

STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief
E. C. KREUTZBERG
Editor
A. J. HAIN
Managing Editor
E. F. ROSS
Engineering Editor
D. S. CADOT
Art Editor

ASSOCIATE EDITORS

G. H. MANLOVE J. D. KNOX
W. L. HAMMERQUIST J. A. CRONIN
F. E. GOODING R. L. HARTFORD
New York
I. H. SUCH B. K. PRICE
L. E. BROWNE
Pittsburgh *Chicago*
D. R. JAMES W. G. GUDE
Detroit *Washington*
A. H. ALLEN L. M. LAMM

London

VINCENT DELPORT

BUSINESS STAFF

G. O. HAYS
Business Manager
C. H. BAILEY
Advertising Service

New York . E. W. KREUTZBERG
B. C. SNELL
Pittsburgh . . . S. H. JASPER
D. C. KIEFER
Chicago . . . L. C. PELOTT
W. F. O'DELL
Cleveland . . . R. C. JAENKE
R. T. MASON J. W. ZUBER
Circulation Manager *Readers' Service*

BRANCH OFFICES

New York 220 Broadway
Chicago . . . Peoples Gas Building
Pittsburgh . . 1650 Koppers Building
Detroit . . . 1010 Stephenson Building
Washington . National Press Building
Cincinnati . . . 418-420 Sinton Hotel
San Francisco . . . 2413 Milvia St.
Berkeley, Calif., Tel. Berk. 7354-W
London Caxton House
Westminster, S. W. 1
Berlin . Berlin, N. W. 40, Roonstrasse 10

Published by THE PENTON PUBLISHING CO.,
Penton Building, Cleveland, Ohio. JOHN A.
PENTON, Chairman of Board; E. L. SHANER,
President and Treasurer; J. R. DAWLEY and
C. O. HAYS, Vice Presidents; F. G. STEINBACH,
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 \$6; 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 1937 by the Penton Publishing Co.



Vol. 101-No. 13

September 27, 1937

READER COMMENTS	9
AS THE EDITOR VIEWS THE NEWS	13
NEWS	
Unprofitable Orders Loom Large in Warehouse Business	15
Elevated Highway Building Encouraged	16
Steelworks Operations for the Week	18
Meetings	18
Financial	19
Labor	20
Men of Industry	21
Obituaries	22
Activities of Steel Users and Makers	23
MIRRORS OF MOTORDOM	25
WINDOWS OF WASHINGTON	29
Industrial Plant Construction Bright Spot in Building— <i>Editorial</i>	31
THE BUSINESS TREND	
Business Outlook Hinges on Timing of Auto Resumption	32
Charts and Statistics	32-33
TECHNICAL	
Flame Hardening	34
Building a Career	37
Columbia Opens New Laboratories	39
Gear Makers See Threat in Legislation	42
MATERIALS HANDLING	
Materials Handling in Forging Plant	45
WELDING, ETC.— <i>Robert E. Kinhead</i>	49
SURFACE TREATMENT AND FINISHING OF METALS	
Finish Important Factor in Motorcycle Sales	52
PROGRESS IN STEELMAKING	
Stainless Steel in the Electric Furnace	54
POWER DRIVES	58
NEW EQUIPMENT	64
RECENT PUBLICATIONS OF MANUFACTURERS	69
MARKET REPORTS AND PRICES	71
The Market Week	72
BEHIND THE SCENES	82
CONSTRUCTION AND ENTERPRISE	92
INDEX TO ADVERTISERS	98



PRODUCTION • PROCESSING • DISTRIBUTION • USE



*As the
Earth
Turns...*

the sun reveals complete new Morgan Mills, recently installed or about to be set up in various industrial centers of distant lands.

These widely scattered locations indicate more than the *international* nature of Morgan's business. They show that sound engineering and technical development are valued the world over—as incorporated into *complete* rolling mills by Morgan.

NEW MORGAN MILL INSTALLATIONS

- ★ CORBY, ENGLAND (*Steuards & Lloyds*)—Hot Strip Mill
- ★ MAKEVKA, RUSSIA (*Amorg Trading Corp.*)—4-Strand Rod Mill
- ★ CARDIFF, WALES (*Guest, Keen & Nettlefolds*)—Merchant and Strip Mill
- ★ SPARROWS POINT, MD. (*Bethlehem Steel Co.*)—4-Strand Wire Rod and Merchant Mill
- ★ PORT KEMBLA, AUSTRALIA (*Australian Iron & Steel*)—Billet and Sheet Bar Mill
- ★ HAMILTON, ONT. (*Steel Co. of Canada*)—Rearrangement and addition to Billet Mill

MORGAN
WORCESTER AND
ENGINEERS AND
MANUFACTURERS

R28

MORGAN CONSTRUCTION CO. Worcester, Mass. U.S.A.

STEEL

As the Editor Views the News

ACTIVITY in the iron, steel and metalworking industries has not rebounded after Labor day with the bouyancy that was expected. For this reason the jittery antics of Wall street have commanded some attention on the part of industrialists. New demand for materials, parts and equipment is spotty. Some companies, well fortified with orders, are optimistic. Others, noting an alarming letdown in new business, are bearish. Our hunch is that the post-Labor day disappointment arises more from inopportune timing than from a marked reduction in the requirements of representative consumers. Perhaps industry was talked into expecting a rebound too promptly after Labor day.

• • •

This proves that we have deplorably short memories. A year ago the spurt, which eventually made the fourth quarter a very gratifying period from the standpoint of business volume, did not get underway until after Oct. 1. Automobile production on new models (p. 33) did not hit its stride until the second week of November.

Is Retracing 1936 Pattern

Last year we experienced a secondary recession late in September following the post-Labor day rebound. Today we are tracing the identical pattern, but at higher levels, yet are momentarily unnerved by the experience. Has a taste of recovery made us more sensitive to external bearish influences?

• • •

If the car of business were taken to an expert garage mechanic, he probably would say that there is plenty of gas (potential demand) in the tank but that the gas line is clogged and the timing of the distributor is off. . . . One of the greatest weaknesses in the educational system of this period is the lack of competent agencies for aiding high school graduates in selecting suitable lines of work. The president of the National Machine Tool Builders' association (p. 37) paints a

Learn a Trade, Rise to Top

bright picture of the opportunities in the machine building field which await enterprising, mechanically-inclined young men. "In the machine tool trade as nowhere else," he says, "the opportunities for advancement from the ranks are numerous." The thousands of top executives who started by "learning a trade" testify to the truth of this statement.

• • •

One hopes that industry will encounter few floods as disastrous as those experienced in the springs of 1936 and 1937. But in case electric motors are submerged for several days, it is well to know how to dry them out effectively. After the Ohio river flood of 1937 a steel company employed a low-heat and vacuum method of drying (p. 62) which proved entirely satisfactory on a 3000-horsepower motor. . . . How can engineering schools obtain faculty personnel adequately qualified by knowledge and experience to teach welding? One suggestion (p. 49) is for the welding industry to cooperate with universities and teachers in sponsoring summer courses where professors may gain supplementary training, leading to a suitable degree.

Summer Schools For Welding?

• • •

Flame hardening, a process whereby the surface of a quench-hardening ferrous material is locally heated by an oxyacetylene flame and then quenched, is comparatively new, yet recent experience (p. 34) has led to a technique by which the process may be utilized for many applications on plane and circular work.

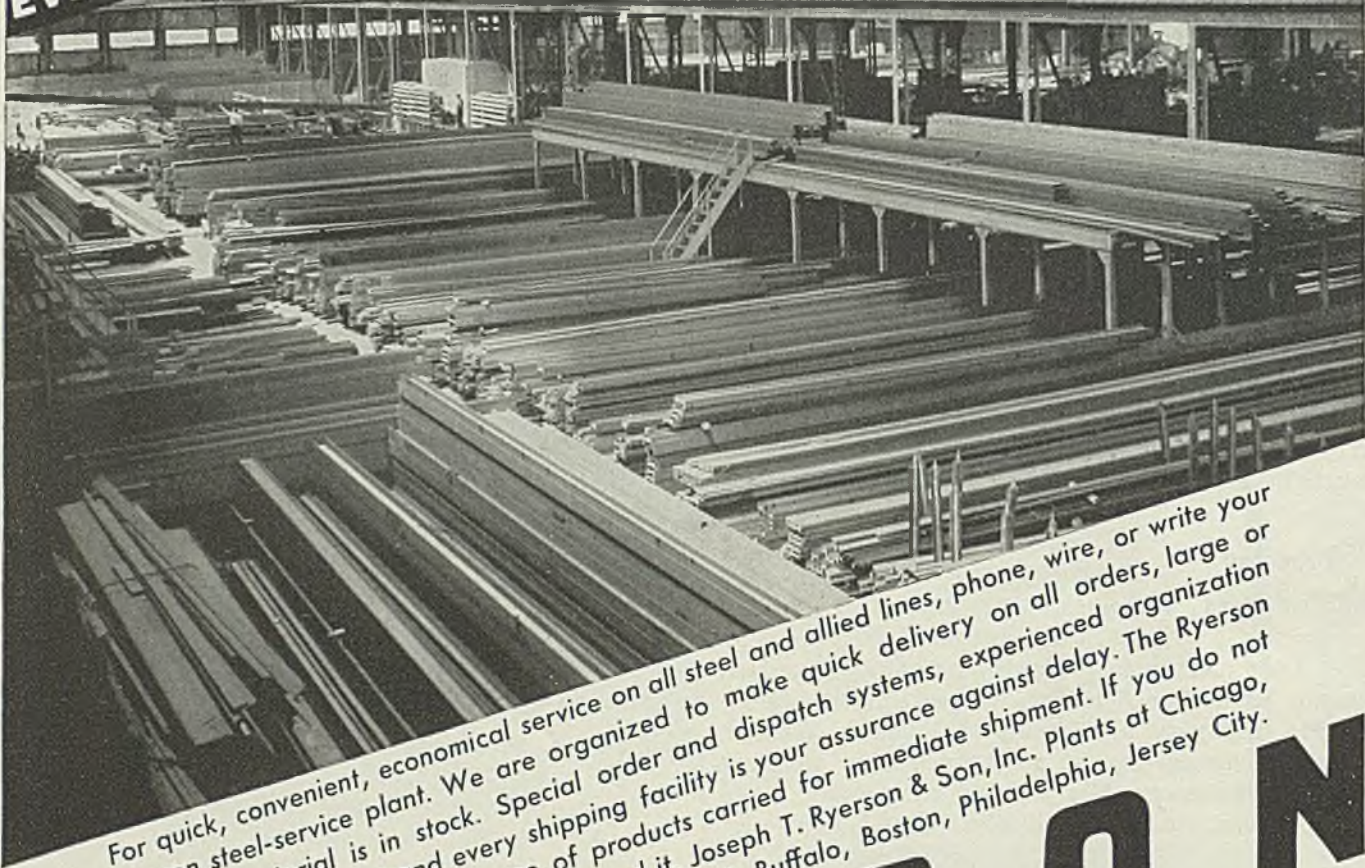
Hardening by Flame, Quench

The speeds and feeds of certain common machine tools is such that by substituting one or more blowpipes for the ordinary tool, adjusting the machine so that the flame plays on the metal for a certain predetermined time, and by providing for a suitable quench, accurate results can be obtained. . . . Industry is installing a number of exceptionally well-equipped laboratories. One of the newest (p. 39) is that which serves the Columbia Steel Co. unit of United States Steel.

E. L. Shaner

Immediate STEEL

EVERY KIND • FOR EVERY PURPOSE • IN STOCK • READY TO USE



For quick, convenient, economical service on all steel and allied lines, phone, wire, or write your Ryerson steel-service plant. We are organized to make quick delivery on all orders, large or small. The material is in stock. Special order and dispatch systems, experienced organization with modern equipment and every shipping facility is your assurance against delay. The Ryerson Stock List shows the complete range of products carried for immediate shipment. If you do not have the current issue, we will be glad to send it. Joseph T. Ryerson & Son, Inc. Plants at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON

BARS • STRUCTURALS • SHAFTING
PLATES • ALLOY STEEL • STAINLESS
TOOL STEEL • IRON & STEEL SHEETS
STRIP STEEL • FLAT WIRE • TUBING, Etc.

Unprofitable Orders Loom Large in Steel Mill and Warehouse Business

APPROXIMATELY half of the steel warehouse orders now being placed are unprofitable to sellers, according to comments developed by STEEL in well informed quarters. Major reason is that the quantities involved in some 50 per cent of the orders are too small to pay the selling and handling expenses, let alone the cost of the material itself.

This situation also affects the mills despite their policy of refraining as far as possible from the practice of accepting less-than-carload orders. This policy is one that cannot be enforced 100 per cent for various reasons.

It is estimated that at least 8 per cent of the individual orders received by mills are unprofitable. This is due to a number of reasons, but in most cases the loss results from the small quantities involved. In instances where mills seek to promote sales of specialties and cannot afford to decline small orders the ratio of unprofitable entries is much higher.

Some Typical Experiences

Magnitude of this situation is indicated by recent estimates by well informed authorities. These show customers on warehouse order books number approximately 250,000 whereas those on mill books number around 30,000.

How this condition affects iron and steel jobbers is revealed by some typical experiences. One large jobber specializing in higher priced finished steels reports that 40 per cent of all its customers during the past six months contributed only 10 per cent of its total sales.

Orders falling into this category averaged a total billing of but \$7.25 per month per customer. On all this business the jobber took a loss.

Another large jobber reports that 32 per cent of its billings in recent months have been comprised of single items of less than \$5 while 18 per cent included items of \$5 to

\$10. In other words, 50 per cent of this jobber's business involved orders coming to \$10 or less.

What can be done to eliminate excessive sales costs on small orders which, in effect, have to be made up out of the profits on large orders if the seller is to remain in business?

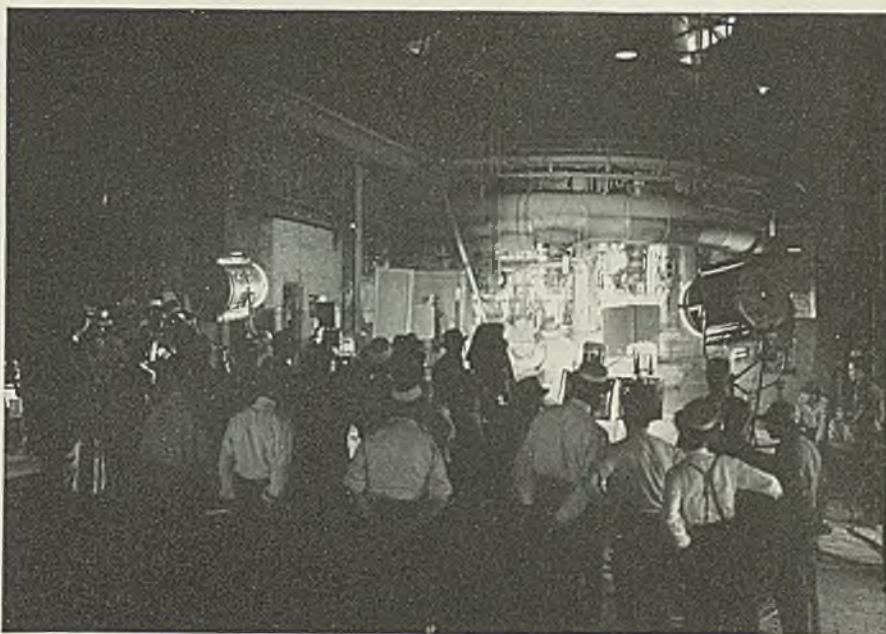
Some mill representatives believe there is not much they can do. On the heavier products the mills stick to the carload minimum, with the fewest number of exceptions possible while serving their customers and maintaining their sales promotional programs. This entire matter constantly is under keen scrutiny

by the mills with a view to keeping the percentage of unprofitable orders as low as possible.

The problem is equally difficult from the point of view of the warehouse industry. Some jobbers have considered a policy of setting a minimum limit on orders they will accept. Such a policy, however, is easier to enunciate than to enforce.

Other distributors believe a solution might be found in increases in quantity differentials on warehouse shipments. Last Jan. 1 an attempt to remedy the situation was made in some areas by increasing the differential on the first 100 pounds by

This Isn't Hollywood but—



A MOVIE crew of 21 photographers, technicians, electricians and other craftsmen making color films of activities at Carnegie-Illinois Steel Corp.'s Homestead works. With films already made at Hibbing and Duluth, Minn., Gary, Ind., and other points, and others still to be made, they will tell a complete story of steel production as conducted by various subsidiaries of the United States Steel Corp.

50 cents to \$1.50. This extra is reported as entirely insufficient to reimburse jobbers for their costs on small orders. It is a fact that the handling costs alone, without any steel, frequently exceed the amounts of the invoices.

This matter of quantity differentials involves a problem held to be far from simple. Many of the small orders, for example, come from consumers whose total business in the course of a year is extremely desirable.

Some well informed authorities believe that the problem best can be solved through intelligent planning

of steel purchases by the consumers themselves.

Many instances are cited where important industrial consumers make a practice of telephoning their orders as the requirements arise. In extreme cases warehouse deliveries to a plant average as high as seven to eight daily, often from the same warehouse.

Sellers declare that such consumers may enjoy substantial price savings through consolidation of orders while at the same time allowing the sellers to distribute their costs over large tonnages, thus avoiding unnecessary loss.

traffic most in badly jammed districts. In the elevated highway, except at specified locations for ramps, such delays are eliminated.

High-powered automobiles frequently are operated below horse-and- buggy speeds and one mile per hour was predicted at some New York points if congestion continues to increase. Speed doesn't exceed 15 miles an hour now for the city as a whole and more automobiles will further reduce the average.

The public, according to Mr. Conley, rapidly is turning from mass means of transportation. Chicago has done well on the problem of regulation, but congestion has not been lessened. In planning elevated highways, he pointed out the importance of the terrain. The Pulaski skyway, Northern New Jersey, has been a great convenience, not a luxury, and it is saving motorists more than the \$20,000,000 paid for its construction. Taking traffic above and over the cross streets, the elevated highway avoids congestion and promotes safety.

Costs for such projects are not out of line with surface paving, said Mr. Conley. He also pointed out taxes from motorists, the automotive and related industries would more than pay for the improvements.

Designs for the highway competition should provide for a H-20 loading or for an exclusive passenger automobile highway of similar strength. Actual size of the steel members need not be given. Loadings are given merely as a guide for proportioning materials and fixing construction limits. Two 11-foot

Elevated Highway Building Encouraged; Prizes Offered for Improved Designs

RECOGNIZING automobile traffic congestion in many large cities has reached a point threatening demand for products of related industries, including steel, American Institute of Steel Construction launched a campaign for building elevated highways at a highway dinner in New York Sept. 21.

National competition with attractive prizes for improved designs for elevated vehicular roads, better to conform to architectural requirements of city streets, was announced by the institute.

President Clyde G. Conley, Mount Vernon Bridge Co., Mt. Vernon, O., announced \$5000 will be paid for the best design, \$2000 for the second, \$1000 for the third and 10 additional prizes of \$100 each. Architects, engineers and others interested may compete.

Steel fabricators on the committee in charge includes R. C. Mahon, president, R. C. Mahon Co., Detroit, chairman; Albert Reichmann, vice president, American Bridge Co., Chicago; and C. M. Denise, general manager of sales, fabricated steel construction, Bethlehem Steel Co., Bethlehem, Pa.

Attended by representatives of the automobile, petroleum, roadbuilding, transportation and other industries, the assembly was told the elevated highway was an economical, efficient and safe solution of the congestion problem. Dr. Miller McClintock, director, Harvard bureau for traffic research, pointed out the appalling casualty list could not be materially reduced by educational and regulatory measures alone; that better highway facilities for the congested centers were needed for a permanent solution.

Success of the west side elevated

highway, New York city, repeatedly was stressed, that project being the first major one of its kind for traffic relief. President Conley declared even New York city and the country as a whole was far behind Europe in traffic safety measures. It was estimated New York state alone needed an expenditure of \$300,000,000 for express highways by 1950. About 37 per cent of the structural steel fabricated last year went into bridges.

New York with its still uncompleted west side elevated highway only has started such needed developments. Crossings are delaying

Elevated Highway Relieves Traffic Congestion



EXPRESS traffic is diverted from main north and south avenues in Manhattan by New York's five-mile elevated highway along the west side waterfront. Success of the project has caused demand for a similar elevated road to be built along East river on the other side of the island. Photo courtesy Ewing Galloway

operating lanes in each direction should be provided, lanes to be physically separated and with adequate outer guard rails. The structure should be designed to pass over existing thoroughfares without supports interfering with the free flow of surface traffic. Competitors may select actual sites and develop designs to meet actual conditions. Free clearance of 15 feet between the bottom of the elevated structure and pavement below should be allowed.

All structural members must be steel with materials for other parts suitable for design. Two drawings for each separate entry are allowed, each to be 20 by 32 inches with a half-inch margin on all sides included. Drawings are also to be mounted on stiff board. The first drawing must be used for a prospective sketch or a plain elevation drawing of the proposed structure without figures, dimensions or written descriptive matter. The second drawing will consist of an elevation covering at least one span and a cross section, showing supports and provisions for ingress and egress on a scale of one-eighth inch to the foot.

Jury for the contest includes: C. M. Pinckney, city engineer, New York; Harland Bartholomew, city planner, St. Louis; Paul P. Cret, architect, Philadelphia; Loran D. Gayton, city engineer, Chicago; Albert Kahn, architect, Detroit; Paul G. Hoffman, president, Studebaker Corp.; and Col. Willard T. Chevalier, president, American Road Builders association. Competition closes March 31, 1938, with drawings to be sent to V. G. Iden, secretary, American Institute of Steel Construction, 200 Madison avenue, New York.

Fears Government Control To Ruin Private Initiative

Unduly strict government regulation of private business is tending to destroy American industrial initiative and to start this country on the economic path now being taken by France. This is the opinion of Georges F. Doriot, professor of industrial management in the Harvard School of Business Administration, who has just completed a comparative study of economic conditions in the two countries.

Both countries have militant radical factions and both have conservative groups intent on holding positions already won, he pointed out. "In my opinion, present economic difficulties, including the restiveness of labor, are attributable equally to both groups, to the lack of liberality on the part of conservatives during the long period when

they were in power and to the extremism of the liberals and radicals now that they have obtained power.

"Increasing rigidity of governmental supervision is tending to weaken or destroy initiative and to give American and French business men closely kindred attitudes. It will be highly dangerous to the future of this country if the governmental encroachment extends too far."

Koppers Awarded Contract For Colorado Coke Ovens

Koppers Co., Pittsburgh, has been awarded a contract by the Colorado Fuel & Iron Corp. to erect a battery of 41 coke ovens and operating machinery at Pueblo, Colo. Amount of the contract was not revealed but is reported to be approximately \$1,000,000.

They will be Becker type, low differential, standard cross flow ovens, with self-sealing doors. Erection is to be completed by mid-August next year.

The present coke plant of the Colorado Fuel & Iron Corp. consists of 120 Koppers type ovens built in 1918 and 31 Becker type ovens built in 1930.

Rolling Mill To Spend \$2,000,000 at Butler, Pa.

American Rolling Mill Co. will spend \$2,000,000 for improvements at its Butler, Pa., plant, George M. Verity, chairman, announced last week at a community celebration of the company's tenth anniversary in Butler. Some improvements already are underway and others will be made as rapidly as possible, he said.

Foundry Equipment Sales Show Increase in August

Foundry equipment orders in August showed a sharp recovery from the decline registered in July, according to statistics of the Foundry Equipment Manufacturers association. The net order index for August was 257.5, compared with 204 in July, 228.2 in June and with 144.8 in August, 1936. Shipments also increased to 266.6 from 216.5 in July, which compares with 137.2 in August, 1936. The unfilled order index dropped slightly, 351.1 in August, compared with 360.3 in July and with 152.1 in August, 1936. The three months average of gross orders was 229.9 in August, compared with 224.7 in July. Indexes are based on averages of 1922-24 as 100 per cent.

Canada Buys More Steel From United States

Canada's iron and steel imports for July had a total value of \$18,886,000, compared with \$11,250,000 for the same month last year. Value of imports from the United States rose from \$8,263,000 to \$14,804,000. Principal items were machinery, \$3,774,000; automobile parts, \$1,841,000; plates and sheets, \$1,807,000; farm implements, \$1,613,000; automobiles, \$1,004,000; rolling mill products (miscellaneous) \$927,000; engines and boilers, \$623,000; castings and forgings, \$233,000; tubes and pipes, \$186,000; stamped and coated products, \$159,000; tools, \$137,000; pigs and ingots, \$128,000.

Exports for the month increased from \$4,979,000 to \$7,376,000. Value of exports to the United States was \$870,000, compared with \$581,000 in July, 1936.

Miscellaneous Demand for Stainless Steel Increases

Miscellaneous sales of stainless steel by Allegheny Steel Co., Brackenridge, Pa., today are facing more rapid growth than any other division of the company's business, according to W. J. McArdle, general manager of sales.

"More than one-third, 35 per cent, of our stainless steel sales this year are classified as miscellaneous, indicating rapid growth in the development of new uses," he said. "Miscellaneous now is our largest tonnage customer for stainless—larger than the automobile, chemical, food or dairy industries, which themselves started as 'miscellaneous' consumers."

Canada's August Ingot Output Shows Increase

Canada's production of steel ingots and direct steel castings in August totaled 126,695 gross tons, compared with 122,968 tons in July and 80,164 tons in August, 1936. For eight months total production was 962,840 tons; in the same period of 1936 it was 727,657 tons.

Pig iron output in August was 74,578 gross tons, compared with 79,736 tons in July and 38,570 tons in August, 1936. For eight months it was 578,258 tons and in the same months of 1936 it was 413,893 tons. Ferroalloy production in August was 9913 tons, in July 6285 tons and in August, 1936, it was 9290 tons. Eight months this year produced 47,816 tons of ferroalloys, compared with 51,050 tons in eight months of 1936.

Production

THE national steelworks operating rate declined 4 points last week to 76 per cent, as producers in the Pittsburgh, Chicago, Wheeling and Birmingham districts adjusted operating schedules to conform with lighter buying.

Youngstown—Held at 70 per cent, with 58 open hearths and three bessemer active. Carnegie-Illinois Steel Corp. will drop one blast furnace from its active list this week, and Youngstown Sheet & Tube Co. may take off one open hearth late in the week.

Central eastern seaboard — Unchanged at 63 per cent.

Cleveland-Lorain—Gained 1 point to 64 per cent, as Otis Steel Co. resumed with all eight furnaces. Republic Steel Corp. and National Tube Co. continue with 6 and 11 on, respectively.

Chicago—Declined 3½ points to 79½ per cent, due to curtailment by three mills. Some reduction in blast furnace operations for repair purposes may be necessary shortly, schedules recently being on the basis of 31 active stacks out of 39.

Pittsburgh—Down 11 points to 73 per cent, representing a closer relationship to actual bookings than had prevailed heretofore. This drop had generally been expected.

Wheeling—Down 7 points to 82 per cent.

New England—Held at 75 per cent. General and minor repairs on several open hearths will pull operations down to approximately 65 per cent this week.

Detroit—All 21 open hearths were melting the full week, bringing the rate back to 100 per cent.

Birmingham—Off 8 points to 83 per cent, due mainly to absence of

new business. Tennessee Coal, Iron & Railroad Co. shut down a second furnace at Fairfield, leaving the company a total of 11 active units.

Buffalo—Gained 4 points to 74 per cent last week, due to relighting of two furnaces down for repairs.

St. Louis—Unchanged at 74 per cent last week.

Cincinnati—Increased 9 points to 89 per cent, when two open hearths were added in this district. Three open hearths are idle, for repairs and reserve.

Meetings

TO HOLD COAL MEETING AT WEST VIRGINIA SCHOOL

A conference on bituminous coal and its uses is to be held at West Virginia university, Morgantown, W. Va., Sept. 29, under sponsorship of the university's school of mines and the West Virginia Coal Mining institute. Purpose of the meeting is to explain to coal operators, retail coal merchants and users of coal, the new problems affecting marketing.

Prominent officials of coal companies and associations are on the program for the combustion course. Among these are J. E. Tobey, manager, fuel engineering division, Appalachian Coals Inc.; Don Steele, chemist, and E. C. Payne, consulting engineer, Consolidated Coal Co.; C. J. Allen and D. T. Buckley, Koppers Coal Co.; and H. A. Glover, assistant to president, Island Creek Coal Co. Mr. Glover will discuss "Burning Equipment Versus Coal Selection."

HARDWARE ASSOCIATIONS GIVE CONVENTION PLANS

Preliminary plans for the forty-third annual convention of the National Wholesale Hardware association and seventy-fifth semiannual convention of the American Hardware Manufacturers' association at the Palmer House, Chicago, Oct. 18-21, have been announced. The two organizations will hold a joint opening session on the evening of the first day and another on the morning of Oct. 20. Wright Patman, congressman from Texas, will address the latter meeting on "Price Discrimination and Price Maintenance."

A meeting of the National Association of Sheet Metal Distributors, an affiliate of the Wholesalers association, is to take place on the afternoon of Oct. 19. This will be addressed by an executive of a prominent steel mill, and the conditions surrounding the distribution of flat and corrugated sheets, tin and terne plate, eaves trough and

conductor pipe, and prepared roofing will be considered.

GREAT LAKES SHIPPERS TO CONVENE IN DETROIT

Great Lakes Regional Advisory board announces its forty-fourth regular meeting to be held at Hotel Statler, Detroit, Sept. 29. The meeting is open and all producers, receivers and shippers of freight, and other representatives of industry and railroads and the public are invited. Included in the reports of commodity committees are those on automobile; automobile parts and accessories; coal, coke and ore; iron and steel; and nonferrous metals.

BLAST FURNACE GROUPS ARRANGE JOINT MEETING

Eastern States Blast Furnace and Coke Oven association and Blast Furnace and Coke Association of the Chicago district will conduct a joint meeting in Cleveland, Oct. 15. Headquarters will be at the University club. The program includes a luncheon, an afternoon session and a dinner.

CHICAGO PURCHASING AGENTS TO HOLD ANNUAL SHOW

Purchasing Agents Association of Chicago will conduct its ninth annual products exposition at Hotel Sherman, Chicago, Nov. 17-18. Companies affiliated with the association will display their products for the benefit of superintendents, engineers, foremen and production men, as well as industrial buyers.

The program includes a luncheon on Nov. 17, at which time speakers will discuss purchasing problems, and the annual banquet on Nov. 18.

NOTCHED BAR IMPACT TEST BRITISH MEETING TOPIC

First technical discussion under auspices of the joint committee on materials and their testing is to be held at the College of Technology, Manchester, England, Oct. 29. With notched bar impact testing the subject for the meeting, the following papers will be presented: "Physical Meaning of Impact Tests," by Prof. R. V. Southwell, University of Oxford; "Some Aspects of the Notched Bar Test," by L. W. Schuster, British Engine Boiler & Electrical Insurance Co., Manchester; and "Development and Present Position of Continental Research on the Notched Bar Impact Test," by Dr. Ing. Max Moser, Fried. Krupp, Essen.

Manchester Association of Engineers, which is organizing the meeting, is arranging to supply advance copies of the papers and to publish the proceedings. Inquiries should be addressed to the association secretary, St. John Street Chambers, Deansgate, Manchester, 3, England.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended	Change	Same week	1936	1935
	Sept. 25		Sept. 25		
Pittsburgh . . .	73	-11	74	46	
Chicago	79½	-3.5	73	59	
Eastern Pa. . . .	63	None	48½	35½	
Youngstown . . .	70	None	80	54	
Wheeling	82	-7	95	81	
Cleveland	64	+1	80½	67	
Buffalo	74	+4	81	47	
Birmingham . . .	83	-8	64	55½	
New England . . .	75	None	88	55	
Detroit	100	+5	95	94	
Cincinnati	89	+9	84	†	
St. Louis	74	None	†	†	
Average	76	-4	73	51	

†Not reported.

Financial

COLORADO FUEL & IRON NETS \$2.18 PER SHARE

In its first annual report the Colorado Fuel & Iron Corp., Denver, organized to acquire the assets and business of the Colorado Fuel & Iron Co. July 1, 1936, reports net earnings for the fiscal year ending June 30 of \$1,207,849 equal to \$2.18 a share on the 553,125 common shares outstanding. A dividend of \$1 a share on common stock was paid March 31.

AMERICAN SHIPBUILDING NET SHOWS MARKED INCREASE

American Shipbuilding Co., Cleveland, report for the fiscal year ended June 30 shows net profit of \$452,518 after all charges. This equals \$3.52 a share on 127,683 shares of common stock after 7 per cent preferred dividend requirements, compared with \$1.31 a share or \$171,546 in the preceding fiscal year.

CAPITAL STOCK ADJUSTMENTS

Stockholders of Ludlum Steel Co., Watervliet, N. Y., have approved an increase in authorized common stock to 1,000,000 shares from 500,000. It is planned later to offer stockholders rights to subscribe to not more than 125,000 shares, balance to be held in treasury for future requirements.

Stockholders of Pittsburgh Steel Co., Pittsburgh, have approved the recapitalization plan proposed by directors which will eliminate arrearage on present 7 per cent preferred, which on Oct. 1 will amount to \$43.50 a share or a total of \$4,583,000.

McKeesport Tin Plate Co., McKeesport, Pa., stockholders will vote Oct. 18 on authorization of 100,000 shares of new preferred stock to provide about \$5,000,000 additional capital. Of the proceeds \$2,000,000 will be employed to liquidate bank loans, \$550,000 for additions and equipment at plants at Baltimore, Maspeth, N. Y., Hamilton, O., and Boston, and the balance to reimburse the treasury for capital expenditures.

Upson-Walton Co., Cleveland, has filed a registration statement with SEC contemplating the issuance of 20,000 additional \$1 par value common shares. After issuing the 20,000 shares there will be 140,000 shares outstanding. Proceeds from this financing, estimated at approximately \$150,000 gross, are to be used to reduce bank indebtedness, purchase new equipment and increase current cash position.

Stockholders of the McCord Radiator & Mfg. Co., Detroit, will be asked at a meeting Oct. 25 to approve

issuance of a special stock in payment of accrued dividends on class A stock.

Pressed Metals of America Inc., Port Huron, Mich., has filed amendment with SEC, delaying until Oct. 25 its offering to common stockholders of 12,429 additional shares at \$25 a share.

Directors of American Stove Co., St. Louis, have called a meeting Oct. 13 for approval of recommendations to split the stock 5 for 1. A dividend of \$2 a share on the present stock was declared, payable Sept. 30 to stock of record Sept. 16. This makes \$4.50 voted so far this year and compares with the \$3 regular and \$4 extra paid in all of 1936. The company has 140,000 shares of no-par common stock authorized, of which 107,998 shares were outstanding Dec. 31 last. After the split up there would be a total of 539,990 shares outstanding.

Directors of New Britain Machine Co., New Britain, Conn., announced their approval of a plan to issue 15,000 additional shares of unissued but authorized stock before the end of the year, in the ratio of one new share for each six held, at \$25 a share. The new capital is to be used to finance expanding business. Application to issue the stock will be filed with the SEC. Earnings from Jan. 1 to Aug. 14 this year equaled \$4.04 a share.

DIVIDENDS DECLARED

American Smelting & Refining Co., New York, recently declared an interim dividend of \$1.75 a share on common stock, payable Nov. 30 to stock of record Nov. 5. On Aug. 31 a dividend of 75 cents was paid.

Laclede Steel Co., St. Louis, has declared a dividend of 25 cents a share, payable Sept. 30 to stockholders of record Sept. 21. Payment of the same amount was made the preceding quarter.

Cleveland-Cliffs Iron Co., Cleveland, has declared a dividend of \$1.25 a share, payable Oct. 5 to stock of record Sept. 29. This will make \$3.75 the directors have voted this year on the \$5 preference stock.

Emerson Electric Mfg. Co., St. Louis, has declared a dividend of \$31.50 on the preferred stock, thus clearing arrearages on the issue; and also the current quarterly dividend of \$1.75 on the preferred stock, both payable Sept. 27 to record Sept. 24.

The Allegheny regional board's forecast of greater Pittsburgh district's carloadings for the next three months estimates revenue freight cars handled will total 1,038,032, a gain of 2.7 per cent over the corresponding quarter in 1936 and the largest carloadings since the peak year of 1929.

China Devoid Of Steelworks

CHINA now is entirely devoid of steelmaking facilities as its four units are within Japanese-dominated territory. Two of the four are Japanese-owned. One is located across the river from Shanghai at Pootung and the other three in Shanghai proper.

The Chinese ministry of industry recently announced plans for a large modern steelworks, but it is believed current hostilities disrupted these plans.

Pig iron production facilities also either are antiquated or controlled by the Japanese. According to statistics available, China produced a total of 650,000 tons of pig iron in both 1936 and 1935.

Ore reserves, which have been sufficient to support a crude native industry for 25 centuries, would not support a modern industry with capacity equal to that of the United States for more than nine years. For many years China was an outlet for scrap material such as old horseshoes, files, tin plate clippings, bar ends, etc., which the handymen fashioned into useful articles. Horseshoes became plow points, and old files, knife blades.

Chinese imports of iron and steel were 70,000 tons in 1890 and by 1935 and 1936 had increased to more than 500,000 tons.

Rising Prices Seen as Threat to Recovery

Rising prices and unwarranted labor demands will hinder business recovery unless checked by reasonable restraint on the part of business and labor leaders, says Henry H. Heimann, executive manager, National Association of Credit Men, in his monthly business review.

The situation abroad and spiraling prices at home makes necessary downward revisions of business expectations expressed earlier, he predicts.

"Some of the unwarranted labor demands by irresponsible union leaders are impossible. Were these demands to become nation-wide and agreed to, we would soon experience another setback—a unionization depression."

Pennsylvania steelworks employment in August declined 0.2 per cent from July but was 21.2 per cent above August, 1936, according to the Federal Reserve bank at Philadelphia. The bank's August index stood at 85.8, with the average from 1923 to 1925 taken as 100.

Labor

HEATED arguments between company counsel and the national labor relations board attorneys and examiners continued to mark the tedious hearings in three independent steel company cases last week.

The Republic Steel Corp. hearing was shifted to Cleveland from Youngstown, O., Thursday. Evidence it had not coerced employees nor dismissed workers for union activity was presented by the company. Board attorneys continually objected to Republic's defense evidence and objections generally were upheld by John T. Lindsay, trial examiner.

Counsel for Weirton Steel Co. in the hearing at Steubenville, O., obtained an admission that the SWOC had conferred on several occasions with national labor relations board officials before filing charges against the company.

In response to questioning, Clinton S. Golden of the SWOC testified that "on several occasions after we had reports of interference with the work of our organizers, we called upon the labor board and told them about it."

SWOC Official Won't Tell

Later at Johnstown, Pa., where a hearing against Bethlehem Steel Co. is being conducted, Golden refused to say whether membership in the Amalgamated Association of Iron, Steel and Tin Workers carried with it membership in SWOC. Attorneys for the labor board suggested Golden answer if able to do so, but the union officer remained silent.

The Steubenville hearing resulted in several heated clashes by opposing counsel during the week. Trial Examiner E. G. Smith's rulings were frequently protested by attorneys for the company as being unfair.

A former Weirton employe testified he was discharged because he was elected a SWOC officer. A few minutes later he admitted under cross-examination he had been denied United States citizenship because he was a communist.

In Pittsburgh, officials of the Heppenstall Co., seeking an injunction to stop picketing at their plant, charged police stood idly by during rioting on Aug. 23. No arrests were made and there were no attempts to disperse crowds, the court was told.

The strike of the Heppenstall Co. started July 12.

Numerous independent unions of steelworkers last week applied to the secretary of state's office in Harrisburg, Pa., for corporate charters.

The groups proposed to establish civil liability and to insure validity of working agreements entered into with employers. Among the many applications filed were such groups as The Independent Brotherhood of Moltrup Steelworkers, the Independent Protective Association of Employes of Union Drawn Steel Co., the Ideal Foundry & Machinery Co. Employes association, and others.

At Youngstown, 14 cases arising from steel strike disorders were disposed of when 29 defendants pleaded guilty. Twenty pleaded guilty to assembling with intent to riot and were fined \$25 and costs. Thirty-day jail sentences were suspended. Nine pleaded guilty to carrying concealed weapons and paid fines of \$50 and costs.

Eleven cases were nolle prossed because defendants were named in more than one case. Four were dismissed.

INLAND GROUP INSURANCE REACHES ALL-TIME RECORD

Group insurance totaling \$33,759,900, covering lives of 17,544 Inland Steel Co., Chicago, employes, was in effect Aug. 31. This is an all-time record, both in amount and number of employes protected. It averages more than \$1900 per employe.

Inland's insurance plan covers all employes from laborers to executive officers. Policies are from \$1000 to \$10,000. Costs are paid jointly by the company and employes.

Since its institution in 1930, 400 claims totaling \$534,575 have been paid. This averages \$1336.

HARVESTER TO DISBURSE \$4,400,000 TO EMPLOYEES

International Harvester Co., Chicago, will distribute \$4,400,000 extra compensation to its 65,000 employes in the United States and Canada. This year's payment is approximately double last year's. It will be disbursed after Oct. 31, end of the company's fiscal year.

Employes with one full year's service will receive compensation equal to one week's pay. Those with two years' service will receive two weeks' extra pay and those with three years or more, will receive three weeks' extra pay.

PRICES, OUTPUT LAG BEHIND INCREASES GRANTED LABOR

Industry has not been compensated either through increased production or better prices for the higher wages and shorter hours granted labor in the past year, according to the National Industrial Conference board.

Between July, 1936, and July, 1937, labor cost per man-hour in-

creased 14.9 per cent, says the board. "This increase in labor cost has not been offset by increased productivity, either on the part of labor or through mechanization and improved methods. Number of man-hours per unit of output increased 3.8 per cent, while the output per man-hour in July, 1937, was 3.7 per cent below that for July, 1936. As a result labor cost per unit of output has risen 19.3 per cent during the past year, and labor cost per each \$100 value of output, which takes into account the rise in prices, has increased 9.6 per cent."

METAL TRADES EMPLOYMENT FALLS SLIGHTLY IN AUGUST

Metal trades employment in 22 leading cities declined slightly in August, according to the National Metal Trades association, Chicago. The association's index for August stood at 104.7 per cent, 0.2 less than in July. Index is based on monthly average from 1925 to 1927.

U. S. HAS FEWER STRIKES THAN FOREIGN COUNTRIES

Industrial disputes in general have been less widespread in the United States than in other countries, Canada and Irish Free State excepted, according to an analysis by the National Industrial Conference board.

From 1923 to 1929, an annual average of 38 persons per 10,000 population were involved in strikes or lockouts. This compares with averages ranging from 26 in Canada to 157 in Great Britain and Northern Ireland during the same years.

Between 1930 and 1936, the United States average had risen to 61. Irish Free State and Canada averaged 24 and 25, respectively. Spain averaged 194; Belgium, 170; France, 114; Poland, 84; Great Britain and Northern Ireland, 63.

General strikes have been responsible for the relatively large number of persons involved in industrial disputes in certain years. In Great Britain, for example, 605 persons per 10,000 population were involved in strikes and lockouts in 1926, which accounts largely for that country's high average in the 1923-1929 period.

Canada Produces 17,941 Automobiles in July

Automobile production in Canada in July totaled 17,941, a sharp decline from June's 23,841, but an increase over the 10,475 made in July, 1936. Cars and trucks made for export totaled 8127, against 6809 in June and 4561 in July, 1936.

For seven months this year, production was 146,512 units, a 26 per cent increase over the 116,423 units made in the first seven months of 1936.

Men of Industry

JOHN MAY has been elected vice president in charge of sales, American Steel & Wire Co., Cleveland, subsidiary of United States Steel Corp. He succeeds Dennis A. Merriman, who is retiring. Mr. May's service with the company dates back to February, 1909, when he was employed in the order department of the New York office. He then was transferred to Worcester, Mass., as assistant to the educational director, and later returned to New York as correspondent in the electrical and wire rope sales division. He held positions as assistant manager of sales, manager of sales, assistant general manager and in March this year was made general manager of sales.

Mr. Merriman retires after better than 46 years' service with the company and its predecessors, having first been employed as a salesman with the St. Louis Wire Mill Co. in 1891. He was general manager of sales from December, 1927, to February, 1937, and had been vice president since April, 1928.

Gustav Laub, general manager of sales, Vanadium Corp. of America, New York, has been appointed assistant vice president and general manager of sales of the company.

W. A. Haven, vice president, Arthur G. McKee & Co., Cleveland, sailed Saturday for England. He will spend considerable time at the plant of the Appleby-Frodingham Steel Co. Ltd., Scunthorpe, Lincolnshire, England.

J. A. Callahan, head of the diversified division of Briggs Mfg. Co., Detroit, for the past seven years, has resigned. He is succeeded by W. F. B. Henderson, who has held several executive positions with the company.

Sydney W. Jones has been appointed purchasing agent, Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y. He succeeds the late Adelbert G. Clark. Mr. Jones has been identified with the engineering department since 1919.

Charles H. McKnight has become associated with Allegheny Steel Co., Brackenridge, Pa., as special sales representative. Following graduation from Virginia Polytechnic institute with a degree in electrical engineering, he immediately joined



John May

General Electric Co. where, save for the war-time years, he had been employed since 1912. He held positions as general supervisor of inventory control, general supervisor of salvage work, general supervisor of waste and spoilage control and during his last few years devoted his time to special cost reduction activities.

C. E. Noble has been placed in charge of the Pittsburgh office recently opened by the Pyrometer Service & Supply Corp., Cleveland. Previous to his association with the Pyrometer corporation he was assistant metallurgist, E. C. Atkins Co., Indianapolis.

E. S. Webster has been appointed district manager of sales at Baltimore for Central Iron & Steel Co., succeeding H. M. Foster, resigned. He has been associated with Central the past ten years in sales capacities, with headquarters at Harrisburg, Pa.

W. R. Persons, who has been working in the Pittsburgh office of Lincoln Electric Co., Cleveland, since the fall of 1934, has been



Charles H. McKnight

named manager of Pittsburgh welding sales. He will be assisted by J. H. Painter, M. S. Schonvizner, R. H. Schuster and H. E. White.

C. A. Carrell has been named sales representative in Georgia for Acme Steel Co., Chicago. He will take up the sales and service duties performed by the late Hugh Duane. Associated with Acme Steel for 17 years, he will make his headquarters in the Atlanta office.

L. O. Burrell and W. A. Snyder, formerly identified with Crucible Steel Co. of America, have been appointed to the Buffalo sales staff of Peter A. Frasse & Co. Inc., New York. They will specialize in tool and alloy steels. C. Paul Erlenbach, also formerly with Crucible, has been appointed, in a like capacity, to the New York sales staff.

William G. Mather, chairman of the board, Cleveland-Cliffs Iron Co., Cleveland, celebrated his eightieth birthday anniversary Sept. 22. A group of Michigan division officials joined Cleveland associates at a birthday dinner for the man who was president of Cleveland-Cliffs 41 years. In 1933 he assumed the chairmanship.

F. S. Spear has become identified with the Young Radiator Co., Racine, Wis. He will supervise the production of Young products being supplied to the automotive, tractor, air conditioning and heating industries. He formerly had been associated with Stewart-Warner Corp., Chicago, and before that was with the Oliver Farm Equipment Co. and Hart-Parr Tractor Co.

G. R. Munschauer was honored Sept. 14 with a testimonial ceremony and presentation on the occasion of his fortieth anniversary with the Niagara Machine & Tool Works, Buffalo. During his 40 years association with the organization, Mr. Munschauer has actively served in all divisions of the business. He became president and general manager in 1918.

H. S. Reizenstein has been appointed contract manager of Westinghouse Electric International Co. A graduate in electrical engineering and business administration from the University of Pittsburgh, Mr. Reizenstein entered the Westinghouse company in 1910. In 1913 he became manager of the order department; in 1915, manager of the price department of the International company. He served as manager of the advertising department from 1918 until being made contract manager. Mr. Reizenstein will have charge of the following important related divisions: Order division, stock control

division, purchasing division, and clerical division.

Carl E. Petersen has been placed in charge of the New York office of Newport News Shipbuilding & Dry Dock Co., 90 Broad street. As noted in STEEL, Sept. 18, page 28, the company is concentrating many of its New York activities at Newport News, Va., with the result that Capt. Roger Williams, vice president, and James Plummer, H. Kenneth Peebles and D. G. Moorehead are moving their offices to Virginia.

C. Clark Wales has resigned as chief engineer of Otis Steel Co., Cleveland, to become associated with Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., in the capacity of as-



C. Clark Wales

stant general manager, effective Sept. 15. He joined Otis Steel in 1925 as assistant chief metallurgist and later became superintendent of the open hearth, bloom and bar mills. He was made chief engineer in 1929.

Ray Fenton has been named chief engineer for the Otis company. He formerly had been manager of the sheet, tin and strip division of Aetna-Standard Engineering Co., Youngstown, O., and before that was chief engineer for Newton Steel Co.

R. D. McManigal has been appointed manager of the central station and transportation division of Westinghouse Electric International Co. He joined the Westinghouse company in 1915. For seven years, except for a period of service in the navy during the war, he was in the general engineering division at East Pittsburgh. In 1922 he went to Japan as railway specialist for Westinghouse Electric International Co. and later was made managing director of the Westinghouse Electric Co. of Japan. In 1931 he returned to New York as assistant

to the manager of the central station and transportation division. Mr. McManigal will make his headquarters at 150 Broadway, New York.

Charles H. Keeney, who prior to 1928 was associated with Connecticut Blower Co., Hartford, Conn., maker of air handling equipment, has again become identified with the company as general manager and chief engineer. A mechanical engineer and a native of Connecticut, Mr. Keeney has had a wide experience of over 29 years, technical and practical, in the blower field. He has invented and patented a number of machines, products and systems in the air handling equipment line.

Ralph L. Wilson, formerly metallurgical engineer, Timken Steel & Tube division of Timken Roller Bearing Co., has become associated with Climax Molybdenum Co., in the capacity of metallurgical engineer in its development field. He will make his headquarters in the Canton, O., offices of the company. A graduate of Lehigh university in 1921, Mr. Wilson served on the metallurgical staff of United Alloy Steel Corp. from 1921 to 1926 and with its successor the Central Alloy Steel Corp. until 1928. He then joined the Timken organization as assistant metallurgical engineer.

John McC. Latimer has been appointed exclusive representative in the western Pennsylvania territory by Lukenweld Inc., designer and builder of welded steel structures, Coatesville, Pa. His headquarters are in the Koppers building, Pittsburgh. Following graduation from Lehigh university as a civil engineer in 1918, he enlisted in the army engineer corps and after his discharge joined the Easton Car & Construction Co., Easton, Pa. In 1925 he



John McC. Latimer

established his own business as a manufacturers' representative, handling the accounts of Easton Car & Construction Co., Worthington Pump & Machinery Corp. and DeWalt Products Corp.

Died:

WILLIAM G. COSTIN, 62, chairman of the board and treasurer, Pittsburgh Screw & Bolt Corp., Pittsburgh, in that city, Sept. 21. Born on the eastern shore of Virginia in Northampton county, he went to Pittsburgh at the age of 19. After a year in a clerical position with a packing firm, he entered the employ of the newly formed Pittsburgh Screw & Bolt Co. In 1899 he was named secretary; in 1903 was made general manager, in 1909 he was elected president and in 1921 chairman.

Max F. Schwab, 50, superintendent, Luntz Iron & Steel Co., Canton, O., in Cleveland, Sept. 12.

John G. Ralston, 59, for seven years president, Reynolds Wire Co., Dixon, Ill., in that city, Sept. 22. He had been associated with the company 26 years.

John C. Kahl, 57, manager of the Vandergrift, Pa., plant of United Engineering & Foundry Co., Pittsburgh, Sept. 21, in that city. He had been manager of the Vandergrift plant 21 years.

C. L. Hippensteel, 40, a member of the technical staff of Bell Telephone Laboratories, New York, in Montclair, N. J., Sept. 20. For the past 16 years he had been engaged in chemical research on the atmospheric corrosion of protective metal coatings on iron and steel. He was a member, American Chemical society, American Electro-chemical society and American Society for Testing Materials.

E. C. Felton, 79, long prominent in the steel industry until his retirement in 1916, in Haverford, Pa., Sept. 18. Thirty-six years with the steel industry, he served for 20 years as president of the Pennsylvania Steel Co., which later was absorbed by the Bethlehem Steel Co. He was a director of the Pennsylvania railroad at the time of his death. He was a member, American Iron and Steel institute, American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers and Franklin institute.

Activities of Steel Users and Makers

AMERICAN ROLLING MILL CO., Middletown, O., reports shipments of iron and steel sheets, exclusive of its subsidiary companies, were greater in the first eight months of 1937 than in any comparable period in the company's history. They were 48 per cent larger than in the first eight months of 1929 and 14 per cent over 1936. An important factor has been the expanding use of iron and steel specialty grades of sheets used in the manufacture of ranges and refrigerators. Shipments of stainless sheets and strip have also shown a very large increase.

Smith Power Transmission Co., Cleveland, has moved its offices, shops and warehouse into new quarters at 410 Lakeside avenue, Northwest.

Iron & Steel Products Inc., Hegewisch station, Chicago, has purchased for dismantling lumber mills at Andrews and Georgetown, S. C., and Burgaw, N. C.

Armstrong Mfg. Co., 2135 Northwest Twenty-first avenue, Portland, Oreg., has added to its line of products a new automatic rip saw sharpening machine.

Republic Steel Corp. has resumed operations at its No. 2 electric weld pipe finishing mill in Youngstown, O., following a fire at the paint machine serving this mill.

Heppenstall Co., producer of dies, forgings, shafting and other similar products, has moved its New York offices from 30 Rockefeller Plaza, to the Singer building, 149 Broadway.

Bliss & Laughlin Inc., Harvey, Ill., has completed construction of its new plant addition at Buffalo. The additional space is to be used largely for storage, but will be available for expansion of manufacturing activities if business volume warrants.

Wrought Washer Mfg. Co., Milwaukee, manufacturer of washers and stampings, is celebrating its fiftieth anniversary this year. When the company, then known as the Nut & Washer Mfg. Co., started business in 1887, it produced about a ton of washers a day, whereas today it is equipped to produce 70

tons of washers daily in thousands of sizes and shapes.

Western Hardware Mfg. Co., Milwaukee, recently developed a new line consisting of five sizes of portable forges and also two sizes of hand forge blowers, in addition to its line of tool grinders, grinding heads, saw mandrels, etc.

Crucible Steel Co. of America has appointed Peter A. Frasse & Co. Inc., New York, as distributor of Crucible high speed and tool steels in the New York, Philadelphia, Buffalo, Rochester, Syracuse, and Jamestown, N. Y., Hartford, Conn., and Baltimore districts.

Edward G. Budd Mfg. Co., Philadelphia, has started work on a stainless steel, light-weight elevator platform to be installed inside the dome of the 200-inch reflector telescope to be erected on Mt. Palomar, Calif. The elevator is being fabricated through use of the Shotweld process.

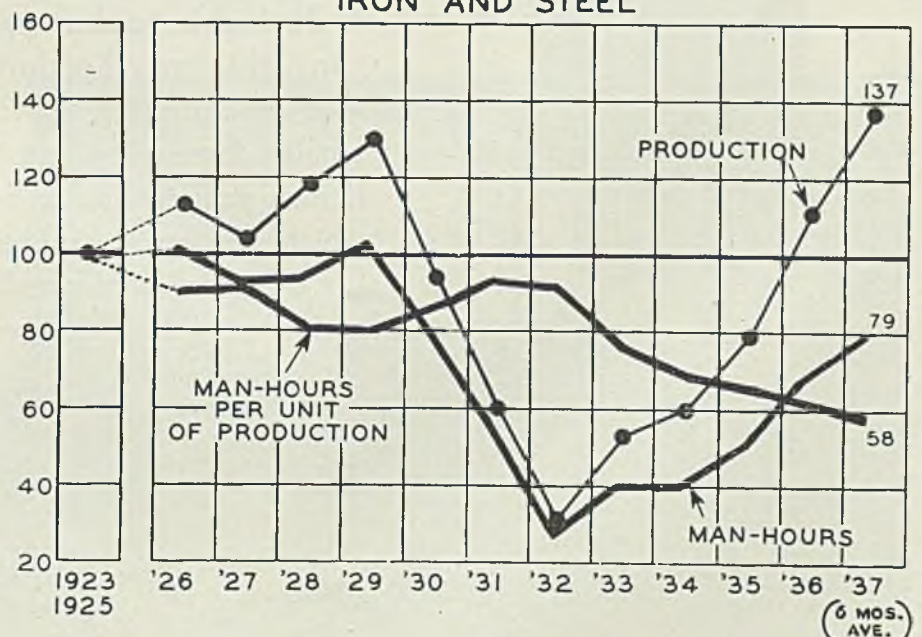
Commonwealth Edison Co., Chicago, reports air conditioning contracts closed in Chicago during August set a new high, both in number and capacity of installations. Contracts for 51 installations were completed, compared with 27 closed

in the corresponding month of 1936, an increase of 89 per cent.

The following six industrial companies have contracted for exhibit space at the New York World's Fair of 1939: Timken Roller Bearing Co., Canton, O.; American Chain & Cable Co., New York; A. B. Dick Co., Detroit; Underwood-Elliott-Fisher Co., New York; American Radiator & Standard Sanitary Corp., New York, and Baker & Co., Newark, N. J.

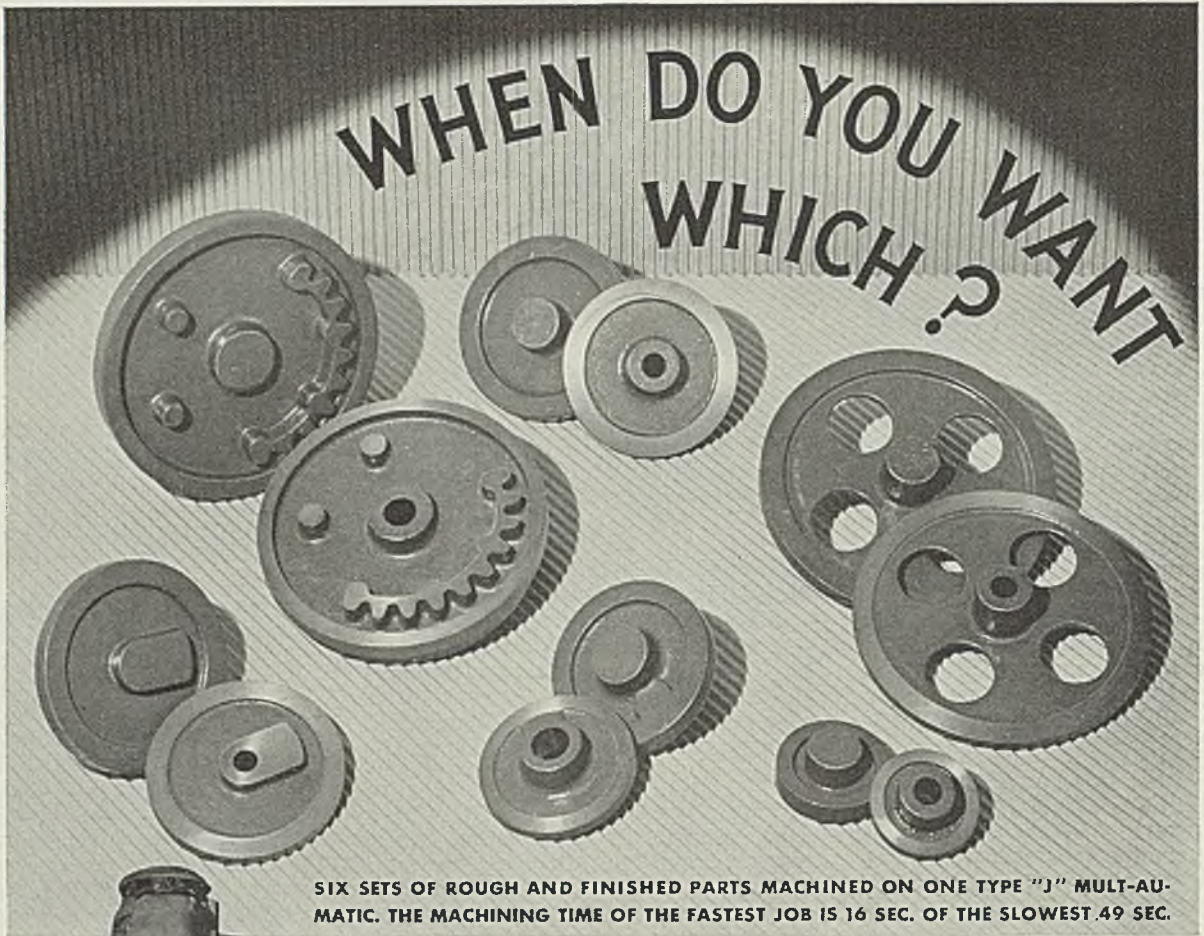
Berger Mfg. Co., Canton, O., a subsidiary of Republic Steel Corp., Cleveland, has acquired a five-year lease on a three-story warehouse, with 40,000 square feet of floor space at 1431 North Second street, St. Louis, to be used as a source of supply in this territory for Berloy blue label sheet metal building products. The Berger company has a 30-acre plant at Youngstown, O., where it manufactures building products. Horace A. Williams has been appointed manager of the new warehouse. He was formerly with the Berger company, which he served in various capacities from 1910 to 1930, when the concern temporarily discontinued the manufacture of building products. He has since been active in the sheet metal industry in the St. Louis territory.

Man-Hours Per Unit of Steel Production Decline
IRON AND STEEL

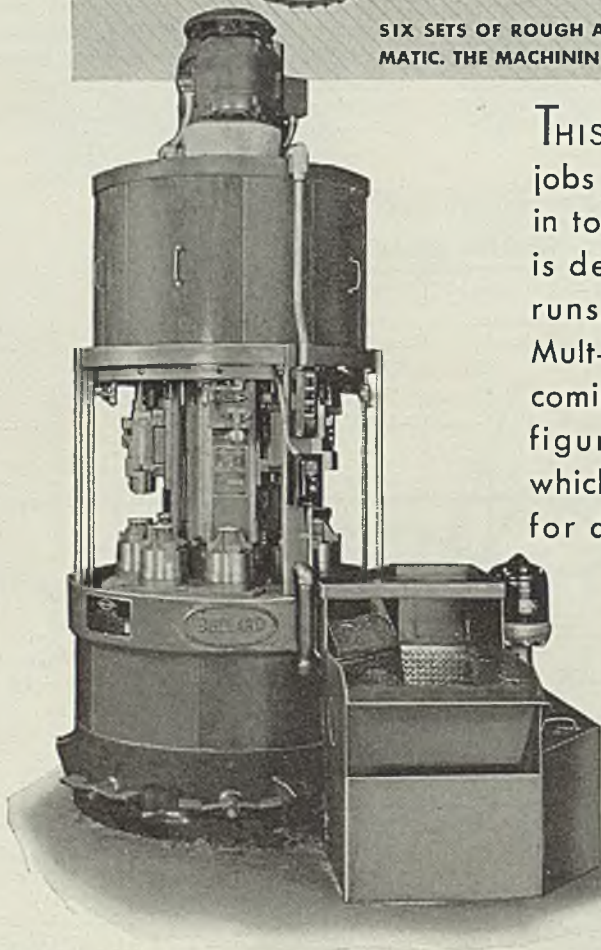


DECLINE of labor's proportional contribution in the iron and steel industry is illustrated in this National Industrial Conference board chart. Here the board uses "man-hours per unit of production" to measure labor requirement, indicating more clearly labor's relation to output than the commonly used "production per man-hour." The latter often is misinterpreted as indicating increasing efficiency or productivity of labor when increase is due to greater use of machinery and mechanical power

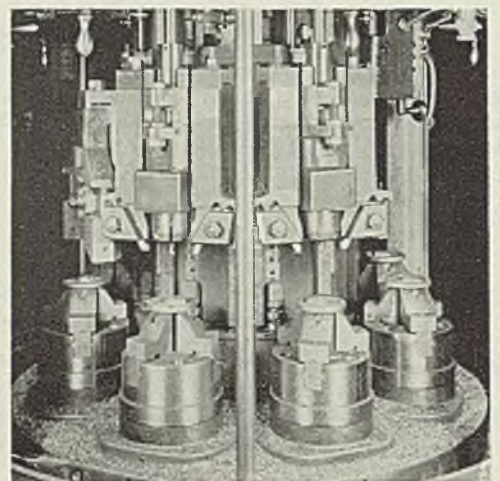
WHEN DO YOU WANT
WHICH?



SIX SETS OF ROUGH AND FINISHED PARTS MACHINED ON ONE TYPE "J" MULTI-AU-MATIC. THE MACHINING TIME OF THE FASTEST JOB IS 16 SEC. OF THE SLOWEST .49 SEC.



THIS Multi-Au-Matic is tooled to do several different jobs at periodic intervals with only slight changes in tooling set-up . . . However, if for any reason it is desirable to change the sequence of schedule runs, this may be done simply and quickly . . . Multi-Au-Matic tooling to meet such conditions is becoming increasingly popular. Let Bullard Engineers figure your jobs for Series Runs . . . those jobs which are approximately the same design except for dimensional or slight contour differences.



THE BULLARD COMPANY

BRIDGEPORT

CONNECTICUT



MIRRORS OF MOTORDOM

DETROIT

BY A. H. ALLEN
Detroit Editor, STEEL

ALL production of 1937 passenger car models having been completed, and a good start made on the upswing to 1938 assemblies, the labor question is becoming more and more important. What will be the attitude of union labor, and more particularly those who are directing the UAW movement, toward employers once the slack has been drawn out of the labor market? What will be the attitude of UAW button-wearers toward their leaders? What will be the net effect on pay envelopes?

One shrewd observer in this district, who has been intimately associated with automobile production over the past decade, when asked these questions, replied substantially as follows:

Figure it out for yourself. In the 1937 model season up to inventory, labor in most cases was putting in 45 hours of work per week. This included the regular 40 hours and 5 hours of overtime at time-and-a-half pay. Assume an hourly rate of \$1. This means a weekly pay envelope of \$47.50.

Will Try To Avoid Overtime

Now, when the 1938 production season gets into full swing, the work week is going to be 40 hours—no more if it can be helped. The weekly pay envelope will be reduced just 19 per cent. After he deducts his union dues, the laborer's earnings will be whittled still further.

A 20 per cent cut in pay is something to be reckoned with, and it seems reasonable to expect a howl to be forthcoming. But, the automobile dealers can say: "You asked for a reduction of the work week to 40 hours, so we have given it to you. We have gone to great expense to re-equip and modernize our plants so that we can keep up with production demands and still avoid overtime work which makes serious inroads on costs. It has taken us about six months to adjust our facilities to accomplish this, but

it has been done, so what now?"

The answer inevitably will be demands for higher wages, or a drift on the part of the men toward a calm balancing of just what their union affiliation has and has not brought them. Considering automobile prices have been advanced twice within the last two months to keep up with rising material costs and wage increases granted earlier, it is difficult to see how further upward adjustments in wages can be made.

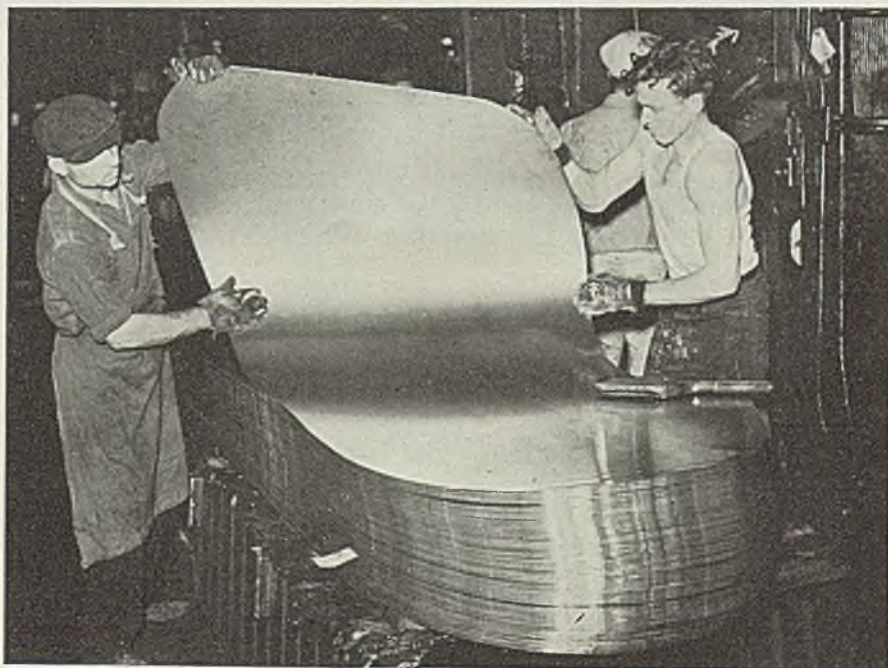
But already the UAW is reported to be asking General Motors for

higher minimum rates, reduction of the work week to 35 hours, vacations with pay and other concessions in exchange for extending permission to the company to discipline instigators of "wildcat" strikes. A committee representing the UAW has been conferring with General Motors officials, but negotiations have been slow, at the moment suspended, and no agreement has yet been reached.

Naturally, elimination of overtime work means an appreciable saving in labor costs which can be applied partly to amortize the huge investment in equipment, and partly to provide a cushion for further wage increases.

Plymouth local of UAW last Thursday presented new demands

Fender Blanks Receive Preliminary Bend



FRONT fender blanks for Pontiac are given a preliminary bend by hand before the first press drawing operation. Sheet steel blanks of the peculiar shape shown are required for the long-deep-drawn fenders currently in use



MIRRORS OF MOTORDOM

to the management including minimum hourly wage of \$1, posting of seniority dates on timecards, time and a half for Saturday and double time for Sunday, discharge by the company of officers of independent Chrysler Employees association and reinstatement of three UAW men recently discharged for part in fight.

Attempts are being made to iron out the dissension in plant over production speeds on 1938 models. Negotiations with the management started at once.

Other rumblings of discontent echo around motordom and are interpreted by some as symptoms of what is to come. The UAW local at the Yellow Truck & Coach division of GM in Pontiac took a secret strike vote last week in protest over the company's proposal to pay production men, regularly receiving 95 cents an hour, only 80 cents an hour during inventory this week. Count of votes showed 2804 to 238 in favor of the strike. Union officials announced Friday that the controversy had been settled and the strike threat removed. It was understood a compromise was reached with the management.

"Deputies" Jail Nonunionists

Members of the nearby Fishery Body local were scheduled to meet Sunday to discuss plant conditions, seniority, dismissals and a possible strike.

A strange incident occurred in connection with the Great Lakes Steel blast furnace construction job in Ecorse. The engineering organization erecting the stack brought in 25 skilled workers from Cleveland after it was found impossible to obtain the required help here. The men were nonunion and on several occasions demonstrations were called at the job site by the union of structural iron and steel workers, CIO affiliate. However, the trouble apparently was settled until last week when three of the men were seized by county deputies after leaving work, and thrown into jail. When five more of the crew went to the jail to inquire about their fellow workers, they too were jailed and held incommunicado for some five hours. Later it developed the deputies were members of the UAW, one of them being a business agent for the union. They claimed the men were held as "suspicious char-

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,775
7 mos.	2,674,825	3,045,714	3,374,195
Aug.	245,075	275,934	*370,000
Sept.	92,728	139,820	.....
Oct.	280,316	230,049	.....
Nov.	408,550	405,799	.....
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:

	Week ending	
	Sept. 25	Sept. 18
Aug. 28	.....	83,310
Sept. 4	.....	64,200
Sept. 11	.....	59,017
Sept. 18	.....	†30,150
Sept. 25	.....	28,030
General Motors	14,000	13,700
Ford	.....	† 5,000
Chrysler	3,075	† 1,750
All others	10,955	† 9,700

*Estimated. †Revised.

acters" and released them only after their employer and lawyers put in appearance and identified them. The county sheriff promised an "investigation."

ARCHITECTS are at work laying out the new press shop and body plant for Ford, mentioned in these columns several weeks ago. The structure will be two stories, it is understood, and will involve expenditure of close to \$5,000,000, adding appreciably to Ford's capacity on body production.

In reference to the statement in this column last week to the effect that Ford had closed on last-quarter sheet steel requirements for approximately 250,000 cars, it appears that comparatively little tonnage was purchased, a considerable portion of Ford's immediate requirements being supplied from its own mills and from stock. The larger sheet producers did not share in the recent allotment of tonnage and still are objecting to the changes in weight tolerances proposed by Ford.

Early schedules on Ford bodies

for 1938 indicate production for the model season is being set at around 1,100,000 jobs. Of these, Briggs will build a total of approximately 210,000 in three models, Murray about 140,000 in eight body styles, with the balance divided between Ford and Budd. The latter builds only commercial bodies, which would mean a total of possibly 650,000 bodies to be built at the Rouge plant.

In this connection it is interesting to note that Murray will have a considerably higher sample cost to charge against its production than will Briggs, while the latter will supply a greater total of bodies. A figure of \$8000-\$10,000 is mentioned as approximating the cost of building up a new body by hand preparatory to production.

Budd, incidentally, holds a number of important patents on steel body construction and some observers here will tell you this is one reason Ford gives Budd a portion of his body business. To what extent, if at all, present universally-used steel bodies may infringe on Budd patents is a matter too delicate to examine in detail, but there is no lack for speculation on the subject, and it gives corporation attorneys something to probe. Budd shortly will begin shipment of 175 Plymouth coupe bodies, assemblies previously made by Plymouth from stampings produced by Budd in Philadelphia.

Speaking of bodies, there are plenty of assembly line headaches being caused these days by delays in receipt or completion of new bodies. It is not an uncommon sight to see rows of bodies all ready for installation on chassis except for shortage of some part or parts. Hupp, for example, has been delayed rather seriously in receipt of plastic moldings for instrument panels, the difficulty being traced back to delays in cutting the dies for the part.

Hupp and Studebaker, by the way, were the first to release advertising on 1938 models, and the fact that this advertising had to be prepared from four to six weeks in advance of publication indicates the models pictured must have been hand-assembled samples.

TRUCK manufacturers are coming closer to the finish line for the current year and are drawing up preliminary plans for a bumper sales crop next year. Federal Truck shortly will be in the field with five new commercial models. Chevrolet is planning to realign its truck parts production facilities, with some sub-assemblies shifted to the new Tonawanda, N. Y., plant, in order to relieve congestion elsewhere. Chevrolet expects to turn out close to 180,000 commercial jobs next year.

(Please turn to Page 91)

SAVE

14%

in stock costs

WITH MANVILLE COLD HEADERS

● Are you turning out small parts with drop forging or screw machines? If you are, there is a good chance that Manville Cold Headers can save you much money. The older methods of making small parts use expensive bar stock. Now, Manville Cold-Forging machines often make these products from wire in coils. Wire costs about 14% less than bar stock. Sometimes the difference between the price of bar stock and wire is even greater.

There is every reason for cold forging small parts whenever possible.

Stock is cheaper. No stock waste. Production 20% to 70% faster. Strength often increased. And Manville machines are automatic. In addition to Cold Headers, Manville also makes Screw Thread Rollers, Screw Slotters, Bolt Head Trimmers and Cold Pressed Nut Machines. Every one is high speed and stamina-proved in the country's largest factories. Find out what cold forging can do for you. Write our engineering department for recommendations drawn up without any obligation.

THE E. J. MANVILLE MACHINE CO.

Waterbury, Conn.

1209 Swetland Building, Cleveland, Ohio

MANVILLE

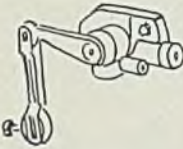
COLD FORGING

MACHINES

"Barnes-made" SPRING APPLICATIONS

Automotive Equipment

Air Brakes
 Anti Rattlers
 Auto Bodies
 Brakes
 Brake Bands
 Brake Rods
 Brake Shoes
 Carburetors
 Clutch
 Curtains
 Generators
 Grease Cups
 Head Lights
 Hood Hooks
 Horns
 Ignitions
 Mufflers
 Odometers
 Oil Cups
 Shock Absorbers
 Speedometers
 Stabilators
 Starters
 Stop Lights
 Tail Lights
 Timers
 Tire Connections
 Transmissions
 Valves
 Windows



Aviation

Aeronautical Equipment
 Antennae Reels
 Brakes
 Carburetors
 Clutch
 Fuel Pumps
 Ignitions
 Oleo Strut Shock Absorbers
 Parachutes
 Push Rods
 Starting Equipment
 Super Chargers
 Tail Skids
 Valves
 Variable Speed Propellers



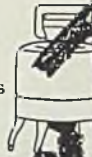
Diesel Equipment

as developed
 and in
 process of
 development



Electrical Appliances

Brushes
 Cords
 Curling Irons
 Curling Iron Holders
 Electric Light Sockets
 Electric Light Switches
 Electric Light Switch Washers
 Heaters
 Irons
 Motors
 Pneumatic Tools
 Pneumatic Tool Clips
 Telephones
 Toasters
 Vacuum Cleaners
 Vibrators
 Washing Machines



Furniture

Cabinet Files
 Chairs
 Desks
 Display Cases
 Drawers
 Locks
 Motors
 Precision Instruments
 Pumping Shears
 Pumps
 Pump Valves
 Punches
 Sashes
 Scales
 Sewing Machines
 Shade Rollers
 Shears
 Spray Guns
 Steam Pumps
 Stethoscopes
 Surgical Instruments
 Suspenders
 Taximeters
 Ticket Punches
 Toys
 Trolleys
 Trolley Catchers
 Trusses
 Truss Attachments
 Vibrators
 Window
 Window Screens
 Window Screen Lifts
 Window Shades
 Wrenches
 Wrench Washers



Machinery, Miscellaneous

Bread Machinery
 Can Opening Machines
 Drills
 Drill Presses
 Floor Surfacing Machines
 Knitting Machinery
 Moving Picture Machines
 Shoe Machinery



Miscellaneous

Berths
 Bicycles
 Bicycle Bells
 Bicycle Brakes
 Bicycle Pants Guards
 Bracelets
 Cameras
 Cars
 Car Windows
 Cigarette Cases
 Clocks
 Door Checks
 Elevators



Exercisers
 Fare Registers
 Fire Extinguishers
 (Small Parts)
 Fire Extinguishers
 Gas Cocks
 Gas Engines
 Gas Heater Washers
 Gas Meters
 Gong Bells
 Governors
 Guns



Musical Instruments

Automatic Pianos
 Bellows
 Cornets
 Horns
 Organs
 Phonographs
 Pianos
 Player Pianos
 Saxophones
 Traps



Office Appliances

Adding Machines
 Addressing Machines
 Auto Calls
 Cabinets and Files
 Cash Registers
 Check Protectors
 Comptometers
 Dictaphones
 Drawing Instruments
 Envelope Sealers
 Loose Leaf Books
 Mailing Machines
 Numbering Machines
 Stamp Affixers
 Staplers
 Time Clocks
 Time Locks
 Time Recorders
 Typewriters



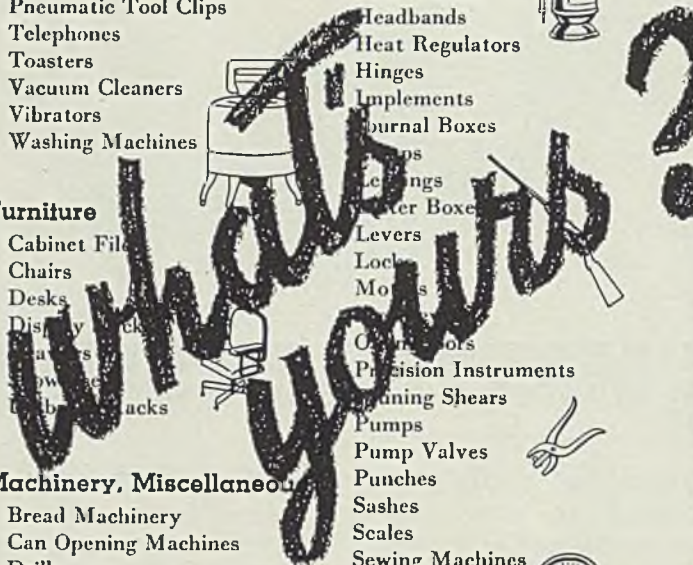
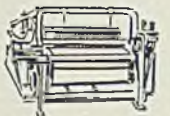
Radio

Battery Clip Parts
 Binding Posts
 Jacks
 Plugs
 Springs
 Spring Washers
 Stampings



Textile Machinery

Bobbin Rings
 Card Repeaters
 Dobbies
 Head Motions
 Looms
 Lubrication
 Picker Sticks
 Reversing Mechanisms
 Shuttles



THE WALLACE BARNES CO., Bristol, Connecticut

DIVISION OF ASSOCIATED SPRING CORPORATION

SPRINGMAKERS FOR MORE THAN THREE QUARTERS OF A CENTURY

COMPLETE HEAT TREATING EQUIPMENT OIL, GAS, ELECTRIC • ALL STANDARD FINISHES

SPECIAL DEPARTMENT FOR SMALL ORDERS • EXPERIMENTAL DESIGN CO-OPERATION



WINDOWS OF WASHINGTON

WASHINGTON

LABOR'S family quarrel apparently will flare up again early next month. Speculations as to the significance of current maneuverings of William Green, president of the American Federation of Labor, and John L. Lewis, head of the Committee for Industrial Organization, are enlivening the dull season here between congressional sessions.

Chief speculation is that the "momentous action" promised by AFL officials at its Denver convention Oct. 4 will be expulsion of CIO unions, suspended at the federation's Tampa, Fla., meeting last year.

Green's invitation to the CIO to attend the Denver parley and settle the unions' dispute in "man-to-man" fashion received no favorable response from the burly Lewis, et al. Lewis countered by calling a meeting of CIO chieftains at Atlantic City, N. J., Oct. 11, one week after the AFL convention, regarded as a move in anticipation of expulsion.

Frey Would Punish "Rebels"

A strong hint of the expected expulsion came from John P. Frey, head of the metal trades department of the AFL, who said he would demand drastic action against the "rebels." Frey repeatedly has attacked Lewis and his methods.

While no direct comment on Green's invitation was issued by the CIO leaders, it was learned acceptance was never seriously considered. CIO lieutenants contend the proposal was so framed that it would prevent a true test of strength between the rivals. Lewis' adherents point out the CIO had only about 1,000,000 members when Lewis broke away from the federation, while the parent union had more than 3,000,000, including the Lewis faction.

Now the CIO claims a membership of 3,700,000, slightly more than the figure claimed by the AFL. But in inviting the CIO to drop its campaign and come to the convention Green did not take into considera-

BY L. M. LAMM

Washington Editor, STEEL

tion (or did he?) the 2,000,000 Lewis says he has added to his union. These men never were members of the AFL and would not be represented if the CIO sent delegates to Denver.

Under such conditions, CIO strategists believe, it would be foolhardy to take notice of Green's invitation to return to the convention floor. In addition, they claim, the convention machinery is entirely in the hands of the AFL leaders who suspended the CIO unions last year and probably will expel them this year, making the interlocutory divorce decree final.

Meanwhile the AFL publicly flaunted its growing resentment against the administration's alleged partiality to the CIO by snubbing Secretary of Labor Frances Perkins. Miss Perkins was not invited to speak at the Denver convention, the first time in history, it is said, the labor secretary has been so slighted. While many observers interpreted the snubbing of Miss Perkins as resentment against the whole Roosevelt regime, others contend it was due largely to the dislike some labor leaders personally have for her.

J. Warren Madden, chairman of the national labor relations board, has been invited to speak, but the same men who invited him are preparing to denounce the labor board for interfering with AFL-employer contracts. A spokesman said the convention will hear a charge Madden's agents have encouraged unaffiliated unions to ignore the AFL and join forces with the CIO.

NEW NEUTRALITY ACT PROVISIONS REVIEWED

Increasing seriousness of the Far Eastern situation and growing resentment expressed by the state department has directed interest toward the new neutrality act ap-

proved by the President earlier this year.

Of course, this act has not yet been invoked by the Chief Executive but, as he has repeatedly said at press conferences, the matter is on a "24-hour basis." Last week it was noted government-owned vessels were forbidden to carry arms or munitions to either Japan or China.

Under the new neutrality act exportation of arms, ammunition or implements of war from the United States shall be unlawful when the President proclaims a state of war between foreign states exists. The same is to hold true when the President finds a state of civil strife in foreign countries threatens the peace of the United States.

The President shall enumerate the arms, ammunition, and implements of war which shall be prohibited. Raw materials are not included under "arms, ammunition or implements of war." Penalty for violation is provided, and goods captured in violation of the act are to be delivered to the secretary of war.

May Restrict Other Articles

When the President finds it is further necessary for the protection of the peace of this country, he shall issue restrictions on certain additional articles and shall proclaim it unlawful for any American vessel to carry such articles. These additional articles named by the President cannot leave the United States until all right, title and interest therein shall have been transferred to some foreign government, agency, institution, association, partnership, or corporation.

The act further provides whenever the President bans the shipping of munitions, it shall be unlawful for any person within this country to purchase, sell or exchange bonds, securities or other obligations of the government of any belligerent state. However, the President may exempt from this ban certain transactions of a character customarily used in

normal peacetime commercial dealings.

A national munitions control board is set up under the act, which, of course, is simply a continuation of the board already in existence under the old law.

Every person engaged in manufacturing, exporting or importing implements of war must register with the secretary of state. Licenses are issued, but all that provide for trade with belligerent nations are revoked when the President bans the sale of implements of war to such states.

Also American vessels are prohibited from carrying banned arms to belligerent states under penalty of fine or imprisonment, in addition to forfeiting the vessel and its cargo to the government.

In connection with the action of the President on government-owned ships, Secretary of Commerce Roper last week, speaking of other than government-owned vessels, said "the procedure for the movement of other commerce to the Far East remains unchanged."

He called attention to the fact that an examination "of our foreign trade figures with China and Japan reveals during the first seven months of this year trade with the United States has appreciably increased over the comparable period of 1936."

DOUGLAS ELEVATED TO CHAIRMANSHIP OF SEC

Yale Law Professor William Orville Douglas last week was appointed chairman of the securities and exchange commission. He succeeds James M. Landis, who resigned to become dean of the Harvard law school.

Known as a liberal, Mr. Douglas' election presages a vigorous regulation policy by SEC, most observers believe. His appointment was quietly but persistently opposed in some banking and brokerage circles.

Douglas came to Washington from Yale university in 1934 to direct the commission's investigation of protective committees and reorganizations. He became a member of the commission in January, 1936; his term expires in June, 1939.

SUBSTITUTE WAGE-HOUR BILL DRAFTED BY LAMNECK

A substitute bill for the pending hours and wages legislation is being drafted by Representative Lamneck, Ohio Democrat, he announced last week.

"My bill," he said, "will contain none of the objectionable features which make the pending bill unconstitutional."

Mr. Lamneck asserted the present measure's provisions are similar to

those of the invalidated NRA in that they undertake to fix wages and hours through a powerful federal agency in Washington.

He said he expects a special session of congress "in six weeks" and plans to have his bill ready by that time.

RAILROAD CONSOLIDATION FAVORED BY PRESIDENT

Railroads of the country should be consolidated, President Roosevelt told newsmen last week, but he does not believe there should be any nationalization of the roads except as the last possible resort.

The question of his attitude on railroads came up a short time ago in connection with a speech by Carroll Miller, chairman, the interstate commerce commission, in which he advocated consolidation, and also because of the recent nationalization of roads in France. The President has some very definite ideas on this subject which he has aired several times and they apparently have not changed.

FOREIGN TRADE WITH AGREEMENT COUNTRIES UP

The aggregate increase in value of exports to all trade agreement countries during 1936 over 1935 was \$110,000,000, while the year's increase in imports from the same countries was \$184,000,000, according to Henry Chalmers, chief of the division of foreign tariffs of the department of commerce.

Mr. Chalmers declares further: "Thus far this year, it happens that the two currents have been increasing in almost equal amounts. United States exports to the agreement countries during the first half of this year were greater by \$169,000,000 than during the same period of last year, while the increase in imports from those countries during the same period was \$163,000,000. Compared with the first half of 1935, the last roughly comparable pre-agreement period, exports to the agreement countries during the first half of this year were greater by \$214,000,000, and imports by \$239,000,000."

Of course all of this has to be taken with a large grain of salt, remembering that trade, both import and export, all over the world has greatly increased and changed since 1934. It is obvious all the benefits have not been due entirely to the trade agreements, so dear to the heart of Cordell Hull, secretary of state.

ROPER PLANS ADDITIONAL INDUSTRIAL BROADCASTS

So pleased has Secretary of Commerce Roper been with reception of broadcasts about industry during the

past year, that in addition to these, which have included one on steel, he is asking members of his business advisory council to make short talks on timely business topics. Some of the leading business men and industrialists of the country are members of this council, including Myron C. Taylor, chairman, United States Steel Corp.

Talks by members of the council, it is said, will include discussion of such matters as relationship of industry with government, with labor, and with the public, and will be intended to voice views of the prominent industrial leaders on these questions. This series will mark a definite effort by the government and industry to bring to the public a more comprehensive understanding of the problems of industrial and commercial management. It is expected that W. Averill Harriman, chairman of the board, will make the first talk.

INDUSTRIAL OUTPUT FOR AUGUST HELD EVEN PACE

Department of commerce officials report industrial output for August held to a rather even pace, "but the weekly data indicate the seasonally adjusted index for the month may be below the July figure."

They state further: "Scheduled steel mill activity decreased slightly from the high summer level attained late in July following the reopening of the plants closed by strikes, but for the month of August production was higher than in July. Automobile assemblies declined as producers completed 1937 runs."

CONGRESSMAN ASSAILS LABOR BOARD AS UNFAIR

In a letter to President Roosevelt, Representative Alfred Phillips, Connecticut, a Democrat who has supported much new deal legislation, asks the President to purge the national labor relations board of further relationship with communists and charges hearings held by the board are very unfair.

Unfairness of the board in hearings has been pointed out in this column several times in connection with hearings in steel cases. Recently similar accusations have been heard from several high sources.

Phillips, in his letter to the President, charged communists and carpetbaggers made a "farce and disgrace of recent hearings of the board on union employe complaints against the Yale & Towne Mfg. Co."

Holding no brief for either the company or the unions, the congressman declared he had information which made him believe that those conducting the hearings (presumably an examiner) were biased in favor of "communists here and other associates of communists."

Industrial Plant Construction Bright Spot in Building

WHILE much has been written concerning the failure of building construction to come up to expectations, the record thus far in 1937, when examined in detail, reveals a number of encouraging and significant trends.

Most of the disappointment in connection with the lag of building construction arises from the fact that residential awards have been declining from the rather encouraging levels of March, April, May and June. While residential construction is extremely important in the broad building field, it should be remembered that it is only one of several classifications.

F. W. Dodge statistics divide building contracts into three main groups: Residential, non-residential and "public works and utilities." Included in non-residential are seven sub-classifications: Commercial, industrial, public, educational, religious and memorial, social and recreational, and hospital and institutional buildings.

During the first half of 1937 and in 11 of the 12 months of 1936, the area of contracts awarded for residential buildings exceeded that for non-residential construction. In July, 1937, the reverse was true for the first time since January, 1936. In July residential awards totaled 20,580,000 square feet and were valued at \$81,050,000, whereas non-residential contracts accounted for 24,510,000 square feet and a value of \$138,100,000.

Comparing non-residential awards for the first seven months of 1937 with those for the corresponding period of 1936, in terms of square feet of floor area, one finds a gain from 108,896,000 to 123,453,000, or 13 per cent. The following shows the areas by classifications:

NON-RESIDENTIAL BUILDING AWARDS IN SQUARE FEET

	First seven months	
	1937	1936
Commercial	38,190,000	31,420,000
Industrial	41,260,000	19,970,000
Public	6,598,000	9,261,000
Educational	21,107,000	32,127,000
Religious and memorial	3,057,000	2,464,000
Social and recreational	6,291,000	7,123,000
Hospital and institutional	6,950,000	6,531,000
	123,453,000	108,896,000

This tabulation indicates gains for commercial, industrial, religious and memorial and hospital and in-

stitutional buildings and losses for public, educational and social and recreational classifications. From a study of these gains and losses, one would suspect that there has been a marked shift in the trends of privately and publicly financed projects during the past 19 months.

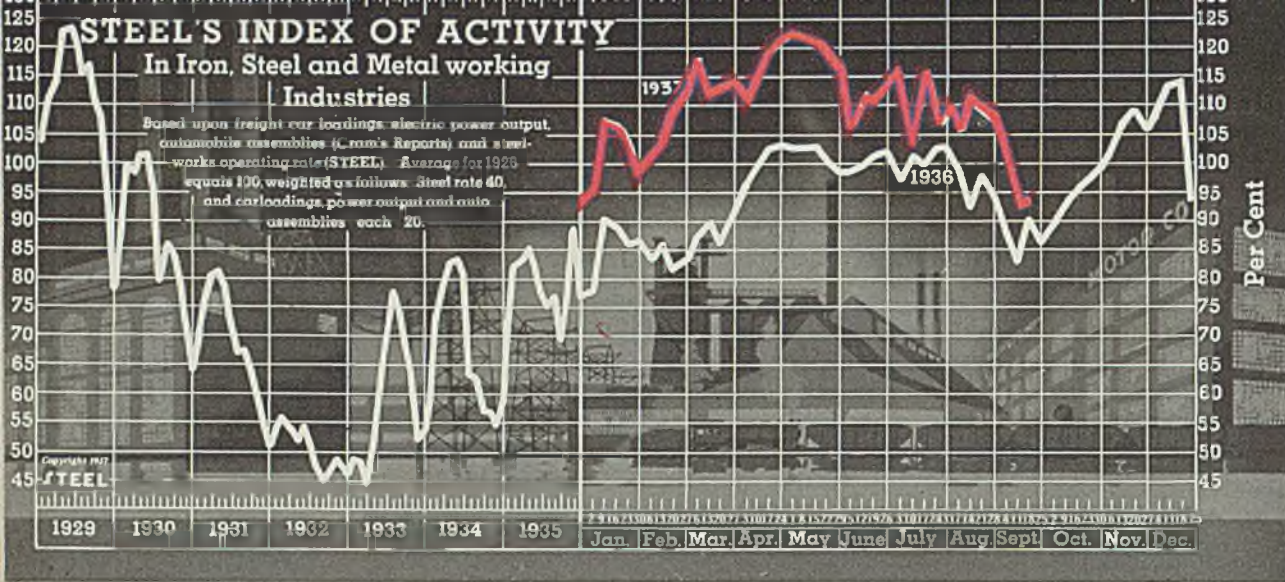
This conclusion is borne out by the statistics. Throughout all of 1936 the monthly average value of building awards financed privately was \$111,900,000 and that of awards financed publicly was \$110,500,000. In other words, the financing for all building was almost evenly divided between private and public funds. But during the first seven months of 1937 the value of awards made possible by private money averaged \$161,800,000 monthly, whereas that underwritten by government funds averaged only \$97,600,000. This represents a shift from 50-50 to 62-38 in favor of privately financed building construction—a decidedly favorable trend.

Another significant point is that the principal factor in the favorable showing of non-residential construction was the sharp increase in awards for industrial buildings. From a total of 19,970,000 square feet in the first seven months of 1936, awards leaped to 41,260,000 square feet in the same period of 1937. In fact, awards in the first seven months of the present year exceed the total for the entire year of 1936 by a small margin.

Steel Industry Provides Important Contribution To Building Activity by New and Enlarged Plants

This means that a substantial portion of building construction is being provided by industry. The iron, steel and metalworking industries are assuming an important role in new plant construction. The Irvin works of Carnegie-Illinois on the Monongahela river and the strip mill of Republic on the Cuyahoga are notable examples of major new construction in the steel industry. New plants for Briggs Mfg. Co. in Detroit, Kelsey-Hayes Wheel on Neville Island, and other recently announced projects indicate that the motor car industry is expanding. New construction of paper and pulp mills in the Southeast and of chemical and glass plants in various sections also is noteworthy. Additions to existing plants also weigh heavily in the increase in the awards under the industrial building classification.

The fact that industry is going ahead so vigorously in plant expansion and rehabilitation should offset to some degree the bearish sentiment that has prevailed in some quarters since Labor day. Extensive appropriations for plant and equipment connote faith in the future.



The

STEEL'S index of activity gained 0.5 point to 94.8 in the week ending Sept. 18:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
July 17	115.7	99.9	79.8	68.1	79.4	46.9	70.0	79.1
July 24	108.0	102.1	80.8	66.4	78.8	51.5	69.7	78.7
July 31	109.1	102.5	78.4	64.6	75.8	46.1	68.9	79.2
Aug. 7	107.3	98.7	73.4	64.6	74.7	45.1	67.0	85.6
Aug. 14	113.8	92.6	71.5	61.4	74.2	44.6	67.4	86.2
Aug. 21	110.3	97.9	77.0	60.3	71.6	44.9	67.3	88.5
Aug. 28	108.5	94.0	77.3	55.1	70.3	45.2	66.5	87.4
Sept. 4	104.8	87.5	70.9	53.5	65.5	45.4	65.3	79.0
Sept. 11	94.3†	83.-	70.1	58.7	69.1	44.9	60.9	85.9
Sept. 18	94.8*	90.1	69.4	58.1	68.2	47.8	65.6	86.2

†Revised. *Preliminary.

Business Outlook Hinges on Timing of Auto Resumption

TANGIBLE evidence that the pace of business is not recovering as rapidly as was expected prior to Labor day is found in the record of industrial activity for the week ending Sept. 18. STEEL'S index for that period stands at 94.8, a gain of only half a point from that of the previous week.

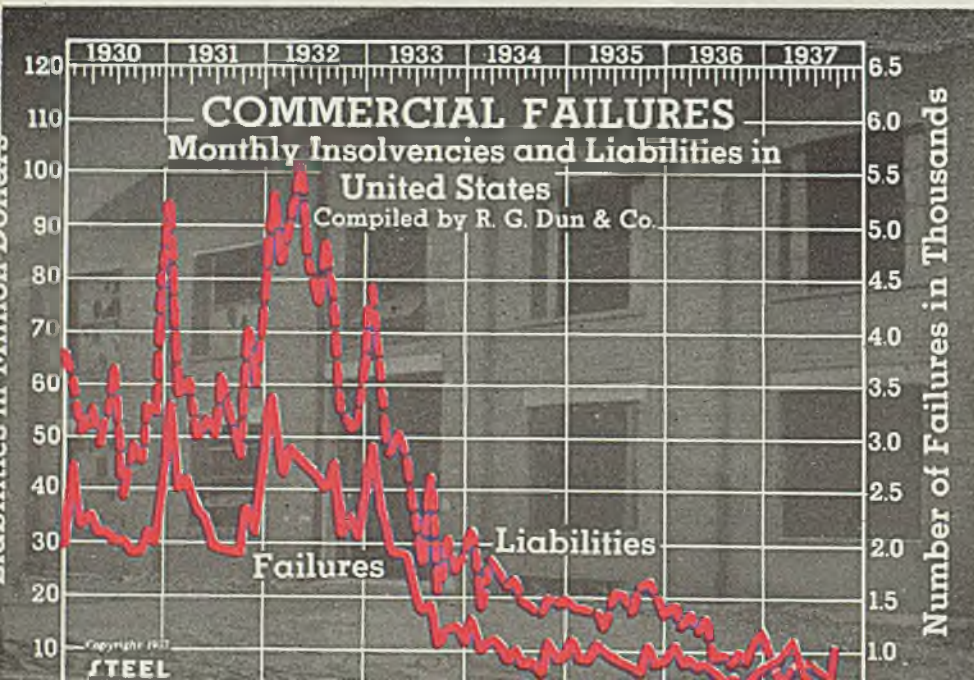
This is an unusually weak rebound from the holiday low, yet it may reflect an oddity in the timing of recovery rather than a marked change in the volume of activity.

The failure of the index to rise more buoyantly was

due largely to a sharp reduction in automobile production. Output dropped from 59,017 in the week ending Sept. 11 to 29,000 in the week ending Sept. 18. Last year in the corresponding weeks automobile assemblies increased from 26,750 to 33,615 units.

All other indicators in STEEL'S index rebounded sharply. Revenue freight car loadings leaped to a figure estimated at around 825,000 — the highest point of the year. Electric power output climbed back to 2,280,792,000 kilowatt hours, which is the sixth highest weekly total on record. Steelworks operations were at 80 per cent of capacity as compared with 72 per cent in the previous week.

Indications point to a sidewise or downward drift in activity in the weeks ending Sept. 25 and Oct. 2. If the index does slip in these weeks, it will be following with uncanny accuracy the pattern traced in



	Failures, Number		Liabilities, Dollars (000 omitted)	
	1937	1936	1937	1936
Jan.....	811	1,077	\$8,661	\$18,104
Feb.....	721	856	9,771	14,089
March...	820	946	10,922	16,271
April....	786	830	8,906	14,157
May....	834	832	8,364	15,375
June....	670	773	8,191	9,177
July....	618	639	7,766	9,904
Aug.....	707	655	11,916	8,271
Sept.....	.....	586	.....	9,819
Oct.....	.....	611	.....	8,266
Nov.....	.....	688	.....	11,532
Dec.....	.....	692	.....	12,288

BUSINESS TREND

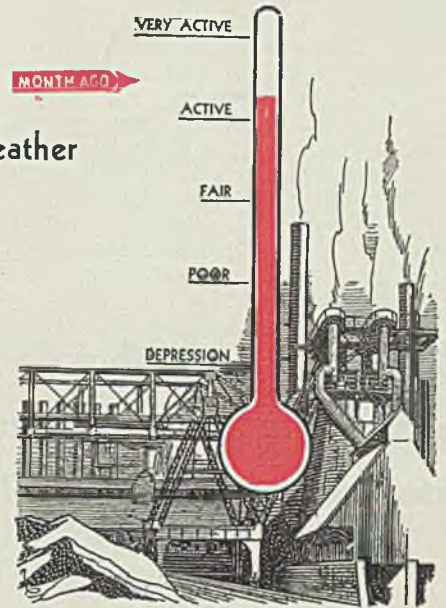
the fall of last year. However, in 1936, the slight recession at the end of September was followed by a sharp, steady rise which continued through the remainder of the year, except for holiday interruptions.

It is significant that this positive upward movement last fall began in the first week of October whereas

Industrial Weather

TREND:

Steady



Where Business Stands

Monthly Averages, 1936=100

	Aug., 1937	July, 1937	Aug., 1936
Steel Ingot Output	124.3	112.2	107.3
Pig Iron Output	139.2	134.7	104.3
Freight Movement	112.3	109.9	106.7
Building Construction	123.2	134.2	117.7
Automobile Production	96.1	118.7	71.7
Wholesale Prices .....	.....	110.9	100.9

automobile production did not hit its stride until the second week of November.

A pertinent question in sizing up the present out-

look is whether demand in miscellaneous and general lines will come to the support of industrial activity before the sustaining influence of new automobile activity begins to be felt. Another question is whether the conditions of greater employment and greater farm income in 1937 than in 1936 will tempt automobile manufacturers to hit full stride on 1938 models several weeks earlier than they did last year.

It would seem that this timing is an important element in the business outlook.

The Barometer of Business

Industrial Indicators

	Aug., 1937	July, 1937	Aug., 1936
Pig iron output (daily average, tons)	116,676	112,947	87,475
Machine tool index	180.9	190.5	135.5
Finished steel shipments ..	1,107,858	1,186,752	923,703
Ingot output (daily average, tons)	186,992	168,763	161,351
Dodge building awards in 37 states (sq. ft.)	42,077,100	45,812,600	40,285,100
Automobile output	370,000	456,775	275,951
Coal output (tons)	33,665,000	31,912,000	33,086,000
Business failures; number	707	618	655
Business failures; liabilities	\$11,916,000	\$7,766,000	\$8,271,000
Cement production (bbls.) .....	.....	11,597,000	11,503,000
Cotton consumption (bales)	604,000	583,000	575,000
Car loadings (weekly av.)	778,927	762,418	740,211

*Estimated.

Financial Indicators

	Aug., 1937	July, 1937	Aug., 1936
25 Industrial stocks	\$220.18	\$216.49	\$221.36
25 Rail stocks	\$30.13	\$41.47	\$41.45
40 Bonds	\$83.63	\$84.05	\$83.74
Bank clearings (000 omitted) .....	.....	\$26,015,000	\$21,269,000
Commercial paper rate (New York, per cent)	1	1	%
*Commercial loans (000 omitted)	\$9,958,000	\$9,784,000	\$8,454,000
Federal Reserve ratio (per cent)	79.7	79.7	79.4
Railroad earnings	†\$60,527,576	\$58,939,875	\$61,773,765
Stock sales, New York stock exchange	17,220,623	20,715,360	26,564,032
Bond sales (par value) ..	\$148,009,375	\$160,160,800	\$215,242,300

*Leading member banks Federal Reserve System.
†July, June and July, respectively.

Foreign Trade

	Aug., 1937	July, 1937	Aug., 1936
Exports	\$267,185,000	\$178,249,000	.....
Imports	\$265,349,000	\$195,016,000	.....
Gold exports .....	.....	\$206,000	\$32,000
Gold imports .....	.....	\$175,624,000	\$67,524,000

Commodity Prices

	Aug., 1937	July, 1937	Aug., 1936
STEEL'S composite average of 25 iron and steel prices	\$40.34	\$40.03	\$33.88
Bradstreet's index .....	.....	\$11.19	\$10.19
Wheat, cash (bushel)	\$1.22	\$1.34	\$1.25
Corn, cash (bushel)	\$1.19	\$1.33	\$1.27

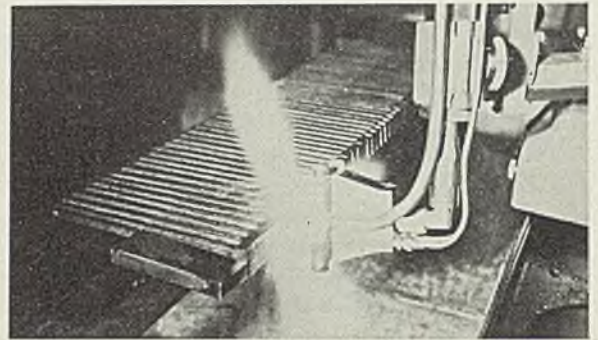
Flame Hardening

Localized hardening and production of a hard surface with a ductile core can be done easily by the flame hardening process

MOST universal method of hardening steel is the relatively simple heating and quenching method. The part to be hardened is held at an elevated temperature—just above the critical point of the steel—for a definite length of time and then rapidly cooled, usually by immersion in oil or water. Although hardening by this method changes the structure of the steel, it does not alter its chemical composition. Its principal limitation lies in the fact that the hardened part is of practically the same hardness throughout.

This limitation of the heating-quenching method subsequently led to the development of a number of hardening processes designed to produce a part having an extremely hard surface or skin, yet with a tough, ductile core. Case carburizing and nitriding are well-known ex-

The quenching spray for this pipe wrench hardening operation is attached to the 30-flame head



amples of processes of this type. In case carburizing, the part to be hardened is surrounded by a carbonaceous material and held at an elevated temperature a sufficient length of time for the surface of the steel to absorb a definite amount of carbon. This is followed by re-

heating and quenching, and the hardened surface is thus of different composition from the interior or core of the part.

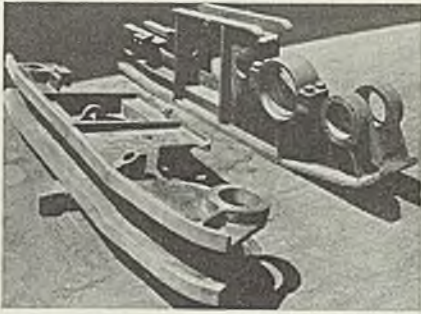
For years, metallurgists have sought for a process for hardening steel which would combine the simplicity and flexibility of the heating-quenching method with the inherent advantages of differential hardening methods. Their investigations quite naturally included the possibilities of the oxy-acetylene flame as a hardening medium, and, after considerable research, their efforts have culminated in the development of a new process known as "flame hardening," according to *Oxy-Acetylene Tips*, published by The Linde Air Products Co., New York.

Flame hardening may be defined as a process whereby the surface of a quench-hardening ferrous material is locally heated by an oxy-acetylene flame followed by a quench.

In a sense, flame hardening may be considered a combination of the hardening processes mentioned above since it imparts a hardened surface to the steel, but does not in-



Flame hardening is considered the only practicable method for hardening the wobbler pads on this 9-ton spindle



These cast steel chain conveyor rails illustrate the value of flame hardening on irregular surfaces

any way alter the chemical composition of the steel.

Before actually discussing the various phases of flame hardening, a brief review of the factors which make it possible to harden steel should prove helpful in a better understanding of the scope of the process.

Most steels, when heated to a fairly bright red heat and cooled rapidly, undergo a transformation producing profound changes in physical properties. One of the most important is an increase in hardness. Such steels are known as hardening steels and range in composition from simple, straight carbon steels to high alloy steels.

This ability of steel to transform is an unique and especially valuable property. Probably all who read this have witnessed simple hardening operations in a blacksmith shop or tool room. Here the steel is heated in a forge or furnace and cooled rapidly by immersion in water or oil.

Depending on the composition and rate of cooling, the steel may be so hard and therefore brittle that additional toughening treatment is necessary before the part can be used commercially. A portion of the hardness may be removed by heating the steel a second time to a low temperature. This operation is called drawing or tempering.

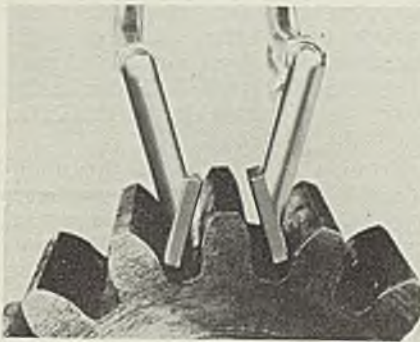
Because ordinary heating methods such as a forge or furnace raise the temperature of the steel so slowly that the heat penetrates throughout the piece, quenching hardens the entire part. This is often highly undesirable because hardness means decreased ductility and, therefore, low shock resistance. To illustrate, it would be preferable to so heat-treat a gear tooth that the faces were hard and wear resistant, while the core was ductile and shock resistant. This desirable result is accomplished by flame hardening which, through the medium of the high temperature oxy-acetylene flame, makes it possible to so rapidly raise the temperature of the surface that the surface

may be hardened without affecting the core.

The cooling rate, which controls the hardening process, is in turn controlled by the quenching medium used, and depends upon its quantity, and certain other physical factors, as well as to some extent its initial temperature. Water is widely used as a quenching medium and is generally acceptable as a flame hardening quench. Water sprayed under pressure upon the metal provides a quicker cooling method than water as a bath.

On certain types of steel an air quench may be sufficiently drastic to give the desired hardness. In other cases oil, or oil and water are most effective, although it is necessary to observe certain precautions when using oil.

Flame hardening is peculiarly suited to applications where a hard surface with a tough ductile core or body is desired. There are applications where the core of some machine part must be of an alloy steel



In these gear hardening heads, the quench is integral with the head

not suited to case carburizing because of desired physical properties. The flame hardening process provides an excellent method of obtaining the desired hard surface without changing the properties of the core material.

In general, any steel that may be hardened by simple heating and quenching may be treated by the flame hardening process. In addition, cast iron and alloy cast iron may be flame hardened.

The ability of plain carbon steels to quench harden is dependent upon the carbon content of the steel. To obtain a maximum degree of hardening, the steel should contain at least 0.40 per cent carbon. As the carbon increases, the hardness obtainable increases. The general range for plain carbon steel is from 0.40 to 0.70 per cent carbon. Steels with greater carbon percentages can be flame hardened, but greater care is required to prevent surface checking.

The most desirable steels for flame hardening are low alloy steels.

These usually harden to a good degree, and, except for certain types, are better able to withstand heating and quenching without checking or cracking.

The higher alloy steels present a more difficult problem from a heating and quenching standpoint and must be individually considered. However certain of the high alloy steels can be sufficiently hardened by an air quench.

Practically all flame hardening operations can and should be made mechanically. Hand operations, although occasionally desirable, are not conducive to uniform results.

There is usually sufficient mechanical equipment available in most shops to eliminate the necessity of building special equipment. A lathe is very easily adapted to flame hardening. The blowpipe is mounted on the tool carrier for smooth horizontal motion along the surface to be hardened. The part to be hardened is mounted on or alongside the lathe. The lathe is also adaptable to hardening of circular pieces, in which case the part to be hardened is rotated.

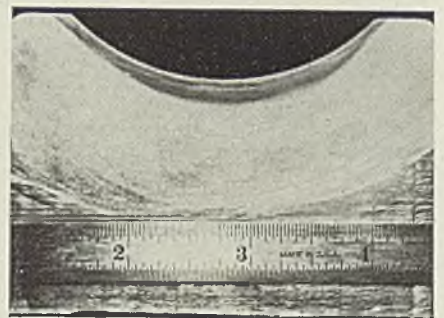
It is convenient to divide the application of the flame hardening process into four methods. These are, (1) stationary, (2) progressive, (3) spinning, and (4) combination.

The stationary method includes those operations wherein the blowpipe and work are motionless during flame hardening. An example is the flame hardening of automotive valve stems, sometimes referred to as "spot hardening."

The progressive method refers to those operations where the blowpipe and work move with respect to each other.

For flame hardening a plane surface, the lighted blowpipe, with a head having sufficient flame area to cover the path to be hardened, is directed along the surface to be hardened at the maximum speed which will heat the steel to the hardening temperature. Immediately behind the flame is a stream or spray of water which progressively quenches the heated surface.

The speed of the flame travel is



Section of a groove roll is shown after flame hardening by the spinning method

determined by operating variables such as flame intensity, type of steel being treated, the temperature desired, and the depth of case desired. It may vary from 4 to 10 in. per min., although the usual speed is between 6 and 8 in. per min.

The blowpipe head should be placed so that the tips of the inner cones are 1/16 to 1/8 in. from the surface being hardened.

On circular work of large diameter, the most successful method is that of heating and quenching by one revolution of the part. A spray or stream of quenching water is directed against the heated surface immediately following the blowpipe. As in the straight line operation, the surface speed of the revolving piece may vary from 4 to 10 in. per min.

The Spinning Method

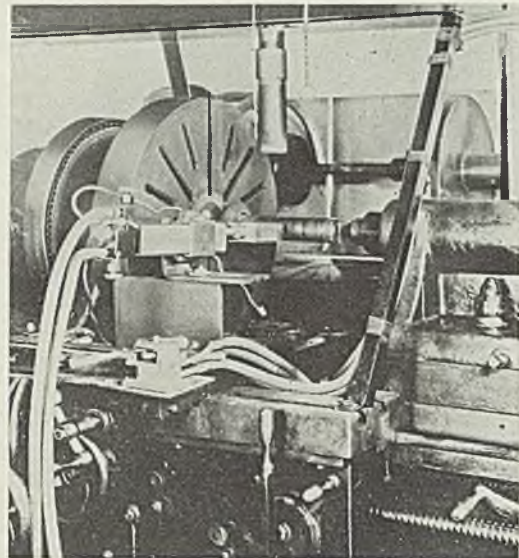
The type of work in which a circular path is to be hardened can most satisfactorily be done by spinning the part under the flames of one or more stationary blowpipes, and quenching the heated portion while it is still spinning. The speed of rotation is not critical. It is usually about 100 r.p.m. but may vary from 80 to 120 or more r.p.m.

Typical examples of this sort of operation are the hardening of local areas on shafts, and the hardening of small gear pinions having very small teeth.

Where the diameter of the part is greater than 4 in., two or more blowpipes will be necessary—the blowpipes being mounted to heat the same area from opposite sides.

The time required for hardening by this method will vary from a few seconds to 2 or 3 min., depending upon the diameter of the piece treated, the number of blowpipes, and other factors. It is generally undesirable to take more than 3 min. for hardening. Any piece that requires more time than this should have more flame, or be treated by

This set-up illustrates the adaptability of a lathe for flame hardening shafts



the single slow revolution method.

The combination method is a combination of the progressive and spinning methods and is applied to circular objects of such length that the blowpipe may traverse while the part is being spun. Example—the flame hardening of shafts by spinning the shaft in a lathe while the blowpipe, mounted on the tool rack, traverses the shaft.

From a description of the methods, it is apparent that many articles may be flame hardened by common machines, such as a lathe, if a suitable blowpipe is substituted for the ordinary tool.

The oxy-acetylene apparatus should be of sufficient ruggedness and flexibility to operate under the rather severe conditions imposed by the flame hardening application. It is necessary that such apparatus be water cooled and of sufficient gas capacity to treat an area of reasonable size in one operation.

In order to accommodate various widths, as well as irregular profiles, the tips are of the threaded remov-

able type and are obtainable in various length and with various size tip orifices. Plugs are furnished so that only a portion of the head may be operated if so desired.

In addition to all-purpose heads, it has been necessary to design heads for specialized applications such as gear tooth hardening.

For progressive hardening it is often convenient to mount flame hardening apparatus on one of the standard oxy-acetylene cutting machines. It so happens that the flame hardening speed falls within the range of speeds obtainable with cutting machines and they thus become ideal traversing devices. Except under unusual conditions it is inadvisable to consider manual flame hardening operations.

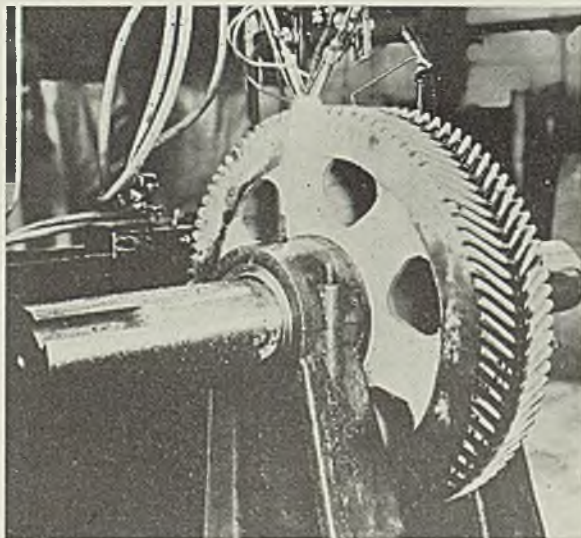
Quenching Easily Set Up

Flame hardening quenching arrangements are easy to set up. In many operations a small stream of water is all that is necessary to cover the area to be hardened. Where a wider path must be covered by water, a fan shaped nozzle or spray may be used. Either of these is simple to make or obtain.

For progressive work, or for the slow revolution method, the pipe carrying the quenching water should be affixed to the blowpipe holder in such a way as to permit the necessary adjustment of position to direct the stream properly on the hot steel. The quench should follow the last flame closely without interfering with the flame.

Best results are usually obtained when the blowpipe cooling water and the water for quenching are separately controlled.

For many of the spinning operations on smaller parts, it is advisable to use a quenching method by which a large volume of water under low head can be released to cover the entire part instantaneously and flow over it in a solid stream.



Here both faces of each tooth are flame hardened simultaneously

Building a Career

An eminent authority in the machine tool industry gives his views on careers in his field for mechanically-inclined boys

THE head of a family was sitting by the fireplace one evening when his son, who was about to graduate from high school, came into the room and said, "Dad, what line of business do you think I should follow as my life's work?"

His father, who had already given considerable thought to the son's future, replied, "There is an old saying which you have probably read in your history books, 'Go west young man; go west.' Today this has been materially changed and the land of opportunity for any young man who is mechanically inclined, like yourself, lies in the manufacturing plants of his own town or state. The best advice I can give you is to become an apprentice in a reliable, forward-looking concern which offers training in the particular trade which most interests you."

The advice which this particular father gave his son was based on a careful study of the economic situation of this country at the present time. The United States is entering

BY C. R. BURT

President, Niles-Bement-Pond Co.,
New York, and President, National
Machine Tool Builders' Association

a period of rapid expansion which covers the development of new products, better materials and improved methods of manufacture. In addition, there is a real shortage of skilled men in practically all industries because training was necessarily curtailed during the recent depression. As a result, the opportunities for young men in the trades are greater than they have ever been before.

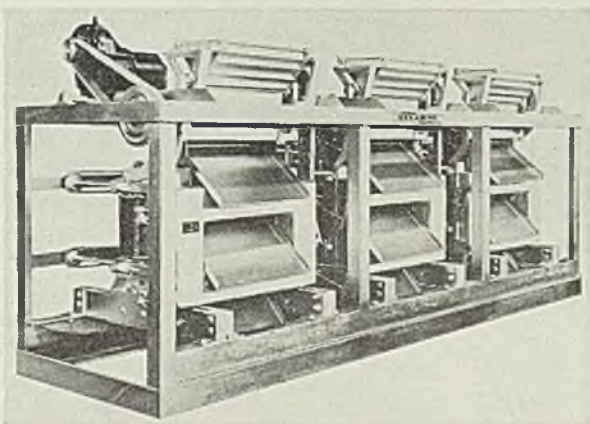
Of the thousands of young men who are being graduated from our high schools and colleges each year, many are mechanically inclined and would have the brightest prospects for a successful future if they en-

tered the industrial field. The question often arises as to how mechanical aptitude can be determined without an actual trial of the work under consideration. This is not so difficult as it sounds; anyone can find out for himself the general line of work to which he is best adapted by considering his own likes and dislikes. Choice of an occupation should not be based upon the fact that John Brown is engaged in it and makes a good living, but on the grounds that it is the work which the individual prefers to any other. Thus, the young man who likes to work with his hands, takes the family clocks apart, and more important, puts them together again so they will run, and otherwise shows a curiosity as to "what makes things go," will normally enjoy manufacturing.

Another sign post which is available for determining the occupation to which the young man is best adapted is the subjects which he likes best in school. Generally speaking, the boy who is mechanically inclined will show a partiality for mathematical and scientific subjects. He prefers problems to which he can apply his powers of reasoning to the memorizing of unrelated, and to him unimportant, facts. It should be pointed out that the boy who "was not interested in anything he studied" is not likely to go far in the industrial field. Here, as everywhere else, he must study the rest of his life if he wishes to keep abreast of his trade.

For the boy who is mechanically inclined and willing to work hard, few occupations are as fascinating as that of the machinist. A look around his home will show him many mechanical devices in use—

Removes Iron Particles From Sand



ONE of the largest of its type K magnetic separators to be built, this machine has been sent by Stearns Magnetic Mfg. Co., Milwaukee, to an Eastern silica sand producer. The unit is a 90-inch, three field, gravity induction type separator and is for use in removing iron particles from sand

washing machines, electrical refrigerators, oil burners, and the like. In the field of transportation alone, the manufacture of automobiles, streamlined trains, express ocean liners and airplanes, requires the services of hundreds of thousands of machinists. Less in evidence, but an indispensable link in the chain of manufacture, are the builders of the machinery and tools used in the building of these products. Development of the machine tool industry is continually reducing the cost of both the necessities and luxuries of life, making possible a higher standard of living for every human being, while it removes much of the drudgery formerly done by hand labor and the "sweat of the brow."

The great demand for more goods at lower cost will in itself force more and more activity in the line of research and development in providing new mechanical devices. Therefore, this type of work requires the highest grade of engineer, draftsman and mechanic to work out the details of construction and to manufacture the finished product.

Opportunities Offered

The building of machine tools offers an excellent opportunity for young men who wish to learn a trade, and many manufacturing concerns which specialize in building machine tools have well-worked-out programs for the training of apprentices. The young man entering such an establishment is required to sign an agreement for possibly a three year or four year training course, which entitles him to receive a reasonable amount of experience on the various types of machine work, such as milling, drilling, planing, lathe work, boring, assembling and finishing many different kinds of machinery. An apprentice learning a trade in a machine tool factory receives a very broad mechanical training and is able to earn a living and be self-supporting at the same time. On completion of this course, any apprentice boy who has worked diligently and absorbed all the knowledge possible will be well rewarded; but he should not overlook the fact that by continuing to add to his knowledge in the mechanical line he will be qualifying himself for a more responsible position.

In the machine tool trade as nowhere else, the opportunities for advancement from the ranks are numerous. The entire history of the trade is filled with names of men who rose to the top with no other equipment than an inherent mechanical ability and a willingness to work hard; and the executives of many of our leading organizations at the present time, including presidents, general managers, factory managers and superintendents,

started out in life by learning a trade.

Program Announced for Porcelain Enamel Forum

As previously announced, the seventh annual meeting of the Porcelain Enamel Institute will be held in Chicago, Oct. 11-12, and the second Porcelain Enamel Institute forum will be conducted at Ohio State university, Columbus, O., Oct. 13-15.

Among the speakers to appear on the annual meeting program are: R. G. Calton, Tennessee Enamel Mfg. Co., Nashville, Tenn., institute president; E. L. Lester, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., institute vice president and chairman of educational bureau; F. E. Hodek, Jr., General Porcelain Enamel Co., Chicago, institute vice president and chairman of forum committee; William Hogenson, Chicago Vitreous Enamel Product Co., Cicero, Ill., treasurer. In addition, the following section chairmen will present their plans for 1938; H. D. Chase, Chicago Vitreous Enamel Product Co., Cicero, Ill., advertising and sales promotion section; Earle S. Smith, Toledo Porcelain Products Co., industry, trade and consumer contact section; George S. Blome, Baltimore Enamel and Novelty Co., Baltimore, market research section; Herman L. Cook, Norge Div., Borg-Warner Corp., Detroit, production control section; R. H. Turk, Porcelain Enamel & Mfg. Co., Baltimore, technical research section.

The complete program, which is now being developed, will be mailed to the entire industry about Oct. 1.

The revised program for the forum, together with speakers who have accepted, is as follows:

Wednesday, Oct. 13

MORNING

Registration

AFTERNOON

"Summary of Porcelain Enamel Institute Activities and Plans for 1938," R. G. Calton, Tennessee Enamel Mfg. Co., Nashville, Tenn.

"Workable Control Systems and Benefits to the Enamel Plant," J. E. Hansen, Ferro Enamel Corp., Cleveland.

Thursday, Oct. 14

MORNING

General Session

"Enamel Shop Costs," Wade Willey, Kelvinator Corp., Detroit.

"Simple and Practical Incentive Systems for Enamel Shops," R. M. James, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Safety in the Enamel Plant," speaker to be selected.

"Plant Maintenance," speaker to be selected.

AFTERNOON

"Welding," Walter W. Petry, Cincinnati Milling Machine Co., Cincinnati.

"Drawing and Cleaning Compounds," D. J. Benoliel, Quaker Chemical Prod-

uct Corp., Conshohocken, Pa.
 "Nickel Treatment of Enameling Iron," James Pettyjohn, Mullins Mfg. Corp., Salem, O.
 "Enamel Process Inspection and Repair," speaker to be selected.

Friday, Oct. 15

MORNING

"Colors and Color Matching," A. J. Strod, Vitro Mfg. Co., Pittsburgh.

"Structural Porcelain Enamel," A. C. Weirich, Davidson Enamel Products Co., Inc., Lima, O.

"Silk Screen Process," speaker to be selected.

"Drawing," speaker to be selected.

AFTERNOON

Hollow-Ware

"Pickle Room Practice, Part II," B. T. Sweely, Chicago Vitreous Enamel Product Co., Cicero, Ill.

"Control and Consistency of Enamels for Dipping," Walter Wolf, Strong Mfg. Co., Sebring, O.

Cast Iron

"Effect of Modern Blast Furnace Practice on the Manufacture of Pig Iron," William Curran, Republic Steel Corp., Cleveland.

"Molding Sand and Molding Practice," R. B. Schaal, Ferro Enamel Corp., Cleveland.

"Abrasive Cleaning Practice and Equipment," R. E. Donnelly, Pangborn Corp., Hagerstown, Md.

"Discussion of Cast Iron Bulletin," to be selected.

Sheet Iron

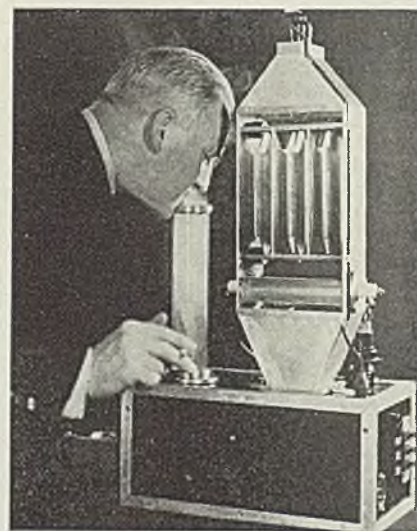
"Collection, Handling and Use of Recycled Enamels," G. N. Tuttle, Frigidaire Div., General Motors Corp., Dayton, O.

"Ground Coat Dipping," to be selected.

"Cleaning and Pickling Practice," D. L. Bensinger, A. B. Stove Co., Battle Creek, Mich.

"Control and Consistency of Enamels for Spraying," L. C. Athy, Porcelain Enamel & Mfg. Co., Baltimore.

Clears Up the Haze



OPERATED on an electrostatic principle, this device charges dust particles held in the air which then cling to magnetic plates in the filter. The cleaner removes particles as small as one-fifth micron in size, as is shown by the above photograph of smoke being removed from the atmosphere. The device was designed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Columbia Opens New Laboratories

THE new metallurgical and chemical laboratory of the Columbia Steel Co., subsidiary of United States Steel Corp., in Pittsburg, Calif., is perhaps one of the most complete for its size in the steel industry today. Designed by the engineering department at the Pittsburg works to afford maximum efficiency

and heat are removed quickly from the atmosphere by means of an exhaust fan placed on the roof, and the lighting fixtures are of all glass design as a further precaution against corrosive deterioration. All partitions are of steel construction, insulated and soundproof.

The pipe line system in the new

laboratory is interesting by virtue of the variety of materials used for different lines. All pipe lines are concealed because the basement of the building is used for office and laboratory work. However, sections of the ceiling may be removed to gain access to the lines should it ever become necessary.

Handling of corrosive liquids by hand has been practically eliminated by the use of glass pipe lines. Extra heavy cast iron pipes carry away the waste water except that containing acid solutions which is carried away in pipes of acid-resisting iron. Distilled water is piped through pure tin. Oxygen and vacuum lines are carried to all work benches in copper

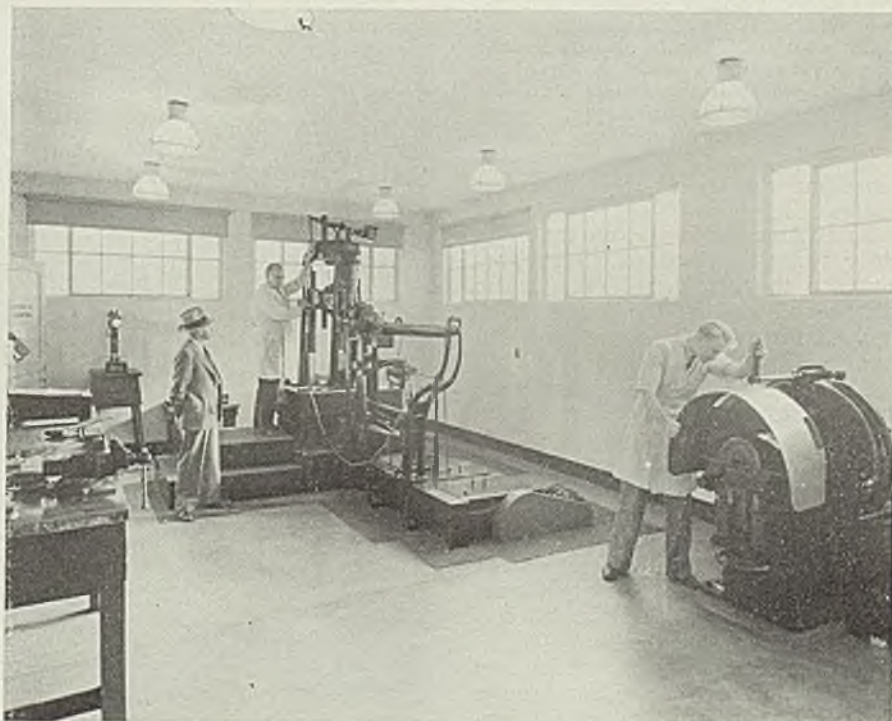


EXTERIOR VIEW of the new laboratory building at the Pittsburg, Calif., works of Columbia Steel Co. is shown at left, while below is a view of the physical testing laboratory, which is located on the lower floor of the building

in technological work, it is equipped with all of the orthodox equipment of a modern metals laboratory, along with facilities for research on methods and products.

In consolidating the activities of scattered laboratories under one roof, the first objective was a compact building in which working conditions would permit every chemist and metallurgist to carry out his tests and experiments with minimum loss of time and effort. Under the direction of G. L. von Planck, chief metallurgist, and Howard Grafton, plant metallurgist of the Pittsburg works, a staff of 23 men carry on an average of 5000 determinations and tests per month in the new laboratory.

The two-story structure, with the first story partially imbedded in the ground, is 40 by 80 feet in plan and has a total available working floor space of 4864 square feet. It is constructed of steel, brick and concrete, is fireproof and includes many desirable safety features. Acid fumes



tubing, most of which is concealed by molding and therefore, readily accessible. Air and gas are piped through welded steel lines which were tested at a pressure of 100 pounds per square inch for a period of three days.

All chemical control work takes place in the main control laboratory at the north end of the main floor where glass encloses a balance room with the latest type of delicate balances, a sample preparation room and the main work laboratory for routine tests. Adjoining the chemical laboratory is a specially constructed research room in which ex-

face hardness and machines for testing other physical properties. The metallographic laboratory, which also handles general plant photography, a sample preparation room and storage vault, offices for the testing engineer, chief inspector, and observer, are all located on the first floor.

A modern air conditioning system maintains a constant and uniform temperature, supplying warm air in the winter and cool air during the summer. Stainless steel has been used extensively in the installation of laboratory equipment throughout the building.

Aircraft Engineers Will Hear Metalworking Papers

Papers on metalworking subjects are scheduled for the National Aircraft Production meeting to be held at the Ambassador hotel, Los Angeles, Oct. 7-9 under sponsorship of the Society of Automotive Engineers, with co-operation of the Aeronautical Chamber of Commerce of America and Air Transport Association of America.

The program is as follows:

Thursday, Oct. 7

EVENING
Production

"Engineering for Production in Stainless Steel," by E. J. W. Ragsdale, Edward G. Budd Mfg. Co.

"Production Control," by Eric Springer, Douglas Aircraft Co.

Friday, Oct. 8

AFTERNOON
Materials

"Procurement Planning of the United States Army Air Corps," by Major J. L. Stromme, Air Corps, United States Army.

"Quality Control of Aluminum Alloy Aircraft Castings," by K. R. Van Horn and H. J. Heath, Aluminum Co. of America.

"Manufacture, Characteristics and Uses of Magnesium Castings," by W. G. Harvey, American Manganese Corp.

EVENING
Processes

"Drop Hammer Applications," by C. R. Delaubenfels, Lockheed Aircraft Co.

"Die Castings," by Harry Hahn, Harry W. Hahn Co.

"Use of Plastics in Aircraft," by G. P. Young, Rohm & Haas Co.

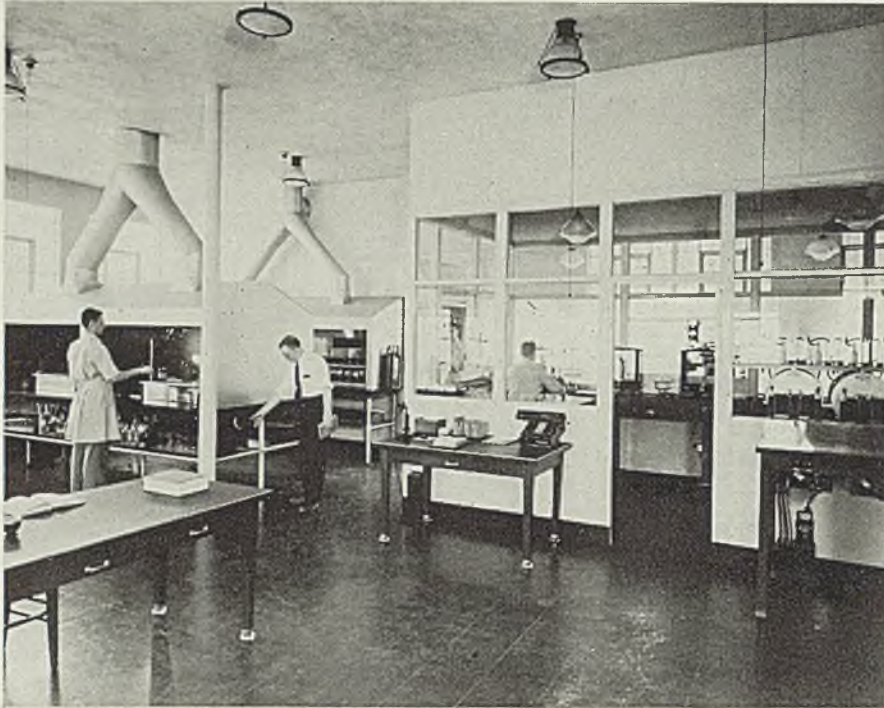
Saturday, Oct. 9

AFTERNOON

Factory Equipment

"Factory Equipment and Tooling," by D. M. Carpenter and J. W. Van Doren, Consolidated Aircraft Corp.

"Production Tools for Airplanes," by H. A. Berliner, Engineering & Research Corp.



GENERAL VIEW of the chemical laboratory in Columbia Steel Co.'s new building is shown in the upper view, while below is a picture of the special analysis bench in the same laboratory

traordinary tests on steel products are conducted.

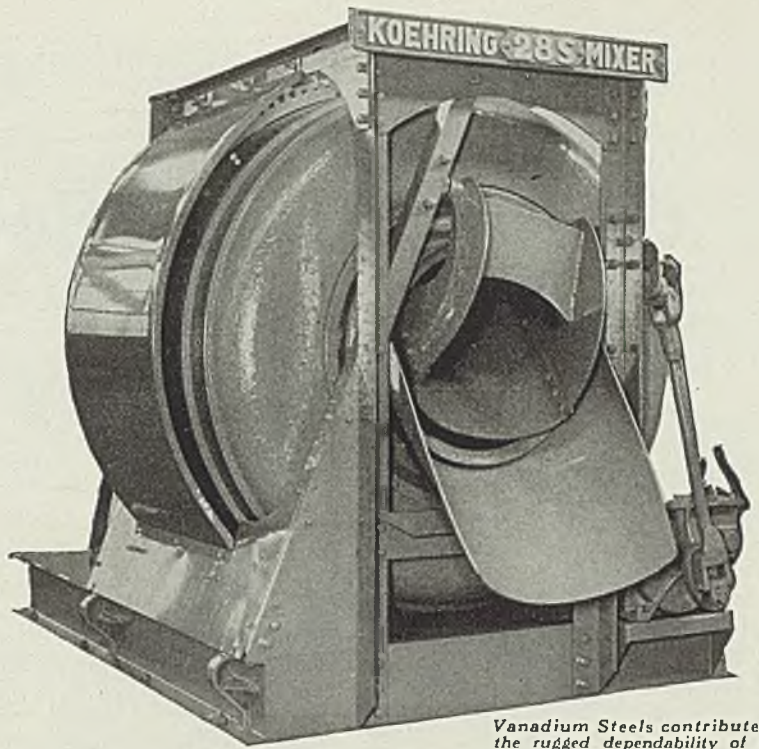
In another room also on the main floor where tin plate is tested for resistance to corrosion is found the only wood used in the entire building. It forms an insulated wall lining. It forms an insulated wall lining.

The balance of the main floor is given over to the offices of the plant metallurgist, laboratory office, observation staff, storeroom and lavatory.

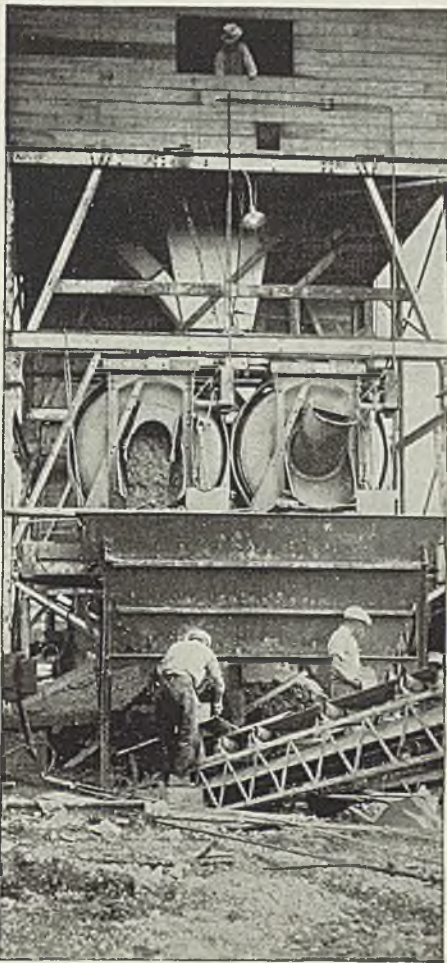
The lower floor, though located partially below ground level, receives ample daylight for such work as physical testing. The equipment installed here includes a 200,000-pound Riehle tensile testing machine, two Olsen bending machines, an Erichsen ductility testing machine, a Rockwell machine for testing sur-



FOR VITAL PARTS OF HEAVY DUTY CONCRETE MIXERS



Vanadium Steels contribute to the rugged dependability of the Koehring 28-S Concrete Mixer, made by Koehring Company, Milwaukee, Wisconsin.



...Koehring Uses Vanadium Steels

When a contractor buys a heavy duty concrete mixer he wants two definite qualities: ability to produce specification concrete at high speed and low operating costs — and 100% dependability. The concrete mixer must stand up under hours and hours of gruelling service; any failure of the mixer may tie up the entire job.

The new 28-S model Koehring Heavy Duty Concrete Mixer meets the contractor's requirements. It is designed to produce quality concrete at low cost. It is safeguarded against failure by the employment of Vanadium Steels in vital parts.

The shaft and reduction gears of the Koehring 28-S Heavy Duty Mixer are Chromium-Vanadium Steel. The drum heads and drum roller tracks which are cast integrally are Manganese-Vanadium Cast Steel.

Vanadium Steels — rolled, forged and cast — will help you add to the performance and dependability of your product. Metallurgical Engineers of the Vanadium Corporation of America will be glad to assist you in the selection of steels for specific applications.

VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK, N. Y.

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.

Research and Development Laboratories at Bridgeville, Pa.

Vanadium Steels



FERRO ALLOYS

of vanadium, silicon, chromium, and titanium, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

FOR STRENGTH • TOUGHNESS • DURABILITY

Gear Makers See Threat in More Regulatory Legislation

SUBJECTS relating to management as well as to the technical phases of the industry were considered at the twentieth semiannual meeting of the American Gear Manufacturers association, held at the Spink-Wawasee hotel, Wawasee, Ind., Sept. 20-22. A departure from the schedule of previous gatherings, meetings were held only in the mornings of the three days. More than 100 attended.

Labor, credit and national legislation were some of the topics other than those related directly to gear manufacturing and use that were treated by the speakers. H. H. Kerr, president, Boston Gear Works Inc., North Quincy, Mass., and president of the association, pointed out at the opening session that the threat still prevails of the passing of additional regulatory legislation in Washington. Expectation that the wage and hour bill will be passed at the next session of congress, provided it can be brought to a vote before the house, was expressed by R. S. Smethurst, assistant counsel, National Association of Manufacturers, in an address reviewing present and pending legislation.

Uniformity Needed in Credit

Manufacturers should be interested in the credit condition of the entire industry, or industries, it serves rather than that of only individual customers, it was stated by Paul Fielden, president, National Association of Credit Men. He also indicated that a breakdown in retail or banking credit easily could be reflected back to the manufacturer. Labor relations and foreign developments are factors which lately have become more important considerations in the extension of credit. The speaker recommended uniformity in discount terms and close adherence to such conditions.

A method whereby a manufacturer can arrive at a clear and graphic understanding of how his

wage rates compare with those in effect among other employers of his community was described by A. S. Crockett, General Electric Co., West Lynn, Mass. This method involves the plotting of the rate for a specific occupation against the rate paid by other neighboring companies for similar work. In order that the average rate not be influenced unduly by the wage of the highest paid workers, a comparison is made of not only the average rate but also of those employes comprising that half of the total number receiving the highest rate.

Automotive Gears Discussed

A supplement to a paper on "Factors Influencing the Durability of Automobile Transmission Gears," presented before the association at its annual meeting in May, by J. O. Almen, head of the dynamics department, research laboratories, General Motors Corp., Detroit, was reviewed by the author. This supplement described the methods for calculating stress in helical automobile transmission gears. A formula also was presented for the determination of the bending stress on spiral bevel gears. While the data included in this report, as indicated by Mr. Almen, is confined to application to automotive gears, the association plans further study to determine its value in connection with other types of gears.

A method of hardening gears by the oxyacetylene torch process was described by W. E. Sykes, Farrel-Birmingham Co. Inc., Buffalo. Since gear teeth will carry a heavier load when hardened, it is common practice to harden gears below 12 inches in diameter, but difficulties have been encountered in treating larger sizes by furnace heating or carburizing and at the same time limiting the amount of distortion, it was pointed out by the speaker. The nitriding process also is somewhat slow and expensive when applied

to large gears and tends to make the metal too brittle.

This situation has prompted the use of an oxyacetylene flame followed by a quick quench. About 7 or 8 years ago a machine was introduced that was adapted to guide mechanically a suitable torch fitted with a water jet. Mr. Sykes presented a motion picture illustrating the use of such a machine in hardening the teeth of large gears.

Use of suitable steels in connection with the torch hardening method was emphasized. "When the case hardening of gears was first introduced considerable trouble was experienced due to the fact that many makers did not realize how important it was to obtain what was called at the time a pure steel" (one with a minimum of nonmetallic inclusions), he stated. "In view of this knowledge and experience it is strange that many experienced engineers should expect the torch hardening process to operate successfully on almost any kind of material. It should hardly be necessary to explain that the application of a torch to poor steel will not eliminate its impurities and other defects.

"It is the author's opinion that the torch hardening method possesses so many advantages that it is likely to be used on an extensive scale notwithstanding a few failures and a certain amount of disparagement. It has the extremely important advantages of hardening gear teeth without appreciable distortion and of doing this relatively economically.

Suitable Steel Must Be Used

"When considering this process it is desirable to bear in mind that by its use steel is heated to a somewhat higher temperature and rapidly quenched and that a steel suitable for this treatment should be used. Up to the present, non-alloyed steel containing from 0.4 to 0.6 per cent

carbon seems to be suitable. Some of the alloy steels have given good results but greater care is necessary to apply the correct heat and to apply the quenching fluid at the correct distance from the heating flame. Some steel castings containing as low as 0.3 per cent carbon with a high manganese percentage also will harden satisfactorily."

So far about 700 pairs of gears have been hardened on the machine described by Mr. Sykes, and these are said to have given excellent results. While the torch hardening method is far from being a cure-all for gear failure, it is predicted as having a growing field of usefulness, not only in the treatment of gears but of other machine parts as well.

Experimental work on the study of gear teeth pitting carried on by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was discussed by Dr. Stewart Way of that company's research laboratories. This work includes tests made with pure rolling contact, using cylindrical rollers, and tests of gear sets. Dr. Way described primarily the results of the roller pitting tests. This method has been used because pitting usually occurs near the pitch line of gear teeth, where there is pure rolling contact.

The rollers used are run together in pairs, one of them being driven externally and it in turn driving the other by traction in the contact area. The upper roller is mounted in a bearing block attached to a loading arm through which pressure is applied.

Pits Start from Cracks

It has been found that pits develop from pitting cracks, the latter starting in a surface layer less than 0.001-inch thick. It is not certain whether they start at the surface or below. The general direction taken by the cracks as they grow always bears a definite relation to the direction of rolling, according to Dr. Way's findings. His other conclusions follow:

"Pitting cannot be produced without the presence of oil, and if oil be added to a pair of rollers that has run dry at a load above the pitting limit for several million cycles, pitting will occur in a few hundred thousand additional revolutions.

"The resistance to pitting was found to be practically independent of the viscosity of the oil for viscosities 400 to 2000 seconds at the operating temperature, at a speed of 400 revolutions per minute. For higher viscosities than 2000 seconds the pitting limit increases appreciably with increasing viscosity. The action of the heavier oils in discouraging pitting was found to lie in their prevention of the formation

of pitting cracks, rather than in the prevention of the growth of cracks to pits.

"The pitting limit was found to depend to a considerable degree on the surface finish, the finer finishes giving higher pitting limits.

"The pitting limit was found, for all materials tested, to increase with increasing hardness."

A paper covering the relation between microstructure and machinability of alloy gear steel, presented by Norman E. Woldman, chief metallurgical engineer, Eclipse Aviation Corp., East Orange, N. J., indicated that no one grain structure is best suited for all types of machining.

Steels React Differently

As pointed out by the speaker, each machining operation in the manufacture of gears requires a specially-designed tool, made from a required alloy and heat treated to a definite hardness. From this it follows that there must be some difference in the behavior of each of these tools on the one grade of steel and that different structures of the same steel will react differently to the same cutting tools. Studies discussed in the paper included only the oil hardening types of alloy steels, such as chrome-vanadium, nickel-chrome and nickel-chrome-molybdenum.

To establish definitely the relationship between the microstructure and machinability of these alloy steels, specimens were treated and machined with the following results:

For SAE 3250 and 4350 steels the quenched and tempered, fine-grained spheroidized structure proved best for automatic machining. For SAE 6150 steel the coarse grained spheroidized structure, obtained by long annealing at and about the lower critical temperature, was found best for automatic machining.

For all three steels, the laminated-pearlite structure, obtained by annealing above the upper critical temperature, was best for broaching as well as for gear cutting and for single point tool turning of the bevel faces of the gears. The spheroidized structure, obtained by long annealing at and about the lower critical temperature, was best for minimum distortion in hardening. The annealed laminated-pearlite structure produced the most distortion.

A paper, "Electric Motors for Gearmotor Applications," presented by L. R. Botsai, Nuttall Works, Westinghouse Electric & Mfg. Co., Pittsburgh, reviewed the different classes of motors and their applications, particularly when applied with reduction gears in motorized speed reducers. Torque characteristics of the various types of induc-

tion and direct-current motors were described and typical uses of each were indicated.

Mr. Botsai stated that the problem of selecting the right motor for any drive is one of studying the application, the starting and load requirements. Motors are rated in horsepower at a given speed or speeds, while the torque varies as the square of the voltage, and any change in frequency of the supply voltage of the motor directly affects the torque and speed of the motor.

Various committee reports comprised the balance of the program. It was announced that compilation of the association's recommended practices will permit distribution before the annual meeting next spring. A proposal of nomenclature for gear dynamics has been prepared and is to be submitted to members.

A report on the relation of the American Gear Manufacturers association to other associations in standardization activities, prepared by T. R. Rideout, Nuttall Works, Westinghouse Electric & Mfg. Co., Pittsburgh, was included in the meeting program but was presented only by title. This report discussed the activities of the association in connection with the American Standards association, the former being a joint sponsor for sectional committees on the standardization of gears, roller chains and sprocket teeth.

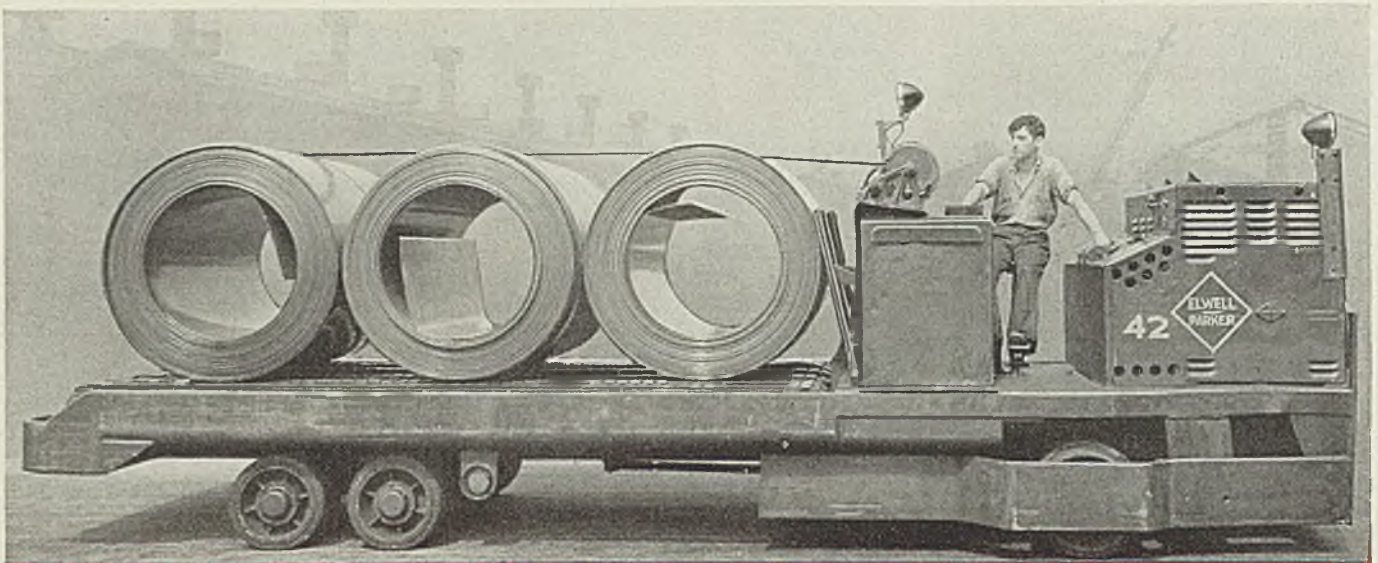
Issues Summary of Silicosis Laws and Literature

The Pneumonokonioses (silicosis) Literature and Laws, Book III, by George G. Davis, Md. Ella M. Salmonsén, and Joseph L. Earlywine, 1033 pages, published by the Chicago Medical Press, Chicago, and supplied through STEEL for \$8.50 and in Europe by the Penton Publishing Co. Ltd., London.

The first part of this volume includes abstracts of articles on silicosis published during 1935 and 1936 in the United States and foreign countries. Part II consists of the occupational disease laws pertaining to pneumonokonioses (silicosis) now in force in the United States and in several foreign countries.

This volume follows Books I and II covering literature and information prior to 1934 and the material presented during 1934 respectively.

Medical index is included for physicians, medical students, medical librarians and medical technicians. This is followed by a subject index which should be of practical value to industrial physicians, and hygienists, as well as to attorneys, insurance carriers and the general reader. An author index also is included as is a bibliography not previously available in Books I and II.



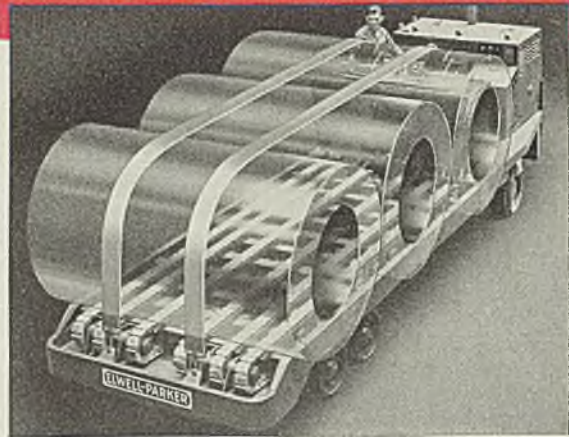
THE FIRST CHAIN TRUCK TO HANDLE 76" COILS OF STRIP WAS AN ELWELL-PARKER P-6

● Even the most unique method of steel transportation soon is quickly forgotten for itself—though appreciated through the years because of its excellent daily performance.

The small view shows the first Chain Truck, P-6, to go into active service. The large picture shows it at work, about a year after it had been installed. This Truck was one of two designed by Engineers of the Steel Company and of Elwell-Parker, who built them, *and the first of its kind to be put into service.*

Elwell-Parker supplied these pioneering Model P-6 Chain Trucks because of unusual loads, handled under unusual conditions. Longer hauls, for example; speedy rate of travel; exceptionally large coils (up to 60" diameter, and totaling 20 tons); quick yet careful loading and unloading by means of chains, the speeds of which were timed to avoid damage to the coils transported.

Today, with transportation taking on new importance as a factor in lower-cost production of steel, Transportation Engineers find Elwell-Parker's co-operation of major importance in designing Truck Equipment



for special, as well as all standard, transportation jobs. Elwell-Parker has built for Steel for a generation. Its advance planning, backed by such practical experience, will bring a quick solution of your own problems when you call in an Elwell-Parker Steel Engineer. The Elwell-Parker Electric Co., 4501 St. Clair Ave., Cleveland, O.

**LOOK FOR THESE MACHINES WHEN
YOU VISIT THE MILLS IN GARY**

New Type **ELWELL-PARKER** *Trucks*

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906

MATERIALS HANDLING



Modern Handling Shows Results In Profits of Forging Plant

EFFICIENT handling systems for standardized production are quite common—in fact, they mean the difference between profits and operations “in the red” at many plants. Systems may be evolved after a study of the product to be made and the necessary processes.

But when an efficient handling system is evolved for a plant which does not produce any standard item—whose products vary in size from a few inches to several feet and in weight from a few ounces to hundreds of pounds—that means somewhere in the past there has been an exhaustive research made and innumerable experiments carried out.

Research of this nature has been done and the resulting system is operating efficiently, at the plant of Transue & Williams Steel Forging

Corp., Alliance, O. In a normal year, 20,000 to 30,000 tons of forgings of all shapes and sizes are handled in job lots through this plant. Efficient handling methods have played an important part in making this one of the largest independent producers of forgings.

That thought has been given to

all phases of the materials handling problem is evident throughout the plant from the yards where incoming material is stored to the shipping dock where it goes out as finished forgings. The cardinal point emphasized in the entire system is that no material is ever placed on the floor. Basic factor is the use



ABOVE is shown a view of the storage yard showing the two types of skids used generally, the box type and the U-shaped type. Lower photo shows the fleet of electric high-lift trucks used in handling the skids and tote boxes. Note the truck at extreme left, which is equipped with a roller platform and a winch to handle dies and die blocks

MATERIALS HANDLING



of electric high lift trucks and pressed steel tote boxes. These boxes are of two types—boxes for the smaller forgings and U-shaped units to accommodate the longer pieces. Skids and tote boxes are formed in one integral unit.

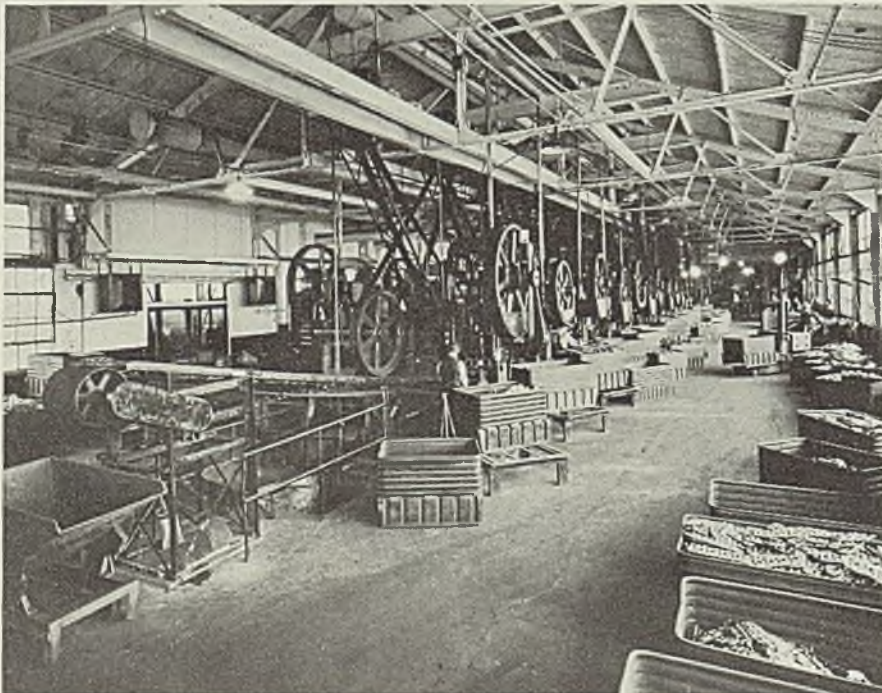
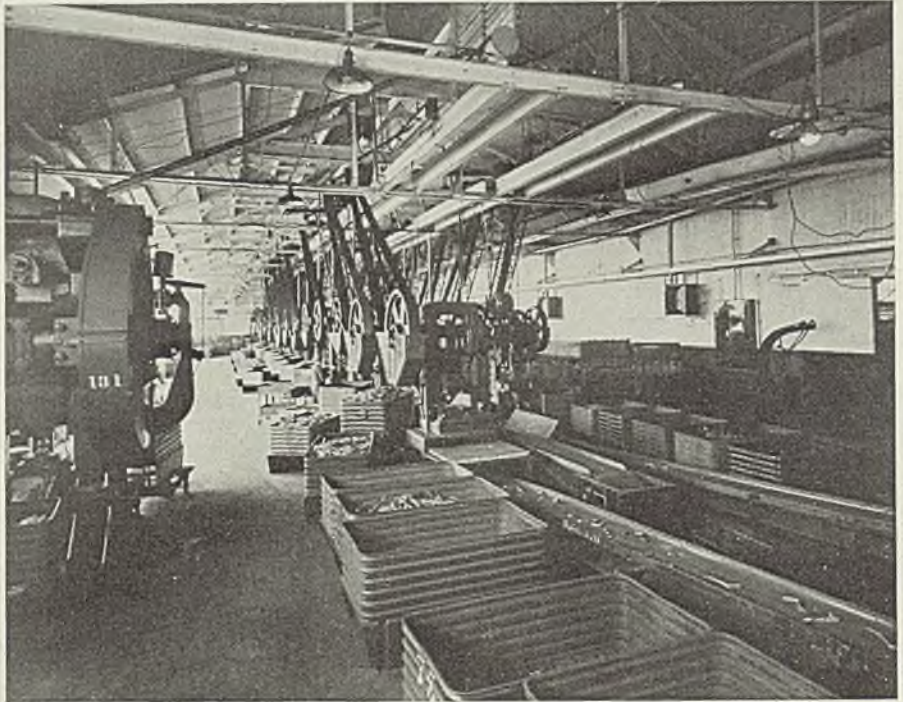
Entering the yards on a siding, steel bar stock is stored according to heat lots, or in some cases according to customers' orders. The stock yard is served by a 15-ton overhead gantry crane. When stock is required, it is loaded on small buggies and carried down a track into the shear room, where it is weighed and cut to length.

Three alligator type shears, a large shear with capacity for 7-inch rounds and a circular saw cut the stock to required lengths. From these cut-off machines the stock is placed in tote boxes.

From this point to the shipping dock, stock is handled entirely in tote boxes. Each box is marked with a ticket showing complete data on its contents. It is interesting to note that the company analyzes all steel before using it on any job. Complete laboratories are maintained to permit production of forgings to any specifications. The shear divi-

sion is located centrally for ease in feeding the three hammer shops. Tote boxes from the shears and saw are taken to the particular hammer designated for the forging job.

After the forging operation, the untrimmed pieces are dropped by the operators into tote boxes and taken to the trim shop. On an entirely mechanized system, flash is removed by two press lines. The presses are mounted bridge fashion over endless rubber belt conveyors. As the forgings are trimmed they fall through onto the twin conveyors and are carried under the presses to the end of the trimming line, where operators remove them. These men serve a dual purpose—they classify the forgings as to jobs and at the same time inspect them, throwing the accepted pieces into the ever present tote boxes.



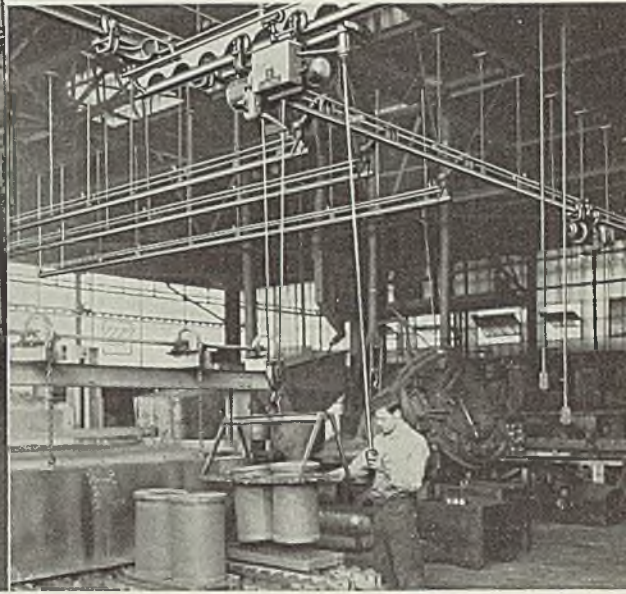
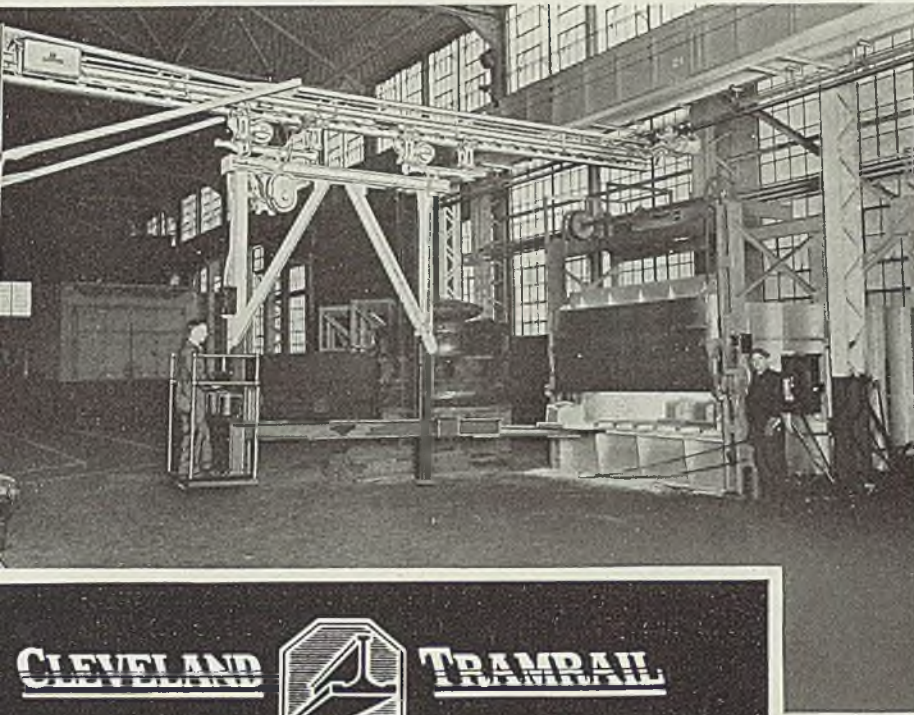
HERE are shown two views of the press line where flash is removed from the forgings. The finished forgings drop through the presses onto two belt conveyors shown in the above photo, from which they are sorted into the tote boxes shown. The flash is placed on the center conveyor which runs in the opposite direction, ending up at the hopper shown in the lower view

Flash from the presses is dropped on a third continuous belt conveyor running in the opposite direction from the forging conveyors. It is carried to the other end of the line where it is dumped into a hopper. This hopper is built so a lift truck may pick it up and carry it to the scrap yard, where a special dumping mechanism on the hopper itself removes the flash.

In the scrap yard are more evidences of the thought given to handling problems. Scrap, classified as to analysis, is baled and stored in

CLEVELAND TRAMRAIL MATERIALS HANDLING EQUIPMENT

For the Metal Working Industry

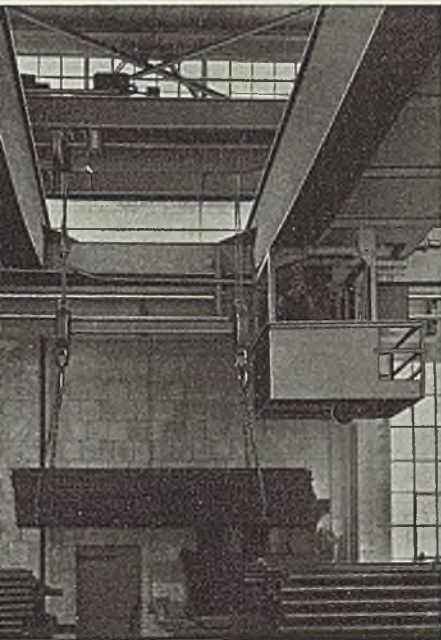


Cleveland Tramrail for handling in the heat treating processes.

CLEVELAND  **TRAMRAIL**

Consult your 'phone directory under Cleveland Tramrail

CLEVELAND ALL WELDED CRANES FOR EVERY INDUSTRY



• A 10 ton 80 foot span Cleveland Crane roller bearing equipped — girders, trolleys, end trucks "All Welded." A MODERN CRANE.

CLEVELAND



CRANES

NEW YORK • DETROIT

PITTSBURG • CHICAGO

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE OHIO



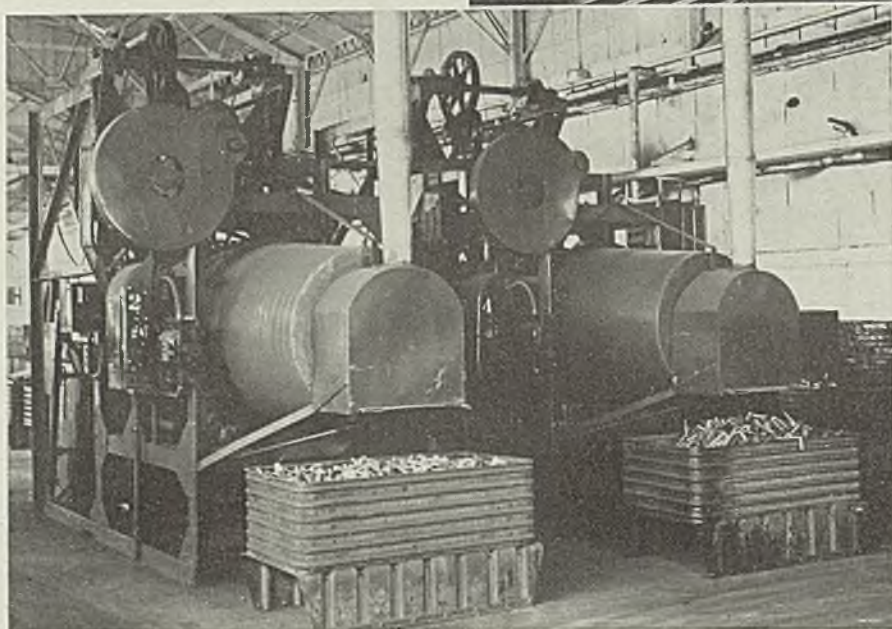
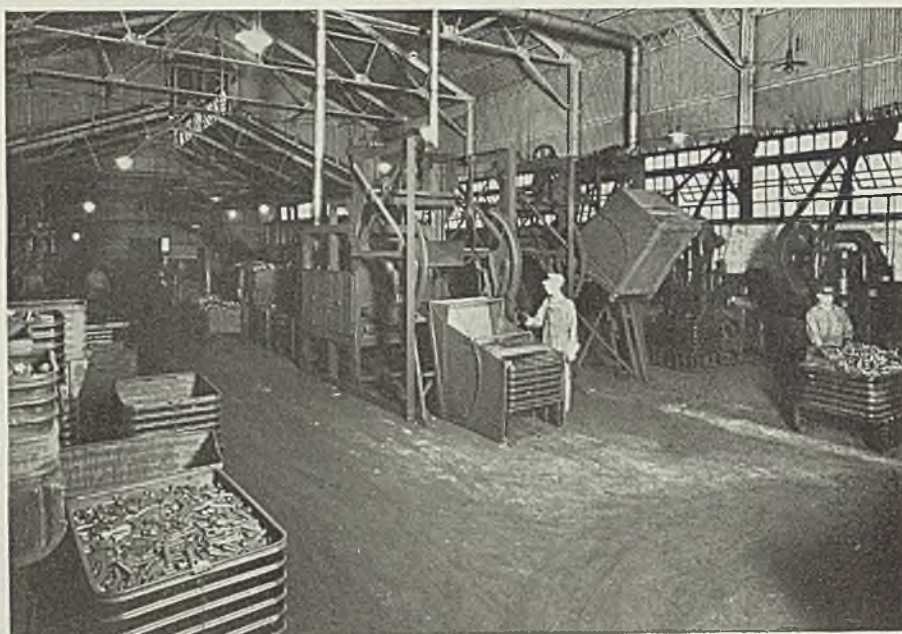
FLEXIBILITY of the skid-and-box system is shown to good advantage in the shipping department

tion and finally to the shipping dock where they are weighed and shipped.

Moderate sized forgings are cleaned in a rotary pickling unit. Contents of the boxes are placed

bins until it reaches carload proportions. Large flash is sheared into pieces suitable for baling to eliminate loose and unwieldy material and consequently loss of space in freight cars.

Tote boxes of trimmed forgings are carried to one of three finishing operations. Smaller pieces are cleaned in a rotary tumble mill loaded with stars. The mill, designed by plant engineers, are excellent examples of the "no extra handling" principle. The tote boxes filled with forgings are placed in a lifting device at one end of the mill, which picks up the box and dumps its entire contents into the mill. An internal spiral holds the forgings in the mill while they are cleaned; when they are finished, the mill is reversed and the spiral removes the forgings, turning them out into a waiting tote box. From the cleaner they are taken to inspec-



in perforated, acid resisting metal baskets, carried through the various stations and returned in the boxes to inspection. Large pieces are cleaned by a steel-shot blasting process.

In the large hammer shop, a monorail crane is used in handling especially large forgings. For example, one operation requiring three hammer operations and two heatings involves a rear axle housing for heavy trucks. The monorail is used to carry these pieces from hammer to hammer and through the furnaces.

Continuous quench and draw furnaces as well as several batch type furnaces are equipped with monorails to handle the trays of forgings. These trays are filled directly from tote boxes to eliminate stacking any pieces on the floor.

It is a testimony to the thorough-

(Please turn to Page 70)

AS shown in the above photo, trucks set tote boxes in the hopper of the rotary cleaning mill, which dumps the contents in the mill. After the cleaning operation the forgings fall into another tote box as shown below, eliminating all handling



WELDING, ETC.

BY ROBERT E. KINKEAD

Education In Welding

IMPATIENCE of many with engineering colleges that deal with welding in a most perfunctory manner is bringing about more serious treatment of the subject.

The plain fact is that civil, mechanical and metallurgical engineers who don't know the fundamentals of welding are seriously handicapped if they wish to advance rapidly in their profession.

But there is much to be said on the side of the overloaded engineering colleges. Where, for instance, will a college get an engineer, with a degree and ten years experience in welding, to teach the subject? And after such men are located, how will the administrative officers get them to teach for less than half as much as they can earn in industry? In the matter of academic rank they would be about on a level with the manual training instructors. Not many would accept such position.

An easier solution to the problem would be for the welding industry to run summer courses for present college teachers of the rank of professor or assistant professor. Such courses could be arranged to conform to academic customs and lead to a suitable degree which would be of real value to professional teachers. By making the activity sponsored jointly by the colleges, the teachers and the welding industry, the money cost would be within bounds but it would be enough to make everyone respect the results.

Atom Busters and Welding

REPORTED construction of two more atom busters by Chicago Bridge & Iron Works, for Carnegie Institute and Rice Institute focuses attention on the work of physicists in a field which intrigues everyone who works with welding processes.

A force which is sufficient to shatter an atom into its component parts might conceivably be applied to bring atoms together in a weld.

Old as the craft of welding is, very little is known of the precise mechanism by which the phenomenon occurs. A molecular bond or weld may be established by heat, heat and pressure or pressure alone.

The theory has been advanced that, if two molecules are in close

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

proximity and the orbits of the electrons are disposed in an optimum manner towards each other, a relatively small amount of energy is required to bring about a molecular bond by which a new system is formed. The energy may be heat or mechanical pressure.

That relatively large amounts of energy are required might be explained by the well known fact that all metals used commercially, no matter how pure they may be, are extremely heterogeneous with reference to any particular arrangement of atoms, molecules and crystals.

It might be suggested that fusion takes place readily at temperatures at which the metal is liquid because resistance has been broken down to a presumed tendency of atoms and molecules to arrange themselves in a manner favorable to establishment of new molecular bonds on a universal scale.

It may seem a long step from the

problems of atom busting to the problems of welding, since the former deals with atomic structure and the latter has to do with molecular bonds, yet there is no scrap of information on the ultimate constitution of matter so small as to be without significance. One chance experiment with results of no interest to the atom busting physicists might change the whole picture of welding over night.

Welding Quality Steel

WITH the addition of Mayari R Steel, Bethlehem's new product, the growing family of high tensile, welding quality steels seems to have reached a mature development.

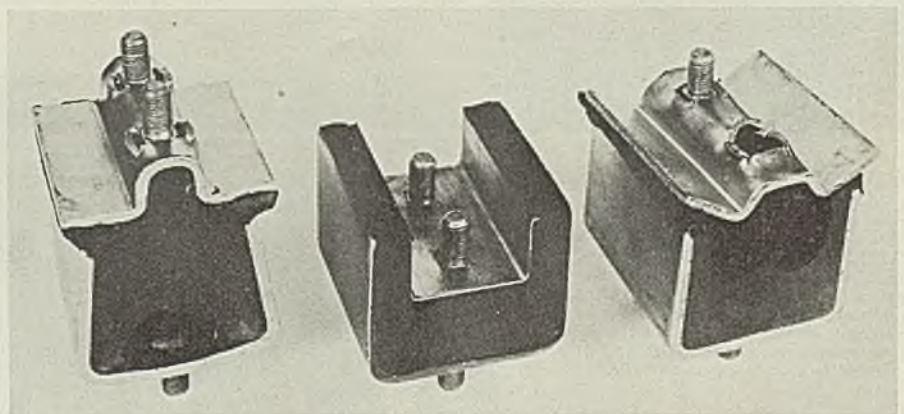
The movement besides introducing such unusual words as Cor-Ten, Man-Ten, Sil-Ten, Yaloy or R. D. S., has pushed the tensile strength of the heavier gages of steel up to about the limit that can be cold fabricated with existing equipment.

These steels are the answer to the welder's prayer of five years ago. The steel producers have put steel on the line that is a match for the best welding rod and technique the welding industry has been able to invent.

Where to go from here seems to be an opportune question. The steel and the perfection of welding technique are at about an even stand-off. It appears likely that the field of composite metals welded together to put the right alloy at the proper point is the next great field of opportunity for the steel producers and the welding industry.

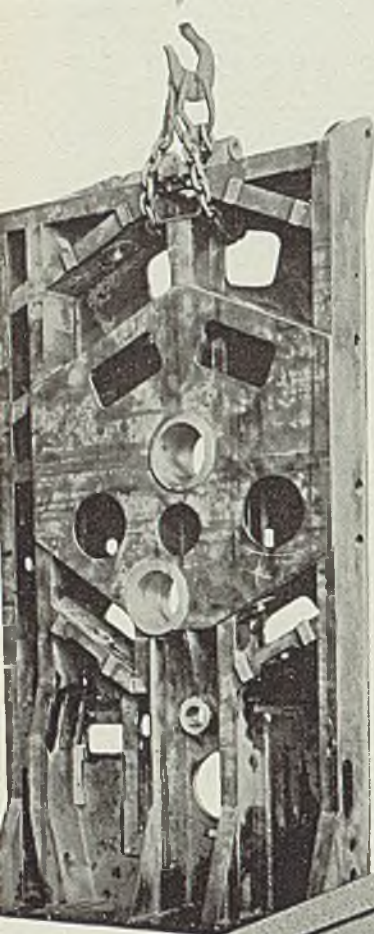
More is known now on this subject than was known ten years ago about producing these new steels.

Rubber Sandwich Withstands Test



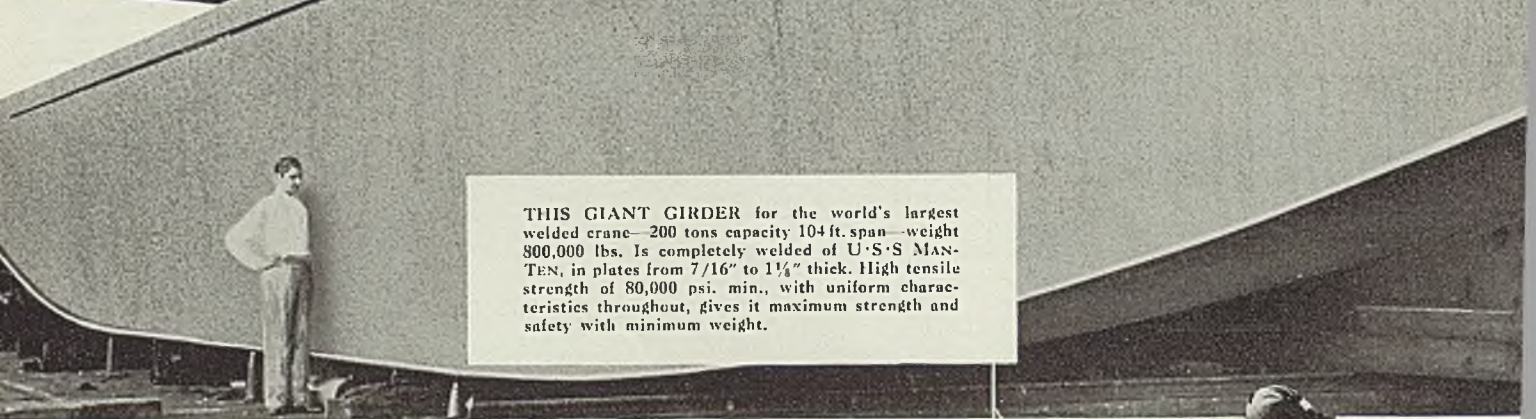
BONDING of rubber to metal so firmly that the metal actually turns inside out before the bond tears loose is illustrated by this test conducted in the laboratories of United States Rubber Products Inc., New York. The rubber mounting, seen in center, was held firmly in a testing machine while a clamp gripped the two bolts located in the channel. Tremendous pull was exerted with the result pictured. At the left, the channel has been pulled inside out, although the bond still holds. At the right, the bolt was pulled out, while the rubber still clings to the metal

THIS SHOVEL BED FRAME, welded from beam sections and rolled steel plates, is part of an all welded dragline shovel handling a 2½ cu. yd. bucket on an 80 ft. boom. On such equipment, good engineering design has made important strides in reducing weight without sacrificing strength. Rolled steel construction—with U·S·S High Tensile Steels—will do it most economically . . . will quickly pay for itself in increased capacity, reduced operating costs.



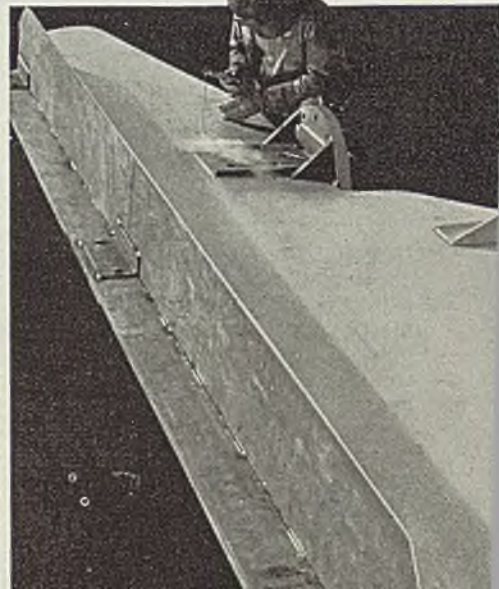
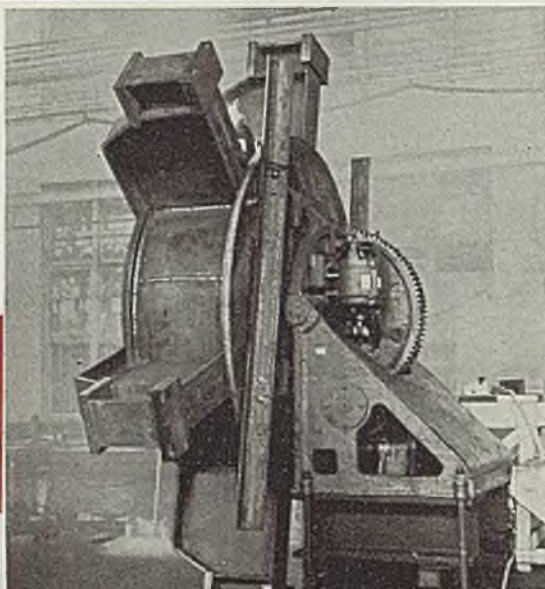
PUTTING THE *Right Steel*

IN THE RIGHT PLACE

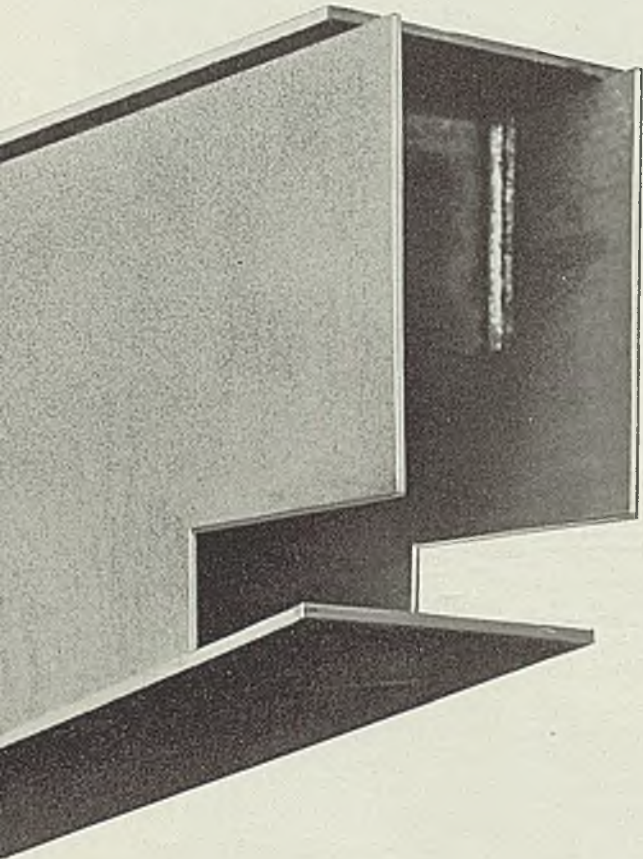


THIS GIANT GIRDER for the world's largest welded crane—200 tons capacity—104 ft. span—weight 800,000 lbs. Is completely welded of U·S·S MANTEN, in plates from 7/16" to 1¼" thick. High tensile strength of 80,000 psi. min., with uniform characteristics throughout, gives it maximum strength and safety with minimum weight.

MANIPULATOR for positioning parts, simplifies handling and expedites the work of welding rolled steel construction. Rolled steel and steel castings are combined in this unit making it strong, rigid and light—thus giving the greatest functional efficiency. Part being welded is a turbo-generator base.



This outstanding advantage of Rolled Steel Construction will increase efficiency...reduce weight and bulk...lengthen life...lower costs



THIS SHIP'S RUDDER for Ohio River use of welded, rolled steel construction. Weighs less in water than the wooden rudder it replaces, presents a smoother, streamlined surface to water flow that should make it more effective. Made of U·S·S COR-TEN having 4 to 6 times the atmospheric corrosion resistance of plain steel, it will last in service.

BY this modern fabrication method, machine frames, housings, beds, bases, supports, drums and wheels—simple and intricate constructions, both large and small—can be built up from individual parts which are torch cut from simple rolled steel shapes and then welded into one strong, homogeneous unit.

Rolled Steel construction offers a new freedom in design. It offers a faster, more economical method of construction. But even more important, it places at the disposal of the designer and fabricator the entire range of metallurgy's special steels. Permits you to pick these steels to exactly fit each job—to place these steels where they will do the most good. Makes it possible to combine one special steel with another. Or to combine them with castings whenever such combinations seem desirable.

So we say, when you design for rolled steel construction, keep in mind the special steels we offer—and what they will do for you. For example—

- to carry high unit stresses and reduce weight to a minimum, there are U·S·S High Tensile Steels.
- to provide high impact strength at low temperatures, there is U·S·S Steel for Low Temperature Service.
- to reduce abrasive wear and cut down replacements, there is U·S·S Abrasion-Resisting Steel.
- to endure temperatures disastrous to other metals, there is U·S·S Heat-Resisting Steel (25-12).
- to carry bearing pressures safely, there are several special analyses of U·S·S Carilloy Alloy Steels.
- to resist corrosive environments, there are U·S·S Stainless Steels in special analyses which can be welded with no loss in corrosion resistance.

For virtually every special need, there are special rolled steels with special properties to make your equipment longer-lasting, safer and lighter. Write us freely about any problem which you feel rolled steel design—or these special steels—might help you solve.

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON and RAILROAD COMPANY, *Birmingham*
United States Steel Products Company, *New York, Export Distributors*

UNITED STATES STEEL





SURFACE TREATMENT AND FINISHING OF METALS

Finish Clinches Motorcycle Sales In Highly Competitive Market

WHILE a highly finished motorcycle may be the pride of a mounted police officer's heart, it can scarcely be expected that its pleasing appearance will even be noticed, much less appreciated by an unhappy motorist who has been ordered to "pull over to the curb." As for the police officer, he could perform his duty just as well if the machine had no finish at all, but the fact remains that motorcycles, whether operated by the police or private owners, are highly finished at a considerable cost. This is true because in a highly competitive market which has forced mechanical development to a high degree of perfection, sales appeal depends largely upon appearance.

Finishes Involve Heavy Expense

Motorcycle finishing can be divided into two classifications, finish of frames, fenders, gas tanks and similar parts, which are done in synthetic enamels of various colors, and plating and polishing of numerous bright parts such as handle bars, hubs, rims and other conspicuous parts. Finishing methods used by Indian Motorcycle Co., Springfield, Mass., reveal the amount of labor and expense involved in applying motorcycle finishes.

Motorcycle frames are welded units and the first finishing operation is filing away of superfluous material around the joints. A motorcycle frame is a somewhat complicated structure and for this reason it is not considered practicable to attempt to polish it on ordinary

setup polishing wheels. However, a certain amount of abrasive work is performed with manufactured alumina cloth, 60 grit, cut in strips and used by hand. Steel wool is also used freely.

Oven Arrangement Is Novel

All enameled parts are first given a spray coat of brown baking primer. Spray booths are adequately equipped with ventilating devices and lighting facilities are provided which shine directly into the booths without objectionable glare. The primer is baked in a steam heated oven, 125 feet long. Baking temperature is from 220 to 250 degrees Fahr. The oven is provided with tracks which accommodate two trains of racks of the type shown in accompanying illustrations. When an operator has filled a rack with sprayed parts he pushes it into the oven. Since the oven is kept full of racks this action pushes a truck of completely baked parts out at the other end. The length of the oven is sufficient to permit complete baking. If slight delays should occur, a short overbaking at this temperature would do little or no harm.

Parts are then sanded to a smooth finish, given another coat of primer followed by two color coats, both of which are baked at 200 degrees Fahr. in the same type of oven as used for the priming coats.

Frames are ready for striping without further treatment but this is not true of fenders, tanks, side cars and other units having large finished surfaces. These parts are

all hand rubbed to a uniformly smooth gloss with pumice and water. The pumice used is the finest grit obtainable and is known as Italian pumice, American ground.

The Indian head which appears on these motorcycles is applied by decalomania though the striping around it is applied by hand. Fenders and other parts are also hand striped although in some instances it is possible to use masks when laying one color over another.

Lettering Done by Hand

Often it is necessary to letter tanks or other parts with advertising matter, police insignia or other devices. This work is done by hand, using stencils on occasion only to outline letters in chalk. Various colors are used such as, gold on a black background with a red outline around the letters and many others. A high standard of quality is maintained since nothing would detract more from the final finish than a poor job of lettering.

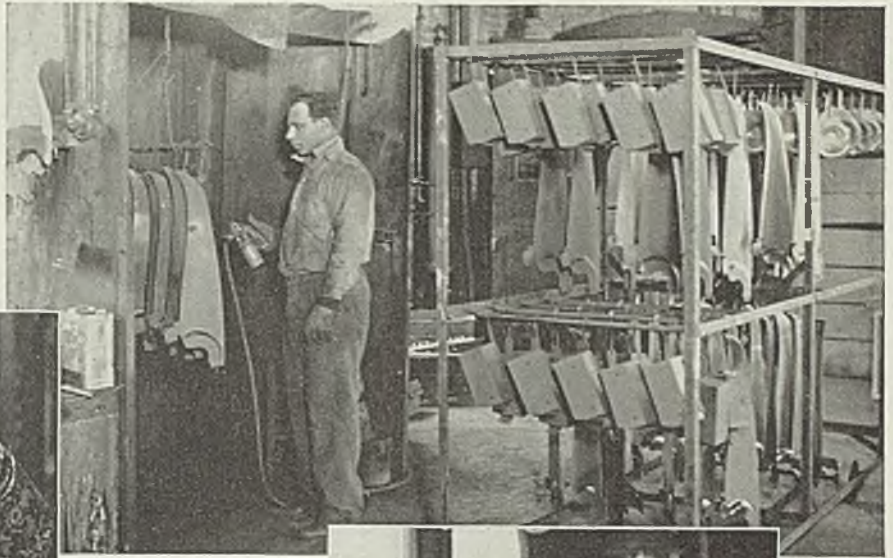
After lettering and striping is completed parts are coated with a clear synthetic enamel which is baked at 200 degrees Fahr. The same type of baking racks and ovens as described above are used for this work.

While these methods of finishing are costly, they represent a considerable saving when compared with the cost of the hand enameling methods formerly used.

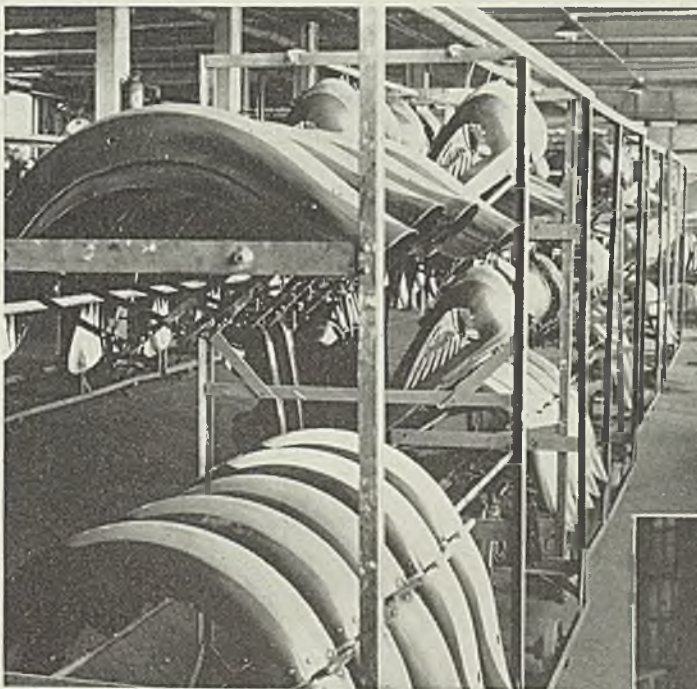
Methods used in preparing metal surfaces for electroplating depend

(Please turn to Page 68)

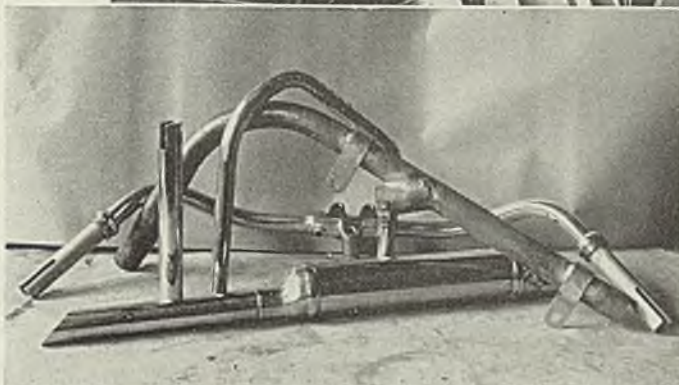
ALL enameled parts are given a spray coat of brown baking primer. Shown right is spray booth and rack of finished parts ready to be wheeled into baking oven



TRADemarks are applied by decalcomania process. Operator at left is hand striping around trademark. Right is shown how finish coat of enamel is rubbed to a smooth surface with pumice and water



FINISHED parts are coated with clear synthetic baking enamel and placed in wheeled racks. Racks are placed in train as shown left and pushed through oven in progressive chain as racks are filled



POLISHING operations are conducted by hand as shown above. Intricate shape of parts shown left illustrates why automatic polishing methods can not readily be applied in motorcycle manufacture



PROGRESS IN STEELMAKING

Details of a Heat of Stainless Steel Produced in the Electric Furnace

WHEN the first electric steel-making furnace was built in this country in 1906, it competed with and soon replaced the crucible process as the principal medium for the production of high grade alloy and tool steels, just as, 38 years before, the first open hearth furnace competed with the bessemer

converter for supremacy in the field of producing ordinary steels in large quantities, according to *Steel Facts*, published by the American Iron and Steel institute, New York.

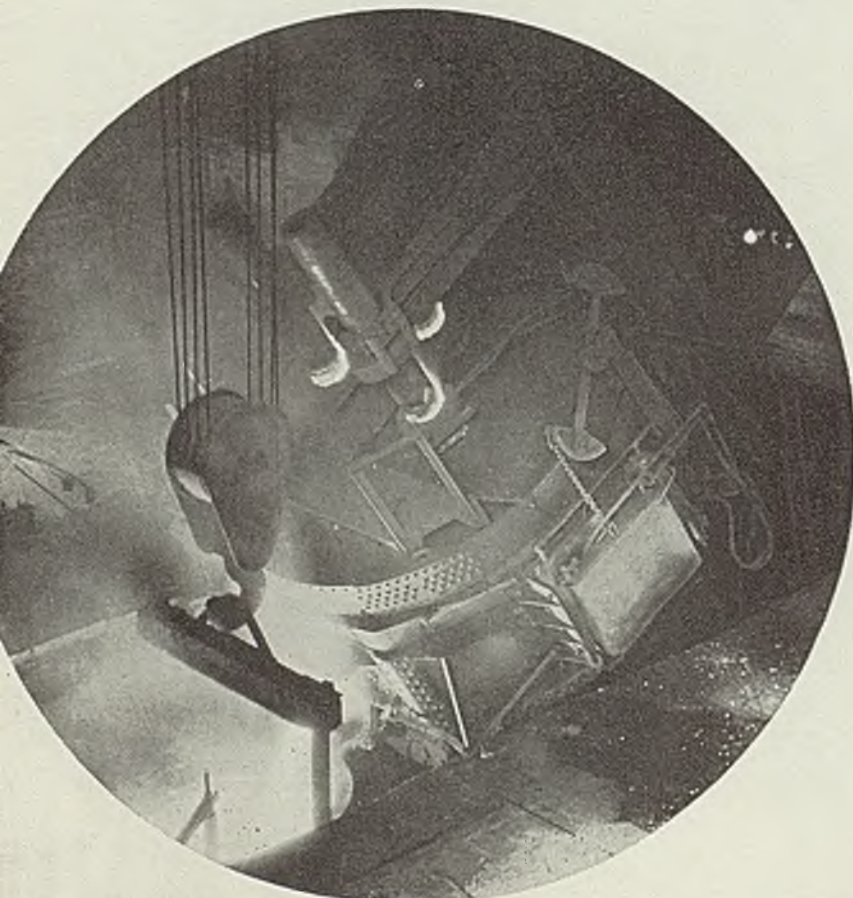
The electric furnace process is inherently more expensive in operation than any of the other modern

steel making processes, and compared with an open hearth furnace or a bessemer converter, the daily output of an electric furnace is small. The average open hearth furnace can produce 225 tons of steel in 24 hours, the bessemer converter about 2800 tons, and the average electric furnace between 30 and 40 tons. For those reasons, only the finest grades of steel are produced by the electric furnace method. About 1½ per cent of the steel made today in the United States is melted in electric furnaces, but its importance is far greater than the tonnage indicates.

Steels of the highest grade for use in aircraft, automobiles, bearings, magnets, many kinds of tools, engine valves and innumerable other important uses are produced in electric furnaces. Stainless and heat resisting steels are made almost exclusively by that process.

Electricity is used solely for the production of heat and does not of itself impart any mysterious properties to steel. Nevertheless, the electric furnace method allows certain advantages impossible of attainment in other steel melting processes. The electric furnace generates extremely high temperature, up to 3500 degrees Fahr., very rapidly. The temperature is at all times under precise control and is easily regulated.

Furthermore, the production of heat by electricity is unique in that oxygen is not necessary to support combustion and the atmosphere within an electric furnace may be





Our Customers

Control Our Sheet Mill Schedules

Doesn't matter how busy Youngstown's sheet mills may be, they are scheduled not by the operating department (which would be the easy way for us) but by the sales department for the convenience and service of you, our regular customer. You as a customer might

have some sudden demand put upon you, or you might need a different gauge or analysis of steel quickly. When that happens, remember that Youngstown's mills are manned by a bunch that's ready to turn the place upside-down to serve you.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels • *General Offices, Youngstown, Ohio*
Sheets • Plates • Pipe and Tubular Products • Conduit • Tin Plate • Bars • Rods • Wire • Nails • Unions • Tie Plates and Spikes

YOUNGSTOWN

regulated at will. The quantity of oxygen entering the furnace can be precisely controlled, which is not the case in the open hearth and bessemer processes. Thus the presence of even minute quantities of oxygen, compounds of oxygen with other elements, or other impurities undesirable in fine steels, can be materially reduced. In addition, the electric furnace process permits the addition of expensive alloying elements to molten steel without loss by oxidation.

For all of these reasons the metallurgist can control composition more closely and produce steel with fewer impurities in an electric furnace than in any other steelmaking furnace.

Description of Furnace

Body of the electric furnace is a circular steel shell, resembling a huge teakettle in general appearance. It is mounted on rockers so that the furnace can be tilted to pour off molten metal and slag. The bottom of the furnace is lined with refractory brick and other heat-resisting materials to form a bowl shaped container.

Side walls which are also lined with refractory brick, contain three or more openings: A clay-lined spout for tapping off the molten metal and slag, and doors for charging raw materials. The doors, operated mechanically, are in some cases water cooled.

Roof of the furnace is lined with nine inches or more of refractory brick and is shaped like a flat dome. Through this dome great columns of carbon reach into the furnace. These are the electrodes which carry the current to the steel charge. They are commonly 17 inches or more in diameter and about six feet long. The flow of current is regulated by raising and lowering the electrodes, each of which may be adjusted independently of the others. In general, the greater the distance between the electrodes and the charge, the less heat is produced.

Electrodes are spaced far enough apart so that no arc can occur between one and another. They project to within an inch of the layer of molten slag which floats on top of the steel and serves to prevent the intense heat of the arc from burning the steel. The slag also shields the metal from carbon vapors emitted by the electrodes.

The current jumps the gap between the electrode and the slag, passes from the slag into the metal and is conducted through the metal and up to the foot of the next electrode, striking another arc. All the heat produced in the furnace is generated by the arcs.

Because the metal immediately below the electrodes is hotter than

that near the walls of the furnace, the molten metal is in constant motion, as if it were boiling, and so is thoroughly mixed and uniformly heated.

Electric furnace steel melting operations are supervised by a melter. The usual crew of a 10-ton furnace consists of a melter and helper, but in plants where more than one furnace is operated it is common practice to place all the furnaces in charge of one melter. In that case each furnace is manned by a first helper and second helper.

In addition to supervising the operation of the furnaces, the melter determines what quantity of alloys is to be added to the steel to meet specified analyses, and generally acts in an advisory capacity to the first helpers who actually operate the furnaces. Second helpers assist first helpers in operating furnaces, make most of the minor repairs and weigh and charge the alloys used in making steel.

Judgment Is Required

Manufacture of steels in electric furnaces depends largely upon the ability and good judgment of the men, for the furnace is simply a tool in their hands. How that tool is used is illustrated in the following authentic "case history" of a heat of stainless steel made in an electric furnace.

The melter was given orders to produce a heat of stainless steel, to contain between 0.07 and 0.12 per cent carbon, from 0.25 to 0.40 per cent manganese, a maximum of 0.02 per cent each of phosphorus and sulphur, silicon between 0.30 and 0.50 per cent, chromium from 18 to 20 per cent and nickel between 8 and 10 per cent. The following record shows how it was done.

11:30 a. m.—Furnace crew repaired the bottom of a furnace in which a heat of steel had just been made.

11:45 a. m.—Began loading or charging the furnace with 5800 pounds of boiler plate scrap, 3000 pounds of spring steel scrap, 2000 pounds of stainless steel scrap and 1500 pounds of pure nickel.

(Scrap for the electric furnace process is carefully selected and is purchased to chemical analysis. The boiler plate and spring steel scrap were selected because they contained little phosphorus and sulphur. The stainless steel scrap was produced in the plant; it consisted of the ends of rolled billets which had been cut off to insure soundness in the finished product. All constituents of the charge are selected to give a smaller percentage of the various elements in the molten steel, or "bath" than is desired in the finished steel. That method allows final adjustment of composition to

be made by adding more alloys, the easiest and most precise method of control.)

12:10 p. m.—Charging finished and current turned on.

(The furnace during the "melting down" period draws 12,000 amperes at 140 volts, which produces sufficient energy in the form of heat, more than 3000 degrees Fahr., to melt the charge of cold metal. By comparison, an electric flatiron draws 5 amperes at 115 volts.

Movement of Electrodes

During the melting down period the electrodes rise and fall, or "search." Those pieces of steel protruding from the charge are melted first, the electrode descending as the piece melts. The electrodes rise and fall many times as protruding pieces melt down until the metal is completely molten, then move very little thereafter.)

1:30 p. m.—Melting down finished. Five hundred pounds of iron ore containing about 50 per cent metallic iron were charged into the furnace.

(Iron ore is a chemical compound of iron and oxygen. The heat of the furnace releases the oxygen which combines with carbon to form carbon monoxide gas which is burned. The iron enters the bath and the impurities in the ore form a slag which assists in the removal of phosphorus and some other impurities. A second slag is formed later to remove the remainder.)

2:00 p. m.—First helper took small sample from the furnace in a long spoon or ladle and poured the molten metal into a mold to solidify. After the test ingot had solidified it was cooled in running water, then drilled and the drillings sent to the control laboratory for chemical analysis.

2:05 p. m.—The slag formed by oxidized impurities was drawn off. The furnace was tilted slightly and a workman skimmed off the slag with a long handled hoe.

2:20 p. m.—An alkaline slag to extract oxygen and other impurities from the charge was now formed by adding 350 pounds of dry lime (calcium oxide), 150 pounds of fluorspar (calcium fluoride), and 120 pounds of crushed ferrosilicon containing 0.50 per cent carbon, 50 per cent silicon and the balance iron. The furnace current was reduced to 10,000 amperes at 110 volts because the furnace was up to proper temperature.

(With the formation of this cleansing slag the true refining stage of the process begins. The most important constituent of the slag is the calcium oxide which removes sulphur and reduces carbon. Fluorspar keeps the slag fluid, while the silicon in the ferrosilicon combines

with the oxygen in the steel and transfers it to the slag.)

2:25 p. m.—Control laboratory reported analysis at 2:00 p. m. as carbon 0.027 per cent (too low) phosphorus 0.017 per cent (within desired range); nickel 12.21 per cent (too high but soon to be diluted by subsequent metallic charges).

2:35 p. m.—The slag was now doing its work. The amount of chromium was brought up to specification by adding 4600 pounds of low carbon ferrochromium, and the furnace current was increased to 12,000 amperes at 140 volts to melt the ferrochromium quickly.

(Ferrochromium is an alloy containing 0.10 per cent carbon, 70 per cent chromium, and the balance iron. At the same time, 15 pounds of crushed ferrosilicon was added to the slag and 30 pounds of lump ferrosilicon was added to the steel. The lumps sink through the slag into the bath.)

2:55 p. m.—Ferrochromium was melted. Furnace current was reduced again to 10,000 amperes at 110 volts.

3:30 p. m.—First helper ordered a ladle preheated preparatory to tapping the furnace.

(Preheating of the ladle is done to reduce chilling of the molten metal as much as possible and to prevent the formation of a large "skull" or crust in the bottom.)

4:00 p. m.—Second test ingot was taken from furnace and drillings sent to control laboratory for chemical analysis.

4:30 p. m.—Laboratory reported analysis of sample as carbon 0.06 per cent (too low); manganese 0.16 per cent (too low); silicon 0.36 per cent (within desired range); chromium 19.35 per cent (within desired range).

(From this report the melter calculated the amounts of the several elements that must be added to bring the steel to the desired composition. He found that as a result of the several metallic additions the nickel content, previously too high, had been lowered by dilution and was now slightly too low.)

5:00 p. m.—Second helper added 56 pounds of pure nickel to adjust composition.

5:10 p. m.—Second helper added 47 pounds of one per cent carbon ferromanganese (80.00 per cent manganese), 25 pounds of "wash" metal (low-phosphorus iron containing 4 per cent carbon); and 30 pounds of lump ferrosilicon.

(The ferromanganese and wash metal adjust the amount of manganese and carbon, respectively; the ferrosilicon is a general scavenger of any remaining impurities.)

5:30 p. m.—The melter's calculations were rechecked and showed that all specified elements of the steel were within the ranges desired. The preheated ladle was cleaned out with a blast of compressed air and brought up under the furnace spout by an overhead crane. Furnace was tilted and steel flowed into the ladle. During tapping, small quantities of alum-

inum were added to the stream of metal to counteract any oxidation that might occur as a result of contact with the air. The slag was prevented from following the steel into the ladle by a skimmer on the spout of the furnace.

5:35 p. m.—Ladle full and furnace empty. Temperature of the steel checked by optical pyrometer and found to be too hot to pour into ingot molds.

(Proper pouring temperature for this type of steel has been predetermined by past experience and careful experiment. A waiting period between tapping and pouring not only cools the steel to proper pouring temperature but also allows any slag that may have gotten into the steel to rise and float on top of the metal.)

5:40 p. m.—Temperature correct for pouring and pouring started. During the pouring of the ingots several test ingots were cast and drillings sent to the laboratory for analysis.

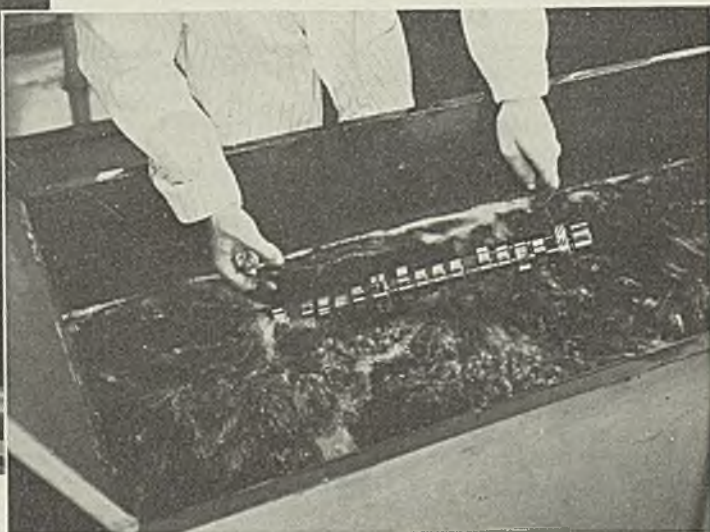
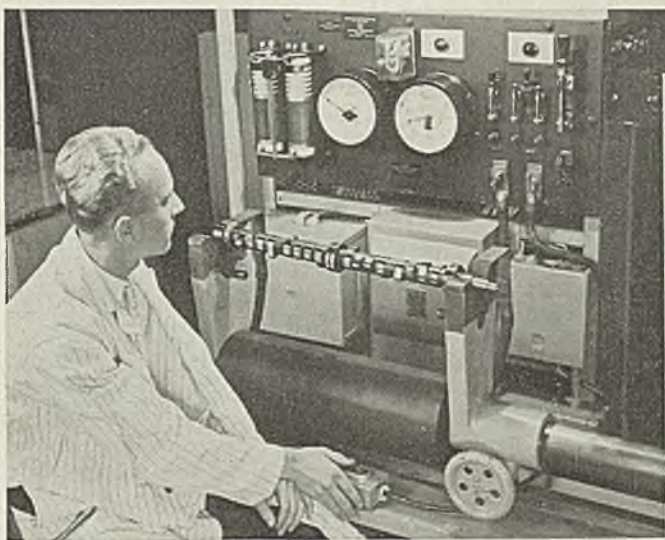
6:03 p. m.—Pouring ended after 17 ingots, 1000 pounds each, had been cast.

Time elapsed was 5¼ hours from charging to tapping. Heat was tapped in 5 minutes, with 23 minutes to pour.

Total metallic charge was 17,503 pounds, including the iron in the ore and all ferroalloys used, of which 97 per cent was returned as ingots. Balance of metal was lost in slags and ladle "skull."

Final analysis of heat was: Carbon 0.109; manganese 0.38; phosphorus 0.014; sulphur 0.011; silicon 0.42; chromium 18.95; nickel 8.91 per cent.

Magnetic Test Reveals Flaws in Camshafts



NONDESTRUCTIVE testing of Cadillac camshafts is accomplished by a magnetic method illustrated in these two photographs. The forged S.A.E. 1015 steel shaft first is magnetized by the setup shown at the left. Then it is dipped into a turbulent solution in which iron filings are kept in constant suspension by air agitation. When the part is removed as shown at the right, filings will be massed around any flaws due to the

establishing of north-south poles across any discontinuities in the metal. Such discontinuities, even though invisible to the naked eye, are focal points of fatigue failure and can be discovered in a few minutes by this test which, although it is used frequently, does not completely supplant photomicrographic examination

POWER DRIVES



Choosing Drives for Ventilating Fans

PROBLEM of choosing between belt or chain and direct-connected motor drives for ventilating and exhaust fans is one which depends upon the circumstances, operating requirements and conditions.

To a large extent, fans are individually driven. In some cases fans can be connected to receive power from the same source that drives the group of machines served, although this is not general practice.

On woodworking and grinding or polishing machines the power required for the exhaust fan often is greater than required for the machines. As both fans and machines must operate together, a single large motor offers some advantages in economy in purchase, in operating at better load factor, and in a single motor to inspect and maintain, as compared to two motors.

Disadvantages are the extra expense in providing spare equipment, as such single motors generally would be considerably larger than the other motors required in the plant, and probable increased shaft diameter because of extra load.

Practice in one plant is to belt drives to fans because the requirements change and it is easier to change a pulley, and motor if necessary, to provide for increased or decreased capacity requirements than if the fan is direct-connected and provided with a special motor. Also, belt or chain drives remove the motor from the dirt in the inlet currents to the fan or farther from the heat, if connected to a furnace.

Standard speed alternating-current motors with spares in stock are more easily used and changed if other than direct-connected. Another reason is that a direct-connected fan is a unit and, if the installation is dismantled or requirements change, the unit may be kept in stock for considerable time before another use is found for a unit of that particular rating. A belt or chain driven fan

removed from service can usually be placed in operation under changed conditions or requirements by changing the pulley or chain sprocket and motor.

Vary Fan Speed

Capacities of duct systems are difficult to estimate exactly and change with incrustations because of the resistance to flow. Duct systems are difficult to clean and after long use, especially where oil vapors mix with the material handled, the pressure must be increased to obtain the required volume of air.

Usually this change is best obtained by varying the speed of the fan. In any change in speed, the pressure delivered by a fan to a fixed duct system varies directly as the square of the speed of the fan, while the horsepower required varies directly as the cube of the speed.

Therefore, increases in pressure and speed require a larger motor; with decreases in speed, where the size of the system or demand is lessened, the motor operates with less power, or a smaller motor may be installed if the change is permanent. Cutoffs in exhaust ducts can take care of temporary idleness of a few machines and decrease the power consumption.

* * *

Ball-Bearing Loose Pulleys

IN STUDYING friction loads most consideration is given to lineshaft friction. Other losses, such as countershafts with tight and loose pulleys, are often ignored or considered part of the lineshaft loss. Changing to antifriction bearings on the lineshaft does not affect these other losses.

In one plant a test indicated that the lineshaft without countershaft load was responsible for only 17 per cent of the total friction load and 83 per cent came from the countershafts.

This would seem to indicate greater need of antifriction bearings in countershafts and loose pulleys.

Loose pulleys, because of the difficulty in lubrication, are always a cause of trouble. To overcome this, the engineer of the plant in which these tests were made has a fixed rule to install ball-bearing loose pulleys on countershafts and machine equipment as soon as the loose pulley supplied by the manufacturer begins to give trouble.

These pulleys are of a type which can be attached over a slightly worn shaft. If badly worn the shaft should be replaced, because its strength and resistance to bending is affected.

On tight and loose pulley countershafts, the belt, when on the loose pulley which is ordinarily with little or no crown, often rides over on the tight pulley for a fraction of an inch, causing excessive wear on the edge of the belt. This probably is responsible for some of the power loss, too.

To overcome this over-riding tendency and also to decrease the belt tension and load when the belt is on the loose pulley, this plant engineer specifies that new loose pulleys shall be slightly smaller in diameter than the tight pulley and have an angular shoulder or flange next to the tight pulley so the belt will climb when shifted. The loose pulley also has an abnormal crown to hold the loose belt central on the pulley and prevent riding off on the other side or against the flange.

This type of loose pulley is not new and often has been recommended, but is not widely used because of the extra initial cost over a standard pulley without the flange and crown. However, this plant engineer believes the cost is more than repaid in lower power consumption and decreased maintenance.

* * *

Substitute Lubricants

WHENEVER a source or grade of lubricant is changed, the maintenance department should know about it.

Sometimes, in the expectation of

obtaining another lubricant, "cheaper, but just as good," the purchasing department changes the source of oil or grease. If the new lubricant is the same, everything goes on as usual, but often not.

In one large plant, a special high-priced oil was used in a large and important motor-generator set. A new oil was purchased and stocked with instructions to the storeroom keeper not to say anything about the change and "they'll never know the difference."

Over a weekend soon afterward the bearings were flushed out and refilled with the new lubricant. When started up, the inspector checked the oil rings to see that they were turning properly. Some hours later a bearing was reported to be running hot and the others to be warmer than usual. As soon as the electrician arrived he ordered the unit shut down.

The babbitt had started to melt before the unit stopped but no damage was done to the shaft or windings. As a result, an important part of the plant was out of operation for several hours while the bearing was rebabbitted and a new supply of oil obtained.

The maintenance department "never knew the difference" until too late, but the bearing did.

It never pays to substitute maintenance supplies, especially lubricants, without the knowledge and approval of the men who are to use them. Also, laboratory tests should be made on the new supplies before use, to see that they are suitable. Shop and operation tests are generally expensive.

Planning New Buildings For Lineshaft Drives

IN THE planning and construction of new buildings or factory additions, one point often neglected is provision for mounting structures on the ceiling. Even if the management does not plan lineshaft drives, production requirements or products may change and make group driving desirable.

Also, plants often have occasion to attach overhead trolleys, hoists on monorail sections, conveyors, or other equipment on the ceiling for handling materials in process. Attaching these to a solid concrete ceiling is expensive and if they are moved it leaves an unsightly appearance. As one plant engineer explained, the ceilings in some of his departments are like sieves.

The cost of installing insert plates in the concrete when poured is less than a few installations in solid concrete, and the plates are always

ready for any change or an addition.

In the use of these ceiling inserts, the original practice was to install on 6-foot centers. A Chicago concern, in an addition to its existing plant which incidentally had no provision for ceiling mounting, has placed inserts on 3-foot centers in the entire addition, even in the section used at present for offices. Provision for using the office space for factory purposes is being followed extensively. In case of growth the office may be moved and operated separately much more easily than a part of the plant.

Closer spacing has shown its advantage in the ease in installation of countershafts to the various machines as well as in mounting the lineshafts.

Temporary Motor Drive

FOR quickly placing a spare line-shaft motor in service, in case of failure for any reason, one plant has a spare motor mounted on a lift truck platform.

This motor is provided with control and leads for making a quick, temporary connection to a convenient power source. In addition, the lineshafts have an extra pulley mounted over the aisle.

In case of motor or control failure, the extra motor is deposited on the floor under the shaft and a belt with metallic fasteners of the hinge and pin type placed over the pulley and connected up. The belt, which is kept with the motor, is tightened by moving and blocking the skid platform. During this operation the electrician connects up the leads and the drive is ready to operate when the belt on the idle motor is removed.

This change is made in much less time than required to remove and replace the motor. However, not till after the group drive is in operation again is the original motor inspected. If the difficulty is of a minor nature and the motor can be repaired while it is in position, the repair is made and the belt replaced at the next idle period. In most cases, the motor must be removed and repaired in the shop or sent out for rewinding. Where this is necessary the temporary drive continues in operation for a day or two until the repaired motor is back in place.

This extra motor is used for running-in new or rebuilt machines, operating special machines on temporary setups and on other odd tasks about the plant. This work can be stopped at any time in an emergency and the motor removed. In this way the only extra expense is the cost of the pulleys, belt and

skid platform, above that of a spare motor.

To keep repairs at a minimum presupposes a high class of installation work backed up by intelligent and rigid inspection.

Limit switches are for emergencies and should not be used regularly for stopping. Such use indicates carelessness on the part of the operator. With excessive use they may fail when the emergency comes.

Having experienced riggers in the electrical department or borrowing them from the mechanical department is a good safety practice when changing motors. Electricians ordinarily are not experienced in handling heavy work.

For safety it is advisable to fasten belt shifters on shapers and planers when changing work on the bed so the belt cannot work over onto the tight pulley. However, if a belt works over regularly, the pulley, shifter or belt should be inspected and adjusted to prevent accidents to the operator or damage to the machine or work.

An executive of a concern specializing in lubricants recently made the prediction that "in the future it will be possible to avoid much of the wastage caused by the present frequent necessity of draining automobile crankcases, speed reducers and circulating systems, by increasing the period at which this is necessary by at least three to five times". This will be accomplished by producing oils of still greater stability which are not seriously affected, decomposed or broken down by heat.

Placing the point of the splice lap joint in a belt to avoid from slippage is usually more important than protecting it from opening because of windage.

When designing short center belt drives, use 140 degrees as minimum arc of contact on small pulley. In such extreme cases do not expect the belt to deliver its full rated capacity with a larger arc of contact.

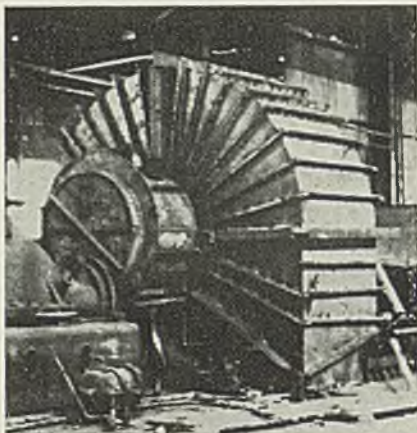
The success of good transmission design to obtain long life, satisfactory operation and freedom from stoppage or excessive maintenance, lies, to a large extent, in the experience and judgment of the engineer with full knowledge of the operating conditions and complete data on the power requirements.

Welded Housing Saves Wet Motor

BY HENRY K. De VRIES
American Murex Corp., New York

DURING the floods of the Ohio river in January 1937, when a large part of the property occupied by the plants of the Andrews Steel Co., Newport, Ky., was flooded, a number of pieces of valuable machinery were completely submerged. Among this equipment was a 3000-horsepower electric motor that remained under water for more than a week.

The method used to dry out this motor, in order to fit it once more for service, was not only unusual but also proved to be highly effective. The application of any great amount of heat was, of course, out of the question because of almost certain injury to the insulation of



THIS all welded housing acted as a vacuum dryer in salvaging a large electric motor

the motor windings. It was decided, therefore, to construct an air tight housing around the motor and to employ both heat and vacuum. In this way, because of the greatly reduced boiling point of water under vacuum, it was possible actually to boil out all moisture from the motor at a temperature low enough to be perfectly safe.

The welded steel casing, built around the motor and shown in the accompanying illustration, was 12 feet long and 5 feet wide with a drum on each side to enclose the shaft. Made of ¼-inch, low carbon steel plate, reinforced with steel bars and I-beams, it was completely electric welded in place, using carbon-molybdenum steel electrodes which had been salvaged from the flood.

Despite the fact that these elec-

trodes had been submerged for at least fourteen days, they not only worked well, but, a test of the welded housing showed only one small leak which was quickly plugged.

When all was ready, the temperature inside the housing was brought up to 150 degrees Fahr. and air was pumped out to establish a vacuum of 28 inches. This temperature and vacuum were maintained for a period of three weeks, after which the housing was removed and the motor was found to be thoroughly dried out.

Careful examination of the welded housing after this rigorous test showed every inch of welding to be in perfect condition.

The work was done by the Andrews Steel Co. under the supervision of A. R. Mitchel, assistant master mechanic and Herbert Groehl, welding superintendent.

Foundrymen Will Hold Conference in Missouri

Twenty technical papers are scheduled on the program for the regional foundry conference to be held at the Missouri School of Mines and Metallurgy, Rolla, Mo., Oct. 8-9, under sponsorship of the American Foundrymen's association and its St. Louis Chapter. Simultaneous sessions will be conducted Friday morning and afternoon and Saturday morning.

Details of the conference are as follows:

Friday, Oct. 8

MORNING

Sands

"Sand Control Program in the Foundry," by H. W. Dietert, Harry W. Dietert Co., Detroit.

"Sand Reclamation, Sand Conditioning and Sand Control," by L. B. Knight Jr., National Engineering Co., Chicago.

"Sources of Molding Sand for Foundries in Missouri," by Dr. H. A. Bushler, state geologist, Missouri School of Mines, Rolla, Mo.

"Relation Between Molding Sands and Casting Defects," by C. F. Bunting, Southern Malleable Iron Co., East St. Louis, Ill.

Refractories

"Lining of Reservations and Ladles Suitable for Soda-Ash Treatment," by J. J. Offutt, A. P. Green Fire Brick Co., Mexico, Mo.

"Bonds and Grouts," by L. C. Hewitt, Laclede-Christy Clay Products Co., St. Louis.

"Linings for Annealing Ovens and Nonferrous Metal Furnaces," by G. D. Cobough, Harbison-Walker Refractories Co., St. Louis.

"Cupola Linings," by James Crawford, Walsh Refractories Co., St. Louis.

AFTERNOON

Metallography

"Metallography of Cast Iron," by S. R. B. Cooke, Missouri School of Mines and Metallurgy, Rolla, Mo.; S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago; and

B. A. Yates, McQuay-Norris Mfg. Co., St. Louis.

"Microstructure in Cast Iron," by J. J. Placco.

Nonferrous

"Nonferrous Metals and Alloys," by A. Fritschle, Federated Metals Division, American Smelting & Refining Co., St. Louis.

"Insulation, Operation and Maintenance of Nonferrous Metal Furnaces," by P. J. Myall, Fisher Furnace Co., Chicago, Ill.

"Use of Plastic Bronzes in Modern Bearing Applications," by Claude C. Morgan, Bronzoid Corp., Dallas, Tex.

EVENING

Dinner. Speaker: H. Bornstein, director of laboratories, Deere & Co., Moline, Ill., and president, American Foundrymen's association.

Saturday, Oct. 9

MORNING

Gray Irons and Alloys

"Requirements of a Good Base Iron for Alloying," by D. B. Roeder, Electro Metallurgical Sales Corp., Chicago.

"Changes in Cupola Technique Required To Meet Special Melting Requirements," by V. A. Crosby, Climax Molybdenum Co., Detroit.

"Some Practical Applications of Alloys in Gray Iron," by Carl Morken, Carondelet Foundry Co., St. Louis.

Steel Foundry

"Review of Current Open-Hearth Practices," by John W. Porter, American Steel Foundries, Granite City, Ill.

"Electric Furnace in Steel Casting Industry," by L. F. Bartholte, St. Louis Steel Casting Co., St. Louis.

"Some Factors in Alloying of Steel Castings," by T. N. Armstrong, International Nickel Co., New York.

"Importance of Maintenance to Foundry Operations," by Carter Bliss, Scullin Steel Co., St. Louis.

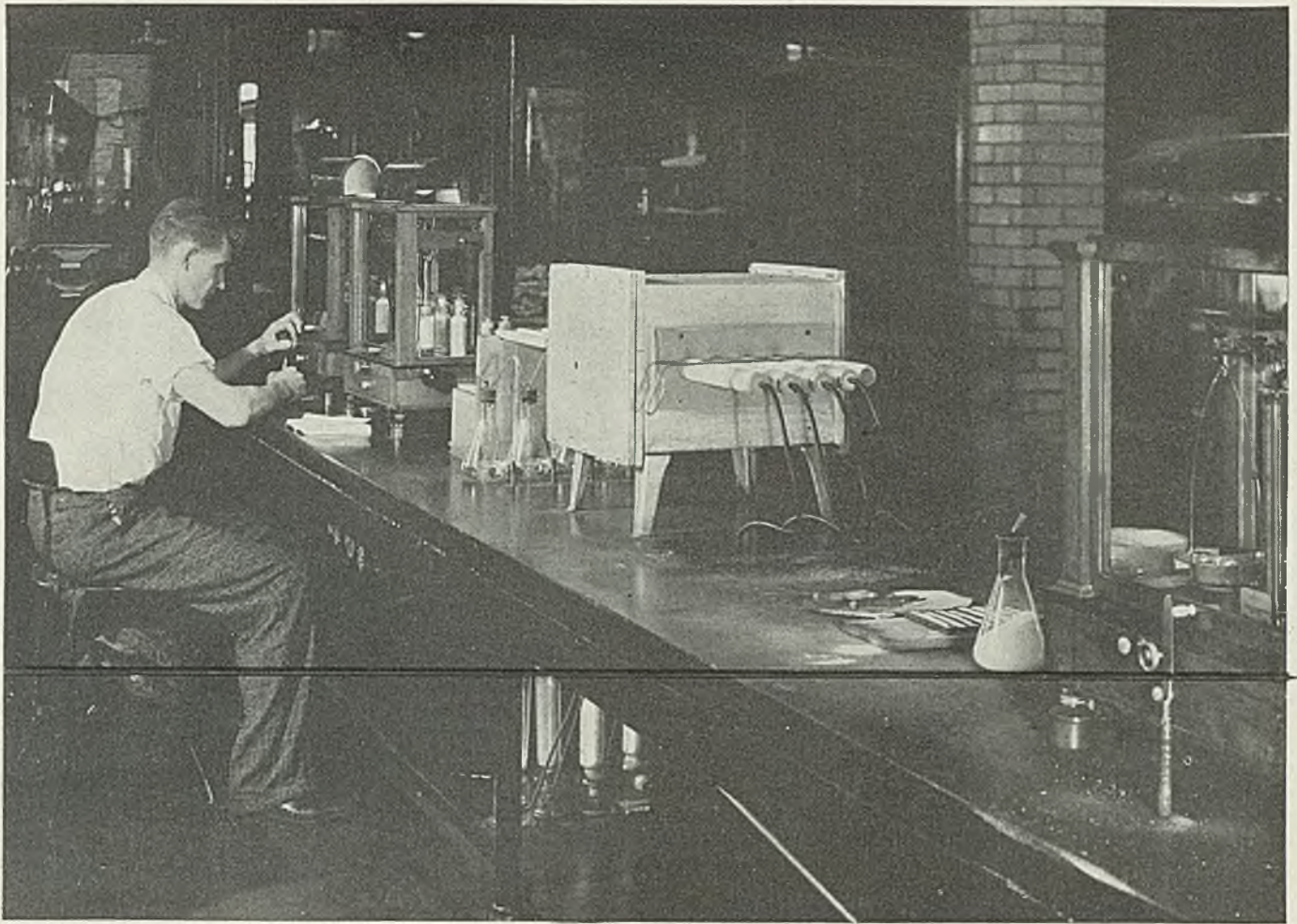
Offers Protective Clothing

Protective clothing for welders has been added to the line of safety equipment manufactured by Davis Emergency Equipment Co., 55 Van Dam street, New York.

For acetylene welders the line of clothing comprises goggles, sleeves, aprons, leggings, spats and gloves, and for arc welders: helmets, hand shields, sleeves, aprons, coats, pants, leggings, spats and gloves.

The goggles, helmets, and hand shields are equipped with glasses of various shades, each suitable for a special type of work. There are five different shades of goggles, ranging in use from light brazing to heavy welding. There are three shades of glasses for helmets and hand shields—for light and heavy metallic electrode work and for carbon arc work respectively.

Clothing is made of either fire-proof duck, asbestos, or chrome leather, the latter being considered superior because it remains soft under heat and is more durable. The garments are designed to give the worker maximum ease while working. Arc welder garments protect the body from the effects of ultra-violet light as well as from heat and sparks.



Analytical control in the Timken chemical laboratory.

QUALITY CONTROL FOR QUANTITY PRODUCTION

The high quality of TIMKEN Alloy Steel is reproduced from day to day as a matter of regular routine in the Timken laboratories. Every heat of steel that passes inspection must meet the customer's most rigid specifications for chemical analysis and physical structure. Out of the routine of this quality control has

come quantity production rarely equalled by a steel manufacturer. You are assured of receiving a closely controlled steel whether your requirements are large or small. Timken technical men will be pleased to discuss your quality problems at your convenience. May we hear from you?



TIMKEN STEEL AND TUBE DIVISION
THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO



8 Budd-built Zephyrs are now rolling on TIMKEN Bearings.

Glide — as you ride a Timken-equipped Train

TIMKEN

ALLOY STEELS

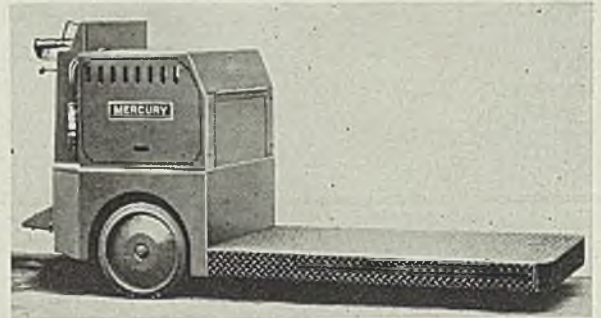
Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

NEW EQUIPMENT

Pipe Cutter—

Landis Machine Co., Waynesboro, Pa., has recently placed on the market a semiautomatic, roller pipe cutter manufactured by Geist Mfg. Co. This machine relieves the operator of all duties other than feeding the pipe. Operation of rollers is by cam action. Both hand lever and foot pedal have been eliminated. Movement of the rollers in a vertical plane is actuated by a gear-driven disk cam. Separate cams are necessary for standard wall and extra heavy pipe. Operating cycle of the new unit is controlled through the medium of pick-off gears. The gear train is arranged so that by reversing one pair of gears, or employing an extra pair furnished as standard equipment, four different speeds are available. Speeds are fixed so it is possible to cut off from 10 to 35 nipples per minute depending on the pipe diameter. Pipe support is in the form of a trough 10 feet long and lined with metal strips to reduce friction. These strips form a bearing on which the pipe rotates, and permit more rapid advancement of the pipe after the cut-off operation. The new Geist machine is equipped throughout with antifriction bearings, a heavy duty roller bearing being used on the cutter disk spindle to assume the thrust load of a heavy cut. A high pressure greasing system is used for positive lu-

Mercury burden-carrying truck has a 72-inch long platform



brication. For lubrication and cleaning of the cutter disk is a built-in lubricator comprising a one pint oil reservoir and a needle valve in constant contact with the cutter disk under spring tension.

♦ ♦ ♦

Burden Carrying Truck—

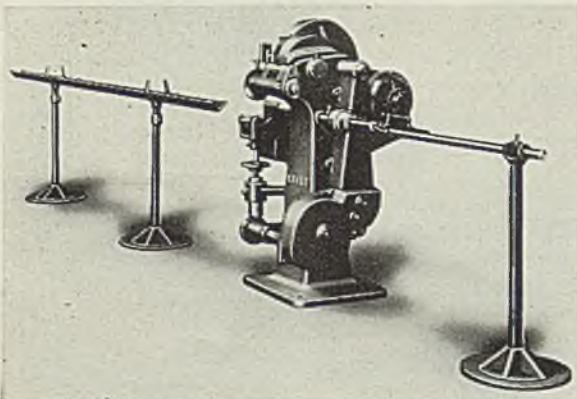
Mercury Mfg. Co., 4118 South Halsted street, Chicago, has completed design and construction of a new low platform burden carrying truck which it has designated as Model A-1015-1. This new machine has a capacity of 4000 pounds and a load platform 72 inches long, 41 inches wide and 11 inches high. A similar truck of 6000 pounds capacity is included in the new line. Frame design includes smooth exterior and adequate protection to battery compartment and operating controls. Assembly of frame is by

electric arc welding. The drive axle is of double reduction spiral bevel and spur gear type with external contracting type brake mechanism. Drive wheels are solid rubber tired, size 20 x 5, and trailing wheels beneath the load platform are also solid rubber tired, size 10½ x 5. The truck is of 4-wheel steer type, with steering control of the horizontal lever or tiller bar type. If desired, vertical lever or wheel type steering mechanism can be furnished. Travel control is Mercury snap action mechanical contactor type providing three speeds in either direction.

♦ ♦ ♦

Conveyor Wheels—

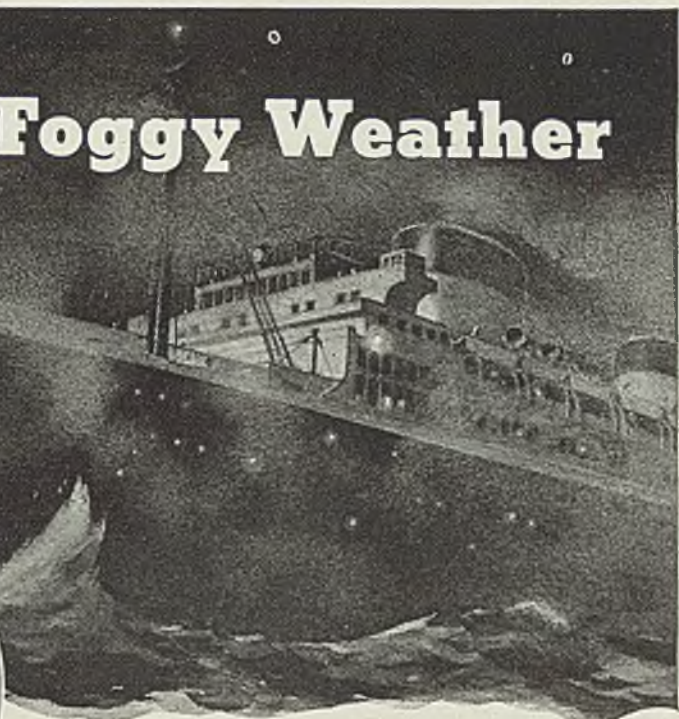
Mathews Conveyer Co., Ellwood City, Pa., has developed a new anti-friction product in the form of rubber-tired conveyer wheels. Two types are available, identical in design but differing in weight and size. When mounted in light frames the wheels become efficient conveying surfaces for shingles, steel sheets, glass or fragile objects which must be protected from jarring or scratching. The sections are available straight or in any practical degree of curvature, with detachable or fixed couplings where portable or stationary conveyer sections are used. Wheels themselves can be applied as casters for cabinets, hand trucks, or are practical for many uses where a free-running, rubber-tired wheel is required. Of pressed steel construction, the



Geist roller pipe cutter is semiautomatic and operator only feeds pipe

It's *always* Foggy Weather

—directing an advertising
and selling program!



TWELVE WAYS THE STEEL REPRESENTATIVE CAN HELP YOU:



● Just as in navigating a stormy sea, all available guides to skill should be employed. But although reliable business papers possess a special knowledge of the markets they serve, many advertisers overlook this trustworthy source of guidance.

By "reliable" we mean the A. B. P. sort of publications that employ highly trained editors whose sole obligation is to glean and interpret important events, to advance practical ideas, to render tangible help to readers who want it enough to pay for it . . . the kind that devote themselves so diligently to the subscribers' interests that they can truthfully offer advertisers "packaged influence" reaching a "conditioned" audience.

Men who represent A. B. P. publications have under their hats, and in their files, a specialized knowledge that can help you steer a true course to advertising economy and maximum sales results. They are more than "space peddlers". They'd rather hear about your sales problems than extol the virtues of their publications, for only then can they be of genuine help, whether the solution indicates their own papers or not. And you can be sure that they will respect your confidence.

Next time you see a STEEL man, toss him a few questions that bear upon your market objectives. If he can't make a helpful suggestion based on his own experience in his publication's field, the chances are excellent that one of his editors can.

1. To sense and evaluate significant trends.
2. To determine market potentials.
3. To suggest product or package changes.
4. To help you select and reach your prime prospects.
5. To help plan sales and advertising strategy.
6. To aid in improving sales and distributive setup.
7. To help you see your business as business sees it.
8. To scan copy for trade jargon.
9. To suggest new products, or new markets for old products.
10. To suggest ways to make sales promotion more effective.
11. To help devise practical merchandising material.
12. To point out specific sales opportunities.



Impartial measurement
of reader interest
in terms of paid
circulation

STEEL
BEARS THE
TWIN HALL-MARKS

OF
**KNOWN
VALUE**

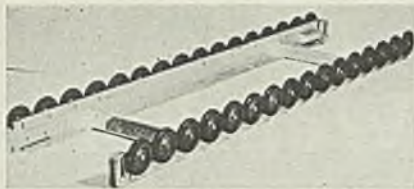


Authentic facts
relating to
editorial scope and
readership analysis

STEEL

CLEVELAND

» » » »



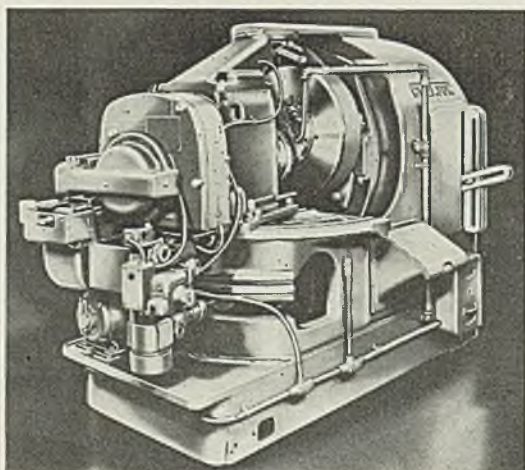
Mathews conveyer sections with rubber-tired wheels are available straight or curved

wheels have hardened steel inner and outer braces. The 70-RT wheel, which has a 2 $\frac{3}{8}$ -inch outside diameter, incorporates ten 3/16-inch hardened steel balls and has a rated capacity of 20 pounds. The type 84-RT wheel has a 3 $\frac{1}{2}$ -inch outside diameter, eleven 5/16-inch hardened steel balls, and a rated capacity of 50 pounds. The rubber tires are steamed into place, contract upon drying, and fix themselves solidly on the wheels.



Gear Finishing Machine—

Gleason Works, Rochester, N. Y., is manufacturing the No. 22 single cycle, Formate gear finishing machine for finish cutting spiral bevel and hypoid ring gears. The gear is previously rough cut, then transferred to this machine for finish cutting. Cutter and gear remain in normal, full-depth operating position during the entire machine cycle. Provision is made for indexing by a gap in the cutter which follows after the second series of blades. When this gap moves abreast of the blank, the latter is indexed. Cutter rotates at a uniform speed and when cutter revolutions equal the number of teeth in the gear, the gear is finished. Because of the light finishing cuts taken by each blade, cutter life is greatly extended. Accurate tooth spacing claimed for this finishing process is said to be a result of rigid construction of the machine, light cuts taken by each blade, the hardened and ground dividing plate



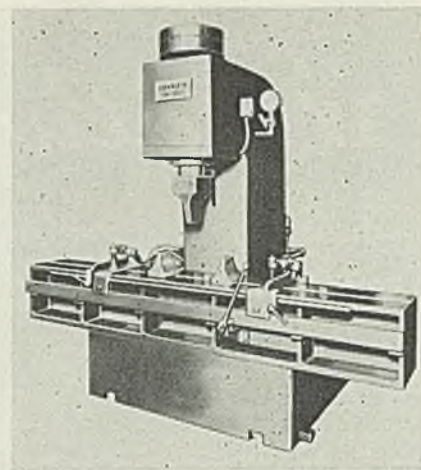
Gleason machine is for finish cutting spiral bevel and hypoid ring gears

mounted directly on the work spindle, and the fact that the same two blades finish each tooth space. Rigidity has been obtained by the use of the overhead tie, heavy sections of ribbed castings and by the hydraulic clamping of the work head. While the cut is taking place, the only movement is the rotation of the cutter spindle which is mounted on preloaded anti-friction bearings. All other bearing and guide surfaces of the machine are securely fastened in place. Chucking and de-chucking operations are facilitated by power chucking and stripping mechanism built into the work spindle and controlled by a conveniently located lever. The chucking arbor centers on the outside diameter of the work spindle for additional rigidity.



Straightening Press—

Hannifin Mfg. Co., 621 South Kolmar avenue, Chicago, has just completed a 35-ton sensitive straightening press especially designed for straightening operations on heavy crankshafts. This press has Hannifin single lever sensitive proportional control. The ram movement is completely controlled by the one lever. When this control lever is moved in either direction the ram will move a proportional distance under full pressure and then stop. The operating valve automatically moves to neutral, and the pump idles at zero pressure until another movement of the ram is required. This control method is said to contribute to rapid and accurate handling of straightening operations. An individual hydraulic power unit is built into the base of the press, and the table is equipped with special fixtures, including an adjustable carriage which rolls on ball bearing mountings on the hardened rails of the table. Supports on this carriage are hardened wheels, and the supports are provided with spring pads. This construction is claimed to simplify movement of



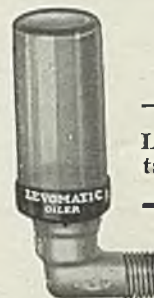
Hannifin press was designed for straightening operations on heavy crankshafts

the crankshafts straightened. The frame, base, reservoir, and the box type table of this press are entirely of welded construction. Capacity is 35 tons and stroke is 6 inches; ram speeds, down 53 inches per minute, up 77 inches per minute. Table to ram up is 20 inches, floor to table 28 inches, and center of ram to face of frame is 9 inches. Table is 90 inches long. Motor required is 10 horsepower.



Constant Level Oiler—

Trico Fuse Mfg. Co., Milwaukee, has announced a new line of constant level oilers. Known as Levomatic



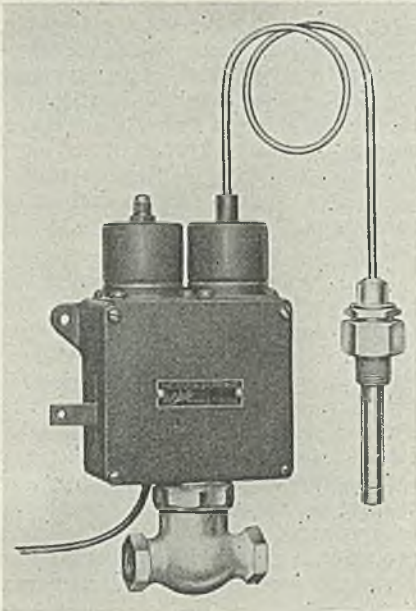
Levomatic oilers maintain accurate oil levels

matic oilers, these new units are for maintaining an accurate level of oil in ring and ball bearings of motors, line shafts, pumps, and other machinery having oil wells. As oil is consumed in the bearing chamber it is automatically replaced with fresh oil from the reservoir. The oiler has no delicate parts which might get out of order, and no attention, except for refilling, is required after installation. Clear glass reservoir is screwed to solid bronze cadmium-plated fittings and is easily removable for refilling.



Diesel Engine Control—

Fulton Syphon Co., Knoxville, Tenn., has recently placed on the



Diesel engine safety control is a non-electric, self-operated unit

market the Sylphon No. 530 diesel engine safety control, a non-electric, self-operated unit. This control was designed to provide positive engine protection against high jacket water temperature and low lubricating oil pressure. Should water temperature go above or lubricating oil pressure go below the safe point, the fuel oil supply to the engine is immediately shut off and the engine stopped. A higher factor of safety is claimed for this control because it is self-operated. Should oil pressure control or thermostat become inoperative on account of accidental injury, the engine will be stopped. There are no stuffing boxes in the assembly of this unit; Sylphon Bellows construction is used throughout. Vibration proof, it is ruggedly built. An external lever is provided for manual operation of control in starting, and lever may be operated remotely. At option of purchasers, a switch can be incorporated in the case to close electrical contacts when control operates. This switch may be connected to audible or visible alarm system. Additional features include adjustable tripping point on temperature and pressure range, provision for sealing instrument against tampering, and exposed lever giving visual indication that control has operated.

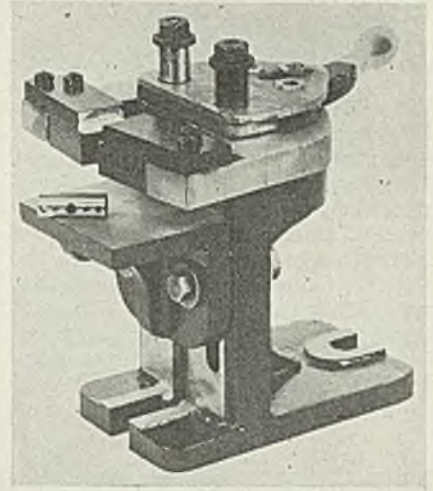
Dry Vacuum Pumps—

Worthington Pump & Machinery Corp., Harrison, N. J., is manufacturing an improved line of single-stage and two-stage horizontal dry vacuum pumps for handling air and vapors not liquified in the condenser, for pulling a vacuum in any closed

system in the chemical and process industries and for which high volumetric efficiencies are claimed. Minimum clearances, necessary because of the direct relation to volumetric efficiency, are maintained by the design of close-grained, semi-steel vacuum cylinders. Other features include large cylinder passages and large valve areas which reduce losses, and head and cylinder water jackets provided with hand holes for easy cleaning. Each of the special feather valves consists of three essential parts: the valve strips, seat and guard. The strips, not held rigidly at any point but restrained from lateral movement by recesses in the curved guard, are the only moving parts. Steel inserts across the ends of the guard milling assure complete freedom of movement for the strips. The double-row tapered-roller-type main bearings are mounted in assemblies, rigidly bolted to the side of the main frame and held in alignment by centering rings. Provision has been made for adjustment. Additional details include light-weight cast-iron pistons, a frame of massive construction, and two counterbalances fitted on an open-hearth steel crankshaft. The entire pump is completely and automatically lubricated. A gage glass provides visible indication of the depth of oil in the crankcase. These single-stage and two-stage units are both built in eight sizes. The former have piston displacements of 250 to 2,832 cubic feet per minute, and the latter of 138 to 1,425. Single-stage units are employed for a vacuum of 28 inches or less, and two-stage units when a higher vacuum is desired.

Knuckle-Action Vise—

Knu-Vise Products Co., 6432 Cass avenue, Detroit, has announced its model No. 325, knuckle action vise suitable for drilling, reaming, tapping, countersinking, or numerous other operations that require the rapid insertion and withdrawal of production pieces. Movement of the handle is only through 30 degrees, while the jaws open $\frac{3}{4}$ -inch, enough for most jobs. Vise can be used as a basic mechanism and with bushing plate and angle support bracket

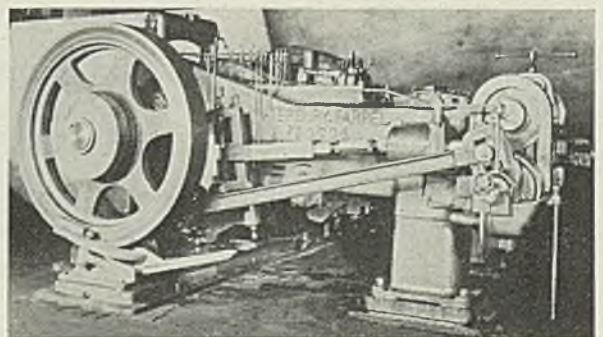


Movement of this vise handle is through only 30 degrees

that are available becomes an efficient drill jig. Work is held rigidly, is easy to load and unload, is always in plain sight of the operator and there is ample chip room.

Crank Header—

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., has recently redesigned its standard line of solid die, double stroke, crank headers to meet the demands for cold heading high carbon alloy steels at high speeds. These changes include the use of a new frame of extra large cross-sectional area and a cut-off mechanism of improved and sturdier construction. The cut-off bar is large in diameter and operates through the frame at right angles to the wire, with its inner end supported in such a way that the knife is held flush with the face of the die, thus assuring a clean shear. The hinged fiddle bow formerly used to hold the blank in the cut-off knife has been replaced by a spring finger fastened to the knife. This construction also permits the more effective guarding of moving parts as a protection for the operator. There are seven standard sizes ranging from the $\frac{1}{4}$ -inch machine, rated at 100 to 125 blanks per minute, to the $1\frac{1}{2}$ -inch machine at 35 per minute.



One of the most massive cold headers, this unit weighs over 66 tons

Finish Sells Motorcycles In Competitive Market

(Concluded from Page 52)

largely upon the nature of this work and the market in which it is sold. Large production runs of comparatively simple parts can be handled in automatic machinery but in the motorcycle industry both the nature of the parts and the fact that production runs are short eliminate this method of surface preparation. Further, the polishing operations must be performed with great care to insure adherence of subsequent

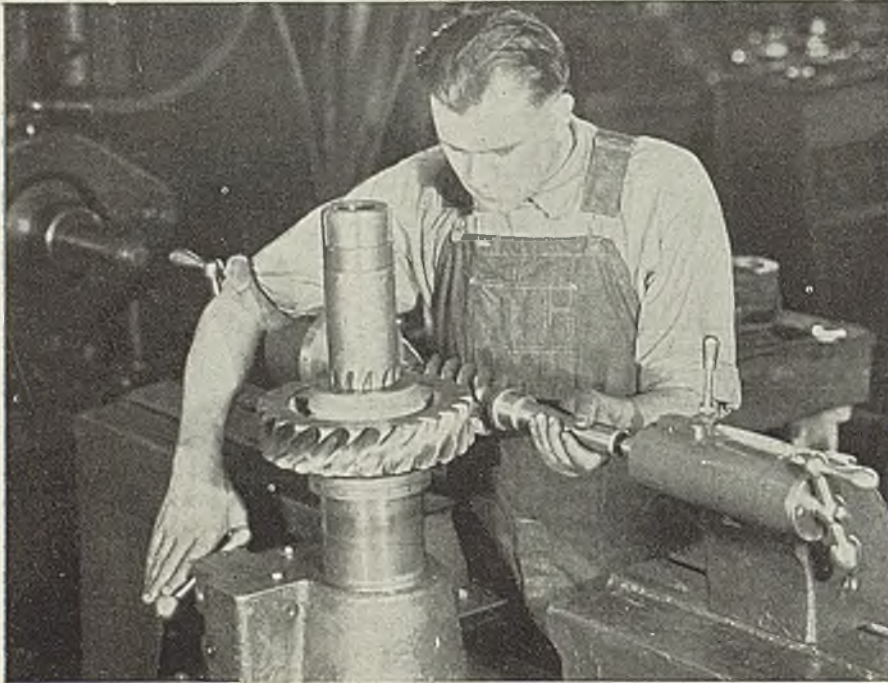
nickel and chromium deposits under severe outdoor exposure conditions.

Motorcycle rims are a good case in point. These rims present a somewhat difficult polishing problem since the metal is raised inside the rim at the spoke holes. It is necessary to polish carefully between these holes and this operation requires the use of comparatively small wheels. In general stitched muslin wheels 8 inches in diameter, from 1 to 2½ inches wide, are used. These wheels operate at a spindle speed of 1800 revolutions per minute. Polishing sequence is as follows: First the rims are polished dry using

No. 120 alundum. This is followed by a greasing operation using No. 180 alundum after which the rims are given a tampico brushing using No. 180 emery cake. This sequence results in a high finish over which copper, nickel and chromium plate is deposited. Nickel plate is buffed with loose muslin wheels and white compound. Chromium plate is buffed with chrome rouge.

Motorcycle handlebars must be highly polished before plating. The handle bars are steel tubing bent to shape and inserted and welded into a drop forged center connection which must be polished as a unit. The polishing cycle is the same as for wheel rims except that a stitched canvas wheel is used. Plating and buffing is accomplished exactly as in the case of wheel rims. The same procedures are used with little or no variation for all other plated parts.

The resulting overall motorcycle finish is thus not only a definite factor in sales appeal but is also a durable protecting medium against weather. It will stand up under much abuse in service and if properly cared for will be a credit to the owner for a long period of time.



New Opaque Porcelain Cover Coat Developed

Recognizing the need for a better super opaque frit required in one coat enameling, Porcelain Enamel & Mfg. Co., Baltimore, has developed a radically different single glass super opaque sheet iron cover coat which is said to offer qualities never before found in a super opaque frit.

The new frit, designated as No. 2117, has been subjected to exhaustive tests in all types of enameling plants. Used without blending with other enamels, the new cover coat is said to have shown high tear resistance and opacity. It is claimed that in no case was there any tendency to curl, sag or slide.

Laboratory tests showed 76.5 per cent reflectance at 65 grams with 7 per cent clay and no opacifier. An addition of 4 per cent tin oxide will increase reflectance 2½ per cent. Warping is reduced to a minimum because the frit can be fired at comparatively low temperatures.

This frit should find a definite place in the enameling industry for one coat porcelain enamel in merchandise in the lowest price brackets, according to the manufacturer.

Lacquers Molded Plastics

Difficulties encountered in obtaining uniform color in natural molded plastics has led to the use of a fine wrinkle lacquer in cases where translucence is not a factor.

PRECISION to less than .001 inch

● Horsburgh & Scott Worms are ground within an accuracy of .001" in lead, indexing and contour... a precision in manufacturing that insures higher efficiency, longer life and quieter operation. To obtain these exceedingly close limits, this company developed its own exclusive grinding machines. These machines plus precision inspection fixtures are your guarantee of the finest worms and gears possible.

A 448 page catalog is yours without obligation.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing **STEEL**, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Industrial Pipe — American Rolling Mill Co., Middletown, O., has issued a 44-page, spiral bound booklet dealing with Armco spiral welded 6 to 36-inch pipe for industrial uses.

Mortar — Truscon Laboratories, Detroit, has printed a folder on Mortite, a waterproof, non-shrinking mortar, picturing and describing the building defects it prevents.

Aluminum Ladders — Aluminum Ladder Co., Tarentum, Pa., describes its line of modern, lightweight ladders in Catalog No. 2. Specifications are given for single wall, extension, roof, folding, and step ladders.

Control Valves — Bristol Co., Waterbury, Conn., describes its line of Synchro Diaphragm control valves in bulletin No. 461. Data on sizes, dimensions and valve metals are included.

Shafting—La Salle Steel Co., Palmolive building, Chicago, has published a new shafting booklet that lists the different shaft applications, giving the kind of steel most suitable in each case.

Air Conditioning—Carrier Corp., Newark, N. J., has published a folder dealing with air conditioning without refrigeration equipment and which describes a floor model and a ceiling model "weathermaker" using water as a cooling medium.

Lubricating Equipment—Gits Brothers Mfg. Co., Chicago, has released a catalog listing and illustrating over 1000 styles and sizes of oil cups, oil and grease seals, oil cans, gages and other lubricating equipment.

Anti-Vibration Products—Korfund Co., 48 Thirty-second place, Long Island City, N. Y., has published a new bulletin on the elimination of vibration losses in which are pictured and described Korfund anti-vibration products and their applications.

Plant Management—Hart A. Lashaw Inc., 33 Rector street, New York, has issued a booklet entitled "Ironing Out Your Problems" that deals with industrial management and financing, liquidations, engineering, appraisals, purchasing and sales.

Electrical Equipment — General Electric Co., Schenectady, N. Y., has issued the following new GEA literature: No. 2447C on the Mutator

arc welder, No. 1285A on the track-type limit switch, No. 2443A on three-shoe direct-current magnet brake, No. 1745A on winder drives, No. 1771A on type TSA-10 time switches, No. 1195B on synchronous

motors for metal-rolling mills, and No. 1569A on Thrustor operated valves.

Maintenance—Martindale Electric Co., Box 617, Edgewater branch, Cleveland, has issued a 40-page catalog of electrical and mechanical maintenance equipment. The new booklet includes sections on commutator, motor, electrical and mechanical maintenance, and a section on safety-first equipment.

STARRETT DIAL INDICATORS FOR EVERY REQUIREMENT



IN THE SHOP
A Starrett No. 25 T2 Dial Indicator checking the setting of teeth in a Hypoid Gear Cutter — one of hundreds of applications in which Starrett Dial Indicators are set up on machine tools, production jigs, fixtures, etc.

IN THE TOOL ROOM

On special tool and gauge work, for setting up jigs and fixtures — in fact, for any work that calls for instant, accurate readings or frequent comparison. The Starrett No. 665 Dial Test Indicator shows here checking an angle gauge is one of a complete line of STARRETT Dial Indicators. The other Starrett Tools are Micrometer No. 226, Universal Bevel Protractor No. 360 and Toolmaker's Clamp No. 161.



ON THE INSPECTION BENCH

For quick, accurate inspection of duplicate parts. A Starrett No. 25-A Dial Indicator set up in a special fixture for testing thread chasers. Indicators can be furnished with Revolution Counters, Tolerance Hands, Shock Resisting Mechanism and similar features when required.

Starrett Dial Indicator Catalog J² (Second Edition) illustrates and describes the entire line of STARRETT and LAST WORD Dial Indicators. A copy sent free on request. Write for it.

THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.

World's Greatest Toolmakers—Manufacturers of Hackaws Unexcelled—Steel Tapes, Standard for Accuracy Dial Indicators for Every Requirement

Standardize on
STARRETT TOOLS
BUY THROUGH YOUR DISTRIBUTOR

MATERIALS HANDLING



Modern Handling Shows Results in Forging Plant

(Concluded from Page 48)

ness of the management's "good housekeeping" policy to note that even maintenance work such as re-roofing furnaces and repairing presses and hammers requires all materials to be carried and to remain in tote boxes while the work is being done. Coal brought into the power plant is dumped into an underground storage bin and conveyed directly into the furnace from there.

Storage of die blocks is provided in a special building with racks built for the purpose. One of the electric lift trucks is provided with a roller bed and crane for handling dies, while two of the hammer shops are provided with monorails and the third with an overhead crane for handling the dies. A three-ton overhead serves the well lighted die department.

Elimination of back breaking labor by efficient handling methods

has not only reduced considerably the man hours formerly required; it has, together with excellent lighting and heating facilities, made labor more productive and brought unexpected dividends from that sector.

Calibrate Testing Machines In New Research Paper

Department of commerce, national bureau of standards, has issued research paper RP1009 entitled "Calibration of Testing Machines Under Dynamic Loading," written by Bruce Wilson and Carl Johnson.

The errors of the indicated loads of testing machines used to determine the mechanical properties of engineering materials are usually determined for static loads. Testing machines are often used to load specimens continuously to failure at a given rate of loading. The additional errors, due to rate of loading, of six testing machines comprising four types widely used

in this country were determined by means of a special elastic calibrating device for rates of loading up to 50,000 pounds per minute.

The additional errors in the indicated loads of these machines, due to rate of loading, at rates currently used in testing, in several cases exceeded the tolerances specified for such testing machines. These errors, therefore, in general cannot be neglected when determining the rates of loading to be used in materials testing.

Results of these tests, although they cannot be used to correct the indicated loads of other testing machines of the same types, because of small inherent differences in the weighing systems and slight differences of adjustment, are useful in that they indicate the magnitude be used in testing of actual materials.

New Book Describes Brown Firth Laboratories

A profusely illustrated, 72-page book describing their complete facilities has been published by the Brown-Firth Research Laboratories, Sheffield, England. These laboratories are among the most completely equipped of their kind in the world. They are operated under the direction of Dr. W. H. Hatfield in conjunction with the activities of John Brown & Co Ltd., Thos. Firth & John Brown Ltd., Firth-Vickers Stainless Steels Ltd. and Firth-Derihon Stampings Ltd. The book describes in detail the various facilities of these laboratories and contains a complete list of all books and other publications in this institution's library.

New Oil-Filled Mercury Switches Non-Explosive

Durakool Inc., Elkhart, Ind., now is making Durakool mercury switches in capacities up to 200 amperes. They can be made for and will operate, however, under loads of any capacity now commercially required. Built with a metallic envelop of great strength, these switches are extremely rugged. In addition, they are filled with a non-explosive oily liquid. For these reasons, and because of the non-sparking character of this type of switch they are being used, in addition to all other switching applications, in explosive atmospheres and under hot oil. Due to design of these switches and the use of a special high meniscus mercury they operate fast, in all cases by a motion of less than 4 degrees and, when desired, by a motion of less than 1 degree.

For all
Purposes

LESCHEN
WIRE ROPE

ESTABLISHED
1857

A. Leschen & Sons Rope Co.
5909 Kennerly Avenue
ST. LOUIS, MO.

New York . . . 87 to 90 West Street
Chicago . . . 810 W. Washington Blvd.
Denver . . . 1554 Wazee Street
San Francisco . . . 520 Fourth Street

Round Strand

Flattened Strand
"P. F. S."

Non-Rotating

Preformed

Steel Clad

Locked Coil

Regular Lay

Lang's Lay

Hemp Center

Wire Rope Center

Metallic Core

Seale - Filler Wire
Warrington



HERCULES
WIRE ROPE (RED STRAND)

Steel Market Adjusts to Slower Trade Tempo

Scrap Drops Fast;

Auto Output Low;

Some Good Buying

WELL sustained production over many weeks during which buying has been at a relatively low rate has brought steelmakers sufficiently close to the end of backlogs to indicate a shortening of activity to match incoming business.

Although the rate of buying shows an increase from the low point of midsummer it has not grown sufficiently to match shipments and some curtailment of production is necessary to meet current conditions. This situation is viewed with equanimity by steelmakers, as, in spite of not equaling earlier expectations, the industry is producing at a high and reasonably profitable rate. Well informed expectation is that for the remainder of the year steelmaking will be at 70 to 80 per cent of the rate prevailing for the first eight months.

It is recognized that consumers are faced by the psychological facts of the decline in the stock market, war scares in Europe and the Far East and political divagations at home, and naturally are keeping commitments close to actual needs. After the unusually high rate of production over a year past an adjustment downward is not to be wondered at.

There are not a few reassuring facts in the week's news. Los Angeles has placed 11,050 tons of plates for a water line, the Denver & Rio Grande has ordered 13,400 tons of rails from Colorado Fuel & Iron Corp., the New York Central has divided about 10,000 tons of steel, largely plates and shapes, for car building and repair and Ford Motor Co. is inquiring for 15,000 tons of structurals for a press shop. In addition it is understood Russia has placed an order for steel axles for cars and locomotives, sufficient to keep axle shops busy six to eight weeks.

These tonnages are not enough to keep up production at the rate of earlier months but they indicate activity in various lines. Orders booked before the decline in buying are by no means exhausted and sheet mills, while able to offer prompt delivery in some cases, have tonnage on books for active production through October.

As a result of lighter operations in important producing centers, due to adjustment to light buying, the national operating rate last week declined 4 points to 76 per cent of capacity. Pittsburgh operations declined 11 points to 73 per cent, Chicago 3.5 points to 79.5, Wheeling 7 to 82 and Birmingham, Ala., 8 to

MARKET IN TABLOID

DEMAND . . . Increasing moderately, awaiting automotive orders.

PRICES Steady, scrap declines further.

PRODUCTION . . . Operations down 4 points to 76 per cent of capacity.

SHIPMENTS . . . Steady, with deliveries closer.

83. As a partial offset to these losses Cleveland advanced 1 point to 64, Buffalo 4 to 74, Detroit 5 to 100 and Cincinnati 9 to 89. There was no change in Eastern Pennsylvania at 63, Youngstown, O., at 70, New England at 75 and St. Louis at 74.

Automotive production last week was a shade lower than the preceding period, with 28,030 units, compared with 30,150. General Motors made 14,000 cars, compared with 13,700, Chrysler 3075 compared with 1750, with the Ford plant closed. This is probably about the low mark for the model change season and increased production may be expected to start at any time as the 1938 lines are put under way more intensively.

Scrap is presenting an aspect of weakness similar to that shown in July. With a drop of \$1 at Chicago, \$2 at Pittsburgh and 50 to 75 cents in Eastern Pennsylvania the situation reflects the apathy of consumers, who are definitely out of the market. A moderate sale to a steel mill in Pittsburgh last week established a price \$2 under the previous nominal quotation. Closing of contracts with eastern scrap dealers for 250,000 tons of steelmaking grades for export to Europe presents an anomaly in an increase of \$2.50 per ton over a larger purchase six weeks earlier. Absence of Japan from the export market on account of exchange difficulties is giving the European buyers a better opportunity to cover their needs. A factor in the increased export price is the fact that the lower freight rate to tidewater on export material is to terminate Oct. 1, thus increasing transportation charges.

Decided weakness in all markets has reduced STEEL'S composite of steelmaking scrap \$1.25 from the preceding week, to \$17.83. This compares with \$17.75 for the second week in July and \$17 at the end of June, and is \$4.25 below the high point in April. The decline in scrap affected the iron and steel composite also, causing a decline of 21 cents to \$39.98. The finished steel composite is unchanged at \$61.70.

COMPOSITE MARKET AVERAGES

	Sept. 25	Sept. 18	Sept. 11	One Month Ago Aug., 1937	Three Months Ago June, 1937	One Year Ago Sept., 1936	Five Years Ago Sept., 1932
Iron and Steel	\$39.98	\$40.19	\$40.21	\$40.34	\$39.82	\$34.15	\$28.93
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.10	47.50
Steelworks Scrap . . .	17.83	19.08	19.33	20.41	17.15	16.18	7.04

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.

A COMPARISON OF PRICES

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

Finished Material	Sept. 25, 1937	Aug. 1937	June 1937	Sept. 1936	Pig Iron	Sept. 25, 1937	Aug. 1937	June 1937	Sept. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	1.95c	Bessemer, del. Pittsburgh	\$25.26	\$25.26	\$25.26	\$20.8132
Steel bars, Chicago	2.50	2.50	2.50	2.10	Basic, Valley	23.50	23.50	23.50	19.00
Steel bars, Philadelphia	2.74	2.74	2.74	2.26	Basic, eastern del. East Pa.	25.26	25.26	25.26	20.81
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95	No. 2 idy., del. Pittsburgh	25.21	25.21	25.21	20.3132
Shapes, Pittsburgh	2.25	2.25	2.25	1.90	No. 2 idy., Chicago	24.00	24.00	24.00	19.50
Shapes, Philadelphia	2.45 1/2	2.45 1/2	2.45 1/2	2.11 1/2	Southern No. 2, Birmingham	20.38	20.38	20.38	15.50
Shapes, Chicago	2.30	2.30	2.30	1.95	Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90	No. 2 X eastern, del. Phila.	26.135	26.135	25.26	21.68
Tank plates, Philadelphia	2.43 1/2	2.43 1/2	2.43 1/2	2.09	Malleable, Valley	24.00	24.00	24.00	19.50
Tank plates, Chicago	2.30	2.30	2.30	1.95	Malleable, Chicago	24.00	24.00	24.00	19.50
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95	Lake Sup., Charcoal, del. Chicago	30.04	30.04	30.04	25.2528
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.50	Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.6741
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20	Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25					
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90	Scrap				
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50	Heavy melting steel, Pittsburgh	\$18.75	\$21.85	\$18.40	\$17.75
Plain wire, Pittsburgh	2.90	2.90	2.90	2.40	Heavy melt. steel, No. 2 East Pa.	16.00	18.00	15.25	14.00
Tin plate, per base box, Pitts.	\$5.35	5.35	5.35	5.25	Heavy melting steel, Chicago	16.75	19.75	16.00	16.15
Wire nails, Pittsburgh	2.75	2.75	2.75	1.95	Rail for rolling, Chicago	19.25	21.75	19.50	16.75
					Railroad, steel specialties, Chicago	20.75	22.25	19.50	17.65
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs	\$37.00	\$37.00	\$37.00	\$30.00	Connellsville, furnace ovens	\$4.40	\$4.50	\$4.65	\$3.90
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	30.00	Connellsville, foundry, ovens	5.25	5.30	5.30	4.25
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	30.00	Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75
Wire rods, No. 5 to 3/8-inch, Pitts.	47.00	47.00	47.00	38.00					

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel	Tin Mill Black No. 28	Corrosion and Heat-Resistant Alloys	Structural Shapes
Prices Subject to Quantity Extras and deductions (Except Galvanized)	Pittsburgh 3.30c	Pittsburgh base, cents per lb. Chrome-Nickel	Pittsburgh 2.25c
Hot Rolled No. 10, 24-48 in.	Gary 3.40c	No. 302 No. 304	Philadelphia, del. 2.45 1/2 c
Pittsburgh 2.40c	St. Louis, delivered 3.53c	Bars 24.00 25.00	New York, del. 2.50 1/2 c
Gary 2.50c	Granite City, Ill. 3.50c	Plates 27.00 29.00	Boston, delivered 2.63 1/2 c
Chicago, delivered 2.53c	Cold Rolled No. 10	Sheets 34.00 36.00	Bethlehem 2.35c
Detroit, del. 2.60c	Pittsburgh 3.10c	Hot strip 21.50 23.50	Chicago 2.30c
New York, del. 2.73c	Gary 3.20c	Cold strip 28.00 30.00	Cleveland, del. 2.45c
Philadelphia, del. 2.69c	Detroit, delivered 3.30c	Straight Chromes	Buffalo 2.35c
Birmingham 2.55c	Philadelphia, del. 3.39c	No. No. No. No.	Gulf Ports 2.65c
St. Louis, del. 2.63c	New York, del. 3.43c	410 430 442 446	Birmingham 2.40c
Granite City, Ill. 2.60c	St. Louis, del. 3.33c	Bars 18.50 19.00 22.50 27.50	Pacific ports, f.o.b. cars, dock 2.80c
Pacific ports, f.o.b. dock 2.95c	Granite City, Ill. 3.30c	Plates 21.50 22.00 25.50 30.50	St. Louis, del. 2.52c
Hot Rolled Annealed No. 24	Pacific ports, f.o.b. dock 3.70c	Sheets 26.50 29.00 32.50 36.50	Bars
Pittsburgh 3.15c	Cold Rolled No. 20	Hot strip 17.00 17.50 23.00 28.00	Soft Steel
Gary 3.25c	Pittsburgh 3.55c	Cold stp. 22.00 22.50 28.50 36.50	(Base, 3 to 25 tons)
Chicago, delivered 3.28c	Gary 3.65c		Pittsburgh 2.45c
Detroit, delivered 3.35c	Detroit, delivered 3.75c		Chicago or Gary 2.50c
New York, del. 3.48c	Philadelphia, del. 3.84c		Duluth 2.60c
Philadelphia, del. 3.44c	New York, del. 3.88c		Birmingham 2.60c
Birmingham 3.30c	St. Louis 3.78c		Cleveland 2.50c
St. Louis, del. 3.38c	Granite City, Ill. 3.75c		Buffalo 2.55c
Granite City, Ill. 3.35c	Enameling Sheets		Detroit, delivered 2.60c
Pacific ports, f.o.b. dock 3.80c	Pittsburgh, No. 10 2.90c		Pacific ports, f.o.b. cars, dock 3.00c
Galvanized No. 24	Pittsburgh, No. 20 3.50c		Philadelphia, del. 2.74c
Pittsburgh 3.80c	Gary, No. 10 3.00c		Boston, delivered 2.85c
Gary 3.90c	Gary, No. 20 3.60c		New York, del. 2.78c
Chicago, delivered 3.93c	St. Louis, No. 10 3.13c		Pitts., forg. qual. 2.80c
Philadelphia, del. 4.09c	St. Louis, No. 20 3.73c		
New York, delivered 4.13c	Tin and Terne Plate		Rail Steel
Birmingham 3.95c	Gary base, 10 cents higher		To Manufacturing Trade
St. Louis, del. 4.03c	Tin plate, coke, (base box), Pittsburgh \$5.35		Pittsburgh 2.30c
Granite City, Ill. 4.00c	Waste-waste, 2.75c; strip 2.50c		Chicago or Gary 2.35c
Pacific ports, f.o.b. dock 4.40c	Long ternes, No. 24, unassorted, Pitts. 4.10c		Cleveland 2.35c
			Moline, Ill. 2.35c
			Buffalo 2.40c
			Birmingham 2.45c

Iron	
Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined....	3.50-8.00c

Reinforcing	
New billet, straight lengths, quoted by distributors	
Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.60c
Gulf ports	2.65c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.84c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young....	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.		
Standard wire nails.....	\$2.75	
Cement coated nails.....	\$2.75	
(Per pound)		
Polished staples	3.45c	
Galv. fence staples	3.70c	
Barbed wire, galv.	3.40c	
Annealed fence wire....	3.15c	
Galv. fence wire	3.55c	
Woven wire fencing (base C. L. column).....		74
Single loop bale ties, (base C. L. column).....		63

To Manufacturing Trade	
Plain wire, 6-9 ga.....	2.90c
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth and Worcester up \$2; Birmingham up \$3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up \$1, Worc. \$2.	

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	2.95c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)			
Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem			3.00c
Alloy			
S.A.E. Diff.	S.A.E.	Diff.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.			0.55
4600 0.20 to 0.30 Mo.			1.50
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring			0.15
6100 bars			1.20
6100 spring			0.85
Cr. N., Van			1.50
Carbon Van.			0.85
9200 spring flats			0.15
9200 spring rounds, squares			0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot rolled, 25-1ton)			
(Base, cold-rolled, 25-3 tons)			
Hot strip to 23 $\frac{1}{2}$ -in.			
Pittsburgh	2.40c		
Chicago or Gary	2.50c		
Birmingham base	2.55c		
Detroit, del.	2.60c		
Philadelphia, del.	2.69c		
New York, del.	2.73c		
Cooperage hoop,			
Pittsburgh	2.50c		
Chicago	2.60c		
Cold strip, 0.25 carbon and under, Pittsburgh,			
Cleveland	3.20c		
Detroit, del.	3.40c		
Worcester, Mass.	3.40c		
Cleve. Worcester, Mass.			
Carbon Pitts.	3.20c	3.40c	
0.26-0.50	3.20c	3.40c	
0.51-0.75	4.45c	4.65c	
0.76-1.00	6.30c	6.50c	
Over 1.00	8.50c	8.70c	

Rails, Track Material

(Gross Tons)	
Standard rails, mill	\$42.50
Relay rails, Pittsburgh, 20-100 lbs.	32.50-35.50
Light rails, billet qual.,	
Pittsburgh, Chicago	\$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	
Do., axle steel	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	\$46.00
Base, light rails 25 to 60 lbs.;	
20 lbs. up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.	

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:	
Carriage and Machine	
$\frac{1}{2}$ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1 $\frac{1}{2}$ and 1 $\frac{1}{4}$ -in.	60-5 off
Tire bolts	50 off
Flow Bolts	
All sizes	65-5 off
Stove Bolts	
In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts	
S. A. E. semifinished hex.:	
$\frac{1}{2}$ to $\frac{3}{4}$ -inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off
Hexagon Cap Screws	
Milled	50-10 off
Upset, 1-in., smaller	60 off
Square Head Set Screws	
Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
$\frac{1}{8}$ -inch and smaller,	
Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut. bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off	

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	\$3.60
--	--------

Do. less carloads, 5 kegs or more, no discount on any extras... \$3.90
Do., under 5 kegs no disc. on any extras... \$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2 $\frac{1}{2}$ less. Wrought pipe, Pittsburgh.

Butt Weld Steel			
In.	Blk.	Galv.	
$\frac{1}{2}$	59 $\frac{1}{2}$	49	
$\frac{3}{4}$	62 $\frac{1}{2}$	53	
1-3	64 $\frac{1}{2}$	55 $\frac{1}{2}$	
Iron			
$\frac{1}{2}$	26	8	
1-1 $\frac{1}{2}$	30	14	
1 $\frac{1}{2}$	34	16 $\frac{1}{2}$	
2	33 $\frac{1}{2}$	16	

Lap Weld Steel			
2	57	47 $\frac{1}{2}$	
2 $\frac{1}{2}$ -3	60	50 $\frac{1}{2}$	
3 $\frac{1}{2}$ -6	62	52 $\frac{1}{2}$	
7 and 8	61	50 $\frac{1}{2}$	
9 and 10	60 $\frac{1}{2}$	50	

Iron			
2	26 $\frac{1}{2}$	10	
2 $\frac{1}{2}$ -3 $\frac{1}{2}$	27 $\frac{1}{2}$	12 $\frac{1}{2}$	
4	29 $\frac{1}{2}$	16	
4 $\frac{1}{2}$ -8	28 $\frac{1}{2}$	15	
9-12	24 $\frac{1}{2}$	10	

Line Pipe Steel			
1 to 3, butt weld	63 $\frac{1}{2}$		
2, lap weld	56		
2 $\frac{1}{2}$ to 3, lap weld	59		
3 $\frac{1}{2}$ to 6, lap weld	61		
7 and 8, lap weld	60		
10-inch, lap weld	59 $\frac{1}{2}$		
12-inch, lap weld	58 $\frac{1}{2}$		

Butt Weld Iron			
$\frac{1}{2}$	25	7	
1 and 1 $\frac{1}{2}$	29	13	
1 $\frac{1}{2}$	33	15 $\frac{1}{2}$	
2	32 $\frac{1}{2}$	15	

Lap Weld			
1 $\frac{1}{2}$	23 $\frac{1}{2}$	7	
2	25 $\frac{1}{2}$	9	
2 $\frac{1}{2}$ to 3 $\frac{1}{2}$	26 $\frac{1}{2}$	11 $\frac{1}{2}$	
4	28 $\frac{1}{2}$	15	
4 $\frac{1}{2}$ to 8	27 $\frac{1}{2}$	14	
9 to 12	23 $\frac{1}{2}$	9	

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld			
Sizes	Steel	Char-coal Iron	
1 $\frac{1}{2}$ " OD x 13 Ga.	\$10.45	\$23.71	
1 $\frac{1}{2}$ " OD x 13 Ga.	11.89	22.93	
2" OD x 13 Ga.	13.31	19.35	
2" OD x 11 Ga.	15.49	23.36	
2 $\frac{1}{2}$ " OD x 13 Ga.	14.82	21.68	
2 $\frac{1}{2}$ " OD x 11 Ga.	17.38	26.02	
2 $\frac{1}{2}$ " OD x 12 Ga.	17.82	26.57	
2 $\frac{1}{2}$ " OD x 12 Ga.	18.86	29.00	
3" OD x 12 Ga.	19.73	31.36	
3 $\frac{1}{2}$ " OD x 11 Ga.	24.89	39.81	
4" OD x 10 Ga.	30.81	49.90	
5" OD x 9 Ga.	47.57	73.93	
6" OD x 7 Ga.	73.25	.....

Seamless			
	Hot Rolled	Cold Drawn	
1" OD x 13 Ga.	\$ 8.41	\$ 9.46	
1 $\frac{1}{2}$ " OD x 13 Ga.	9.96	11.21	
1 $\frac{1}{2}$ " OD x 13 Ga.	11.00	12.38	
1 $\frac{1}{2}$ " OD x 13 Ga.	12.51	14.09	
2" OD x 13 Ga.	14.02	15.78	
2 $\frac{1}{2}$ " OD x 13 Ga.	15.63	17.60	

2 $\frac{1}{2}$ " OD x 12 Ga.	17.21	19.37
2 $\frac{1}{2}$ " OD x 12 Ga.	18.85	21.22
3" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4 $\frac{1}{2}$ " OD x 10 Ga.	40.15	45.19
3 $\frac{1}{2}$ " OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton	
6-in. & over, Birm.	\$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago.	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00
Class A Pipe \$3 over Class B	
Std. ftgs., Birm., base	\$100.00

Semifinished Steel

Billets and Blooms	
4 x 4-inch base; gross ton	
Pitts., Chi., Cleve., Buffalo, Young., Bham.	\$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets	
6 x 6 to 9 x 9-in., base	
Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars	
Pitts., Cleve., Young., Sparrows Point	37.00

Slabs	
Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods	
Pitts., Cleve., No. 5 to $\frac{1}{2}$ -inch incl.	47.00
Do., over $\frac{1}{2}$ to $\frac{1}{4}$ -inch incl.	52.00
Chicago up \$1; Worcester up \$2.	

Skelp	
Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur.	\$4.35- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	6.00- 6.50
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry	
Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens.	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants	
Pure and 90% benzol.	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (200 lb. drums).	16.25c
do. (450 lbs.)	15.25c
Eastern Plants, per lb.	
Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port Sulphate of ammonia.	\$28.50

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; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$25.00	\$25.50	\$23.50	\$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.	20.38	20.38	19.38	25.00
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	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	24.50
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	22.00	22.00	22.00
Sharpville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	25.00	24.50	25.00
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:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	25.58	24.46	25.46
Boston from Birmingham	26.37	26.37	25.87	26.87
Boston from Everett, Mass.	26.25	26.25	25.75	26.75
Boston from Buffalo	26.25	26.25	25.75	26.75
Brooklyn, N. Y., from Bethlehem	27.27	27.27	26.77	27.77
Brooklyn, N. Y., from Bmghm.	27.05	27.05	26.55	27.55
Canton, O., from Cleveland	25.26	25.26	24.76	25.76
Chicago from Birmingham	24.22	24.22	23.72	24.72
Cincinnati from Hamilton, O.	24.07	25.01	24.51	25.51
Cincinnati from Birmingham	23.69	23.69	23.19	24.19
Cleveland from Birmingham	24.12	24.12	23.62	24.62
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	26.26
Milwaukee from Chicago	25.00	25.00	24.50	25.50
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	26.01	25.51	26.51
Newark, N. J., from Bethlehem	26.39	26.39	25.89	26.89
Philadelphia from Birmingham	25.38	25.38	24.88	25.88
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	26.26
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and \$1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	26.75
St. Louis, northern	24.50	24.50	24.00	25.00

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	\$24.12	23.82	23.82	26.44
St. Paul from Duluth	25.94	25.94	25.94	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$28.50, Phila. base, standard and copper bearing, \$29.63.

Gray Forge

Valley furnace	\$23.50	Lake Superior fur.	\$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		Lyles, Tenn.	26.50

Charcoal

Silvery†

Jackson county, O., base: 6-6.50 per cent \$28.50; 6.51-7—\$29.00; 7-7.50—\$29.50; 7.51-8—\$30.00; 8-8.50—\$30.50; 8.51-9—\$31.00; 9-9.50—\$31.50; 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

Fire Clay Brick

Super Quality Pa., Mo., Ky. \$64.60

First Quality

Pa., Ill., Md., Mo., Ky. 51.30
Alabama, Georgia 51.30
New Jersey 56.00

Second Quality

Pa., Ill., Ky., Md., Mo. 46.55
Georgia, Alabama 41.80
New Jersey 51.00

Ohio

First quality 43.70
Intermediate 43.70
Second quality 35.15

Malleable Bung Brick

All bases \$59.85

Silica Brick

Pennsylvania \$51.30
Joliet, E. Chicago 59.85
Birmingham, Ala. 51.30

Ladle Brick

(Pa., O., W. Va., Mo.)
Dry press \$30.00
Wire cut \$28.00

Magnesite

Imported dead-burned

grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) \$45.00

Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick \$49.00
Chem. bonded chrome 49.00
Magnesite brick 69.00
Chem. bonded magnesite 59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton \$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail \$20.00
Do., for barge \$22.00
No. 2 lump 22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd. \$102.50
Do., Baltimore, base 102.50
Do., del. Pittsburgh 107.29

Spiegeleisen, 19-21% dom.

Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmer- ton 39.00

Ferrosilicon, 50% freight

allowed, c.l. 69.50
Do., less carload 77.00
Do., 75 per cent 126-130.00

Spot, \$5 a ton higher.

Silicomane, 2 1/2 carbon 106.50
2% carbon 111.50; 1%, 121.50

Ferrochrome, 66-70 chrom- ium, 4-6 carbon, cts. lb. del. 10.50

Ferrotungsten, stand., lb. con. del. cars n.m.
Ferrovanadium, 35 to 40% lb., cont. 2.70-2.90

Ferrotitanium, c. l., prod. plant, frt. all, net ton 142.50
Spot, carlots 145.00
Spot, ton lots 150.00

Ferrophosphorus, per ton, c. l. 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage 63.50

Ferrophosphorus, electro- lytic, per ton c. l. 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage 80.00

Ferromolybdenum, stand. 55-65%, lb. 0.95
Molybdate, lb. cont. 0.80

†Carloads. Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper				Strait's Tin, New York		Lead	Lead	Zinc	Alumi- num	Antimony	Nickel
Electro, del.	Lake, del.	Casting, del.	Midwest refinery	Spot	Futures	East N. Y.	East St. L.	St. L.	99%	American Spot, N. Y.	Cath- odes
Sept. 18	14.00	14.12 1/2	13.75	59.25	58.62 1/2	6.50	6.35	7.25	20.00	16.75	35.00
Sept. 20	14.00	14.12 1/2	13.75	58.75	58.00	6.50	6.35	7.25	20.00	17.25	35.00
Sept. 21	14.00	14.12 1/2	13.75	59.75	58.87 1/2	6.50	6.35	7.25	20.00	17.25	35.00
Sept. 22	14.00	14.12 1/2	13.75	59.62 1/2	58.87 1/2	6.50	6.35	7.25	20.00	17.25	35.00
Sept. 23	14.00	14.12 1/2	13.75	59.12 1/2	58.37 1/2	6.50	6.35	7.25	20.00	17.25	35.00
Sept. 24	14.00	14.12 1/2	13.75	57.87 1/2	57.12 1/2	6.25	6.10	7.25	20.00	17.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper

Sheets

Yellow brass (high) 19.75
Copper, hot rolled 21.87 1/2
*Lead, cut to jobbers 9.75
Zinc, 100-lb. base 12.25

Tubes

High yellow brass 22.50
Seamless copper 22.62 1/2

Rods

High yellow brass 16.25
Copper, hot rolled 18.62 1/2

Anodes

Copper, untrimm'd 19.12 1/2

Wire

Yellow brass (high) 20.00

OLD METALS

Nom. Deal, buying prices

No. 1 Composition Red Brass

*New York 8.00-8.25
*Cleveland 8.75-9.00
*Chicago 8.75-9.00
St. Louis 8.50-8.75

Heavy Copper and Wire

*New York, No. 1 10.25-10.50
*Cleveland, No. 1 10.25-10.50
*Chicago, No. 1 10.75-11.00
St. Louis, No. 1 10.50-10.75

Composition Brass Borings

*New York 7.50-7.75

Light Copper

*New York 8.25-8.50
*Cleveland 8.25-8.50
*Chicago 8.75-9.00
St. Louis 8.75-9.00

Light Brass

Cleveland 5.25-5.50
Chicago 5.75-6.00
St. Louis 5.25-5.50

Lead

*New York 5.50
*Cleveland 5.00-5.25
*Chicago 5.25-5.37 1/2
*St. Louis 4.75-5.00

Zinc

New York 4.25-4.50
Cleveland 3.75-4.00
St. Louis 4.00-4.25

Aluminum

Borings, Cleveland 9.75-10.00
*Mixed cast, Cleve. 13.25-13.50
Clips, soft, Cleve. 15.25-15.50
Mixed cast, St. L. 12.75-13.00

SECONDARY METALS

*Brass, ingot, 85-5-5-1, 13.75
Stand. No. 12 alum. 18.50

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York† (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York† (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	3.10c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York† (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ¼-in.	3.86c
and over	3.95c
Detroit	3.95c
Detroit, ½-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York† (d)	4.00c
Philadelphia	3.90c

Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York† (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Houston	4.66c
Cleveland	4.68½c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York† (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York† (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ½-in.	4.185c
and lighter	4.35c
Houston	4.80c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York† (d)	4.32c

Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York† (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c

New York† (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York† (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

Base	
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening 12½c	
Uniform extras apply.	
BOLTS AND NUTS	
(100 pounds or over)	
Discount	
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65

New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add \$1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with \$1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; †† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 23

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports	Continental Channel or North Sea ports, metric tons	
		Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON			
Foundry, 2.50-3.00 Silicon	\$29.76 6 0 0	\$24.11	3 0 0
Basic bessemer	19.47 3 18 6	23.71	2 19 0
Hematite, Phos. .03-.05	35.96 7 5 0*	.....	.....

SEMIFINISHED STEEL

Billets	\$39.06 7 17 6	\$43.20	5 7 6
Wire rods, No. 5 gage	53.69 10 16 6	49.22	6 2 6

FINISHED STEEL

Standard rails	\$50.22 10 2 6	\$46.20	5 15 0
Merchant bars	2.43c 11 0 0	2.18c to 2.28c	6 0 0 to 6 5 0
Structural shapes	2.35c 10 12 6	1.96c	5 7 6
Plates, ½ in. or 5 mm.	2.56c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.32c 15 0 0	3.18c	8 15 0††
	4.14c 18 15 0	3.99c	11 0 0
Sheets, galv., 24 gage, corr.	3.03c 13 15 0	2.36c	6 10 0
Bands and strips	4.31c 19 10 0	2.54c	7 0 0
Plain wire, base			
Galvanized wire, base	5.14c 23 5 0	3.18c	8 15 0
Wire nails, base	4.09c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	\$ 6.45 1 6 0	.....	.....

British ferromanganese \$102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, Si. 2.5	\$25.05 5 1 0(a)	\$17.27 505	\$27.80 825	\$25.29 63
Basic bessemer pig iron	24.80 5 0 0(a)	.....	.....	27.90 (b) 69.50
Furnace coke	8.80 1 15 6	5.40 158	7.25 215	7.63 19
Billets	39.06 7 17 6	25.91 757.50	32.35 960	38.74 96.50
Standard rails	2.24c 10 2 6	1.58c 1,050	2.06c 1,375	2.38c 132
Merchant bars	2.53c 11 9 0	1.49c 995	1.65c 1,100	1.98c 110
Structural shapes	2.44c 11 0 6	1.46c 970	1.65c 1,100	1.93c 107
Plates, ½-in. or 5 mm.	2.59c 11 14 3	1.86c 1,240	2.06c 1,375	2.29c 127
Sheets, black	3.48c 15 15 0‡	2.48c 1,650‡	2.36c 1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.31c 19 10 0	3.38c 2,250	2.85c 1,900	6.66c 370
Plain wire	4.31c 19 10 0	2.22c 1,480	2.49c 1,650	3.11c 173
Bands and strips	2.70c 12 4 0	1.75c 1,165	2.33c 1,550	2.29c 127

*Basic. †British ship-plates. Continental bridge plates. ‡24 ga. †1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed. **Gold pound sterling carries a premium of 65 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL	
Birmingham, † No. 1	15.00-16.00
Birmingham, † No. 2	14.00-15.00
Bos. dock No. 1 exp.	17.50
N. Eng. del. No. 1	17.00
Buffalo, No. 1	18.00-18.50
Buffalo, No. 2	16.00-16.50
Chicago, No. 1	16.50-17.00
Cleveland, No. 1	17.50-18.00
Cleveland, No. 2	16.50-17.00
Detroit, No. 1	15.50-16.00
Eastern Pa., No. 1	18.50
Eastern Pa., No. 2	15.50-16.50
Federal, Ill.	15.00-15.50
Granite City, R. R.	17.00-17.50
Granite City, No. 2	15.00-15.50
New York, No. 1	15.50
N. Y. dock No. 1 exp.	16.00
Pitts., No. 1 (R. R.)	20.00-20.50
Pitts., No. 1 (dlr.)	18.50-19.00
Pittsburgh, No. 2	17.00-17.50
St. Louis, R. R.	17.00-17.50
St. Louis, No. 2	15.00-15.50
Toronto, dlrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	18.50-19.00
COMPRESSED SHEETS	
Buffalo, dealers	16.00-17.00
Chicago, factory	15.50-16.00
Chicago, dealer	15.00-15.50
Cleveland	17.00-17.50
Detroit	17.25-17.75
E. Pa., new mat.	18.50
E. Pa., old mat.	13.50-14.00
Pittsburgh	18.50-19.00
St. Louis	12.50-13.00
Valleys	18.00-18.50
BUNDLED SHEETS	
Buffalo	12.00-12.50
Cincinnati, del.	12.50-13.00
Cleveland	13.00-13.50
Pittsburgh	18.50-19.00
St. Louis	11.50-12.00
Toronto, dealers	8.00
SHEET CLIPPINGS, LOOSE	
Chicago	12.25-12.75
Cincinnati	11.00-11.50
Detroit	13.25-13.75
St. Louis	10.50-11.00
STEEL RAILS, SHORT	
Birmingham	17.00-18.00
Buffalo	22.50-23.50
Chicago (3 ft.)	19.50-20.00
Chicago (2 ft.)	20.50-21.00
Cincinnati, del.	20.50-21.00
Detroit	22.00-22.50
Pitts., 3 ft. and less	24.50-25.00
St. Louis, 2 ft. & less	20.00-20.50
STEEL RAILS, SCRAP	
Boston district	15.50-15.75
Buffalo	19.00-19.50
Chicago	16.50-17.00
Cleveland	19.50-20.00
Pittsburgh	20.50-21.00
St. Louis	18.00-18.50
STOVE PLATE	
Birmingham	10.00-10.50
Boston district	11.00-11.25
Buffalo	15.00-15.50
Chicago	10.50-11.00
Cincinnati, dealers	9.50-10.00
Detroit, net	11.25-11.75
Eastern Pa.	15.00-15.50
New York, fdry.	11.50-12.00
St. Louis	12.00-12.50
Toronto, dealers, net	9.50-10.00

SPRINGS	
Buffalo	23.00-23.50
Chicago, coil	23.00-23.50
Chicago, leaf	20.50-21.00
Eastern Pa.	24.00-24.50
Pittsburgh	24.50-25.00
St. Louis	22.00-22.50
ANGLE BARS—STEEL	
Chicago	17.50-18.00
St. Louis	18.50-19.00
RAILROAD SPECIALTIES	
Chicago	20.50-21.00
LOW PHOSPHORUS	
Buffalo, billet and bloom crops	21.50-22.00
Cleveland, billet, bloom crops	23.50-24.00
Eastern Pa., crops	24.00-24.50
Pittsburgh, billet, bloom crops	24.50-25.00
Pittsburgh, sheet bar crops	24.00-24.50
FROGS, SWITCHES	
Chicago	16.50-17.00
St. Louis, cut	18.00-18.50
SHOVELING STEEL	
Federal, Ill.	15.00-15.50
Granite City, Ill.	15.00-15.50
Toronto, dealers	9.00-9.50
RAILROAD WROUGHT	
Birmingham	13.50-14.00
Boston district	11.00-10.25
Buffalo, No. 1	14.50-15.00
Buffalo, No. 2	16.00-16.50
Chicago, No. 1 net	14.50-15.00
Cincinnati, No. 2	15.50-16.00
Eastern Pa., No. 1	20.50-21.00
St. Louis, No. 1	14.00-14.50
St. Louis, No. 2	17.00-17.50
Toronto, No. 1 dlr.	15.00
SPECIFICATION PIPE	
Eastern Pa.	17.00-17.50
New York	12.00-12.50
BUSHING	
Buffalo, No. 1	17.00-17.50
Chicago, No. 1	15.50-16.00
Cincin., No. 1, deal.	14.50-15.00
Cincinnati, No. 2	8.00-8.50
Cleveland, No. 2	12.00-12.50
Detroit, No. 1 new	15.50-16.00
Valleys, new, No. 1	18.00-18.50
Toronto, dealers	9.00
MACHINE TURNINGS	
Birmingham	6.00-7.00
Buffalo	12.50-13.00
Chicago	10.00-10.50
Cincinnati, dealers	9.50-10.00
Cleveland	12.00-12.50
Detroit	11.50-12.00
Eastern Pa.	12.50-13.00
New York	9.00-9.50
Pittsburgh	14.00-14.50
St. Louis	8.00-8.50
Toronto, dealers	8.00-8.50
Valleys	14.50-15.00
BORINGS AND TURNINGS	
For Blast Furnace Use	
Boston district	†8.00

Buffalo	11.50-12.00
Cincinnati, dealers	9.00-9.50
Cleveland	13.00-13.50
Detroit	12.00-12.50
Eastern Pa.	12.00-12.50
New York	†9.00
Pittsburgh	14.00-14.50
Toronto, dealers	8.00-8.50
CAST IRON BORINGS	
Birmingham	8.00-8.50
Boston dist. chem.	†10.00
Bos. dist. for mills	†8.75
Buffalo	11.50-12.00
Chicago	10.50-11.00
Cincinnati, dealers	9.00-9.50
Cleveland	13.00-13.50
Detroit	12.00-12.50
E. Pa., chemical	14.50-15.00
New York	†9.00-9.50
St. Louis	8.00-8.50
Toronto, dealers	9.00
PIPE AND FLUES	
Cincinnati, dealers	10.00-10.50
Chicago, net	12.50-13.00
RAILROAD GRATE BARS	
Buffalo	13.50-14.00
Chicago, net	11.50-12.00
Cincinnati	10.00-10.50
Eastern Pa.	15.00-15.50
New York	†11.00-11.50
St. Louis	12.00-12.50
FORGE FLASHINGS	
Boston district	†11.25-11.50
Buffalo	16.00-16.50
Cleveland	16.50-17.00
Detroit	15.50-16.00
Pittsburgh	17.00-17.50
FORGE SCRAP	
Boston district	†9.50-10.00
Chicago, heavy	20.50-21.00
ARCH BARS, TRANSOMS	
St. Louis	20.00-20.50
AXLE TURNINGS	
Boston district	†11.00-11.50
Buffalo	15.50-16.00
Chicago, elec. fur.	18.00-18.50
Eastern Pa.	18.00-18.50
St. Louis	14.00-14.50
Toronto	9.50
STEEL CAR AXLES	
Birmingham	19.00-20.00
Buffalo	21.00-21.50
Boston district	†24.00-25.00
Chicago, net	24.50-25.00
Eastern Pa.	26.00-26.50
St. Louis	24.00-24.50
SHAFTING	
Boston district	†18.00-18.50
New York	†18.00-18.50
Eastern Pa.	24.00-24.50
St. Louis	19.50-20.00
CAR WHEELS	
Birmingham	18.00-19.00
Boston dist. iron	†15.00-15.25
Buffalo, iron	21.50-22.00
Buffalo, steel	23.00-24.00
Chicago, iron	18.50-19.00
Chicago, rolled steel	19.50-20.00

Cincinnati, iron	18.00-18.50
Eastern Pa., iron	20.50-21.00
Eastern Pa., steel	24.00-24.50
Pittsburgh, iron	20.00-20.50
Pittsburgh, steel	24.50-25.00
St. Louis, iron	19.00-19.50
St. Louis, steel	21.00-21.50
NO. 1 CAST SCRAP	
Birmingham	15.50-16.00
Boston, No. 1 mach.	†15.00
N. Eng. del. No. 2	15.50-15.75
N. Eng. del. textile	18.50
Buffalo, cupola	16.50-17.00
Buffalo, mach.	17.50-18.00
Chicago, agri. net	12.50-13.00
Chicago, auto	13.50-14.00
Chicago, mach. net	13.50-14.00
Chicago, rail'd net	13.50-14.00
Cincin., mach. cup.	14.00-14.50
Cleveland, mach.	18.50-19.00
Eastern Pa., cupola	20.00-20.50
E. Pa., mixed yard	17.50
Pittsburgh, cupola	19.25-19.75
San Francisco, del.	13.50-14.00
Seattle	8.00-9.00
St. Louis, No. 1	12.75-13.25
St. L., No. 1, mach.	13.75-14.25
Toronto, No. 1, mach., net	16.00-17.00
HEAVY CAST	
Boston dist. break.	†13.50
N. Eng. del.	15.00-15.25
Buffalo, break.	15.00-15.50
Cleveland, break.	16.00-17.00
Detroit, break.	14.00-14.50
Detroit, auto net.	15.50-16.00
Eastern Pa.	18.50-19.00
New York, break.	†14.00-14.50
Pittsburgh	16.00-16.50
MALLEABLE	
Birmingham, R. R.	12.50-13.50
New England, del.	20.00
Buffalo	19.00-19.50
Chicago, R. R.	17.75-18.25
Cincin., agri. del.	15.50-16.00
Cleveland, rail.	20.50-21.00
Detroit, auto	15.50-16.00
Eastern Pa., R. R.	19.50-20.00
Pittsburgh, rail	19.50-20.00
St. Louis, R. R.	18.00-18.50
RAILS FOR ROLLING	
5 feet and over	
Birmingham	19.00-20.00
Boston	†17.50-18.00
Chicago	19.00-19.50
Eastern Pa.	21.00-21.50
New York	†17.50
St. Louis	19.75-20.25
LOCOMOTIVE TIRES	
Chicago (cut)	21.00-21.50
St. Louis, No. 1	19.50-20.00
LOW PHOS. PUNCHINGS	
Buffalo	22.50-23.00
Chicago	20.50-21.00
Eastern Pa.	24.50-25.00
Pittsburgh (heavy)	23.00-23.50
Pittsburgh (light)	22.00-22.50

Iron Ore

Lake Superior Ore	
Gross ton, 51 1/2 %	
Lower Lake Ports	
Old range bessemer	\$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore	
Cents, unit, del. E. Pa.	
Foundry and basic	
56.63% con.	9.00-10.00
Cop.-free low phos.	
58-60%	nominal
Foreign Ore	
Cents per unit, f.a.s. Atlantic	
Foreign manganiferous ore, 45.55% iron, 6-10% man.	*17.00

No. Afr. low phos.	20.00 nominal
Swedish low phos.	
Spanish No. Africa basic, 50 to 60%	*16.00
Tungsten, Nov.-Dec. sh. ton, unit, duty pd.	nominal
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton. c.i.f.	\$25.50-26.50
*Nominal asking price for spot.	

Manganese Ore

(Nominal)	
Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52%	non. 52.00 to 53.00
So. African, 50-52%	non. 52.00 to 53.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 72

Pittsburgh—Incoming business in sheets has been lighter during the past week than in any previous weekly period this month, and unless a good-sized increase is shown before the end of this month, the gain over August will be negligible. Agricultural demand since the middle of this month has been the feature of the market. Delivery promises on cold-reduced range up to six weeks, insuring a good rate of activity through October. Hot-rolled delivery promises range up to four to six weeks. With miscellaneous consumers now receiving deliveries on material which they ordered in early August, sellers can understand the slow rate of reordering. Prices are steady.

Cleveland — Requirements for hot and cold-rolled sheets continue to expand but are still considerably below the forecasts earlier this month. However, miscellaneous consumers are fairly active, specifying freely for prompt deliveries, for in most instances inventories are well below the levels carried earlier this year. Specifications from automotive sources are still disappointing, although additional tonnages have recently been placed.

Chicago—While backlogs of sheets still are larger than in other finished products, new business is insufficient to prevent a further decrease in backlogs. Automotive buying is disappointing but is blamed to a large extent on stocks still in the hands of motor car interests. Consumption of this material shortly is expected to permit new buying. Demand elsewhere shows little change but is regarded as below the rate of consumption. Mill operations continue heavy though a decrease is in prospect on some grades unless new business shortly is heavier.

Boston—There has been a spotty gain in sheet buying with specifications from range and heating equipment builders slightly heavier. Demand is uneven, however, and jobbers are still ordering fill-in requirements. While most volume is for early delivery, covering for needs next quarter has gained. Small tank builders are generally operating with light stocks on a good volume of business.

New York—Demand for sheets drifts sluggishly with little change in new tonnage, buying being light and usually for prompt shipment. Coated sheets are notably dull. Consumers show little interest in future requirements, depending on the improved delivery situation to fill

depleted specifications. Practically no purchases are being made for inventory as numerous consumers appear more conservative.

Philadelphia—An easier situation has developed in steel sheet deliveries with most mills now able to make shipments in hot-rolled within two to three weeks and one week is not uncommon. Some cold-rolled sheet makers are still booked as much as four weeks ahead. Additional releases of both hot and cold-rolled material is expected momentarily from the automotive trade, which so far has specified for little more than needs for preliminary new model work. Makers of automobile radios are still doing well but demand from refrigerator and stove makers, which normally should be active, is not showing much life.

Cincinnati—Excepting for a moderate upturn in sales of galvanized, sheet demand is following the pattern of recent weeks. Bookings remain near 75 per cent with shipments heavier. Automotive needs are slow to expand. Steelmaking and rolling schedules have been well maintained.

St. Louis—Demand for sheets from all sources continues slack, miscellaneous requirements showing less than the expected seasonal pickup. Mill backlogs have been noticeably reduced and new business would be welcomed. Shipments, however, are holding up well, particularly of galvanized material and enameling stock. The delivery situation on hot-rolled sheets is reported the most favorable in many months.

Birmingham, Ala. — Mills have an unprecedented amount of business in sheets. As usual, most of the product is going to manufacturers of drums, and there is no immediate indication of lagging in this specification.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh—Good-sized inquiries for export and a fair amount of domestic business for fourth-quarter delivery have been noted recently by tin plate producers, who at present are trying to get out low-priced tonnage before Sept. 30. In this district it appears that practically all the low-priced material will be cleared by the deadline. Fourth-quarter activity depends to a large extent upon whether an early frost cuts off the canning of seasonal goods and upon what buyers believe the price outlook is for next year. Export prices in most cases are still a little better than domestic levels. Operations are down

slightly, but are close to 100 per cent.

New York—New buying of tin plate is nil, consumers taking shipments against contracts in steady volume with continued improvement in delivery. Spot buying is light.

Strip

Strip Prices, Page 73

Pittsburgh—Unless strip requirements show a belated spurt late this month, September will close with new business under the estimates made in late July and August. Demand from the automotive industry has been somewhat less than expected, and other consumers show a disposition to restrict buying to actual current needs.

Cleveland — Specifications for wide and narrow hot and cold-rolled strip have improved somewhat but are still hampered by delayed buying from automotive consumers. However, activity among electrical equipment and small tool manufacturers has held up well. Most consumers are specifying freely against immediate needs. Little forward buying has been reported, as sellers are able to offer prompt deliveries.

Chicago—Strip demand is lagging, improvement in orders from both the automotive and miscellaneous industries failing to measure up to expectations. While stocks in users' hands partly account for slowness in buying, consumption has shown but little change lately. Producers are able to give early delivery on most sizes, backlogs being light.

Boston—While some narrow cold strip sellers note a slight increase in advance buying with scattered covering for deliveries through the fourth quarter, incoming volume holds to about the recent slow rate. Until recently shipments have been considerably in excess of new tonnage, but with backlogs depleted, shipments and orders are about equal. Mill operations are more spotty. Demand for stainless strip in narrow widths is slack. Hot strip moves in line with cold strip operations and is still of a fill-in character generally.

New York—Failure of many industrial and fabricator cold strip consumers to buy in volume expected at close of quarter now is attributed to decline in anticipated demand for products. While there are low points in stocks, numerous buyers still have fairly substantial tonnage on hand. While shipments are still ahead of incoming volume, the gap is narrowing as backlogs are lowered, the latter already be-

ing considered normal by most sellers. Hot strip demand is sluggish.

Birmingham, Ala. — Continued demand for cotton ties figures prominently in sustained production of strip. While the buying probably is not quite as spirited as a few weeks ago, mills here still have sizable unfilled tonnages, but deliveries are fairly prompt and shipments are steady.

Plates

Plate Prices, Page 72

Pittsburgh — Railroad requirements in the past week have helped bolster the plate market in this district, New York Central buying a substantial tonnage in its order for 10,000 tons of carbiding material, a large proportion of which will be produced in the Pittsburgh district. Deliveries are much better, with less than four weeks obtainable by consumers. Tank and barge work continue active. Prices are steady.

Cleveland — Requirements for plates are moderately active with most sellers offering delivery of three to six weeks, depending on the grade. Recent demand is for structural projects, although a west side water main project, Cleveland, requiring large diameter pipe, is expected to take considerable tonnage. Railroad outlook is unchanged for the immediate future.

Chicago—Plate backlogs still are fairly heavy and shipments are well sustained but new business shows no improvement. Railroad equipment markets offer little promise of heavier plate orders in the near future and structural fabricators are taking smaller lots than during midsummer. Tank fabricators continue good customers, however.

Boston—Potential plate requirements are heavy on specified projects, the full advantage offered by such tonnage not likely to be felt for several months, especially from shipyards, which are heavily booked. Two 1600-ton destroyers have been allotted the Boston navy yard for construction, making six in the district for which hull steel must be purchased. Bids on 1955 tons for the Portsmouth, N. H., navy yard for two submarines, recently bid, brought out uniform quotations on most items, 3.25c, delivered, being quoted on the greater part.

New York—Buying is irregular with no general improvement in new tonnage. Indications are that shipyard releases in early October will be somewhat better with most of the material backed up by the recent strike being worked off at a better rate. Railroads are ordering spar-

ingly and the reported purchase of 10,000 tons by the New York Central is tonnage placed several months ago, now being released. For a 48-inch steel pipe line for Newark, N. J., close to 1400 tons of plates will be needed.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., will be awarded the contract for the United States liner, the contract to be signed by Oct. 15 unless unexpected circumstances arise. This will require 16,000 tons of hull steel.

Philadelphia—Some miscellaneous carlot business is reported in plates but this is insufficient to bolster mill backlogs and some interests which were booked as much as 16 weeks ahead recently are not able to offer deliveries well under two weeks. Tonnage business is almost entirely lacking with railroads, shipbuilders, the oil industry and tank makers largely out of the market. The Pennsylvania railroad indicated in connection with its less favorable August showing it would cut maintenance and other expenses until relief is afforded through increases in revenues.

San Francisco—The largest plate award of the year has just been placed with Consolidated Steel Corp., Los Angeles, and involves 9600 tons for a welded steel pipe line for the metropolitan water district, Los Angeles. In addition 150 tons of rods will be needed. Little new business of size is noted and pending projects require less than 1500 tons. California Corrugated Culvert Co. was awarded 175 tons for a corrugated culvert pipe line for the United States engineer office, Los Angeles, under proposal No. 17.

Seattle—No large projects are up for immediate figures but fabricators report a fair volume of business in small tonnages, mostly boiler, tank and service station jobs. Bellingham, Wash., expects to invite bids soon for a \$60,000 pipe line extension to the enlarged plant of Puget Sound Pulp & Timber Co. C. C. Moore & Co., Seattle, has contracted to furnish boilers to the University of Washington, the main plant of the Puget Sound Pulp & Timber Co., Bellingham, Wash., and for the power plant of the Simpson Logging Co., Shelton, Wash., involving a total of 300 tons of plates. The boilers will be fabricated at Babcock & Wilcox plant, Barberton, O.

Plate Contracts Placed

11,050 tons, 54-inch pipe line, Eagle Rock to Los Angeles, to Consolidated Steel Corp., Los Angeles.
300 tons, boilers for University of Washington and industrial plants, to C. C. Moore & Co., Seattle.
265 tons, 15 sections, 32-inch i. d. by 52 feet long welded steel pontoon pipe, U. S. engineers, Memphis, Tenn., to St.

Louis Shipbuilding & Steel Co., St. Louis; bids July 30, cir. 8F.
100 tons, anchor barge, 65 feet long by 20 feet wide and five feet deep, U. S. engineer, Memphis, Tenn., to St. Louis Shipbuilding & Steel Co., St. Louis, \$12,270, delivered afloat, Memphis, 60 days; bids Aug. 27.

100 tons or more, 54-inch siphon pipe for Bitterroot irrigation project, Hamilton, Mont.; Clinton & Applegate, Anaconda, Mont., general contractors.

100 tons, for 200,000-gallon elevated steel tank, Erlanger, Ky.; bids in; also steel supports for control and chlorinator house.

Plate Contracts Pending

1400 tons, for 4000 feet 48-inch steel pipe; bids in.
Unstated tonnage, 50,000-gallon steel tank, Kennett dam, Calif.; California Steel Products Co., San Francisco, low.

Bars

Bar Prices, Page 72

Pittsburgh—Demand for hot-rolled bars continues below expectations, although September business shows improvement over August. Many buyers are unwilling to extend themselves beyond their bare current needs for the time being, even though inventories are low, and this condition has resulted in district mills' bookings fluctuating from day to day. Automotive buying has gained slightly. Deliveries are easy.

Cleveland — Local forging concerns continue to play an important part in the moderate improvement in requirements for commercial and alloy steel bars, since the first of the month. However, shipments still exceed specifications by a considerable margin. Farm equipment manufacturers continue the active pace set during the summer months, although specification from this source for new models has also been delayed for a week or two.

Chicago—Bar shipments still are in excess of new business despite continued heavy requirements of the farm equipment industry. Failure of automotive demand to increase more rapidly partly is responsible for the lack of sustained gain in orders, though heavier buying by this group is seen for the near future. Fairly prompt deliveries now can be given on most sizes of bars.

Boston—Commercial steel bar demand continues slack. With prices stabilized for next quarter and deliveries on some specifications under three weeks, consumers are buying in small lots as needed to keep stocks balanced. Alloy, forging and high speed steel stocks are relatively more active, notably the latter, with machine tool builders stocking moderately before the price advance late this week. Bid of 3.32c was low on flat bar requirements for sub-

—The Market Week—

marines, Portsmouth navy yard last week.

New York—Jobber stocks of commercial steel bars are sufficient to fill reduced demand and warehouse distributors are placing little new tonnage with mills. Specifications from bolt and nut makers are steady, but new buying is light. Alloy and forging bar demand, dependent materially on automotive needs has not developed in volume.

Philadelphia—Incoming business in merchant steel bars is light with most specifications generally available within a week or two. Miscellaneous consumers account for little business and jobbers are also well stocked.

Pipe

Pipe Prices, Page 73

Pittsburgh—Tubular goods bookings this month have been running under August total and producers continue catching up on backlogs. Oil country activity has slackened and some large companies appear well stocked. Standard pipe continues slow and seamless mechanical has eased. Uncertainties in general business and war tension are partly responsible for the decline in demand.

Cleveland—Backlogs of most jobbers have materially decreased, as incoming orders have consistently fallen behind shipments. General outlook for the near future is mixed, although considerable improvement is expected during October with increased tonnage from industrial sources materializing. Cast pipe awards remain well under 100 tons, with most foundries fairly active on backlogs. Pending work includes considerable tonnage from small municipalities.

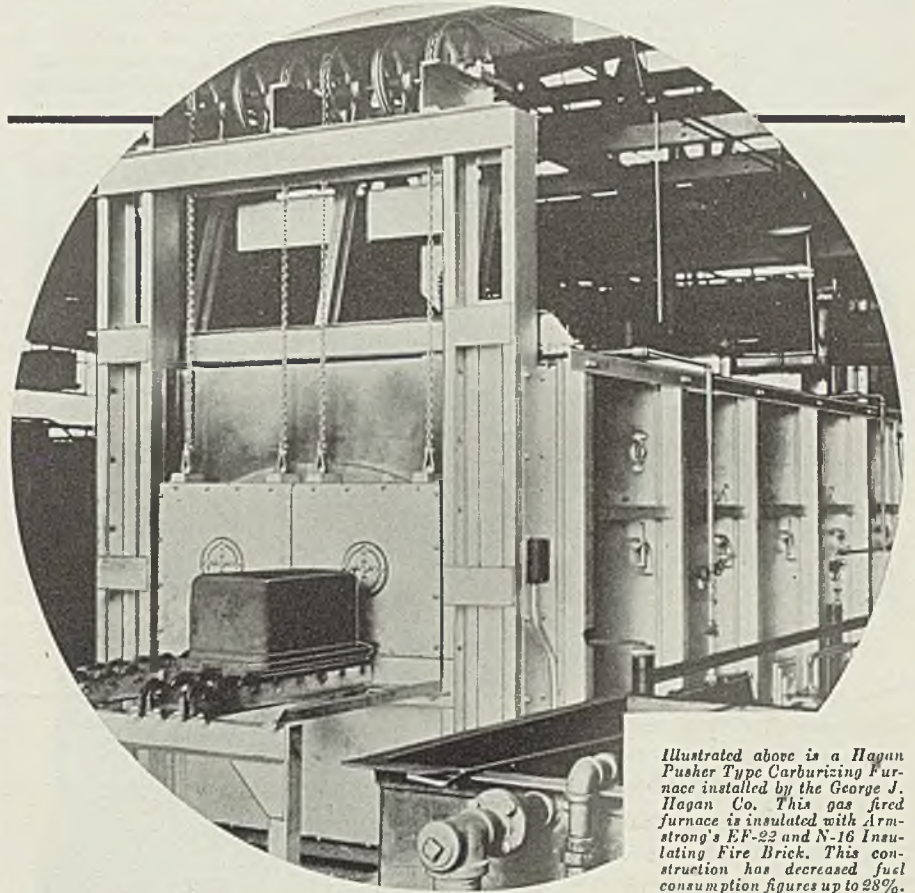
Chicago—Cast pipe inquiry is headed by 2610 tons of 6, 8 and 12-inch material for Chicago. Bids close Oct. 4. Another Chicago inquiry for 203 tons of fittings closes, Sept. 30. Inquiries elsewhere generally are small and orders are made up largely of individual lots of less than 100 tons.

Boston—Supply department, city of Boston, is closing on 1355 tons, class C cast pipe, Sept. 27, the largest active inquiry. Small-lot buying continues steady with deliveries prompt. Merchant steel pipe activity through resellers has improved spottily in small lots with distributors' stocks well balanced. Wrought pipe demand is steady, but in light volume. Steel pipe prices are firm.

New York—Cast pipe buying and inquiry have declined, activity being

Fuel savings up to 28%

ARE OBTAINED IN HAGAN FURNACES INSULATED WITH ARMSTRONG'S BRICK



Illustrated above is a Hagan Pusher Type Carburizing Furnace installed by the George J. Hagan Co. This gas fired furnace is insulated with Armstrong's EF-22 and N-16 Insulating Fire Brick. This construction has decreased fuel consumption figures up to 28%.

Furnaces operating at 1700° F. for nearly two years have required no repairs or replacements of Armstrong's Insulating Fire Brick

IN addition to maximum heat saving, Armstrong's Insulating Fire Brick provide many other advantages. They make possible the construction of thinner furnace walls and consequent larger hearth area. They assure a high heat seal on the inside of the furnace providing uniform heat distribution. These efficient brick help provide easier and more flexible temperature control with quicker heating and cooling. And because of their light weight, furnaces in which these insulating fire brick are used can be constructed of lighter steel.

The high crushing strength of Arm-

strong's Insulating Fire Brick makes them suitable for any type of design without sacrificing thermal efficiency. They are available in five types for a wide range of temperatures and uses behind the refractory and for direct exposure. Special shapes are made to match each of the five types of Armstrong's Brick and are of two distinct classes—machined to size and molded to size. Write today, for complete information, samples, and prices. Armstrong Cork Products Company, Building Materials Division, 985 Concord St., Lancaster, Penna.



Armstrong's HIGH TEMPERATURE INSULATION

confined to small lots, including some 12-inch for Westchester county, New York. A good part of current buying is shipped from stock and foundries in the east, generally with low backlogs, will soon reduce operations further, unless unexpected tonnages appear. New York city requirements recently placed assure the current rate for a few weeks with the successful bidders. Of this tonnage close to 850 tons, mostly 12-inch in 16-foot lengths will be cast at the Everett, Mass., foundry. Material will be cement-lined. Lack of demand from the

building industry has curtailed steel pipe buying.

Birmingham, Ala. — Demand for cast iron pipe continues spotty and in somewhat disappointing volume. Southern shops are able to maintain a fairly steady operating rate by piecing together business in small lots. No outstanding business is reported.

San Francisco — Activity in cast iron pipe remains almost stationary and inquiries and bookings are confined to lots of less than 100 tons. Largest pending inquiry in-

volves 153 tons of 4 and 6-inch pipe for Los Angeles. So far this year only 22,346 tons have been placed as compared with 34,686 tons for the corresponding period in 1936.

Seattle — Inquiry is more active although no important tonnages are involved. Bids were opened Sept. 16 for furnishing 225 tons of 10-inch for McNeill Island, Wash., and 125 tons for Sixty-fourth avenue S. W., Seattle. Helena, Mont., is considering bids opened Sept. 13, for furnishing 165 tons of 4, 8 and 10-inch cast iron pipe.

Cast Pipe Placed

125 tons, 6 and 12-inch for Spokane, Wash., to Hughes & Co., Spokane. Unstated tonnage, 2800 feet of 6-inch, Neenah, Wis., to James B. Clow & Sons, Chicago.

Cast Pipe Pending

2610 tons, 6, 8 and 12-inch pipe, Chicago; bids Oct. 4; bids close Sept. 30 on 203 tons of fittings for 3 to 24-inch pipe.

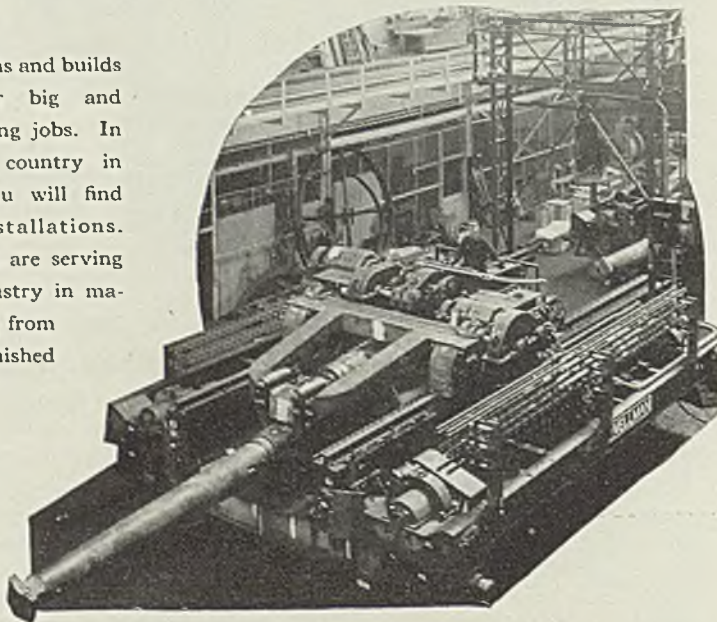
1355 tons, including 100 tons, 6-inch; 400 tons, 8-inch; 800 tons, 12-inch, and 55 tons, 48-inch, all class C, supply department, Boston; bids Sept. 27, D. Frank Doherty, superintendent of supplies.

690 tons, 10-inch, Erlanger, Ky.; bids in. 225 tons, 10-inch for McNeill Island, Wash., bids in.

125 tons, Sixty-fourth avenue S. W., Seattle, extension; bids in. Unstated tonnage, 3600 feet of 6-inch, Kenosha, Wis.; bids in.

Creative ENGINEERING

Wellman designs and builds machinery for big and unusual handling jobs. In almost every country in the world, you will find Wellman installations. Many of them are serving the metal industry in material handling from ore mine to finished product.



MATERIAL HANDLING EQUIPMENT

WELLMAN PRODUCTS INCLUDE: Steel Mill Equipment . . . Charging Machines, Cars and Boxes . . . Open Hearth Furnaces . . . Manipulators . . . Coal and Ore Handling Machinery . . . Clam Shell Buckets . . . Car Dumpers, all types . . . Blast Furnace Skip Hoists . . . Gas Producers, Valves and Flue Systems . . . Wellman-Galusha Clean Gas Generators . . . Gas Reversing Valves . . . Mining Machinery . . . Safety Stops for Traveling Structures . . . Welded Steel Construction . . . Castings and Machine Work to customers' drawings.

The **WELLMAN**
ENGINEERS · CONSTRUCTORS · MANUFACTURERS *Engineering Co.*
CLEVELAND, OHIO.

Wire

Wire Prices, Page 73

Pittsburgh—In some quarters it is estimated incoming business in wire products has been around 10 per cent better than last week. Replacement orders in rods and manufacturers' and merchants' wire have helped bolster conditions. Stocks of other consumers may need replenishing in early October. Expected pick-up in demand for fencing from agricultural districts will strengthen activity in merchant wire products. Prices are steady.

Cleveland — Sellers of manufacturing and merchant wire products report a definite upward trend in shipments and consumption of wire, although in some instances, particularly from automotive sources, this improvement has been disappointing. However, most sellers still retain an optimistic outlook for the near future, as consumption from the agricultural industry for merchant products and demand from bolt and nut and other manufacturing consumers show little tendency to let up, in some instances a gradual improvement has been noted.

Chicago — While steel wire demand is slow to improve in some

directions, business is moderately heavier than a month ago and further gains in buying are looked for from the automotive industry and from certain miscellaneous users. Rural demand for wire products also is counted on for expansion soon. Distributors' stocks are not excessive for this period. Production shows little change and backlogs are sufficiently small to permit early delivery on most items.

Boston—Finishing mill operations at wire plants are more uneven, about parallel to incoming specifications which usually are for immediate shipment. While orders are well diversified, backlogs are smaller. September shipments will not be much above August except in scattered departments. While stocks of billets and semifinished steel at mills are much better balanced, one works continues 100 per cent operations on ingot production. Shipments and new tonnage are rapidly nearing equality in some plants. Spot buying for fill-in needs accounts for bulk of orders with advance covering limited. Demand for wire rods is fairly steady.

New York—While rod buying is fairly well sustained, incoming wire orders, although well diversified as to products and uses, are still for hand-to-mouth needs and aggregate volume is light. Bulk of new business is for early shipment with advance buying slack. Fill-in buying of manufacturers' wire is steady, but demand for specialties is uneven. Some producers estimate September tonnage will not be much, if any, above August. Here again the spotty condition in buying is revealed, some departments being fairly active with others slow.

Birmingham, Ala.—Demand for wire products, which three weeks ago gave some indication of reviving, has not measured up to expectations. This is dependent largely upon farmers having funds with which to create a market demand, and a two weeks set back in the cotton crop has had telling effect upon current sales in all specifications.

Denver—Colorado Fuel & Iron Corp., Denver, has been awarded the contract for 755 spools of barbed wire, at \$3.445 each and 10 kegs of staples, at \$4.696 each, f.o.b., Worland, Wyo. Material was bought by the department of interior, bids Aug. 19.

Cold Finished

Cold Finished Prices, Page 73

Pittsburgh—New business for cold finishers has shown little change during the past week. Shipments are holding up fairly well, but new

business so far this month has been less than was anticipated. Requirements of the automotive industry remain light, and it is apparent that some consuming sources in this field are using up their inventories. Prices are steady.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Bolt, nut and rivet demand shows no improvement and producers an-

ticipate only a moderate seasonal pickup among miscellaneous users, with a declining trend in requirements of railroads and freight car builders. Specifications from jobbers are slow to increase. Substantial demand from farm implement and tractor manufacturers is in prospect while an upturn in needs of automotive parts manufacturers is appearing. Rivet consumption among structural fabricators is slow. Fourth quarter contracting is under way at unchanged prices.



ON YOUR REQUIREMENTS

• With sales and operating headquarters right at the mill, Cold Metal department heads can quickly confer on your special strip steel requirements and make decisions concerning production, delivery dates, etc. There are no delays in determining whether your specifications for quality or service can be met. Generally the answer is "Yes" but, under any circumstances, you get a prompt response.

Cold Metal is prepared for special demands as well as standard requirements. Unusual sizes of Cold Rolled Precision Strip Steel such as 24" x .005" or 19" x .002" in extra large coils are regularly produced, illustrating the wide range of our operations.

The Cold Metal Process Co.
Youngstown, Ohio



Cold Rolled
PRECISION
STRIP STEEL

Behind the Scenes with STEEL

Transportation

Track Material Prices, Page 73

Fresh Guy

STACKS and stacks of promotional material have we waded through, and thousands of letters have we relegated to that convenient circular file under our desk, shattering the hopes of free publicity held by the writers. Most of them are very, very sure that nothing better has ever been brought to our attention, and nothing like it will ever be seen again. Perhaps they're right, but we were happily surprised the other day to find this frank letter from an advertising agency:

"Will you please hand the attached nifty little folder to that harried individual who gathers up loose ends and dumps them into a trade literature column in the back of your fearless publication? Maybe in a weak moment he'll break down and give it a mention."

We made a mental note to see to it that particular trade publication gets a mention!

♦ ♦ ♦

Stretch

PROMISES of future growth and greatness for this department are being fulfilled as you have perhaps noticed. Upon orders from headquarters, we rushed to our secret bullet, gas, bomb and termite-proof room where is stored our precious plate stretcher and, grasping the old format securely in the device, raised it up to two-thirds of a page. Not only that, but with a dignity heretofore not accorded to the sheet we point with pride to the fact that at last we are represented in the contents page. No longer do all of our readers have to thumb surreptitiously through the columns of market news to find us; the both of them need only to turn to the contents page.

♦ ♦ ♦

Hootch

OUT of the mailbag comes a note from *Thiokol Facts*, stating that one-half of all the vodka from all the Russias goes into the manufacture of synthetic rubber. We would hate to haz-

ard a guess, but after our one and only encounter with the spirit of Peter the Great we are inclined to believe the other fifty per cent of vodka production is also being used to produce synthetic rubber—or is it leather?

♦ ♦ ♦

Feetsball

CAPTURING the spirit of the season and the plaudits of all who saw it was the football game built by Crane Co., Chicago, in which all the players were made from standard pipe fittings manufactured by the company. Feet of all the boys were made from rubber caps for beer taps. That in itself strikes a harmonious chord in our nature—rubber beer tap caps. We didn't ask the guy who built the show, but we've confident he'd say it was a pipe—so modestly.

♦ ♦ ♦

Cancelled

BUSINESS department of this book last week called the editors to account for this: *Cancelled was a subscription on the grounds that the editorial policy of STEEL was biased; that facts were misrepresented; that editorial content in general was uninteresting. STEEL's editors were horrified until they learned the identity of the subscriber. It was the Committee for Industrial Organization, Washington.*

♦ ♦ ♦

Stoppers

BUNDLING through a bunch of STEEL's readers, present, past and prospective, the other day we came across these arresters of normal progress, were arrested and marvelled at the things we had not seen. Long long hours have we sat and waited for some device like the one put out by the New Idea Spreader Co., of Coldwater, Ohio. And we have no doubts whatsoever that marital bliss could be assured through the use of a Fearless Dishwasher, from the Fearless Dishwasher Co. Inc. of Rochester, N. Y.

—SHRDLU

New York Central railroad has ordered about 10,000 tons of plates, shapes and other carbuilding material for its repair program. A large proportion of the material will be produced in the Pittsburgh district.

Denver & Rio Grande Western has ordered 13,400 tons of 131-pound and 112-pound rails from Colorado Fuel & Iron Corp. for delivery during the last quarter. The Colorado Fuel & Iron rail mill, closed Sept. 16, is reopening to fill this order.

Union Switch & Signal Co., Swissvale, Pa., has been awarded a contract by the Philadelphia department of city transit for a subway signaling system.

Special Examiner H. C. King has recommended to the interstate commerce commission that the railroads be required to equip about 3500 locomotives now in service with automatic stokers. Estimated cost of the additional equipment is \$11,000,000.

Rail Orders Placed

Denver & Rio Grande, 13,400 tons of 131 and 112-pound rails, to Colorado Fuel & Iron Corp., Denver.

General Chemical Co., New York, 90 tank cars, to General American Tank Car Corp., Chicago.

Rail Orders Pending

Atchison, Topeka & Santa Fe, 30 stainless steel passenger cars.

Barrett Co., New York, fifteen 6000-gallon tank cars and twenty-five 8000-gallon tank cars; bids Sept. 28.

New York Central, 5000 tons.

Metallurgical Coke

Coke Prices, Page 73

H. C. Frick Co. is closing 647 ovens at two beehive plants in the Connellsville, Pa., district; 400 to be taken out at Phillips and 247 at Kyle, leaving the company with 120 ovens at Crossland in operation. It is estimated that around 1000 ovens will be out in the Connellsville district by the end of this month, unless conditions show a marked improvement. At the end of August approximately 3600 were in operation. On occasional spot carloads during the past week sellers have obtained \$4.35. With installation of new mechanical equipment valued at \$1,500,000 practically completed, Isabella mine will be opened for production the first of next month, according to officials of Weirton Coal Co.

Shapes

Structural Shape Prices, Page 72

New York—Of the 20,000 tons of structural steel active in the New York metropolitan district 13,150 tons are for one project, the Bronx-Whitestone bridge. New inquiry has slumped and structural contracts are also down. Tonnage for World's Fair buildings is coming out in better volume, but not enough to offset the drop in other directions. Increased costs for fabrication and erection of structural steel indicate some reduction in profits as current bids on steel contracts do not fully reflect such advances.

Boston—Excepting 2250 tons tentatively placed for a powerhouse, South Boston, structural steel buying is confined to small lots. Several projects, although largely reinforcing, take more structural steel than first estimated, including the architectural building, M.I.T., Cambridge, and fish pier superstructures, Gloucester, Mass., about 700 tons.

Philadelphia — Private construction work continues restricted but some Pennsylvania state work remains in the offing. The newest announced project is a number of small additions to a hospital, Selingsgrove, involving 1000 tons shapes and 400 tons of bars. Keen competition and close figuring are noted for available construction jobs, but mill quotations on plain shapes remain firm.

Pittsburgh—United States department of commerce has placed 1900 tons for radio towers with Blaw-Knox Co., Blawnox, Pa. Other awards recently over 1000 tons are infrequent. Pending business includes 1100 tons for a new airplane hangar at Baltimore.

Cleveland — Deliveries continue to improve, with shipments obtainable within three to four weeks in most instances. Fabricators have ample stocks and experience little difficulty in meeting delivery sched-

Shape Awards Compared

	Tons
Week ended Sept. 25	10,614
Week ended Sept. 18	16,548
Week ended Sept. 11	23,743
This week, 1936	12,626
Weekly average, 1936	16,332
Weekly average, 1937	25,039
Weekly average, August... ..	21,801
Total to date, 1936	892,424
Total to date, 1937	976,531

Includes awards of 100 tons or more.

Unit Steel Bids To Connecticut Commissioner Of Public Works

Steel arch bridge, Saugatuck river and section of Merritt parkway, grading and drainage, Sept. 13, to Robert A. Hurley, commissioner, Hartford

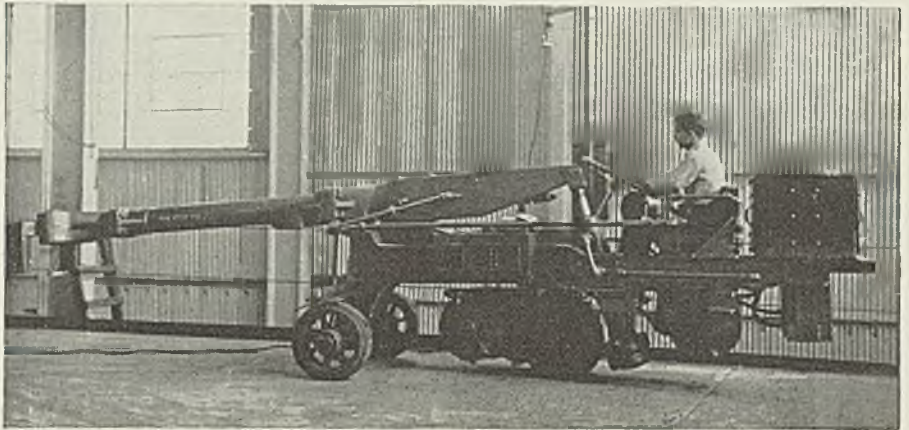
Material	Unit	A	B	C	Lowest total
Steel piles, pounds	592,900	\$0.03	\$0.03	\$0.03	\$17,787.00
Structural steel, pounds	415,000	0.0725	0.075	0.08	30,087.50
Deformed steel bars, pounds	278,485	0.045	0.045	0.045	12,531.82

A—Mariani Construction Co., New Haven, Conn., contract at \$179,413.88; B—Julius Varvello, New Haven, second, \$179,718.76; C—Frank T. Westcott, Attleboro, Mass., third, \$181,269.67.

Section Merritt parkway, 14,838.24 feet, Trumbull, Conn., varied width, bids same date

Material	Unit	A	B	C	Lowest total
Fabric expanded metal or bar mat reinforcement, square yards.....	96,766	\$0.25	\$0.23	\$0.23	\$22,257.18
Deformed steel bars, pounds	71,594	0.05	0.05	0.045	3,221.73

A—D. V. Frione & Co., New Haven, Conn., contract at \$249,466.91; B—A. I. Savin Construction Co., East Hartford, Conn., second, \$249,744.11; C—Paul Bacco, Stamford, Conn., third, \$253,707.78.



FORTY-EIGHT

Brosius Auto Floor Charging Machines

have been supplied to the steel industry in the United States and abroad. They supply the needs of the smaller plants where expensive charging equipment is not justified.

The Brosius Charger is comparatively inexpensive, self contained, and requires no tracks or runways. It operates in congested areas as it can turn on its own wheel base.

The machine is built for serving open hearths, and similar melting furnaces, for handling slabs, billets, ingots, etc., and for manipulating pieces under hammers and presses.

Other BROSIOUS Equipment: Hydro-Electric Clay Guns . . Automatic Steam Operated Clay Guns . . Goggle Valves, hand and motor operated . . Cinder Notch Stoppers . . Flue Dust Conditioners . . Dry Slag Granulating Mills . . Overhead Charging Machines . . Single Hoist Charging Machines . . Horizontal Charging Machines . . Auto Floor Manipulators . . Single Hook Grab Buckets . . Automatic Single Hoist Grab Buckets . . Automatic Dump Buckets.

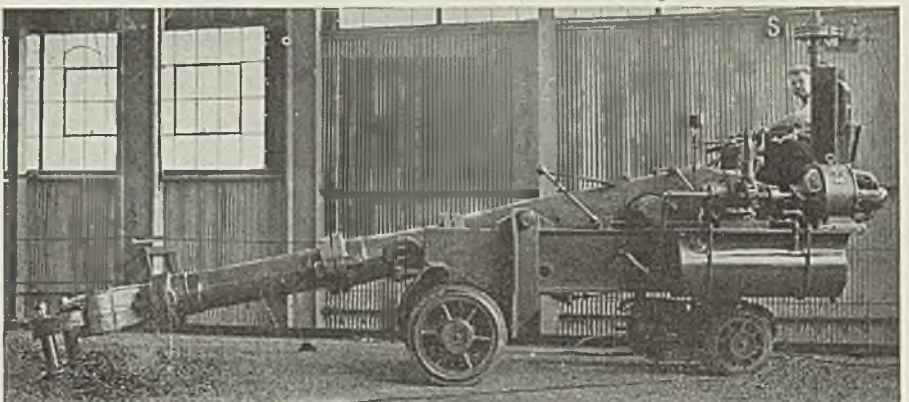
Edgar E. BROSIOUS, Inc.

ENGINEERS and MANUFACTURERS

PITTSBURGH, SHARPSBURG BRANCH, PA.

European Distributors: Dango & Dienenthal, Siegen, Westphalia, Germany

Brosius Equipment is patented in the United States and Foreign Countries



ules. State work continues to dominate although numerous small jobs are active for industrial projects.

Chicago—Small lots still predominate awards and inquiries. A smelter plant in Kansas will take 1000 tons and an Illinois state bridge 550 tons. Operations of fabricators are declining in some instances and backlogs of both fabricated and plain shapes are light.

Birmingham, Ala. — Shapes are not in anything like expected demand. Mills are confident the situation will be alleviated when specifications are in for several major structural jobs, including more than 10,000 tons for the Baton Rouge, La., bridge.

San Francisco — New inquiries are slow and pending business, excluding from 1500 to 9000 tons of sheet piling and shapes for construction work in connection with the Mare Island drydock, does not exceed 2000 tons. Awards aggregated 2899 tons and brought the total for the year to 126,497 tons compared with 134,302 tons in 1936.

Seattle — Business pending includes more than 400 tons for two Washington state bridges, bids opened Sept. 21. About 225 tons are re-

quired in three boiler and power contracts awarded to C. C. Moore & Co., Seattle. Link Belt Co., Chicago, has been awarded ten traveling water screens for Bonneville at \$78,148.

Shape Contracts Placed

- 1900 tons, radio towers, various locations, U. S. department of commerce, to Blaw-Knox Co., Blawnox, Pa.
- 600 tons, addition, public school No. 26, Bronx, N. Y., to Harris Structural Steel Co., New York.
- 560 tons, public school No. 26 addition, Bronx, N. Y., to Harris Structural Steel Co., New York, on low bid of \$53,259, Sept. 2, on steel direct fabricating and erecting.
- 504 tons, including 296 tons steel piling, steel arch bridge, Saugatuck river, Westport, Conn., to American Bridge Co., Pittsburgh, structural steel, and Carnegie-Illinois Steel Corp., Pittsburgh, piles; Mariani Construction Co., New Haven, general contractor at \$179,413.88; bids Sept. 13.
- 415 tons, steel girder bridge, carrying tracks of Pennsylvania railroad, Bladensburg road, N. E., between New York avenue and Queens Chapel road, Washington, to American Bridge Co.; Pittsburgh; Diamond Construction Co., Washington, general contractor; bid Aug. 20 to district commissioners, \$76,484.84 low.
- 415 tons, twelve-story apartment 8 East Seventieth street, New York, Ingalls Wheeler Engineering Co., New York, general contractor.

- 410 tons, twelve-story apartment, 35 East Sixty-ninth street, New York, Ingalls Wheeler Engineering Co., New York, general contractor.
- 400 tons, building, Westinghouse Elevator Co., Jersey City, N. J., to Bethlehem Steel Corp., Bethlehem, Pa.
- 370 tons, building No. 60, Aluminum Co. of America, Mobile, Ala., to Bethlehem Steel Corp., Bethlehem, Pa.
- 360 tons, paint-press shop and loading dock, Fruehauf Trailer Co., Detroit, to Palmer-Bee Co., Detroit.
- 350 tons, framing for bulkheads, Pickwick Landing dam, Tennessee valley authority, to Treadwell Construction Co., Midland, Pa.
- 315 tons, mill building, Victor Chemical Co., Mt. Pleasant, Tenn., to Nashville Bridge Co., Nashville, Tenn.
- 315 tons, bridge PWS 1043, Hinds-Rankin counties, Mississippi, to Virginia Bridge Co., Roanoke, Va.
- 310 tons, state highway bridge X1 of 58-5-21, C-1, Erie, Mich., to American Bridge Co., Pittsburgh.
- 280 tons, store and office building, DiSabatino Holding Co., Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.
- 250 tons, railroad bridge, Stearns, Ky., to Vincennes Steel Corp., Vincennes, Ind.
- 240 tons, state highway bridge over Pennsylvania and Michigan Central railroads, Grand Rapids, Mich., to Bethlehem Steel Corp., Bethlehem, Pa.
- 225 tons, miscellaneous Washington state boiler and power installation, to C. C. Moore & Co., Seattle.
- 210 tons, extension to No. 3 tractor building, Allis-Chalmers Mfg. Co., Milwaukee, to American Bridge Co., Pittsburgh.
- 188 tons, state bridge, Madison county, Montana, to Midwest Steel Co., Denver; Colonial Construction Co., Spokane, general contractor.
- 175 tons, state highway bridge and approaches, South Main street, over Millers river, Orange, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Charles Hosmer Inc., Greenfield, Mass., general contractor, \$71,435.10.
- 170 tons, beam bridge, Pennsylvania state highway, Berks county, to Bethlehem Steel Co., Bethlehem, Pa.
- 170 tons, bridge, southerly sewage disposal project, Cleveland, to Wheeling Structural Steel Co., Wheeling, W. Va.
- 170 tons, community building, Elmhurst, Long Island, N. Y., to Belmont Iron Works, Philadelphia; through Procurement division treasury department.
- 150 tons, Western district high school, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.
- 150 tons, alterations, Interboro Rapid Transit railroad, New York, to Belmont Iron Works, Eddystone, Pa.
- 135 tons, bridge FA-57-B1, Gentry county, Missouri, to St. Joseph Structural Steel Co., St. Joseph, Mo.
- 132 tons, steel piles, reinforced concrete rigid frame bridge, Merritt parkway at Black Rock turnpike grade separation, Fairfield, Conn., to Carnegie-Illinois Steel Corp., Pittsburgh; Mariani Construction Co., New Haven, general contractor at \$47,883.78; bids Sept. 13.
- 125 tons, steel tower footings, Pennsylvania railroad, to Belmont Iron Works, Eddystone, Pa.
- 120 tons, highway bridge, Ulster county, New York, to American Bridge Co., Pittsburgh; through Kingston Construction Co., Kingston, N. Y.
- 100 tons, alterations and remodeling, Morrison Steel Products Co. Inc., Buffalo, N. Y., to R. S. McManus Steel Construction Co., Buffalo.
- 100 tons, warehouse and office, H. J. Heinz Corp., Los Angeles, to Modern Iron Works, Los Angeles.
- 100 tons, building, Carpenter Steel Co.,

Maintenance WELDING AND CUTTING EQUIPMENT



WELDIT Cutting TORCH
MODEL - 'S'

For general cutting. Furnished with Monel heads and tubes. Optional heads 70°, 90° or straight. Length 21". Weight 2 lbs. 12 oz. Thousands in service.



WELDIT Welding TORCH
MODEL P-30

For general welding. Tip sizes 3 thru 12. Length 18". Weight 1 lb. 9 oz. A very popular seller for all kinds of maintenance work.

WELDIT ACETYLENE CO.

642 BAGLEY AVE. DETROIT, MICH.

test these TORCHES free FOR TWO WEEKS IN YOUR PLANT

Irregularities still persist in prices.

Boston — Highway requirements for Connecticut approximate 1350 tons, mesh and bars, mostly the former. Small lot buying is sustained and better prices are attained on this type of business, the larger tonnage transactions usually being done on shaded prices.

New York—Sewers and highways account for the bulk of reinforcing steel activity. Including mesh for the latter, close to 6500 tons is being figured. New Jersey state's requirements have been well below normal this year due to the diversion of highway tax funds. The price situation shows no improvement, concessions of \$5 a ton or more on even relatively small tonnages being frequent.

Philadelphia — Excluding state projects, reinforcing bar fabricators are figuring on little work. The small amount of current private work involves plant alterations and additions to various apartment houses. Rail steel bars will be used for Laurelton State Village job.

Birmingham, Ala. — Reinforcing awards have been especially light, particularly in concrete bars. Backlogs, as in most other specifications, are almost at the vanishing point.

San Francisco — Most awards were lots of 25 to 80 tons totaling only 1845 tons. This brought the aggregate for the year to 75,419 tons, compared with 184,210 tons a year ago. The largest award went to Bethlehem Steel Co. and involved 345 tons for buildings at Petaluma, Calif., for Poultry Producers of Central California.

Seattle — New business is not promising and local mills are curtailing operations in line with reduced orders. Some small tonnages have been placed but awards of over 100 tons are infrequent. Tonnages pending include 1250 tons for the Roza project, bids opened at Yakima, Wash., Sept. 22.

Reinforcing Steel Awards

2000 tons, contract 2, section 2, Queens borough sewer, New York, to Jones & Laughlin Steel Service, New York.

475 tons, foundations, Museum of Modern Art, New York, to Carroll-McCreary Inc., New York.

425 tons, office building and film laboratory, Metro-Goldwyn-Mayer studios, Culver City, Calif., to unnamed interest.

400 tons, mesh, Merritt Parkway, Stamford and New Canaan, Conn., to American Steel & Wire Co., New York; through New Haven Road Construc-

tion Co., New Haven.

385 tons, mesh, Merritt Parkway, New Canaan and Norwalk, Conn., to American Steel & Wire Co., New York; through New Haven Road Construction Co., New Haven.

370 tons, mesh and bars, Merritt Parkway, Trumbull, Conn., to Truscon Steel Co., Youngstown, O.; through D. V. Frione & Co., New Haven, Conn.

370 tons, highway project RC 3911, Tloga county, New York, to Wickwire Spencer Steel Co., New York; through Connell & Laub, Roscoe, N. Y.

345 tons, feed mill and warehouse, Poultry Producers of Central California, Petaluma, Calif., to Bethlehem Steel Co., San Francisco.

275 tons, city warehouse, Richmond, Va., to Virginia Steel Co.

250 tons, generating plant, Ottawa station, Lansing Mich., to Truscon Steel Co., Youngstown, O.

230 tons, building, Bendix-Aviation Corp., Teterboro, N. J., to Bethlehem Steel Corp., Bethlehem, Pa.

204 tons, bridges, Fairfield and Westport, Conn., to Truscon Steel Co., Youngstown, O.; through Mariani Construction Co., New Haven, Conn.

200 tons, garage, department of sanitation, Bergen Landing, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through Stock Construction Co., New York.

200 tons, highway project RC 3910, Livingston county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through C. P. Ward Inc., Rochester, N. Y.

200 tons, post office and court house, Paducah, Ky., to Laclede Steel Co., St. Louis; Algernon Blair, Montgomery, Ala., general contractor.

192 tons, Western district high school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

175 tons, grade elimination, Pennsylvania railroad, Montour Falls, N. Y., to Igoe Bros., New York.

150 tons, truck plant, Mound road near Detroit, Chrysler Corp., to Truscon Steel Co., Youngstown, O.

130 tons, factory building, Libbey Glass Co., Toledo, O., to Hausman Steel Co., Toledo, O.

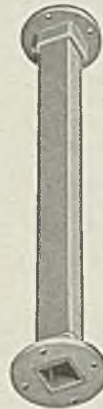
125 tons, post office, Miami Beach, Fla., to Connors Steel Co., Birmingham, Ala.; A. Farnell Blair, Lake Charles, La., general contractor.

120 tons, highway project RC 3907, Ontario county, New York, to Wickwire Spencer Steel Co., New York; Bero Engineering & Construction Corp., North Tonawanda, N. Y., general contractor.

CROSBY FOR STAMPINGS



ALL our efforts have been concentrated on one product—STAMPINGS—for 40 years. We have made stampings, deep, intricate, heavy, light, large and small, for nearly every branch of industry.



Stamping Specialists Since 1896

An Experience You Should Not Overlook
Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

Concrete Awards Compared

	Tons
Week ended Sept. 25.....	7,621
Week ended Sept. 18.....	7,278
Week ended Sept. 11.....	12,097
This week, 1936.....	11,353
Weekly average, 1936.....	6,005
Weekly average, 1937.....	6,428
Weekly average, August...	9,495
Total to date, 1936.....	278,144
Total to date, 1937.....	250,686

Includes awards of 100 tons or more.

- 100 tons, Lorain avenue grade elimination, Cuyahoga county project 142, Cleveland, to Builders Structural Steel Co., Cleveland; C. B. Moon Co., Cleveland, general contractor.
- 100 tons, highway and grade separation, Westport and Fairfield, Conn., to Truscon Steel Co., Youngstown, O.; through Peter Mitchell Inc., Greenwich, Conn.
- 100 tons, highway project RC 3909, Westchester county, New York, to Wickwire Spencer Steel Co., New York; through A. E. Ottaviano Inc., Croton-on-Hudson, N. Y.
- 100 tons, paving, Henry Hudson bridge, New York, to Truscon Steel Co., Youngstown, O.; through Clancull Construction Co., New York.

Reinforcing Steel Pending

- 1870 tons, sewer, contract 3, project 2, across Grand Central parkway extension from proposed pierhead and bulkhead line of Flushing bay, Queens, N. Y.; Nicholas DiMinna & Sons, New York, low; bids Sept. 20.
- 1500 tons, building, Olson Rug Co., Chicago.
- 1400 tons, sewer contract 2 of project 1, in third ward, Queens, N. Y.; bids Oct. 4, president borough of Queens.
- 1250 tons, Roza irrigation project, Washington; bids in at Yakima, Wash.
- 600 tons, stores and cold storage building, fish pier, Gloucester, Mass.; bids in.
- 525 tons, federal court house, Kansas City, Mo.
- 500 tons, state bridges, Illinois; bids Oct. 1.
- 400 tons, additions to hospital, Selinsgrove, Pa.; bids Oct. 12.
- 275 tons, bridge, 105th street, Chicago.
- 265 tons, highway, route 6, section 10, Cobbs corner to Trov Brook, Morris county, New Jersey; bids Oct. 4, state highway department, Trenton.
- 220 tons, Black Canyon, Idaho, reclamation project; bids in at Boise, Idaho.
- 195 tons, highway, route 25, section 8D, Elizabeth, N. J.; bids Oct. 4, state highway department, Trenton.
- 180 tons, officers quarters, Government air depot, Sacramento, Calif.; bids opened.
- 179 tons, highway work in four counties, California; bids Oct. 6.
- 175 tons, dam, Montana Power Co., Polson, Mont.
- 172 tons, four bridges in Montezuma and Dolores county, Colorado; bids Oct. 1.
- 150 tons, bridge, over Saugatuck river, Westport, Conn.
- 139 tons, two bridges, Marin county, California; bids opened.
- 132 tons, irrigation project, Raymondville, Tex.
- 130 tons, post office, Evanston, Ill.
- 123 tons, deformed steel bars and steel piles, 32 tons latter, Merritt parkway section and grade separation at Bayberry Lane, Westport Fairfield, Conn.; Peter Mitchell Inc., Greenwich, Conn., contract at \$302,217.75.
- 100 tons, bars and shapes, 3-span I-beam overpass and approaches, route U. S. 2, Richmond, Vt.; bids Oct. 1, H. E. Sargent, commissioner of highways, Montpelier, Vt.
- 100 tons, state bridge, Franklin county, Idaho; Olof Nelson, Logan, Utah, general contractor.
- 100 tons, bridge, Thurston County, Wash-

- ington; Cornell & Co., Tacoma, general contractor.
- 100 tons, addition to Security market garage, Seattle; Balley Construction Co., Seattle, general contractor.
- 100 tons, dormitory, Lehigh University, Bethlehem, Pa.
- 100 tons, water filtration plant, Marysville, Mich.

Pig Iron

Pig Iron Prices, Page 74

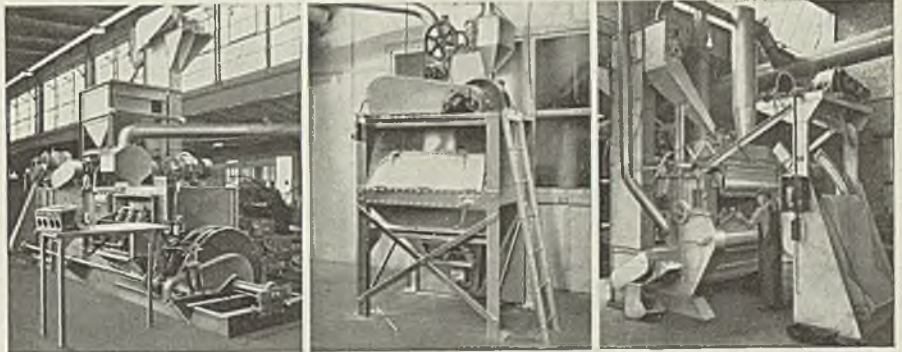
Pittsburgh—Aggregate pig iron demand continues sluggish, and sellers are actively soliciting business. With September near an end, it appears shipments will show no great gain over August movement, contrary to earlier expectations. One adverse factor has been slump in railroad equipment buying, which in turn has been reflected in reduced pig iron demand from some foundries. The easier tone and the recent drop in scrap prices have eliminated all talk of any possible price advance.

Cleveland — Auto foundries have increased requirements moderately, although demand from other channels remains practically unchanged with little interest in contracting

for fourth quarter. Sales and shipments this month are equal to August. Little change is anticipated soon except a gradual increase from automotive sources. All talk of a possible advance in prices during fourth quarter has disappeared with recent recession in scrap market quotations.

Chicago—Pig iron consumers are taking shipments at steady rate, with movement well ahead of deliveries a month ago. Pickup in shipments is restricted to a certain extent by failure of foundry operations in some industries to increase as rapidly as expected. New pig iron business is quiet, consumers generally having covered for balance of the year. The market is firm at \$24, furnace, for No. 2 foundry and malleable.

Boston—Pig iron buying this month is ahead of August, but with the fourth quarter at hand, covering has been somewhat below earlier estimates. Many consumers are marking time with the situation rather mixed. Export shipments have been active, close to 7400 tons in less than 10 days, but new foreign inquiry less. Several larger consumers with stocks to carry them well into next year are revising their ideas as to buying enough to



for every cleaning job— a WHEELABRATOR!

Four WHEELABRATOR applications are illustrated: a Tablast for production cleaning of parts not suitable to tumbling; a Tumbblast for rapid cleaning of miscellaneous castings, forgings and pieces from half an ounce to 300 pounds; a Utility Cabinet for handling single pieces and castings secured to runners; and a Special Cabinet for cleaning medium to large size parts, sheets, bars, tubes, etc.

No matter what your cleaning job may be, there is a WHEELABRATOR designed for the job—a WHEELABRATOR that will cut cleaning costs up to 50%—increase production—improve the finish and generally reduce cleaning room overhead.

Bring your special cleaning problems to American engineers. Their experience is unequalled and their recommendations are available to you without obligation on your part.

THE AMERICAN FOUNDRY EQUIPMENT COMPANY

509 So. Byrkit St., Mishawaka, Indiana



Makers of Abrasive Blast Equipment for every metal cleaning operation—dustube Dust Collectors, Sand Cutters, and other foundry and industrial equipments.

maintain such stocks, or at least are waiting longer than expected.

New York—Pig iron buying in car load and under 100-ton lots is steady without much gain in tonnage booked. Such volume centers mostly with foundries which as a rule are operating with relatively smaller stocks than the steel plants served by sellers in this district. Most of the latter have good stocks on hand and are buying slowly. While shipments against old foreign orders continue active, new inquiry for export has slumped.

Philadelphia—Shipments against contracts are holding up in excellent volume, although new business so far has failed to show improvement as consumers have little incentive to make additional commitments. With scrap showing further weakness and foreign inquiry not active, prospects are less promising for a fourth quarter advance. However, since it has weathered lower offers from abroad and it is pointed out that the proposed 10 per cent advance in freight rates now under consideration would increase cost about \$1 per ton better business is expected soon. Order backlogs are being pared down and further buying is considered necessary.

Buffalo—Mixed tendencies prevail in pig iron demand. Improvement is expected soon in shipments as foundries have been operating recently on inventories now being depleted. Shipments currently about equal to last year and slightly ahead of August.

Cincinnati—Shipments of pig iron, except for automobile parts, have tapered, with lighter demand most

prominent in jobbing foundries. In some cases iron inventories are adequate to provide for the melt for a few weeks. Quarter requirements are only partly covered by contracts, but interest in new commitments has dulled.

St. Louis — New buying of pig iron is relatively light and confined to small tonnages for spot delivery. Shipments during the first three weeks of September were about on a parity with August. The melt has picked up moderately, after receding in late August and early this month.

Birmingham, Ala. — Pig iron remains steady with active buying though not in large quantity. Seventeen furnaces are in operation with one down for relining. Shipments are fairly well maintained against contract, and not much iron is being stocked. Tennessee Coal, Iron & Railroad Co. has seven furnaces in production; Sloss-Sheffield, four; Woodward Iron Co. three and Republic Steel Corp., three.

Toronto, Ont.—Merchant pig iron sales are moving steadily upward with awards for the week reported at approximately 2200 tons. Awards range from a car to 500 tons with foundry iron sales totaling around 1600 tons and malleable, 600 tons. Producers are opening books for fourth quarter contracts and it is stated some inquiries already have been received. It is expected booking for the coming quarter will reach a record for the year. In addition some larger melters are taking in iron on spot delivery account to carry them through to the

year's end, while hand-to-mouth buyers are in the market at frequent intervals. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 76

Pittsburgh—As the result of a moderate-sized sale of No. 1 heavy melting steel to the leading mill consumer, the market is down \$2 a ton to \$18.50 to \$19. The transaction was quite plainly an attempt to establish the market, due to the fact no mill buying had occurred for nearly three weeks. Actually, the consumer had little need for the material. Railroad heavy melting, railroad specialties, and other grades are down. Dealers appear unwilling to go short on any tonnage at the present quotations, but in view of the reduced activity of steelworks in this district, mills may prefer to buy only lightly until the fall outlook is further clarified.

Cleveland — Dullness in actual trading, stricter embargoes against shipments in some directions and sympathetic weakness from adjacent areas have combined to beat down quotations. Based upon some small tonnage transactions and the usual relationships they now are down by \$1 to \$1.50 a ton. Still the Cleveland market remains inactive, buyers apparently not showing interest in offerings.


Chicago—Scrap is weaker and most prices are off \$1. Heavy melting steel to a certain extent is nominal at \$16.50 to \$17, a decline of \$1, though sellers are able to pick up this grade at \$16.50, with some lots going for less. Consumers generally are not interested in new purchases and unless mill demand appears shortly, the trade anticipates still lower prices.

Boston—With buying less active for both domestic and dock delivery, scrap prices have weakened further, with grades which have resisted the general trend during the last two weeks declining. In the latter class are cast grades for New England foundries. Heavy melting steel for export slipped to \$17.50, dock, for No. 1 with \$16.50 paid for No. 2, both being subject to further pressure. Boat loading has dropped and little No. 2 cast for export is being bought. Most grades for New England delivery are lower, also for Eastern Pennsylvania and other outside points, although demand is light.

New York—Weakness continues in most grades, especially heavy melting steel, which for export has dropped to \$16. For domestic ship-

HANNA PIG IRON

“THE
BEST KNOWN NAME
IN IRON”



BRANDS:
Buffalo
Detroit
Susquehanna

GRADES:
Foundry
Silvery
Malleable
Ferro-Silicon

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION

Buffalo Detroit New York Philadelphia Boston

ment the decline has been even more marked, to \$15.50, f.o.b. cars. Stove plate and old compressed sheets for export are lower but No. 2 cast holds steady. Cast grades for car-loading are off 50 cents, as are grate bars and stove plate. Domestic buying and shipments to eastern mills are almost at a standstill. On meager shipments mills are checking specifications more carefully and rejections appear to be above the average.

Philadelphia—The scrap market shows further weakness, with leading consumers mostly out of the market. The situation is complicated by a strike of truck drivers and helpers in Philadelphia, involving production of 6000 to 8000 tons of material each week. No. 1 steel is now quoted at \$18.50 and it is said a lower price might develop on offers. The leading steelworks consumer has dropped its offering price on No. 1 to \$16.50, delivered. The entire list is down 50 cents or more. Additional information reveals that the recent purchase of 250,000 tons of scrap by the European cartel brought \$21.50, up \$2.50 from the purchase some six weeks previously. It is understood the higher price takes into consideration the cancellation Oct. 1 of special lower freight rates on exported material. This means export scrap will pay the same rates as domestic consumers.

Buffalo—A further drop of 50 cents a ton in scrap has been registered as the stalemate of the last three weeks was broken. The leading consumer returned to the market with bids of \$18 to \$18.50 a ton for No. 1 heavy melting material with the \$2 differential posted on No. 2. While no outstanding volume sales were reported several individual 1000-ton lots changed hands.

Detroit—Prices on nearly all grades of scrap are off 50 cents and some, stove plate and short shoveling turnings for example, are down \$1 per ton. Production of scrap locally is mounting and current lists are bringing lower prices. One steel producer here is reported to be quietly laying in extra tonnage of scrap in anticipation of expanding production shortly.

Cincinnati—Iron and steel scrap is off another 50 cents, and even at lowered prices mills remain out of the market. Where material is not being taken for coverage on contracts, prices quoted are even lower, in a generally soft market. Considerable tonnage on dealers' yards, held for higher prices during the upturn, now forms a drag in the situation.

St. Louis—Weakness still dominates in the market for iron and

steel scrap, with indications holding little hope for immediate betterment. Purchasing by melters has dwindled to insignificant proportions, and both mills and foundries intimate that they will not increase commitments until the general situation is clarified. Meanwhile melters are taking in all scrap due on contracts, and operations have not receded in notable degree.

Birmingham, Ala. — No change in the scrap market is evident over the past week. Demand has eased considerably from the peak of a few weeks ago, and large buyers have shaved their offerings for heavy melting. Republic Steel Corp., largest Southern buyer, probably will return to the market late this month or early next.

Seattle—There is practically no turnover at the moment, except occasional lots purchased by steel foundries. The mills are out of the market and conditions in the Orient prohibit movement across the Pacific. Tidewater stocks are heavy and dealers are discouraging further shipments from the interior. There have been no substantial sales on which prices can be based.

Toronto, Ont.—Trading in iron and steel scrap is in good volume. Steel mills in the Hamilton district are taking scrap on contract and there is good movement of steel grades. Railroads have started to offer scrap and it is stated that large tonnages will be thrown on the market this fall, the greater part of which will be absorbed by mills without passing through the hands of dealers. Foundries and electric

furnace operators are in the market and there is a good demand for iron scrap. Machinery cast and stove plate are lightly held and consumers are having difficulty in obtaining scrap for spot needs. New scrap offers are limited, dealers state, and little material is coming from rural districts.

Warehouse

Warehouse Prices, Page 75

Pittsburgh—Warehouse sales for September compare favorably with August. Demand has been light recently, and is well below the level of the peak months earlier this year. Consumers are well stocked and warehouses' supplies are in fair shape, although certain sizes have been running low, as usual. In some quarters it is reported structurals have been holding up well, with some good-sized orders placed this month for industrial repair work.

Cleveland — Shipments out of warehouse have held on a par with August so far this month and in some instances a moderate improvement has been noted. With deliveries from mills on all products greatly improved there has not been the incentive to purchase from warehouse stock as earlier this year. Prices remain firm, with only a minimum of shading by smaller dealers.

Philadelphia—The situation in the warehouse trade is irregular, with some interests reporting a fair volume of business and others con-

NEW-BETTER

HOMMELAYA PROCESS

of

Vitreous Enameling

The greatest development in the Porcelain Enameling industry in the past century is here—proved—accepted.

- 1) Produces a perfect Porcelain Enamel finish with only ONE coat and ONE fire!
- 2) Cuts enameling costs by one-third!
- 3) Reduces possible chipping to an absolute minimum!
- 4) Produces a BETTER finish in ONE coat than regular enamel in two coats!
- 5) Ware may be finished in any color desired!

Write us TODAY and learn more about this NEW, BETTER, INEXPENSIVE method of Porcelain Enameling.

THE O. HOMMEL COMPANY

209 FOURTH AVENUE, PITTSBURGH, PA. • NEW YORK OFFICE
421 SEVENTH AVENUE • FACTORY, CARNEGIE, PENNSYLVANIA

tinued quiet. In general the larger orders received a few weeks ago have practically disappeared because of better mill deliveries.

Buffalo—With buying failing to show expected improvement, warehouse distributors doubt sales will keep pace with first half of year. Manufacturing and building products are in poor demand. Gradual pickup is shown in minor specifications favoring alloy and stainless steel.

Detroit—Sales of iron and steel out of store show little variation from the steady level of summer months. To offset slight drop in general business there has been a spurt in buying for automobile plants where rearrangements and alterations have required some tonnage.

Outlook for next quarter is uncertain, some warehouse interests leaning toward the bearish side, feeling a corrective movement will carry business lower this fall, despite optimistic predictions of automobile manufacturers. Warehouse prices are unchanged for fourth quarter.

Cincinnati—Sales from warehouse are near levels attained in August, with no appearance of the customary seasonal upturn. Only small lots of building items are moving. Industrial inquiries have increased, possibly a forerunner of heavier demand.

St. Louis — Sales of steel from warehouses are holding fairly steady, but improvement looked for after the middle of the month has failed to materialize in expected volume. General disposition is to

purchase for immediate requirements only, and consumers are using inventories before making additional commitments. Railroad buying is confined chiefly to shop supplies and fill-in track materials. Some expansion is noted in buying by the bituminous coal mines, including light rails and plates. Building material items are quiet.

Bookings so far this month are running approximately 30 per cent under the comparable period in August. Suspensions or cancellations have been negligible. Billets and wire rods are moving well. Prices are steady.

Steel In Europe

Foreign Steel Prices, Page 75

London — (By cable) — Pig iron supplies are slightly easier, especially hematite. Seven thousand tons of Canadian steelmaking iron has been received here. Some British hematite has been shipped to Australia and Denmark. Semifinished steel supplies are improving but their position still is stringent, forcing rerollers to work intermittently. The European steel cartel will supply 15,000 tons extra wire rods to Great Britain.

The Continent reports export markets are uncertain, but works are well occupied and autumn revival is expected soon. Belgium's domestic trade is expanding.

Semifinished

Semifinished Prices, Page 73

While demand for semifinished products has moderated since midsummer, due to lighter requirements of finishing mills, production still is fairly well maintained in this dis-

Iron Ore

Iron Ore Prices, Page 76

Cleveland—Stocks of iron ore at the lower lakes ports and furnaces Sept. 1, were approximately 7,200,000 tons more than on the comparable date last year, reflecting the marked increase in the Lake Superior iron ore movement this year. The Lake Superior Iron Ore association's report follows:

	Tons
Consumed in July	5,236,487
Consumed in August	5,373,264
Increase in August	136,777
Consumed in August, 1936....	3,968,845
On hand at furnaces Sept. 1..	30,861,483
On Lake Erie docks Sept. 1..	4,481,726
Total on hand at furnaces and Lake Erie docks Sept. 1....	35,343,209
Reserve total Sept. 1, 1936...	28,157,694

The movement from the upper lakes is beginning to slow down, after proceeding for five months prior to Sept. 1 at a pace never before equaled in the history of Great Lakes shipping. The movement reached its peak in August when 10,811,381 gross tons were shipped from the upper lake ports. It is said that the heavy movement has loaded stock piles at lower lake docks and furnaces almost to capacity and for the first time this season has caused a noticeable reduction in the American ore fleet in commission.

In a report issued by M. A. Hanna Co., Cleveland, the fleet in commission on Sept. 15 numbered 307, compared with the capacity total of 311 on Aug. 15. On the same day last year only 247 out of an available 315 vessels were in the ore trade.

Hyman-Michaels Co. Buys Railway for Scrapping

Hyman-Michaels Co., Chicago, has acquired for \$100,000 the abandoned Buffalo-Niagara Falls high-speed line of the International Railway Co. at public auction, for scrap. Demolition of the line is scheduled to be completed by Dec. 15. Included in the sale are approximately 2376 tons of steel rails, 76 tons of which are considered scrap, the remainder suitable for street railway relayers. Copper trolley wire totaling more than 29,000 pounds, feeder cable weighing 38,300 pounds and more than 1000 tons of steel contained in the overhead towers were also sold.

Special Carbon and Alloy Spring Wire



The demand for SENECA Quality Special Spring Wire is increasing rapidly.

We are prepared to meet all demands.

We can supply practically all grades in rounds and

SHAPES and sizes from $\frac{1}{8}$ " to .004.

HIGHEST QUALITY GUARANTEED

Please send your inquiries with specifications

The Seneca Wire & Mfg. Company
FOSTORIA, OHIO

Established 32 Years

Mirrors of Motordom

(Concluded from Page 26)

Plymouth is expanding its commercial car production, and it is understood to be ready to move into the present Dodge truck plant when the latter transfers to the new Mound road location around the first c. the year.

The new Briggs plant on Mound road, announced in the news columns of STEEL last week, confirms Briggs' threat to manufacture its own body moldings and other parts now received from Motor Products, following collapse of merger negotiations between these two companies. Astute followers of the Detroit scene have turned bearish on Motor Products, whereas a few months ago they had already fitted the company neatly into the expanding Briggs picture. The Briggs structure at the city limits will be 150 by 700 feet, with monitor roof, two stories high, with a craneway across one end. It is being rushed to completion and will be ready for manufacturing by Jan. 1.

SECOND-GUESSERS with European connections are wondering whether the lines of the new Ford "ten," recently introduced in Britain, may suggest what is in store for Ford in this country. Ford of England makes two small cars, on approximately 94-inch wheelbase, a "ten" and an "eight," as well as the larger "22" and "30." The figures refer to horsepower and not number of cylinders. The latter two correspond to the "60" and "85" in this country.

The Ford "ten" is naturally a rather stubby-appearing car. Headlamps are mounted on the fenders. Hood louvres comprise six horizontal vents in a parallelogram-shaped frame trimmed in bright metal. The radiator grille slopes at an angle of about 25 degrees with the vertical; viewed from the front, it comprises three parallel vertical sections, each trimmed in bright metal strips. The side of the body carries a streamline "crease" similar to that on the Chevrolet, which sweeps across the cowl and part of the front door. "The bonnet," states the literature on this newest Dagenham offspring, "is secured by easily-operated fasteners, eliminating rattles."

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York—Domestic nonferrous metal markets weakened last week due to a combination of unfavorable developments including a decline in

prices abroad, light consumer demand, and uncertainties in the outlook for general business as reflected in the weak security markets.

Copper—Export dropped to 12.85c, c.i.f. European ports, the lowest level attained in several months. Electrolytic held at 14.00c, Connecticut, although offerings of resale metal at 13.12½c were not absorbed. Red metal scrap declined \$5 per ton while brass ingots declined \$10 per ton on all base prices except No. 1 yellow which declined \$5 per ton.

Lead—Prices declined \$5 per ton on Friday to the basis of 6.25c, New York, and 6.10c, East St. Louis. St. Joseph Lead Co. continued to quote \$1 premium on certain brands in the East. Lead sheet, pipe, oxide, and scrap prices declined \$5 per ton in line with the primary market. Buying was not stimulated by the reduction in prices.

Zinc—Prime western held at 7.25c, East St. Louis, although the differential on brass special was lowered to \$2 from \$5, or to a price of 7.35c, East St. Louis. Fresh demand was dull due to limited offerings and well bought position of consumers.

Tin—Straits tin prices held up well until Friday when a severe break in the London market caused a sharp drop here to 57.87½c, the lowest level quoted since early in July.

The mills, one a four-high and the other a two-high, are designed to run both stainless and carbon grades and will be housed in buildings of discontinued hot mills at Carnegie, Pa. Present plans call for units to be in operation next April. Annealing furnaces, slitters, pickling and other auxiliary equipment are yet to be awarded. Superior at its Carnegie plant is now erecting a \$25,000 two-story fireproof office building.

Westinghouse Electric & Mfg. Co. has increased prices on small and medium-size turbine generator units.

Hagan Corp., Pittsburgh, announces receipt of an order through Rust Furnace Co. for a complete combustion control with furnace pressure, gas pressure and air-gas ratio control to be installed on a regenerative soaking pit in the plant of Otis Steel Co., Cleveland, according to E. W. Wagenseil, general sales manager.

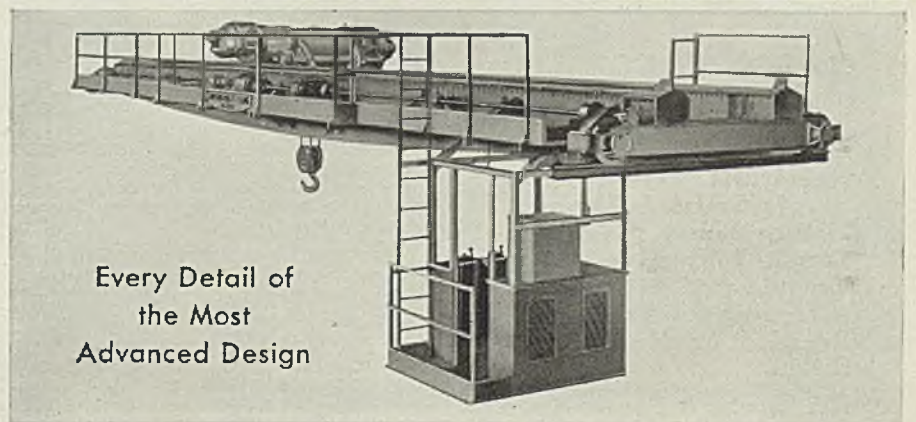
Cleveland — Bardons & Oliver, Cleveland, are low on the bulk of turret lathes included in navy inquiry for machine tools for Pensacola, Fla., station, closed last week. About 30 tools are in the list, including engine lathes, precision lathes, radial drills, shapers, grinders and miscellaneous equipment.

Seattle—Labor troubles are retarding buying by lumbering and maritime interests but other items are still in fair demand, particularly electrical and road maintenance equipment. Puget Sound navy yard has called bids Sept. 29 for furnishing 125,000 feet of cable.

Equipment

Pittsburgh—Superior Steel Corp.'s two new 30-inch cold mills have been awarded to E. W. Bliss Co.

ELECTRIC TRAVELING CRANES 1 TO 450 TONS CAPACITY



Every Detail of
the Most
Advanced Design

SHEPARD NILES

CRANE & HOIST CORP.

358 SCHUYLER AVENUE, MONTOUR FALLS, N. Y.

A Complete
Line of
Cranes and
Hoists

Construction and Enterprise

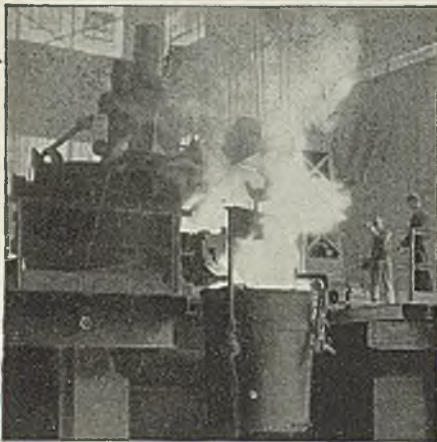
Ohio

BLOOMVILLE, O.—Village will take bids shortly for waterworks system, for which PWA has approved grant of \$30,150, out of total estimated cost of \$56,000. Champe, Flnkbelner and Associates, Nicholas building, Toledo, O., are engineers.

BUCYRUS, O.—City plans construction



BASIC ELECTRIC STEEL FORGINGS



N. F. & O. Basic Electric Steel produced under rigid metallurgical control is an important quality factor in the ultimate forged product

BASIC ELECTRIC STEEL

Carbon, Alloy, Corrosion Resistant and Special Steels Smooth Forged, Hollow Bored, Rough or Finished Machined, Heat Treated to Specifications ...Forging Quality Ingots, Pressed or Hammered Billets.

Die Blocks & Piston Rods

NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

of sewage disposal plant, on which bids will be taken soon. Estimated cost \$140,000. F. G. Browne, Marion, O., is engineer.

CIRCLEVILLE, O.—City will soon take bids for sewage treatment plant. PWA has approved grant of \$61,000 out of total cost of \$136,000. F. G. Brown, Marion, O., engineer.

CLEVELAND—Harshaw Chemical Co., C. Parker in charge of construction, 1945 East Ninety-seventh street, will erect an extension to its plant. Estimated cost \$250,000.

CLEVELAND—Brewing Corp. of America, S. T. Creighton, secretary, 9400 Quincey avenue, plans to build a bottling plant and fermentation building at a total cost of about \$200,000.

CINCINNATI—General Spring Co., McMicken avenue and Walnut street, plans erection of a one-story factory building, costing \$21,920.

DAYTON, O.—National Cash Register Co. expects to build a new unit here costing \$800,000, including machinery.

EDON, O.—Contracts will be let soon for waterworks system, costing \$48,000. PWA has approved grant of \$19,363. C. J. Simon, Van Wert, O., is engineer.

GALION, O.—Bids will be taken soon for sewage disposal plant, costing \$90,000. PWA has granted \$40,000. P. A. Uhlman, 2083 Dayton street, Columbus, O., is engineer.

KENTON, O.—City, W. C. Bopp, mayor, will have complete plans ready about Oct. 1 for erection of waterworks addition and softening equipment. Two deep well pumps and one high lift pump, filters, water tanks, etc., will be installed. Estimated cost \$45,000.

NAPOLEON, O.—City, board of public affairs, Earl Wirick, clerk, will take bids Oct. 11 for light plant addition and improvements. Froehlich & Emery, Second National Bank building, Toledo, O., consulting engineers.

Michigan

BESSEMER, MICH.—City has received \$187,500 PWA loan and grant for erection of a municipal light and power plant and for installation of two 320-kilowatt diesel engine generators, electrical distribution system, etc. Walter Maki is city clerk.

BRIGHTON, MICH.—Brighton-Advance Corp., 222 Grand River avenue, has been incorporated with \$50,000 capital stock to deal in metal stampings, by Edmund Nolan, Detroit.

DETROIT—J. A. Utley, 729 Penobscot tower, Detroit, has been awarded contract for alterations to the factory of American Brass Co., located on McKinsirey avenue, here.

DETROIT—Rodney Welch Industries Inc., 26548 Schoolcraft avenue, has been formed with \$10,000 capital to deal in steel tools by Rodney R. Welch.

DETROIT—Parker Rust Proof Co., 2177 East Milwaukee avenue, Detroit, has let contract to Esslinger-Misch Co., Detroit, for an addition and alterations to its factory building.

DETROIT—R. H. Neubrech, 10043 Maplelawn avenue, Detroit, architect, is taking figures on separate trades for

construction of a factory addition in Detroit for the Motor Tool Mfg. Co., 12281 Turner street.

GRAND RAPIDS, MICH.—Keeler Brass Co., Grand Rapids, has awarded general contract to H. Hauser Construction Co., Grand Rapids, for erection of an addition to its factory building.

KALAMAZOO, MICH.—Automatic Buffing Corp., 417 Pitcher street, has been organized to manufacture automatic buffing machines, by William G. Balz, Kalamazoo.

MENOMINEE, MICH.—City council is considering plans by Robert Cramer & Sons, consulting engineers, 647 West Virginia street, Milwaukee, for primary sewage treatment plant estimated to cost \$245,000, and secondary treatment plant estimated to cost \$312,000. August Siegel is city clerk.

Pennsylvania

AMBRIDGE, PA.—A preliminary survey has been made for construction of waterworks system, costing about \$282,000. P. F. Loftus, Oliver building, Pittsburgh, is engineer.

PITTSBURGH—McCann Shields Paint Co., 27 Alexander avenue, plans to construct a factory. H. H. Cahoon, 337 Boulevard of the Allies, Pittsburgh, is architect. Cost estimated at \$40,000.

PITTSBURGH—Owner, care of G. P. McKinney, architect, 927 Fulton building, Pittsburgh, will build a pottery plant in New Brighton, O., estimated to cost \$50,000.

READING, PA.—S. Sychlerz has had plans prepared by W. M. High, 230 North Sixth street, for a one-story dairy products plant. Cost to exceed \$40,000, with equipment. Will purchase transmission and conveying equipment.

Illinois

CHICAGO—Atchison, Topeka & Santa Fe Railroad Co., 179 West Jackson boulevard, plans one-story, 43 x 90-foot power house, costing \$40,000. G. W. Harris, 80 East Jackson boulevard, is engineer.

RAMSEY, ILL.—Village, care of A. M. From, president of board of village trustees, will build a new pump house and install pumping equipment. PWA grant has been allotted.

WAVERLY, ILL.—F. O. Brown, mayor, is having plans drawn for waterworks and distribution system, also sanitary sewage system, for which PWA has allotted \$81,000. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, is engineer.

Connecticut

PORTLAND, CONN.—Rogers & Hubbard are making plans for rebuilding fertilizer plant and replacing equipment destroyed by fire recently.

STAMFORD, CONN.—Vick Chemical Co. has purchased 18 acres in Springdale, a suburb of Stamford for erection of large factory. Total expenditure estimated at \$2,000,000.

New York

BATAVIA, N. Y.—Doehler Die Casting Co., 386 Fourth avenue, New York, plans constructing plant here for making brass and magnesium castings. Cost to exceed \$100,000.

BUFFALO—National Gypsum Co., Buffalo, plans to construct a plant for manufacture of insulating fiber board in Mobile, Ala., estimated to cost \$1,000,000.

ROME, N. Y.—Rome Cable Corp. plans

building plant addition, cost of which will exceed \$40,000.

Indiana

COLUMBIA CITY, IND.—Columbia Products Co. will build a new plant, costing about \$60,000.

EAST CHICAGO, IND.—A. Rooney, chairman of board of public works, will soon receive bids on waterworks improvements, including special mixing equipment and mechanical feed machines. R. N. Moore & Co. Inc., Indianapolis, is engineer.

Maryland

BALTIMORE—Intercoastal Paint Co., 2230 Edgewater street, plans rebuilding its factory destroyed by fire. Estimated cost \$100,000.

BALTIMORE—Owens-Illinois Can Co., 2809 Boston street, will spend \$100,000 for improvements. Francisco & Jacobus, 511 Fifth avenue, New York, are builders.

BALTIMORE—Carr Lowrey Glass Co., 2201 Kloman street, will soon let contract for constructing addition to present glass factory, estimated to cost \$100,000. Amsler Morton Co., Pittsburgh, architect.

BALTIMORE—National Can Co., 811 South Wolfe street, will expend \$550,000 for additional equipment and machinery for its local plant. Other improvements are proposed for plants at Maspeth, N. Y., and Hamilton, O.

District of Columbia

WASHINGTON—Treasury department, procurement division, branch of supply, Seventh and D streets, will take bids until Oct. 4 for one portable arc welding machine, electric motor driven.

WASHINGTON—United States maritime commission will receive bids until Oct. 20 for the purchase of 25 vessels. Bidders may obtain names of vessels and information and instructions upon application to the commission.

WASHINGTON—Bureau of Supplies and accounts, navy department, will take bids until Oct. 1, schedule 1653, steel forgings, delivered Newport, R. I.; schedule 1658, diesel engine driven tractors with earth moving and earth rooting or loosening attachments; schedule 1662, diesel driven lifting crane; schedule 1677, 9 tons steel wire for mattress springs, delivered Philadelphia; schedule 1684, diesel engine driven generator, delivered Sewall's Point, Va.; until Oct. 5, schedule 1667, one motor-driven tool room lathe with universal relieving attachment; schedule 1668, one motor-driven engine lathe; schedule 1671, one motor-driven radial drill; schedule 1686, 3000 feet cast iron pipe; schedule 1688, one motor-driven core making machine; until Oct. 8, pumping units and fueling pits, delivered Sewall's Point, Va.

Florida

JACKSONVILLE BEACH, FLA.—City, Wade Hoffmann, chairman of beach commission, has authorized city engineer to secure location for proposed electric light plant and to prepare plans and specifications. First unit to cost \$150,000.

Mississippi

OSYKA, MISS.—Precision Lumber Co. Inc. of Louisiana has acquired the sawmill of W. D. Ott, and will install planer and other machinery.

Louisiana

BATON ROUGE, LA.—H. C. Leonard, president, Baton Rouge Electric Co., and executive head of Louisiana Steam Generating Corp., 329 Florida street, announces expansion program involving approximately \$3,000,000, including \$2,800,000 addition to plant and installation of 15,000-kilowatt boiler.

NEW ORLEANS—Harry Brothers, 3505 South Carrollton avenue, has purchased a site on Carrollton avenue and will spend \$200,000 for plant improvements.

Virginia

BELLEWOOD, VA.—E. I. Du Pont de Nemours & Co., Wilmington, Del., plans installation of motors and controls, regulators, conveyors, transformers and accessories in new chemical plant being erected here. Cost about \$750,000.

HARRISONBURG, VA.—Shenandoah Valley Electric Co-operative, has been granted permission from state corporation commission, Richmond, Va., to borrow \$35,000 additional from REA in connection with building generating plant.

NORFOLK, VA.—Sheridan P. Gorman, state director of PWA, Richmond, Va., announces approval of \$331,000 grant to city for constructing electric light and power plant system.

SALEM, VA.—Moore Milling Co., D. E. Moore in charge, will repair and make alterations to its plant. Cost to exceed \$50,000.

Wisconsin

BRILLION, WIS.—Arlens Co., machine shop, is making an addition to its plant that will double capacity. Automatic machinery will be installed.

GREEN BAY, WIS.—Hudson & Sharp Machine Co., maker of paper converting machinery, has awarded contract to Charles Edwards for construction of a factory addition.

MILWAUKEE—Oilgear Co., 1407 West Bruce street, maker of hydraulic power feeds, presses, broaching machines, etc.,

is building plant addition to house additional facilities for welding machine structures. Walter Ferris is chief engineer.

MILWAUKEE—Department of public works, city hall, closes bids Oct. 8 for furnishing chemical feed equipment for new \$5,000,000 water purification plant. Bond of \$27,000 or certified check for \$13,500 required. Herbert H. Brown is plant engineer.

WAUKESHA, WIS.—Waukesha Motor Co. is roofing court, 35 x 350 feet, between two machine shop units to provide additional storage and handling space. Henry Harmon is plant engineer.

Minnesota

MINNEAPOLIS—Sperzel Modern Seat Co. has been incorporated with capital stock of \$150,000 to manufacture toilet plumbing supplies, by Peter Sperzel, John Corser and H. J. Sperzel.

MINNEAPOLIS—Foley Mfg. Co., Walter M. Ringer, president, 10 Second street, Northeast, manufacturer of saw filing, grinding and sharpening machinery, has started construction of a one-story factory addition, 40 x 160 feet.

MINNEAPOLIS—R. R. Howell & Co., Benjamin R. Howell, president, maker of saw mill machinery, drilling machines, agricultural implements and couplings, will soon start construction of a one-story plant addition, part of which will be used to store patterns.

ST. PAUL—A-W Co. Inc., 2328 Territorial road, has been incorporated with capital stock of \$100,000 to distribute road building machinery, tractors, shovels, etc., by H. T. Hoskins, R. H. Bossenmaier and R. J. Collopy.

ST. PAUL—Herzog Iron Works Inc., Harry F. Fisher, president, manufacturer of ornamental iron and bronze, will soon start production of a solid steel door, for use in hospitals and clinics, for which it has just obtained a patent. The company recently erected a new \$100,000 factory building.

SPRINGFIELD, MINN.—City plans



Heading Specialists

Special screws of great variety made to order

Quality rivets and studs from all grades of materials to order only for other manufacturers.

Progressive Manufactured Products are made on both a quality and price basis, their uniformity of construction insures against slowing down your assembly operation.

A great many parts now made on screw machines lend themselves to heading which results in great savings and improved service. Have our specialists consult with you, our service is free and we might suggest something that may prove of considerable importance to you.

THE PROGRESSIVE MFG. CO.
 TORRINGTON, QUALITY **PROMCO** BRAND CONN., U. S. A.

In Stock At All Times—

Standard Machine Screws — Machine Screw Nuts
 Interchangeable bolts and nuts made strictly to A.S.M.E. tolerances

improvements to municipal light and power plant, including installation of a 1000-kilowatt turbine generator. A. C. Mueller is city clerk. Burlingame, Hitchcock & Estabrook, Sexton building, Minneapolis, are engineers.

Texas

DONNA, TEX.—Citrus Fruit Products Inc. of Florida, will spend approximately \$30,000 for remodeling its canning plant here.

HOUSTON, TEX.—American Can Co., 230 Park avenue, New York, plans erection of \$15,000 addition to its plant here at Lockwood and Clinton streets.

North Dakota

VALLEY CITY, N. DAK.—City will receive bids until Oct. 4 for improvements to municipal light and power plant, including new turbine generator unit with surface condenser and auxiliary equipment. W. T. Craswell is city auditor. Burlingame, Hitchcock & Estabrook, Sexton building, Minneapolis, engineers.

WAHPETON, N. DAK.—North Dakota State School of Science, E. F. Riley, president, plans construction of a three-story trades school building, to include shops. Estimated cost \$90,000.

South Dakota

FREEMAN, S. DAK.—Voters approved a \$100,000 bond issue to finance construction of municipal light and power plant. E. Schamber is city auditor.

Iowa

CHEROKEE, IOWA—Date for receiving bids on construction of a boiler house and equipment to cost about \$95,000 has been indefinitely postponed by the state board of control, H. C. White, chairman, State house, Des Moines, Iowa. Henry J. Liebbe, State House, is architect in charge of plans.

OTTUMWA, IOWA—Dain Mfg. Co.,

subsidiary of Deere & Co., manufacturer of hay handling machinery, has awarded contract to Lanning Construction Co. for erection of six new factory buildings, including a paint shop, woodworking shop, extension to present foundry, finished stock storage building, tool manufacturing building and foundry sand storage building. Entire project to cost about \$100,000, exclusive of equipment. Herman Moschel is general manager.

SEYMOUR, IOWA—City is making survey of costs of miscellaneous improvements to municipal light and power plant, including new turbine generator. H. S. Nixon, 219 Grain Exchange building, Omaha, Nebr., is consulting engineer.

WATERLOO, IOWA—John Deere Tractor Co. has awarded contract to Jens Olesen & Sons Construction Co. for construction of one-story plant addition, the greater part of which will be used for storage of raw materials.

Nebraska

ALLIANCE, NEBR.—City, Ethel M. Nation, city clerk, has selected Black & Veatch, 4706 Broadway, Kansas City, Mo., as its consulting engineer in the construction of its new municipal power plant, to house 30,000-pound per hour high pressure boiler and turbine generator to cost \$242,700.

Montana

GLENDIVE, MONT.—Glendive unit of the proposed Buffalo Rapids irrigation project has been officially approved for federal funds totaling \$1,605,000. Project includes a \$400,000 pumping plant.

MISSOULA, MONT.—Preliminary work has begun on the pumping plant for the Flathead irrigation project, for which \$200,000 is available. An additional \$500,000 will be granted for equipment.

Pacific Coast

COACHELLA, CALIF.—California Cotton Oil Corp. plans to make repairs and

alterations to its plant here. Cost to exceed \$40,000.

LONG BEACH, CALIF.—Procter & Gamble Co., Long Beach, plans installation of motors and controls, regulators, conveyors and other equipment in new addition to local soap, washing powder and oil processing plant, costing about \$1,000,000. J. H. Davies, Ocean Center building, Long Beach, engineer.

LOS ANGELES—An addition to the factory building of the Willard Storage Battery Co. of California is being erected at 5700 East Ninth street here, at a cost of \$25,000.

LOS ANGELES—A. W. Klachko, 2834 Boulder street, has been granted certificate to conduct business under the firm name of American Iron Nipple Mfg. Co., with a plant at 1153 Firestone boulevard.

LOS ANGELES—A certificate to conduct business under the firm name of Modern Metals Mfg. Co., with a plant at 1755 East Slauson avenue, has been issued to the owners: Marvin E. Coontz, 7822 California avenue, Huntington Park, Calif., and Herbert Stenstrom, 872 West Twentieth street, San Pedro, Calif.

LOS ANGELES—Whitehead Metal Products Co., New York, has bought a factory site here at 4801 East Fiftieth street, and will build a plant at a cost of about \$100,000 for production of metal products. Company is a subsidiary of International Nickel Co. Ralph H. Bailey has been appointed manager of the Los Angeles plant.

LOS ANGELES—Rheem Mfg. Co. is building an addition to its tank manufacturing plant at 4361 Firestone boulevard at a cost of \$45,000.

LOS ANGELES—Lane-Wells Co., producer of oil-well specialty tools, has filed with the securities and exchange commission a registration statement covering a proposed \$870,000 stock issue. Of the proceeds \$100,000 will be used to pay for new buildings now under construction, \$100,000 for new rolling mill equipment and \$75,000 for new buildings at Houston, Tex.

SAN DIEGO, CALIF.—National Iron Works is erecting a new warehouse building at 636 Front street, costing about \$5000.

SANTA MONICA, CALIF.—Building permit has been issued for construction of an addition to the aircraft manufacturing plant of Douglas Aircraft Co. at 3000 Ocean Park boulevard here. The structure will cost \$200,000.

WHITTIER, CALIF.—A new machine shop, 50 x 100 feet, is being erected at 100 Whittier boulevard here for Security Engineering Co. Total cost, \$10,000.

ANACORTES, WASH.—Engineers are making a preliminary survey for proposed \$400,000 steam plant for Puget Sound Pulp & Timber Co.

BELLINGHAM, WASH.—H. S. Wright & Co., Seattle, has been awarded general contract for the construction of 18 buildings, costing about \$500,000, a unit of the expansion of the plant of Puget Sound Pulp & Timber Co., estimated at \$2,500,000 including equipment. Structures include drying machine house, buildings for digesters, screens, laboratory, acid plant, warehouses, boiler and power house.

Canada

WYNDELL, B. C.—J. B. Winlow Co. is rebuilding its saw mill recently destroyed by fire. The company is interested in prices of complete equipment.

These Springs Look Alike



This spring has a long, and useful life of one hundred million or more compressions.

THE DIFFERENCE?

Here

Carefully selected materials; Proper design and manufacturing methods; controlled heat-treating; and the Fifty Years Experience of

RAYMOND MFG. CO.
Corry, Pa.
Producers of Superior Springs



This spring may fail before reaching one hundred thousand compressions.

Here

Ordinary spring wire, Out-of-date methods, poorly regulated heat treatment, lack of broad experience, produce the ordinary spring, perhaps useful fifty years ago, but worse than useless in the high grade engineered products of today.