new factory and office building. A. G. Hall, 694 Brunswick road, Cleveland, is architect.

LANCASTER, O.—Anchor Hocking Glass Corp. will take bids soon on construction of warehouse and loading plat-

form. Estimated cost \$100,000.

RUSHESYLVANIA, O.—Village, J. W. Hemminger, mayor; Carl Williams, clerk, is considering water and sewage systems. Cost \$217,000. Edison Ellis, Van Wert, O., consulting engineer.

WOOSTER, O.—Akron Brass Mfg. Co. will take bids soon for one-story addition to house factory and office. Cost \$40,000.

Connecticut

BRANFORD, CONN.—Nutmeg Crucible Steel Co. has let contract to Joseph N. Rice Inc., 60 Park street, New Haven, Conn., for erection of one-story, 70 x 130-foot steel foundry addition. Cost \$40,000.

TORRINGTON, CONN.—Torrington Co. has awarded contract to Torrington Building Co., 187 Church street, for erection of one-story, 85 x 150-foot steel factory addition. Estimated cost \$45,000.

Rhode Island

PROVIDENCE, R. I.—Brier Mfg. Co., 222 Richmond street, will take bids in January for three-story manufacturing plant, costing \$40,000. Barker & Turpiff, Grosvenor building, engineer.

New York

BUFFALO—Fedders Mfg. Co. Inc., 57 Tonawanda street, has let contract for construction of plant to H. E. Beyster Corp., General Motors building, Detroit, engineer. Cost about \$500,000.

ITHACA, N. Y.—Board of trustees, Cornell university, Edmund E. Day, president, has authorized construction of a \$150,000 high-voltage laboratory for the college of engineering.

NIAGARA FALLS, N. Y.—National Carbon Co. will soon let contract for 70 x 400-foot factory. Cost \$100,000.

SYRACUSE, N. Y.—Lamson Co. Inc., E. Bergland, president, has let contract for 45 x 200-foot plant addition to J. D. Taylor Construction Co., South Salina street. Estimated cost including equipment \$40,000.

New Jersey

GLOUCESTER, N. J.—Sherwin Williams Paint Co. will soon let contract for erecting plant buildings. Cost over \$100,000. C. E. Wunder, Architects building, Philadelphia, architect.

Pennsylvania

LESTER, PA.—Westinghouse Electric & Mfg. Co. will build a one-story, 80 x 500-foot addition to its plant here. H. H. Bates, plant engineer.

OAKMONT, PA.—Edgewater Steel Co., R. C. Boak, superintendent, has let contract to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, for one-story, 100 x 180-foot manufacturing plant addition.

PHILADELPHIA—Owner, care United Engineers & Constructors Inc., 1401 Arch street, will build a 175 x 600-foot warehouse. Cost about \$250,000.

PHILADELPHIA—Pennsylvania Forge Corp., Milner and Bleigh streets, has let contract to J. J. Clearkin, Pratt street, for erection of factory building. Estimated cost over \$40,000, including equipment. I. S. Towsley, Otis building, engineer.

PHILADELPHIA—Linear Packing & Rubber Co. Inc., State road and Levick street, will make improvements and construct an addition to its plant. Clarence E. Wunder, Architects building, architect and engineer. Estimated cost including equipment, \$40,000.

PHILADELPHIA—Molded Insulation Co., Price street, will soon let contract

for three-story, 52 x 175-foot addition to plant. F. D. Shaw, 34 South Seventeenth street, engineer. Estimated cost \$100,000.

PHILADELPHIA—SKF Industries Inc., is erecting an addition of 56,200 square feet to plant No. 2. In addition, a two-story wing enclosing 12,000 square feet is extending office facilities at plant No. 1.

POTTSTOWN, PA.—Doehler Die Casting Co., Toledo, O., will build a plant here to cost over \$40,000, including equipment.

Michigan

MARINE CITY, MICH.—Standard Products Co., B. L. Prentice, plant manager, will build a steel factory addition, costing \$55,000.

SCOTTVILLE, MICH.—Western Michigan electric co-operative, F. C. Comstock, superintendent, will construct a generating plant. Cost \$240,000.

Illinois

CHICAGO—Mall Tool Co., 7740 South Chicago avenue, has doubled its factory space of 100,000 square feet through recent acquisition of Republic Steel Corp.'s former tack manufacturing plant. New equipment costing about \$100,000 will be installed, this to include automatic tool grinders and boring machines.

CHICAGO—Central Steel & Wire Co., 4545 South Western avenue, has begun construction of new facilities at 3000 West Fifty-first street, at cost of \$500,000. Completion scheduled for March 15.

CHICAGO—Calumet Pattern Works, 10604 South Buffalo avenue, is erecting a one-story building, 75 x 100 feet. Expansion program will cost about \$20,000, including purchase of new grinders and other machinery.

CHICAGO—Crescent Tool & Die Co., 4140 Belmont avenue, which recently completed construction of a 6500-square foot \$20,000 plant addition, has started work on another unit to be completed next April. New equipment costing about \$15,000 will be purchased.

CHICAGO—Owner, care of H. G. Banse, architect, 605 North Michigan avenue, plans three-story, 126 x 275-foot factory and laboratory. Cost about \$350,000.

CHICAGO—Logan Engineering Co., 4091 West Lawrence avenue, has plans by J. A. Nielson, 5248 North Glenwood avenue, for erection of one-story steel factory addition, to cost \$50,000.

CICERO, ILL.—Chicago Rivet & Machine Co., 1830 South Fifty-fourth avenue, Cicero, has awarded contracts for new plant at Bellwood, Ill. Cost of the ten-acre site, building and equipment may total over \$500,000.

QUINCY, ILL.—Gardner-Denver Co., Quincy, Ill., has purchased the 13-acre plant of the former Robert Gair Co. paper mill adjacent to its property. Part of the buildings will be utilized immediately for expansion and a new plant unit will be constructed soon.

ROCKFORD, ILL.—Barnes Drill Co., 314 Chestnut street, has awarded contract to Schmeling & Sons Co., 1031 School street, for one-story, 50 x 145-foot plant addition. Estimated cost with equipment \$50,000.

Maryland

BALTIMORE—Charles T. Bradt Inc., Ridgely & Russell streets, will soon let contract for 192 x 296-foot steel factory. L. R. White Jr., 10 West Chase street, architect.

Tennessee

KNOXVILLE, TENN.—City, W. W.



Our aim is to render service. A little more complete... more hospitable... more pleasing... than even the most exacting guest expects.

CHAS. H. LOTT
Manager

Every Room Outside
with Private Bath

Single from \$2.50
Double from \$4.00

DETROIT
LELAND
HOTEL

CASS AT BAGLEY A.
GARAGE IN CONNECTION



SPRING COTTERS
RIVETED KEYS
SCREW EYES, HOOKS
and WIRE SHAPES



HINDLEY MFG. CO.
Valley Falls, R. I.

H. A. BRASSERT
& COMPANY

Consulting Engineers
for IRON, STEEL, FUEL and
HEAVY METALLURGICAL
INDUSTRIES

First Nat'l. Bank Bldg. 60 E. 42nd St. 310 S. Michigan Ave
PITTSBURGH NEW YORK CHICAGO

DESIGNING AND COMBUSTION ENGINEERS
SPECIALIZING IN
OPEN HEARTH FURNACES

LOFTUS ENGINEERING
Corporation

506 OLIVER BLDG. PITTSBURGH, PA. TELEPHONE ATLANTIC 4480



—SPRINGS—

HOT WOUND HELICAL SPRINGS OF CARBON AND
ALLOY STEELS HEAT TREATED IF DESIRED.
PITTSBURGH SPRING & STEEL COMPANY
1417 Farmers Bank Bldg. Pittsburgh, Penna.

LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS



THE OHIO LOCOMOTIVE CRANE CO.
BUGYRUS OHIO

• HOT DIP • • • • •
GALVANIZING

Shipment via boat, truck or any railroad. Over 40 years in
one location.

ENTERPRISE GALVANIZING CO.
2525 E. CUMBERLAND ST., PHILADELPHIA, PA.



SCREENS
of Perforated Metal
ANY METAL • ANY PERFORATION



The
Harrington & King
PERFORATING CO.

5634 Fillmore St., Chicago, Ill.
New York Office—114 Liberty St.



“COWLES”

ROTARY SLITTING KNIVES
for Modern Requirements
Highest Quality Long Service
The Product of Many Years Specialization
MADE BY TOOLMAKERS

COWLES TOOL COMPANY
Cleveland, Ohio



Write for Catalog of
HOBART Arc Welders

. . . and see how easy you can increase
production! Welds easier; faster; better!
Ask for liberal trial.
Hobart Bros. Co., Box ST-1202, Troy, O.

PARALAN COATED STEEL IN ANY FORM

Satisfies Producers — Consumers — Handlers
NO RUST—CLEAN TO HANDLE—EASILY REMOVED
For Sheets—Strip—Wire—Parts—Tools, etc.

SEND FOR BOOKLET
“ONLY PARALAN CAN DO ALL THAT PARALAN DOES”
AMERICAN LANOLIN CORP. • Lawrence, Mass.
Warehouses: Lawrence, Mass. — Cleveland, Ohio

WELDED STEEL PARTS

are fabricated to meet each manufacturer's individ-
ual requirements. For an interesting quotation, send
prints and complete specifications.

GEORGE KOCH SONS, Inc.
EVANSVILLE, INDIANA

HOT-DIP GALVANIZING PRACTICE

By W. H. SPOWERS JR.

- 200 Pages 6 x 9
- 45 Illustrations
- 4 Tables
- 7 Charts

Price \$4.00 Postpaid

Note: Orders for delivery in
Ohio add 3% for compulsory
Sales Tax.

GIVES full and carefully reasoned explanations of the why
and wherefore of galvanizing. All the latest methods and large
processes are described and very copiously illustrated by a large
number of diagrams and photographs.

Highly recommended to the man on the kettle, the designer of
galvanizing plants, the metallurgist, as well as to those who zinc
coat steel commodities and containers, etc.

THE PENTON PUBLISHING COMPANY, Book Department, Penton Building, Cleveland, O.
350-S

Wynatt, city engineer, plans erection of incinerator costing about \$100,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineer.

Missouri

MILAN, MO.—Ferguson-Dehl Construction Co., Jefferson, Iowa, was low at \$164,000 for construction of 278 miles of rural transmission lines for Sullivan county rural electric co-operative. Paultette & Wilson, Salina, consulting engineers.

Wisconsin

CHIPPEWA FALLS, WIS.—City, L. C. Millard, clerk, plans sewage pumping station.

EAU CLAIRE, WIS.—City, O. E. Olen, clerk, is taking bids to Jan. 8 on furnishing and installing two 1740-gallon-per-minute turbine type well pumps, electric control equipment and chlorination control units.

GRANTSBURG, WIS.—Clam River Dam Co. will start work as soon as public service commission of Wisconsin approves project for construction of hydro-electric power plant costing \$85,000. Herman T. Hagstead, River Falls, Wis., engineer.

LANCASTER, WIS.—Grant electric co-operative, J. C. Hendricks, secretary, has let contract to E. W. Wylie, 2239 Ford road, St. Paul at \$104,152 for rural transmission lines. Wisconsin Development Authority, 522 Tenney building, Madison, Wis., consulting engineer.

OREGON, WIS.—Village, Donald McGill, clerk, will be ready for bids soon on deep well pumping equipment. Mead, Ward & Hunt, State Journal building, Madison, Wis., consulting engineer.

PLATTEVILLE, WIS.—City, Jack Stephenson, clerk, has appointed Kuehling & Jeffrey, Lancaster, Wis., as consulting engineers to prepare plans for sewage treatment plant additions and alterations.

Kansas

CLAY CENTER, KANS.—REA has allotted \$141,000 to C. & W. rural electric co-operative to finance construction of

additional rural transmission lines.

KANSAS CITY, KANS.—United States engineers office, Maj. A. M. Neilson, district engineer, will take bids after Jan. 1 on construction of three flood pumping plants, including seven electrically-driven and four gas-driven pumps.

STERLING, KANS.—REA has allotted \$335,000 to Arkansas Valley electric co-operative to finance construction of rural transmission lines.

Nebraska

LEXINGTON, NEBR.—REA has allotted \$400,000 to Dawson county public power district to finance construction of 403 miles of rural transmission lines, to serve 669 customers, and install 140 irrigation pumps.

Iowa

ANAMOSA, IOWA.—REA has allotted \$264,000 to Maquoketa valley rural electric co-operative to finance construction of rural transmission lines.

MARION, IOWA.—REA has allotted \$133,000 to Linn county rural electric co-operative to finance construction of transmission lines.

California

HAWTHORNE, CALIF.—Northrop Aircraft Corp. has awarded contract for construction of a manufacturing building, 300 x 540 feet and costing \$450,000. Niles Werner, 257 South Spring street, Los Angeles, is engineer.

LOS ANGELES—Aluminum Co. of America, 5151 Magnolia avenue, has been issued building permit for construction of addition to plant here, to cost about \$129,000.

LOS ANGELES—Soule Steel Co., 6200 Wilmington avenue, will build a new factory building to cover an area of 80 x 346 feet and to cost \$20,000.

LOS ANGELES—Independent Pneumatic Tool Co. has let contract to Austin Co. for erection of addition to its factory at 6200 East Slauson avenue, here. Estimated cost \$30,000.

LOS ANGELES—Neu-Bart Stamping & Mfg. Co. will erect a one-story addition to its factory at 120 West Slauson avenue, at cost of \$10,000.

Canada

GRIMSBY, ONT.—Concord Foundries Ltd., care R. F. May, 302 Bay street, Toronto, plans erection of foundry to cost \$40,000 with equipment.

HAMILTON, ONT.—Steel Co. of Canada Ltd., 7 Wilcox street, plans one-story, 100 x 400-foot plant addition, to cost \$300,000. Hulton & Souter, 36 James street, architect.

LEASIDE, ONT.—Research Enterprises Ltd., 350 Bay street, Toronto, has let sub-contracts in connection with erection of plant here to cost \$1,000,000. Milne & Nicholls, 57 Bloor street, West, Toronto, have general contract.

LEASIDE, ONT.—Canadian Aircraft Instruments & Accessories Ltd. has let general contract to R. J. Hibbs Construction Co. Ltd., 15 Trent avenue, Toronto, for two-story plant to provide 33,000 square feet of floor space.

LEASIDE, ONT.—Koreet Depth Gauge Co. Ltd., Croyden, England, and Self Priming Pump & Engineering Co. Ltd., Sough, England, have let general contract to R. J. Hibbs Construction Co. Ltd., 15 Trent avenue, Toronto, for erection of one-story factory here.

LEASIDE, ONT.—Canada Wire & Cable Ltd. has let general contract to R. J. Hibbs Construction Co. Ltd., 15 Trent avenue, Toronto, for erection of plant addition.

LONDON, ONT.—Empire Brass Mfg. Co. Ltd., Dundas street, East, has awarded Pigott Construction Co., Hamilton, Ont., general contract for erection of two-story 65 x 87-foot plant addition here.

ST. CATHARINES, ONT.—English Electric Co. of Canada Ltd., George street, has called for bids through T. H. Wiley, architect, 186 St. Paul street, for erection of plant addition.

TORONTO, ONT.—Small Arms Ltd., a government owned company, will triple the size of the original plant at Long Branch. New plant will cost \$5,000,000.

TORONTO, ONT.—Gray Forgings & Stampings Ltd., 710 St. Clarens avenue, has given general contract to Thomson Bros. Ltd., 56 Grenville street, for plant addition to cost \$30,000.

TORONTO, ONT.—William & J. G. Greely Ltd., 58 Esplanade, will build a one-story machine shop, 66 x 158 feet, and has given general contract to Graham & Sibbett Ltd., 388 Yonge street, Harold World, engineer.

TORONTO, ONT.—Waverley Petroleum Products of Canada Ltd. plans erection of oil refinery and petroleum products plant here to cost \$50,000.

WESTON, ONT.—Canada Cycle & Motor Co. Ltd., Dufferin street, West, has given general contract to Ramsay Contracting Co. Ltd., 39 Indian road crescent, Toronto, for erection of addition to heat treating plant. T. Pringle & Son, 36 Toronto street, Toronto, engineers.

JOLIETTE, QUE.—Barrett Co. Ltd., 5551 St. Hubert street, Montreal, Que., is having plans prepared for erection of plant here to cost \$75,000. G. E. Bradleu is manager.

MONTREAL, QUE.—Canadian Car & Foundry Co. Ltd., 621 Craig street, will build machine shop extension, plans for which have been prepared by Spence-Mathias & Burge, 2063 Union avenue.

OUTREMONT, QUE.—McArthur Irwin Ltd., 11 Bates road, is having plans prepared by Perry, Luke & Little, architects, 1405 Bishop street, Montreal, for \$35,000 plant addition.

ST. LAURENT, QUE.—Continental Can Co. Ltd., Quimet avenue, plans to start work in the spring on erection of plant addition here to cost \$500,000.



YOUR HOME in Philadelphia

All the creature comforts graciously administered, plus the thrilling atmosphere of a great and famous hotel.

All dressed up for the Winter. A streamlined lobby—a smartly refurbished Cocktail Lounge offering a delightful interlude on the way to the beautiful Burgundy Room, the Hunt Room, famous Bar Cafe in the club manner—await you. Reasonable rates.

BELLEVUE-STRATFORD

IN PHILADELPHIA

CLAUDE H. BENNETT, General Manager

SUPERIOR STEEL CORPORATION

HOT AND COLD ROLLED STRIP STEEL
AND SUPERIOR STAINLESS STEELS

Successfully serving steel consumers for almost half a century

EXECUTIVE OFFICES — GRANT BLDG., PITTSBURGH, PA.
GENERAL OFFICES AND WORKS — CARNEGIE, PA.

THE JACKSON IRON & STEEL CO.

MANUFACTURERS OF

"JISCO"

PIG IRON SPECIALTIES

JACKSON, OHIO

FIRTH-STERLING

TOOL STEELS - STAINLESS STEELS - SINTERED CARBIDES
FOR COMPLETE SHOP TOOLING - McKEESPORT, PA.



TRI-LOK

Grating and Treads
Steel — Aluminum — Brass
No Rivets, Bolts or Welds

Manufactured by
The Tri-Lok Co., Pittsburgh, Pa.
National Distributors

DRAGO CORPORATION, Machinery Division
300 Penn Ave. Pittsburgh, Pa.



ATLAS DROP FORGINGS

All shapes and sizes to 500 lbs.

ANY ALLOY STEEL - LABORATORY CONTROLLED

ATLAS DROP FORGE CO · LANSING, MICHIGAN

Pickling of Iron and Steel

—By Wallace G. Imhoff

Price
Postpaid
\$5.00

This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.

THE PENTON PUBLISHING CO.

Book Department

1213 W. 3rd St.

Cleveland, O.

429-5

RYERSON CERTIFIED STEELS

represent the highest quality obtainable in each class and type of material. All kinds from standard carbon grades to special alloys in stock for immediate shipment. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON

WIRE

Iron — Steel — Alloy
Round — Flat — Shapes
All Sizes and Finishes
Also Wire Screen Cloth

The Seneca Wire & Mfg. Co.
Fostoria, Ohio



Just published . . . new reference book "Handbook of Special Steels—Their Properties, Uses, Fabricators." Write for it!



ALLEGHENY LUDLUM STEEL CORPORATION

OLIVER BUILDING

PITTSBURGH, PA.

Sales Offices and Complete Stocks in all Principal Cities

BELMONT IRON WORKS

PHILADELPHIA NEW YORK EDDYSTONE

Engineers - Contractors - Exporters

STRUCTURAL STEEL—BUILDINGS & BRIDGES

RIVETED—ARC WELDED

BELMONT INTERLOCKING CHANNEL FLOOR

Write for Catalogue

Main Office—Phila., Pa. New York Office—44 Whitehall St.



Certified Steel Abrasives

FOR USE IN BLAST CLEANING EQUIPMENT

SAMSON STEEL SHOT
ANGULAR STEEL GRIT

PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASS.

SMALL ELECTRIC STEEL CASTINGS

(Capacity 500 Tons Per Month)

WEST STEEL
CLEVELAND



CASTING CO.
OHIO, U. S. A.

"He Profits Most
Who Serves Best"

Better Steel
Castings

Let Us Send You This New Catalog!

For your files—a listing of available standard Stampings (Washers, Dies, Clips, Holders, and Specialties for which we have dies in the Whitehead plant). Complete with illustrations, specifications, prices.

Send for yours now.



FREE ON REQUEST

WHITEHEAD STAMPING CO.
1667 W. Lafayette St. Detroit, Mich.





CONTRACT WORK

PATTERN EQUIPMENT

WOOD or METAL
Made Right and Delivered
When Promised.

Castings in magnesium, silicon
aluminum and bronze alloys to
government specification.

THE WELLMAN BRONZE & ALUMINUM COMPANY

6011 Superior Ave. Cleveland, Ohio

Hollow Bored Forgings Lathe and Milling Machine Spindles Hydraulic Cylinders

Let us have your inquiries on any requirements of
Hollow Bored Forgings and Steel Shafts.

AMERICAN HOLLOW BORING COMPANY

1054 W. 20th St., ERIE, PENNA.

KIRK & BLUM

WELDED MACHINE BASES,
PEDESTALS and FRAMES

LATHE PANS

GEAR and BELT GUARDS

Pressed Steel Louver Panels
and Cover Plates

THE KIRK & BLUM MFG. CO.

2822 Spring Grove Ave., Cincinnati, Ohio

Are You Alive?

■ Do the executives in the metal-
working industries—the ones who
have business to place under con-
tract—know that you are alive?
Thousands of them read these
pages every week. Let them
know your facilities, that you are
ready and capable. You can do
it regularly and economically
through these columns. Write
for details.

Send Your Inquiries for
ACID PROOF CONSTRUCTION
TO THE

SAUERISEN CEMENTS Co.

PITTSBURGH (15), PENNA.

Manufacturers of Insa-Lute, Technical and
Industrial Cements . . . Compounds

Send your inquiries for
SPECIAL ENGINEERING WORK

to the

A. H. NILSON MACHINE COMPANY, BRIDGEPORT, CONN.

designers and builders of wire and ribbon
stock forming machines.

We also solicit your bids for cam milling

USED and REBUILT EQUIPMENT MATERIALS

LOOK

- 1—300 HP, Sterling Vertical Watertube boiler—
150 lbs.
- 3—550 HP Nordberg Diesel Engine Generator Sets,
440 V., Burke, 60 cycle, 3 phase, alternators all
complete.
- 1—950 Ing-Rand belted Air Compressor.
- 1—150 HP 440 V. 60 cycle, 3 ph., 720 RPM, Slip
Ring Motor.

INDEPENDENT ELECTRIC MACHINERY CO.
300 Southwest Blvd. Kansas City, Mo.

WANTED

Good used 20" or 24" Shaper.
Write air mail price and full
description. NePage Electric Co.,
804 6th Ave. So., Seattle, Wash.

Boring Mills 42" Bullard, 72" Niles B.D.
Boring Mill, 10" Niles, 2 lds. B.D.
Grinder, Knife 10' Bridgeport, M.D.
Grinder, Roll 30" x 76" Farrel, M.D.
Locomotive, 50 Ton Baldwin, Std. Ga.
Press, Forging 150 ton United Steam Hyd.
Pipe Machs. 2-4-6-8-12" Williams, M.D.
Shears, Plate, 10' x 1/4" - 48" x 1/2" M.D.
Sheet Levelers, 48"-60"-81" McKay, 17 roll, M.D.
Slitters Gang, 36" Yoder M.D.

WEST PENN MACHINERY CO.
1208 House Building Pittsburgh, Pa.

Rails—"1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—
All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried
in stock—Angle and Splice Bars, Bolts, Nuts,
Frogs, Switches, Tie Plates.

Buy from One Source—Save Time and Money
Phone, Write, or Wire

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

—REBUILT—

BLOWERS - FANS - EXHAUSTERS

Connorsville-Roots positive blowers.
Centrifugals for gas and oil burning.
Sand blast, grinder and dust exhausters.
Ventilating fans and roof ventilators.

GENERAL BLOWER CO.

404 North Peoria St. Chicago, Ill.

MILL MOTOR

300 HP 230V-DC 500 RPM
G. E., Type MPC, form A Comp. wound,
interpole, pedestal hrs., with magnetic re-
versing control panel, master controller and
spare armature, condition equals new.

JOHN D. CRAWBUCK CO., PITTSBURGH, PA.
Phone Atlantic 6345

SHEET BAR SHEAR

11 1/4" x 36" Mesta vertical open throat
1/4" bar shear with gauge. Cuts four
per m8" cold soft steel sheet bars, 30 cuts
motor 00, 4 1/2" stroke, 18" throat. Arrgd.
weight 58,000 lbs.

JOHN D. CRAWBUCK CO., PITTSBURGH, PA.
Phone Atlantic 6345

HORIZ. MILL, 3-3/8" bar Detrick-Harvey
POST MILL, 6-1/2" bar Niles, R.P.T. M.D.
DIE SINKERS, E-3 and E-4 Keller, M.D.
HAMMER, Bd. Drop, 2000 lb. Chambersburg
GEAR CUTTERS, (2) 84" Newark, M.D.
PRESS, Stoll 79-D, Bed 72"x26", M.D.
PLATE SHEAR, 10' x 3/8" United, M.D.

LANG MACHINERY COMPANY

28th St. & A.V. R.R. Pittsburgh, Pa.

LOOKING FOR USED OR SUR-
plus machinery? STEEL read-
ers may have the equipment
you want. Place an advertise-
ment in this section. Rates are
moderate. Write today.

STEEL CAN HELP YOU BUY OR SELL

Used or Surplus Machinery and Equipment. Send in your copy instructions for an
advertisement in this column. Your ad will reach the important men in the metalworking
and metal-producing industry. Write to STEEL, Penton Bldg., Cleveland.



CLASSIFIED

Positions Wanted

MANUFACTURER'S REPRESENTATIVE selling plant equipment requiring engineering ability Detroit territory, 12 years same firm, employed, engineer, age 46, family, wants improvement similar position. Address Box 378, STEEL, Penton Bldg., Cleveland.

CHEMICAL AND METALLURGICAL POSITION wanted: Twenty years' Mill and Laboratory experience with Carbon and alloy steels. Married, now employed. Excellent references. Address Box 387, STEEL, Penton Bldg., Cleveland.

REGISTERED ENGINEER AVAILABLE. Executive capable of producing excellent results. Contact and designing engineer. Wide experience on all classes of engineering in connection with the steel, by-product coke and gas industries. Address Box 382, STEEL, Penton Building, Cleveland.

PLANT MANAGER; TWENTY-FIVE years' experience metals manufacturing. Seasoned executive in sizable industry, methods, costs, incentives, organization, management, and controls. Capable engineer. Age 45. Prefer moderate size industry. Address Box 383, STEEL, Penton Bldg., Cleveland.

EXPERIENCED ROLLER HAVING rolled 18 years on bar and guide work, now open for position anywhere. Address Box 385, STEEL, Penton Bldg., Cleveland

WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—

Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry.

When you have an opportunity to offer, use the Help Wanted columns of STEEL.

SEEKING CONNECTION IN SALES DEPARTMENT of steel manufacturer or fabricator. Fifteen years' experience, eleven in sales and sales promotion on complete line of steel commodities in Cincinnati, Detroit and Chicago territories; four years chief inspector, engineer of physical tests and claim adjustments. Employed at present time, references available from past and present employers. Age 38, height 6 feet, weight 180 pounds. Address Box 380, STEEL, Penton Bldg., Cleveland.

MANUFACTURERS REPRESENTATIVE with wide acquaintance in Indiana industrial field, now selling Tungsten Carbides and Small Tools. Desires additional line with permanency and dollar volume possibilities. Address Box 388, STEEL, Penton Bldg., Cleveland.

TWENTY YEARS' EXPERIENCE STRUCTURAL and plate shop superintendent available January 1st as superintendent of plant, or estimating sales representative. Moderate salary until proven results. Address Box 372, STEEL, Penton Bldg., Cleveland.

ENGINEERING AND CONSTRUCTION executive available upon reasonable notice. Well trained. Ten years' extensive construction experience. Constantly associated with some of the largest industries and best engineers in the country. This man has large acquaintance and can secure able assistants in design, purchasing and fabricat on on large undertakings. Will offer services to highest bidder in present demand for experienced construction executives able to get satisfactory results. Reply Box 371, STEEL, Penton Bldg., Cleveland.

Help Wanted

DESIGNERS & ENGINEERS

Squad leaders, checkers, designers, computers for design of 350,000 ton annual capacity steel plant.

PLANT LAYOUT:

Experienced in any one or more of the following: boiler or power house; blast furnace blowing equipment; steel plant pumping stations; rolling mill equipment such as motor rooms, storage yards; rolling mill auxiliaries for blooming; hot strip, cold sheet, universal plate and tin mills; rail and structural accessories. General plant shops such as machine, electrical, pattern, forge, etc., also general steel mill buildings such as office, laboratories, etc., and transportation and sewer systems.

CONCRETE AND STRUCTURAL STEEL:

Experienced in any one or more of the following: general steel mill buildings, intricate reinforced concrete structures such as machinery and building foundations, steel and concrete trestles, etc.

MECHANICAL:

Experienced in any one or more of the following: general steel plant piping such as water, steam, air systems for rolling mills, power house, pumping stations, etc.

ELECTRICAL:

Experienced in any one or more of the following: general power plant such as overhead and underground distribution systems, switchboards, lighting, etc.

TECHNICAL ASSISTANTS:

Experienced in general computation such as calculating distribution of utilities and materials, determination of flow diagrams for power, fuel, water, compressed air, steam, etc. Preparation of specifications and economic study of steel plant equipment and operation.

IN REPLYING:

Give full particulars in first letter, qualifications, past experience in detail and date available. Write to ARTHUR G. MCKEE & COMPANY, CLEVELAND, OHIO, Attention: Stephen Derry, Employment Director.

CLASSIFIED RATES

All classifications other than "Positions Wanted," set solid, minimum 50 words, 5.00, each additional word .10; all capitals, minimum 50 words, 6.50, each additional word .13; all capitals, leaded, minimum 50 words 7.50, each additional word .15. "Positions Wanted" set solid, minimum 25 words 1.25, each additional word .05; all capitals, minimum 25 words 1.75, each additional word .07; all capitals, leaded, minimum 25 words 2.50, each additional word .10. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge.

Classified pages are 3 columns, each column 2 1/4 inches wide.

Forms close Wednesday preceding publication date.

Employment Service

SALARIED POSITIONS \$2,500 to \$25,000

This thoroughly organized advertising service of 31 years' recognized standing and reputation, carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been \$2,500 or more, send only name and address for details. R. W. Blxby, Inc., 110 Delward Bldg., Buffalo, N. Y.

Castings

OHIO

THE WEST STEEL CASTING CO., Cleveland. Fully equipped for any production problem. Two 1 1/2 ton Elec. Furnaces. Makers of high grade light steel castings, also alloy castings subject to wear or high heat.

PENNSYLVANIA

NORTH WALES MACHINE CO., INC., North Wales. Grey Iron, Nickel, Chrome, Molybdenum Alloys, Semi-steel. Superior quality machine and hand molded sand blast and tumbled.

Accounts Wanted

LET ME REPRESENT YOU ON A COMMISSION Basis in Chicago territory; 15 years' experience. Reply Box 374, STEEL, Penton Bldg., Cleveland.

WE CAN BUILD SALES OF STEEL PLATE and any products or supplies interesting to the aircraft and shipbuilding industries on the Pacific Coast. We have close connection with shipyards and entree with the aircraft industry. Many years' experience handling plates and general steel products. Able to finance all sales, carry own accounts. Write Box 376, STEEL, Penton Bldg., Cleveland.

ACCOUNTS WANTED — DETROIT client-Graduate Metallurgist, Established additional tele in Detroit area, wants stenographic services. Office, telephone 662, STEEL, Penton Bldg., Cleveland.

OPPORTUNITIES AND PROFITS

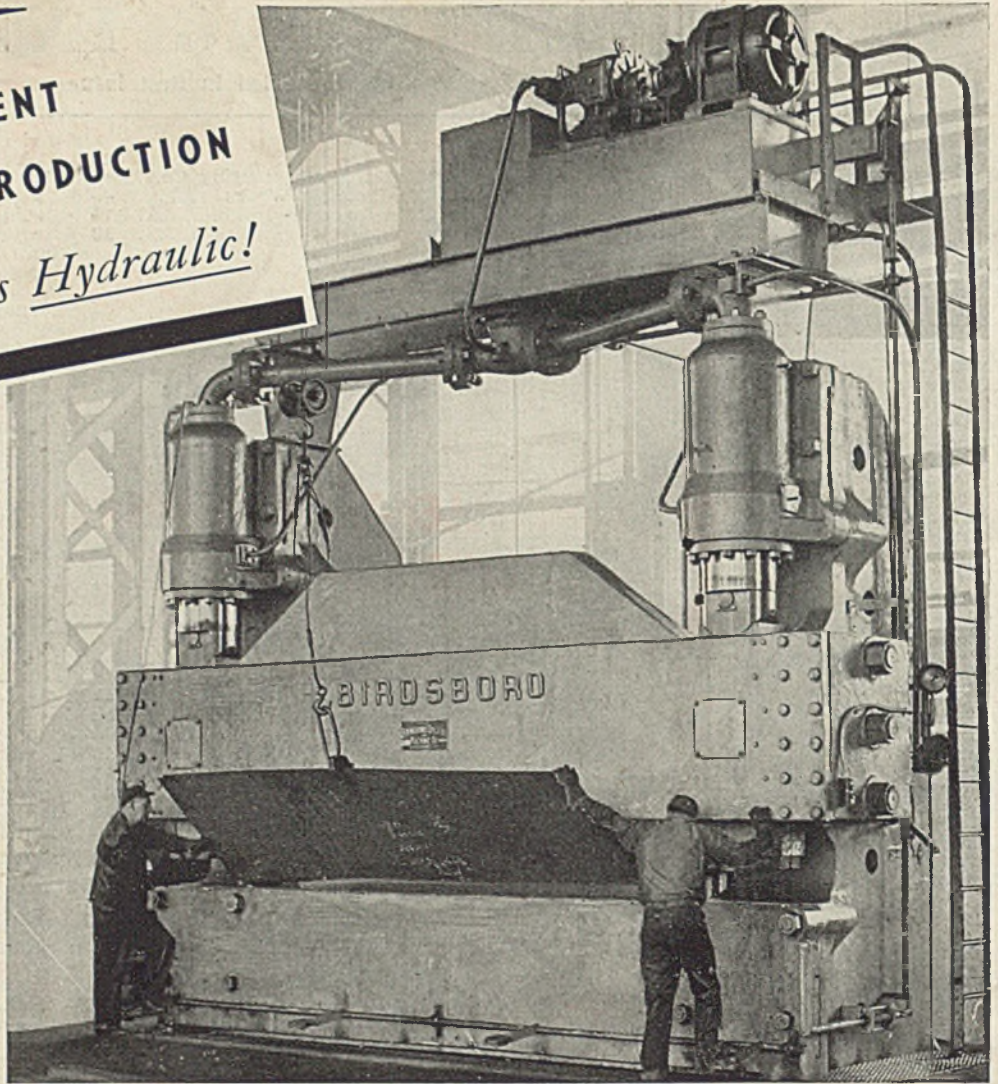
Interest to distributors are of manufacturers—use an ad on and next week to let manufacturers know you are interested in turning on new lines.

♦ ♦ ADVERTISING INDEX ♦ ♦

Where-to-Buy Products Index carried in first issue of month.

Page		Page		Page
King Fifth Wheel Co.	—	North American Manufacturing Co.	—	Stewart Furnace Division, Chicago
Klinnear Mfg. Co.	—	Northern Engineering Works	—	Flexible Shaft Co.
Kirk & Blum Mfg. Co.	92	Northwest Engineering Co.	75	Strong Steel Foundry Co.
Koch, George, Sons	89	Norton Co., The	10	Sturtevant, B. F., Co.
Koppers Co.	—			Sun Oil Co.
Koven, L. O., & Brother, Inc.	—	O		Superior Mold & Iron Co.
Kron Co., The	—	Ohio Electric Mfg. Co.	—	Superior Steel Corp.
		Ohio Ferro-Alloys Corp.	—	Surface Combustion Corp.
L		Ohio Locomotive Crane Co., The	89	Sutton Engineering Co.
Laclede Steel Co.	—	Ohio Seamless Tube Co., The	—	Swindell-Dressier Corp.
Lake City Malleable Co.	—	Ohio Steel Foundry Co., The	—	
Lamson & Sessions Co., The	—	Oxweld Acetylene Co.	—	T
Landis Machine Co., Inc.	—			Tennessee Coal, Iron & Railroad Co.
Landis Tool Co.	—	P		Thomas Steel Co., The
Lang Machinery Co.	92	Page Steel & Wire Division of Ameri-		Thompson-Bremer & Co.
Lansing Stamping Co.	—	can Chain & Cable Co., Inc.	—	Tide Water Associated Oil Co.
LaSalle Steel Co.	—	Pangborn Corp.	—	Timken Roller Bearing Co.
Latrobe Electric Steel Co.	—	Parker-Kalon Corp.	—	Timken Steel & Tube Division, The
Lawrence Copper & Bronze	—	Pease, C. F., Co., The	—	Timken Roller Bearing Co.
LeBlond, R. K., Machine Tool Co., The	Back Cover	Penn Galvanizing Co.	—	Tinnerman Products, Inc.
		Pennsylvania Industrial Engineers ...	—	Toledo Scale Co.
Leeds & Northrup Co.	—	Pennsylvania Salt Mfg. Co.	—	Toledo Stamping & Mfg. Co.
Lee Spring Co., Inc.	—	Penola, Inc.	—	Tomkins-Johnson Co.
Lehigh Structural Steel Co.	—	Perkins, B. F., & Son, Inc.	—	Torrington Co., The
Leschen, A., & Sons Rope Co.	87	Petroleum Iron Works Co., The	—	Townsend Co.
Lewis Bolt & Nut Co.	—	Pheoll Mfg. Co.	—	Tri-Lok Co., The
Lewis Foundry & Machine Division of	—	Pittsburgh Crushed Steel Co.	91	Truscon Steel Co.
Blaw-Knox Co.	—	Pittsburgh Gear & Machine Co.	—	
Lewis Machine Co., The	—	Pittsburgh Lectromelt Furnace Corp. ...	—	U
Lincoln Electric Co., The	—	Pittsburgh Rolls Division of Blaw-	—	Union Carbide & Carbon Corp.
Lincoln Hotel	78	Knox Co.	—	Union Drawn Steel Div. Republic
Linde Air Products Co., The	—	Pittsburgh Spring & Steel Co.	89	Steel Corp.
Lindemuth, Lewis B.	—	Pittsburgh Steel Co.	—	United Chromium, Inc.
Link-Belt Co.	47	Plymouth Locomotive Works, Div.	—	United Engineering & Foundry Co. ...
Loftus Engineering Corp.	89	The Fate-Root-Heath Co.	—	United Maintenance Sales Co.
Logemann Bros. Co.	—	Poole Foundry & Machine Co.	—	United States Steel Corp., Subsidiaries
Lovejoy Flexible Coupling Co.	—	Pressed Steel Car Co., Inc.	—	American Bridge Co.
Ludlow-Saylor Wire Co., The	—	Pressed Steel Tank Co.	—	American Steel & Wire Co.
	Inside Back Cover	Prest-O-Lite Co., Inc., The	—	Atlas Lumnite Cement Co.
		Progressive Welder Co.	—	Carnegie-Illinois Steel Corp.
Mc		Pure Oil Co., The	—	Columbia Steel Co.
McKay Machine Co.	—			Cyclone Fence Co.
McKee, Arthur G., Co.	93	R		Federal Shipbuilding & Dry Dock Co.
McKenna Metals Co.	—	Raymond Mfg. Co., Division of Asso-	—	National Tube Co.
		ciated Spring Corp.	—	Oil Well Supply Co.
M		Relliance Electric & Engineering Co. ...	—	Scully Steel Products Co.
Mackintosh-Hemphill Co.	—	Republic Steel Corp.	—	Tennessee Coal, Iron & Railroad Co.
Macwhyte Co.	—	Revere Copper and Brass, Inc.	—	United States Steel Export Co.
Marr-Galbreath Machinery Co.	—	Rhoades, R. W., Metaline Co., Inc.	—	Universal Atlas Cement Co.
Mathews Conveyor Co.	—	Riverside Foundry & Galvanizing Co.	—	Virginia Bridge Co.
Maurath, Inc.	—	Roosevelt Hotel	—	United States Steel Export Co.
Medart Co., The	—	Rucmelin Mfg. Co.	—	
Mesta Machine Co.	—	Russell, Burdsall & Ward Bolt & Nut	—	V
Metal & Thermit Corp.	—	Co.	—	Valley Mould & Iron Corp.
Michigan Tool Co.	—	Rustless Iron & Steel Corp.	—	Vanadium-Alloys Steel Co.
Midvale Co., The	—	Ryerson, Joseph T., & Son, Inc.	91	Vickers, Inc.
Milwaukee Foundry Equipment Co.	—			Voss, Edward W.
Mississippi Valley Equipment Co.	—	S		
Missouri Rolling Mill Corp.	—	St. Joseph Lead Co.	81	W
Moltrup Steel Products Co.	—	Salem Engineering Co.	—	Waldron, John, Corp.
Monarch Machine Tool Co., The	—	Samuel, Frank, & Co., Inc.	—	Warner & Swasey Co.
Monarch Steel Co.	—	San Francisco Galvanizing Works ...	—	Washburn Wire Co.
Morgan Construction Co.	—	Sanitary Tinning Co., The	—	Wean Engineering Co., Inc.
Morgan Engineering Co.	—	Sauerensen Cements Co.	92	Weinman Pump & Supply Co., The
Morrison Metalweld Process, Inc.	—	Scovill Mfg. Co.	—	Weirton Steel Co.
Morris Paper Co.	—	Scully Steel Products Co.	—	Wellman Bronze & Aluminum Co.
Morton Salt Co.	—	Sellers, William, & Co., Inc.	—	Westinghouse Electric & Mfg. Co.
		Seneca Wire & Mfg. Co., The	91	West Penn Machinery Co.
N		Shafer Bearing Corporation	—	West Steel Casting Co.
National Acme Co., The	—	Shakeproof Lock Washer Co.	—	Wheeling Steel Corporation
National Bearing Metals Corp.	—	Shaw-Box Crane & Hoist Division,	—	Whitcomb Locomotive Co., The
National Broach & Machine Co.	—	Manning, Maxwell & Moore, Inc.	—	Whitehead Stamping Co.
National Carbon Co., Inc.	—	Shell Oil Co., Inc.	—	Whitewire Brothers, Inc.
National Cylinder Gas Co.	—	Shenango Furnace Co., The	—	Wickwire Spencer Steel Co.
National-Erie Corp.	—	Shenango-Penn Mold Co.	—	Wilcox, Crittenden & Co., Inc.
National Forge & Ordnance Co.	—	Shepard Niles Crane & Hoist Corp. ...	—	Williams, J. H., & Co., Inc.
National Lead Co.	—	Shuster, F. B., Co., The	—	Wilson, Lee, Engineering Co.
National Machinery Co.	—	Simonds Gear & Mfg. Co.	—	Wisconsin Steel Co.
National Roll & Foundry Co.	—	Simonds Saw & Steel Co.	—	Witt Cornice Co., The
National Screw & Mfg. Co.	—	Sinton Hotel	—	Wood, R. D., Co.
National Steel Corp.	—	SKF Industries, Inc.	—	Worthington Pump & Mach
National Telephone Supply Co., Inc. ...	—	Snyder, W. P., & Co.	—	Worth Steel Co.
National Tube Co.	—	Socony-Vacuum Oil Co., Inc.	—	Wyckoff Drawn Steel Co.
New Departure Division General Mo-	29	South Bend Lathe Works	—	
tors Sales Corp.		Standard Galvanizing Co.	—	Y
New Jersey Zinc Co.	—	Standard Steel Works	73	Yale & Towne M. Co.
New York & New Jersey Lubricant Co.	—	Stanley Works, The	—	Youngstown Alloy Casting
Niagara Machine & Tool Works	—	Steel & Tubes Division, Republic Steel	—	Youngstown Sheet & Tube Co.
Nicholson, W. H., & Co.	—	Corp.	—	Youngstown Welding & Eng
Niles Steel Products Div., Republic	—	Steel Conversion & Supply Co.	—	Co., The
Steel Corp.	—	Steel Founders' Society of America ...	—	
Nilson, A. H., Machine Co.	92	Steelweld Machinery Division, Cleve-	—	Z
Nitralloy Corp., The	—	land Crane & Engineering Co.	—	Z...
Norma-Hoffmann Bearings Corp.	—			Z...

**TO PREVENT
INTERRUPTED PRODUCTION**
...make sure it's *Hydraulic!*



This 750-ton Birdsboro bending brake forms transformer cases from heavy-gauge stock. Note duplicate foot and hand control for most convenient operation, and rigid construction with self-contained hydraulic drive.

With hydraulic press equipment, you can work right up to the absolute capacity limit of your machine, safely . . . and without worrying about breakage. If you should overload your machine, nothing breaks. It simply stops—ready to go again at the instant the oversize work is removed.

In forming heavy-gauge stock—armor plate, transformer cases, pressure tanks, etc.—that is an important advantage. It insures uninterrupted production. And with modern hydraulic presses—like the brake illustrated—you get fast approach speeds and more uniform working pressures.

Let Birdsboro engineers design your next heavy press for economical hydraulic operation. Write, wire or phone today.

THE BIRDSBORO STEEL FOUNDRY AND MACHINE CO. • Plants at Birdsboro & Reading, Pa.



Hydraulic Machinery • Steel Castings
Iron Castings
Steel, Alloy Steel, Grain and Chilled Iron Rolls
Steel Mill Equipment • Special Machinery
Crushing Machinery

District Sales Offices: New York & Pittsburgh



STEEL