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# STEEL

ESTABLISHED 1882


# Contents


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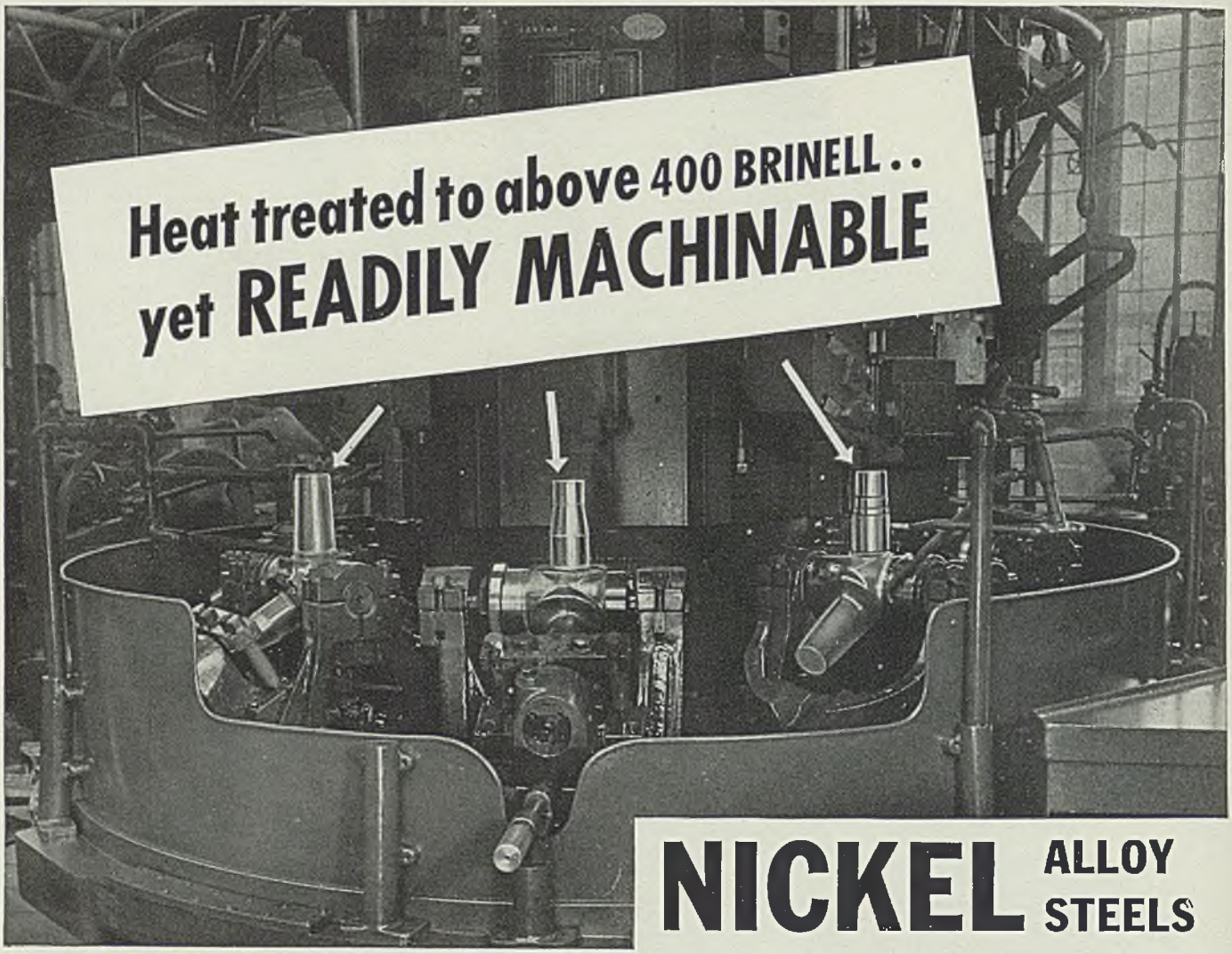


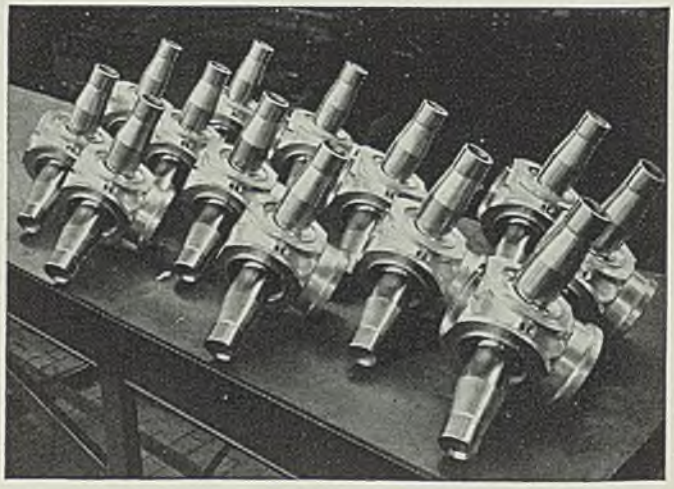

# NICKEL ALLOY STEELS

For parts subject to high stresses in service, heat treatment *before* machining offers many advantages. Warpage and distortion frequently resulting from heat treatment after machining are minimized. In addition, points of stress concentration are avoided resulting in considerably greater life for the machined part when placed in service.

Especially interesting are present shop practices of airplane part and other mass production plants now machining heat treated Nickel alloy steels ranging in hardness up to 450 Brinell. *(above)* Stressed Hydromatic Propeller spiders of SAE 4340 heat treated to approximately 415 Brinell are machined with ease in the regular produetion line at the East Hartford, Conn. plant of Hamilton Standard Propellers, Division of United Aircraft Corp.

• • •

In a recent demonstration on a standard Warner & Swasey turret lathe conventional high speed tools readily turned, chamfered and drilled a 2″ bar of Nickel-chromium-molybdenum steel at a hardness of 450 Brinell. The turning cut was fed at .012″ at a speed of 42′ a minute. The close helical chip showed no tendency to tear, check or burn. The smooth surface produced indicates that machining Nickel alloy steels at high hardness is not unusually difficult.



Hamilton Standard Propellers, Division of United Aircraft Corp., East Hartford, Conn. regularly machine SAE 4340 stressed Hydromatic Propeller parts including spiders, illustrated here, and cams after they have been heat treated to approximately 415 Brinell. Hard Nickel alloy steels are no hazard where machining is concerned. For additional information please write to the address printed below:

**THE INTERNATIONAL NICKEL COMPANY, INC.**
67 WALL STREET
NEW YORK, N. Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

# As the Editor Views The News

■ STEEL production last week declined ½-point (p. 29) to 61 per cent of ingot capacity and all indications seem to imply (p. 85) that there will be little fluctuation from this rate, up or down, during the next few weeks. Domestic consumption reflects reassuring stability. Export demand continues important even though (p. 23) spread of the war threatens our trade with Scandinavian countries. Price irregularities, recently reported by STEEL, last week culminated in a $4 a ton reduction on hot and cold rolled sheets and strip, and enameling sheets. Certain other products reflect irregularities although not yet in disturbing volume.

• • •

**Steel Earns 3.36 Per Cent**

Net 1939 income for 91 per cent of the country's steel industry (p. 40) was $130,831,176, only 3.36 per cent on capitalization despite the fact 1939 was the third best year of the last decade from standpoint of volume. . . New units for expanding Canadian production of sheets, plates and other steel products (p. 26) will be ready for operation in two to three months. . . Historic old Pencoyd plant for the first time since the business began in 1852 (p. 28) is listed as inactive. Many innovations in steel producing methods had their inception there . . . Lower priced steels are finding wider use (p. 37) in production of automobile parts.

• • •

**Sickness Toll Can Be Cut**

Before the temporary national economic committee last week (p. 25) Mr. Hook explained the relation of the continuous mill to employment. While it has displaced workers it has added greatly to total employment. Absorption of displaced workers, said Mr. Hook, depends on general business conditions and relative freedom from factors that restrict free flow of capital. . . . Sick absenteeism costs industry at least five times as much as the corresponding figure for the cost of industrial accidents—a fact of which industry (p. 42) only now is becoming conscious. Those who have studied the problem say that this toll on industry can be reduced greatly.

• • •

**Furnaces Aid Production**

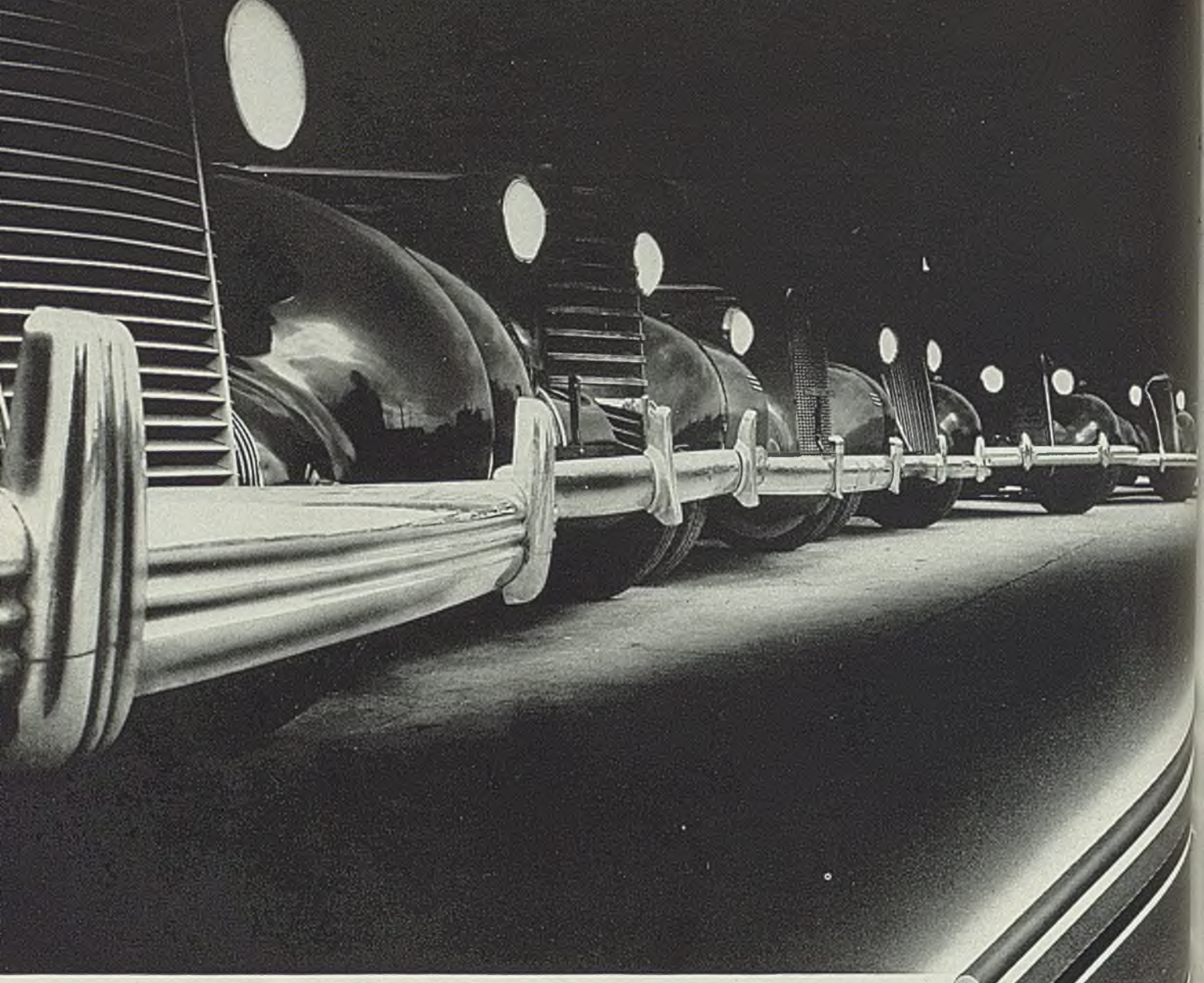
New annealing furnaces (p. 48) enable a Cleveland steel mill better to meet exacting strip-sheet requirements, with improvements in speed and cost. . . . Carbon dioxide has proved its worth (p. 46) in smothering various types of industrial fires, instantly and without damage to materials or equipment involved. . . . Shorty Long indulges in some gossip (p. 57) about pulling rolling mill bearings that have worked all right up to now. . . . Special electric lift truck (p. 50) has reduced expense of handling air conditioning units at a plant which fabricates this product. . . . Engineering Societies' library, New York, offers (p. 66) a new photostat and microfilm service.

• • •

**Brazing Of Aluminum**

The stage is set (p. 67) for the annual meetings of the Open Hearth and Blast Furnace and Raw Materials committees, to be held at Pittsburgh, April 24-26. Well-rounded-out programs have been prepared. . . . Several commercial applications following extensive laboratory work (p. 60) prove that brazing is a practical method for joining aluminum alloys. Included are furnace, dip and torch brazing. . . . To obtain ductility required for cold heading work, a spheroidizing heat treatment is recommended. This (p. 64) involves temperatures of 1380 to 1410 degrees Fahr., a heating period of about 2 hours, soaking 2½ to 3 hours and cooling 4½ to 5 hours

E C Kreutzberg



# BARS—that test the skill of steelmakers

For many years Inland has been a leading producer of bumper bars, one of the most intricate and exacting types of bars rolled. The steel must be clean and sound . . . the size and shape must be accurate. Although a hot rolled product, an unusual degree of surface smoothness is required for plating, assuring a permanent finish.

The same degree of skill evidenced in the making of bumper bars is practiced throughout the Inland Bar Department. When you buy hot rolled bars from Inland, you secure a product that will meet the specifications required to speed up your production and reduce your shop costs. When you seek high quality bar stock, come to Inland.

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

# War in Scandinavia Dislocates United States Steel Exports

*Automobiles, machinery and other products affected as shipments to Norway, Sweden and Holland are halted. Increase expected to follow reopening of trade lanes*

■ SHIFTING the theater of war to Scandinavia has brought the United States' rapidly expanding iron and steel export business with Norway and Sweden to a temporary standstill. The crisis also has halted shipments to Holland, a large neutral buyer in recent months, and to varying degrees has dislocated exports to many other countries.

Also affected are exports of automobiles, machinery and other products which have been shipped to the northern countries in large volume.

Allied victory in Norway and the reopening of trade lanes to Scandinavia would be accompanied by a still heavier movement of iron and steel products to this area, eastern iron and steel exporters believe.

Steel exports to Sweden of 146,226 tons in 1939 were substantially heavier than in recent years and compared with 31,418 tons in 1938, 110,169 tons in 1937 and 36,678 tons in 1936. During the first two months of this year Sweden has taken about 17,500 tons.

Iron and steel exports to Norway have been more modest, amounting to 42,533 tons in 1939, 12,152 tons in 1938, 21,972 tons in 1937 and 9891 tons in 1936. However, Norway took 19,000 tons in the first two months of this year alone, with a further sharp rise indicated.

Steel exports to the Netherlands reached a peak of 116,262 tons in 1939, compared with 85,293 tons in the preceding year, 51,131 tons in 1937 and 18,935 tons in 1936. A much higher peak has been anticipated this year. Danish steel imports from this country have been negligible, actually amounting in 1939 to less than 2000 tons.

Iron and steel imports from Scandinavia have been confined almost entirely to special high quality tool steels and puddled iron from Sweden and while having had a steady market in this country for many years, have not been heavy. Full returns for last year are not yet available, but in 1938 Swedish iron and steel arrivals here were valued at $3,800,000; in 1937, at $7,000,000 and in 1936 at $5,600,000. Much Swedish production, particularly in recent months, has been going to Germany.

Sweden's iron ore, the fuse which set off the present Scandinavian conflagration, because of its importance to German steel production, has been used in this country for many years, principally by one eastern producer, who has relied upon it to supplement requirements. By far the heavier iron ore importations, however, come from Chile, with a much smaller, but fairly sizable amount from Cuba.

### U. S. Ore Imports Small

Scandinavian iron ore shipments to this country, including a small quantity of manganiferous ore, totaled approximately 450,000 tons in 1939, at which time more than 44,000,000 tons were consumed by the American steel industry. Hence, it is obvious that should Scandinavian shipments be held up indefinitely it would have little bearing here. For not only does this country produce practically all of its own ore requirements, but it has many foreign sources which it could tap.

Norway as well as Sweden exports ore to this country. The department of foreign and domestic commerce explains that "the country to which imports shall be credited for statistical purposes is the country of origin—that is, the country where the material was mined, grown or manufactured."

However, it is admitted unofficially that despite the effort to keep the figures on this basis it is not always possible to do so and in the trade the belief is accepted that the great bulk of ore credited to Norway by the department actually is mined in Sweden, coming from the Kiruna mines in Sweden to the Norwegian port of Narvik. Norway's principal ore is low phosphorus. In 1938, she mined 1,400,000 tons, an increase of about 400,000 tons over the preceding year and more than two and a half times as much as in 1934.

Sweden is the world's largest ore exporter on a basis of iron content

## Sweden's Ore Treasure

■ One of the largest single deposits of high grade iron ore in the world, at Kiruna, Sweden, is a mountain ridge 3 miles long with rich magnetite ore like this extending as far as 8000 feet underground. Estimated reserve in this deposit is around 1,500,000,000 tons. Ore averaging over 60 per cent in iron content is mined from open cut pits. NEA Photo


## Scandinavian Ore Deposits

■ Rich ore deposits so vital to the German iron and steel industry are located mainly around Kiruna and Gellivare in Northern Sweden, with lower grade deposits scattered through Central and Southern Sweden. Summer ore route is through Lulea, Sweden, ice-bound five months of the year and winter route is through Narvik, Norway, ice-free the year around

and is exceeded only by France in tonnage shipped. Her most important deposits are at Kiruna and Gellivare in Swedish Lapland. Iron content is above 60 per cent and the reserves at the two deposits have been estimated at 3,000,000,000 tons.

Always of prime importance to Germany, the war has made Sweden's ore supply a vital necessity. With imports from France, Algeria and Newfoundland (nearly 7,000,000 tons in 1938) and her domestic ores of lean quality, the Reich must depend on Sweden for the bulk of her supplies. In recent years, Germany has imported about two-thirds of all ore consumed.

Since the war began last September Germany's imports of Swedish ore have shrunk considerably, just how much no one on this side knows. Germany undoubtedly was able to bring a substantial tonnage through the Baltic from Lulea, on the Gulf of Bothnia, during the open season, which runs from May to December. However, her movement of ore from Narvik was greatly reduced last fall, with only three German ore ships, in fact, clearing that port in October.

However, since the first of the year she has had somewhat better luck in obtaining Scandinavian ore from Narvik. Up to the present time, it is reliably estimated that she has been able to bring down from that port something like 500,000 tons. Within another month, assuming that her supply of Scandinavian ore is not seriously interfered with, Germany will be able to resume shipments from Lulea.

According to best available information, Germany was able in 1939 to bring 2,200,000 tons of iron ore from Narvik, the great bulk of this movement falling in the first eight months of the year, prior to the outbreak of the European war.

Extension of the neutrality act to include Norwegian waters will in itself have little effect on shipments of iron and steel to Scandinavia. Most of this tonnage is hauled in foreign ships, and if the Allies are successful in freeing Norway from German invaders, there should be little trouble in obtaining adequate bottoms to transport the anticipated increased tonnage.

At present a substantial tonnage of iron and steel, principally pig iron and plates, is awaiting shipment; a still much heavier tonnage is in process of production and on order. Where work on orders has not been started, producers plan to withhold action until the situation on the other side clarifies.

Foreign dispatches refer to the molybdenum mines owned by the Knaben Molydengruber Co. in southeastern Norway as being one of the first objectives of Germany in her invasion of Norway. Cut off from her supplies here last fall, Germany would find these mines valuable, although they only produce about 1,000,000 pounds of contained molybdenum annually, compared with 32,000,000 pounds produced in this country last year.

**UNITED STATES IMPORTS OF IRON ORE**
(Gross tons)

| | 1939 | 1938 | 1937 | 1936 |
|---|---|---|---|---|
| Norway | 195,966 | 75,625 | 252,657 | 158,344 |
| Sweden | 264,353 | 213,616 | 150,233 | 166,150 |
| Cuba | 269,866 | 148,701 | 441,500 | 444,500 |
| Brazil | 16,700 | 9,650 | 11,000 | 6,102 |
| Chile | 1,586,625 | 1,577,750 | 1,438,886 | 1,264,130 |
| Australia | 16,520 | 82,827 | 79,588 | 72,904 |
| Algeria | 7,480 | 3,700 | 12,293 | |
| Newfoundland & Labrador | 14,450 | ..... | 45,080 | 11,300 |
| *Total | 2,412,784 | 2,122,455 | 2,442,069 | 2,232,229 |

*All imports, including those from countries not listed above.

**SWEDEN'S ORE PRODUCTION, EXPORTS TO GERMANY**
(Metric tons)

| | Total Production | Exports to Germany | Per Cent Output to Germany |
|---|---|---|---|
| 1913 | 7,476,000 | 4,977,000 | 67 |
| 1914-18 av. | 6,659,000 | 4,326,000 | 65 |
| 1929 | 11,468,000 | 7,955,000 | 69 |
| 1932 | 3,299,000 | 1,515,000 | 46 |
| 1936 | 11,250,000 | 8,248,200 | 73 |
| 1937 | 14,953,000 | 9,083,800 | 61 |
| 1938 | 13,928,000 | 8,992,300 | 64 |

**SOURCE OF GERMAN ORE IMPORTS**
(Metric tons)

| | 1936 | 1937 | 1938 |
|---|---|---|---|
| Sweden | 8,248,200 | 9,083,800 | 8,992,300 |
| France | 6,859,800 | 5,739,500 | 5,056,100 |
| Spain & Spanish Morocco | 1,067,700 | 1,381,600 | 1,807,100 |
| Luxembourg | 564,700 | 1,470,400 | 1,718,000 |
| Norway | 527,300 | 509,700 | 1,181,000 |
| Newfoundland | 171,400 | 808,000 | 1,121,500 |
| Algeria | 531,200 | 724,600 | 755,500 |
| Greece | 182,300 | 219,100 | 249,400 |
| Tunis | 47,300 | 13,500 | 131,000 |
| Switzerland | 5,400 | 67,200 | 121,000 |
| Belgium | 3,600 | 68,000 | 57,500 |
| TOTAL IMPORTS | 18,469,300 | 20,620,000 | 21,927,500 |
| TOTAL CONSUMPTION | 26,000,000 | 30,500,000 | 33,000,000 |

## War Increases Output, Consumption of Tin

■ Production and consumption of tin continues at a high rate, according to the March statistical bulletin of the International Tin Research and Development council, The Hague, Holland. Comparison of January and February production, deliveries and apparent consumption, with total for the first six months of the war and the preceding six months, are as follows:

Gross Tons

| | World production | Smelter deliveries | Apparent world consumption |
|---|---|---|---|
| Jan. 1940 | 15,700 | 19,968 | 22,600 |
| Feb. 1940 | 16,000 | 14,157 | 18,100 |
| Six war months | 128,200 | 97,454 | 104,800 |
| Preceding six months | 61,100 | 65,724 | 80,000 |

During the first six war months visible supply increased 3530 tons to 23,865 tons and smelters' stocks increased 9387 tons to 23,660 tons, an increase of total stocks of 12,917 tons to 47,525 tons.

Average cash price for standard tin in London was £243 in February and £237 during the first six war months, compared with £225 in the preceding six months. Average cash price for Straits tin in New York was 46 cents in February, 52 cents in the six war months and 48 cents in the preceding half year.

# TNEC Hears How Technological Advance Raised Steel Employment

*WASHINGTON*

■ ACTUAL employment increases, resulting from steel industry's technological improvements, were cited by Charles R. Hook, president, American Rolling Mill Co., Middletown, O., last week. Appearing before temporary national economic committee's technology hearing, with especial reference to alleged labor displacement by continuous sheet process, Mr. Hook asserted development of the continuous rolling mill has made possible production of better material at a lower price, has developed an expanding market.

Despite greater production capacity resulting from machinery's displacement of man power, according to Mr. Hook, reduction of the industry's work week to 30 hours would increase costs beyond the point at which consumption begins to shrink. Answering Senator O'Mahoney, Wyoming, monopoly committee chairman, who asked whether steel industry employment could be increased by shortening the work week, Mr. Hook said he did not favor the proposal. Hourly wages, he said, would have to be increased to maintain employes' income, resulting in greatly increased production costs and a negative effect upon consumption.

"I think we have reached the minimum," Mr. Hook said, referring to Senator O'Mahoney's question, "and it would be a serious matter to go further."

Mr. Hook told the committee that when it takes up the question of how patents, government policies and taxation have affected price levels, competition and profits business will suggest various factors having a depressing effect, especially in durable goods industries. Large share of unemployment, he said, can be attributed to lack of capital financing.

Most of Mr. Hook's testimony was largely concerned with changes in the steel industry between 1926-1937, during which period all but one of the present continuous sheet rolling mills were installed. While more than 500 hand mills have been replaced in that period, said Mr. Hook, and approximately half the remaining 750 are out of operation, there has been an actual increase of 117,000 employed in the steel industry.

Greatest number that could have been employed on the 1264 hand mills for producing hot-rolled sheets and black plate in existence in 1926, said Mr. Hook, would have been approximately 43,000, working on three-shift operations. That total would have been only 10 per cent of all workers employed in iron, steel industries at the time.

If all hand mills in existence in 1926, he continued, had been eliminated by introduction of continuous sheet mills, job displacements total could not have possibly been even half the alleged 90,000 claimed due to technological advancement. With approximately 375 hand mills still in operation, however, reduction of men employed in that department was about 27,000.

That temporary dislocation in one phase of industry due to introduction of improved processes is offset by gain in others was pointed out by Mr. Hook. Twenty-seven continuous rolling mills, he said, were installed by 1937, representing an approximate $500,000,000 total investment. Building that equipment provided work for thousands in construction and equipment industries, he added.

Inevitable in a progressive society, such dislocations, and others caused by introduction of new products, as the automobile, need cause concern only when displaced wo ers are unable to find other empl ment without prolonged delay, clared Mr. Hook. Testifying, witness said:

"It is my opinion, as a busin man, that the time which m elapse before any displaced work are reabsorbed into other lines work depends upon general bu ness conditions and the relati freedom from causes which restr the free flow of capital. The elaps time is brief when all factors favorable, as during the postw period of the early 1920's, when e ployment gained simultaneou with many technological advanc

"Elapsed time may be long when general conditions are unf orable, as they have been in rece years, but experience of the l century seems to provide no e ence for concluding that tech logical improvements cause pern nent unemployment or help to bri about prolonged depressions."

Periods of business depressi he explained, always give rise efforts to locate focal point of inf tion. This is not the first ti technological improvements ha been held unemployment's ch cause. Clamor against impro ments in manufacturing techniq has been raised many times in p 150 years. Subsequent events ha proved, each time, the charg were unfounded and fallacious.

"Too many factors enter into determination of changes in employment and man-hour outpu said Mr. Hook. "Actually it is possible to measure precisely broad effect of the introduction a machine upon either employm or output per man . . . To attribu a given increase in output worker to any one of these ma factors would seem to me high theoretical and, from a practi point of view, impossible to dem strate with any degree of accura

Discussing steel industry's creased employment record duri the period in which continuous r ing mills were installed, allege throwing 90,000 out of work, Hook said total employed in st industry increased from 427,000 1927 to 544,000 in 1937. This w an increase of 27.4 per cent, co pared to 11.2 per cent increase population. Both figures were tak from United States census.

Significant increase in light f rolled products output was an portant factor in employment during that period, declared Hook. Production increased fr 6,327,000 tons in 1926 to 10,793,0 in 1937, providing work, direc and indirectly, for many more e ployes.

Listing advantages to labor, general public and steel users wh accrued through installation of c

(*Please turn to Page* 102)

## Sees New Advances

■ **Industry is equipped to produce a national income of $90,000,000,000 or more, Dr. Theodore J. Kreps, TNEC economic adviser, told the committee last week in discussing technological advances in recent years. Dr. Kreps predicted future technical advances will outstrip those made to date. NEA photo**

# New Canadian Steel Capacity Soon Will Ease Pressure on Mills

*TORONTO, ONT.*

■ NEW steel orders continue to be received, taxing productive capacity and increasing backlogs to record levels. Bringing into production of large plant additions at three leading Canadian mills within the next two or three months will add capacity for sheets, plates and other products in especial demand since the war started.

Canada's plate and sheet requirements are reported considerably in excess of capacity, resulting in the more than doubling of imports from the United States in recent weeks.

Large orders recently placed include several from automakers who have received government contracts for trucks and other vehicles. Further large orders from these companies are pending.

H. J. Kelley, vice president, Dominion Steel & Coal Corp., Sydney, N. S., stated the order for 57,000 tons of rails from the South African railway and harbor administration, divided equally between his company and Algoma Steel Corp., Sault Ste. Marie, Ont., will provide more work for the rail mill, which otherwise might have been idle. He expects deliveries to start in the fall. Large development plans of Dominion Steel are nearing completion. In February one of the new open hearths was lighted. Work on the second furnace is being rushed and will be completed in May.

He stated that 50 per cent of the company's iron and steel output last year was for export and it is understood British purchasers will take all production that can be spared for the duration of the war.

### New Shipbuilding Company

W. A. Kingsland, 322 Inglewood drive, Toronto, announces the formation of the Dufferin Shipbuilding Co. Ltd., to take over the old Dominion Shipbuilding Co.'s plant at Toronto. New company will put the old plant in shape for immediate operation. It is stated that the company has received orders from the war supply board for minesweepers valued at $3,500,000; contract calls for delivery this year of two of these all-steel vessels. Equipment for the plant has been purchased and orders placed for steel plates. James Franceschini, Lake Shore road, Mimico, Ont., also is associated with the new company.

War contracts placed during the week by the war supply board totaled $1,457,825, slightly under recent weeks. It is understood more extensive orders will be awarded in the immediate future. Orders placed:

Aircraft supplies—Canadian Pratt & Whitney Aircraft Co. Ltd., Lonueuil, Que., $812,700; British air ministry, $11,000.

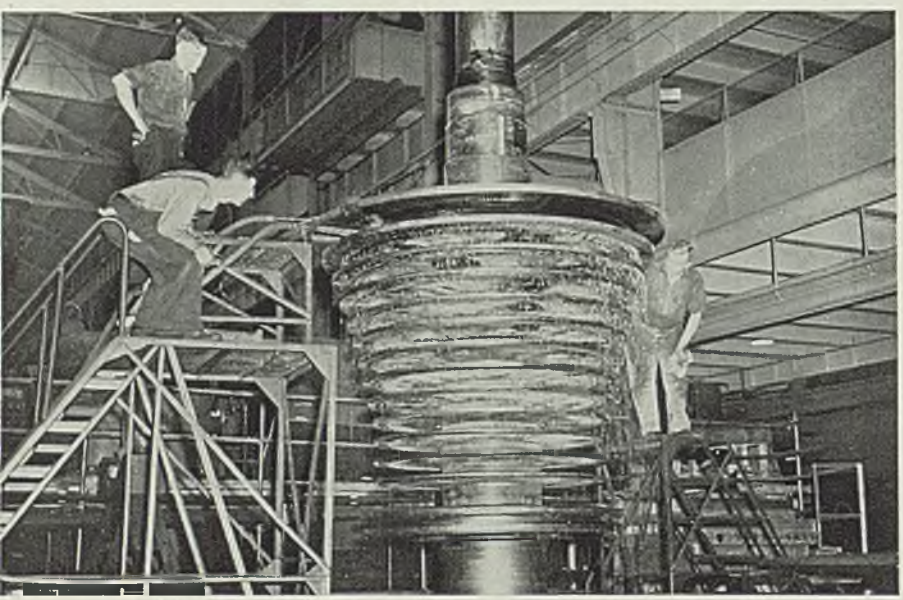
Barracks stores—Bronton Lumber Co., Toronto, $6302; Maxwell's Ltd., St. Mary's, Ont., $5646; Canada Wood Specialty Co. Ltd., Orillia, Ont., $5348.

Electrical Equipment — International Harvester Co. Ltd., Ottawa, Ont., $19,203.

Construction — Newton Construction Co., Sherbrooke, Que., for work at flying school at Windsor Mills, Que., $80,562; Coast Construction Co., Vancouver, B. C., for work at R.C.A.F., station, Ucluelet, B. C., $53,873; Smith Bros. & Wilson Ltd., for work at R.C.A.F., station at Jericho Beach, B. C., $8285.

Canadian Pacific Railway, Montreal, Que., will spend upwards of $4,000,000 on new construction and improvements this year, in addition to the rolling stock purchases exceeding $10,000 000 formerly announced. The proposed works will include replacements and enlargements of structures. $166,018; additions to stations, $185,333; miscellaneous roadway improvement, $1,589.459; replacement of rails, $564.788; rock ballasting, $513,789; additions and improvements to shop machinery, $213,729; additional terminal and sidetrack, $76,946.

## Shrinking Wheels on Steam Turbine Shaft



■ Scene in General Electric turbine shop at Schenectady, N. Y., during process of shrinking bucket wheels on shaft for a 50,000-kilowatt steam turbine. Expanded uniformly by heating, wheels are slipped over up-ended shaft one at a time, contract to a tight fit when cooled by water as shown

## "Refugee" Industries Settle in Montreal

*MONTREAL, QUE.*

■ Forty-seven new industries have been established in the Montreal area during the past year, according to a survey by the city's industrial and economic bureau. Majority of these are "refugees" from war-torn or threatened Europe, founded by businessmen who have fled to Canada to put capital and special skill to work.

Twelve hundred new jobs have been created by the new plants which cover a variety of manufacturing enterprises.

Largest single development is the Schneider-Creusot armament plant at Sorel, Que., which involved an expenditure of $10,000,000. Other firms recently established or expanding plant capacity in Montreal are spending at least $3,200,000.

Germany is listed as country of origin for 11 of the new industries; Czechoslovakia, 5; Egypt, 1; England, 2; Holland, 1; Poland, 2; Rumania, 1; United States, 3.

New industries of Canadian origin total 19, of which 15 were financed by Montreal capital, three by Ontario capital, and one by Alberta capital. In addition there have been 12 sizeable plant expansions.

# Acetylene Association Reviews Progress at Milwaukee Meeting

■ FORTIETH annual convention of the International Acetylene association, held at Schroeder hotel, Milwaukee, April 10-12, attracted an attendance of 2030 for the first day's sessions. Registration at the close of the second day numbered 564, a figure which was higher than that of last year. The demonstrations and roundtable discussions on the evening of April 10 were particularly popular, with 1267 participating.

Henry Booth, sales manager, Shawinigan Products Corp., New York, was elected president to succeed H. P. Dolisie, managing director, Canadian Liquid Air Co. Ltd., Montreal. Mr. Booth served as vice president during the past year.

E. L. Mills, Bastian-Blessing Co., Chicago, a retiring director, was elected vice president to succeed Mr. Booth. For the ninth time, H. F. Reinhard, Union Carbide Co., New York, was re-elected secretary.

Re-elected also were three directors: C. O. Epperson, National Cylinder Gas Co., Chicago; W. C. Keeley, National Carbide Corp., New York; and H. S. Smith, Union Carbide Co., New York. Retiring President Dolisie was named a director.

**Revising Underwriters' Regulations**

High point of the opening luncheon on April 10 was award of the James Turner Morehead medal for 1939 to Otto C. Voss, advisory superintendent of tank and plate shop, Allis-Chalmers Mfg. Co., Milwaukee, for "continuous pioneering, untiring educational effort, and constructive sponsorship of oxyacetylene process applications."

Secretary Reinhard reported that the two films of the association—"The Prosperity Process" and "Profits of Progress"—were shown at 86 meetings to 6000 individuals during the past year.

Since underwriters' regulations, "Gas Systems for Welding and Cutting," were last revised in 1931, new revisions are now being prepared. The association has co-operated with the bureau of explosives and interstate commerce commission to revise regulations for transportation of explosives and other dangerous articles, including specifications for shipping containers.

Acetylene committee reported completion of revision of: "Sample Pipe Welding Specifications"; "Tests for Selection of Operators of Welding Equipment"; "Design of Jigs for Oxyacetylene Welding"; "Safe Practices for Design and Operation of Oxyacetylene Welding and Cutting Equipment." A new pamphlet is "Flame Hardening by the Oxyacetylene Process"; and another, "Pipe Welding by the Oxyacetylene Process," is being prepared.

Henry Booth

New company memberships include Pressed Steel Tank Co., Milwaukee; and Wall Chemical Co., Detroit. Four new individual memberships were reported.

A report on technical sessions of the convention will be presented in STEEL next week.

## 120 Attend Management Conference at Cleveland

■ More than 120 members and guests attended the spring conference of the Society for the Advancement of Management, Hotel Statler, Cleveland, April 11-12.

Donald B. Gillies, vice president, Republic Steel Corp., Cleveland, speaking at the Thursday dinner meeting on "What Is Ahead of Business in the U.S.A." stated that as things stand today, business is not in a good spot to get back on the right road.

No administration can laugh off the national debt piled up by the New Deal, he pointed out, adding that we still must care for the unemployed and unemployable. To balance the budget will involve continued high taxation, the speaker contended.

No matter what administration is in office, the problem of making present legislation more workable will have to be solved. He said it all comes back to the question of confidence. When business has confidence, business invests money in future possibilities. When business has no confidence, its activities are confined to meeting current requirements.

Regardless of the outcome of the election this fall, business will have to reckon with both the immediate and the long-term effects of the present European conflict.

While what lies ahead of business in this country cannot be foreseen, Mr. Gillies advised, management should settle down to the job of conducting and promoting its own affairs as intensively and efficiently as possible.

Resume of the conference's various sessions will be presented in STEEL next week.

## Electro Manganese Corp. Offers Research Prizes

■ Three $150 prizes will be awarded to under-graduate or graduate students for best papers presenting original fundamental research work on electro manganese and its alloys or compounds by Electro Manganese Corp., Rand Tower, Minneapolis. Research may be in metallurgy, metallography or chemistry.

Subjects of research papers should be submitted to the company as soon as possible that they may be compared and excessive duplication avoided before research has progressed far. Papers must be submitted by midnight Sept. 20, 1940.

Aspirants in the contest will be supplied with electro manganese without charge as long as they employ reasonable quantities.

## March Scrap Exports, Consumption Decline

■ Domestic consumption of iron and steel scrap in March declined to 2,932,000 gross tons from the 3,054,000 tons in February, according to Institute of Scrap Iron & Steel Inc., New York. March, 1939, consumption was 2,634,000 tons. First quarter 1940 consumption totaled 9,761,000 tons, compared with 7,442,000 tons in first quarter and 11,804,000 tons in fourth quarter of 1939.

Scrap exports increased slightly in February to 234,716 tons, but are rapidly falling behind 1939. In first two months of 1940, exports totaled 422,173 tons, according to department of commerce, Washington, compared with 452,797 tons for same period 1939.

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■ Orders received by General Electric Co., Schenectady, N. Y., in the first quarter of 1940 amounted to $97,490,047, compared with $86,882,953 for the corresponding period in 1939, an increase of 12 per cent.

# What's New at Pittsburgh . . .

By R. L. HARTFORD, Pittsburgh Editor, STEEL

■ ALTHOUGH steelworks operations in Pittsburgh have been dropping consistently for several months, there are many indications that the end is in sight and a reversal can be expected. First changes in trend are due this week. New bookings here are gratifyingly large for the first time this year, and mill men hope much capacity which was made ready for production last fall at heavy cost, then ran only a few weeks, again will be called into action. This condition, if it occurs, would have a beneficial effect on financial statements because the money spent last fall took its bite out of fourth quarter statements. Now this capacity can run on an almost equal footing with the more active mills, speaking in terms of cost.

♦

### Pencoyd Plant Inactive

In the official roundup of capacity for Carnegie-Illinois Steel Corp. for 1940, facilities at the Pencoyd plant for the first time are listed as inactive. Plant is one of the oldest in the United States Steel Corp.'s fold. Company officials state there are no plans for dismantling the plant, nor has it been placed on the list of properties for sale.

Plant was built in 1852 by Algernon and Percival Roberts at Pencoyd, Montgomery county, Pennsylvania. Later George Theodore Roberts became a member of the firm, retiring in 1883. Algernon died in 1868, and Percival ran the business under the name of A. & P. Roberts & Co. until 1894, when it was incorporated as The A. & P. Roberts Co. Percival's death in 1898 brought Percival Jr. to the presidency, which he held until 1901 when the United States Steel Corp. took over the plant.

First product was blacksmiths' anvils. Plant soon became a rolling mill, however, turning out axles for railroad cars and locomotives. The axles were hauled to railroad shops in Philadelphia in wagons, which brought back coal for the boilers and scrap for the mill's furnaces.

First capital of the firm was $5000, put up by the brothers Roberts. Algernon was the office manager, and in his journal was kept religiously the activities of the company. His first entry reads, "1852, June, Monday, 21st. Commenced with four carpenters, a boy and three laborers, the first at framing and the others cutting the level of the building. Received part of the Hammer from James Rowland & Co."

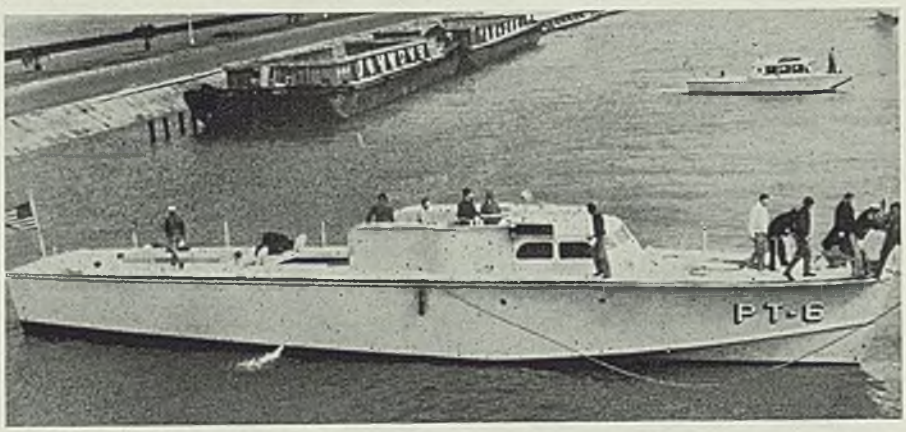
Most important changes in the plant came in 1875. The Roberts brothers read Philadelphia was to stage the Centennial exposition, and that the buildings were to be structural steel. They decided to go after the business. A 23-inch 3-high mill was installed, and structural shapes from this mill went into the exposition buildings. This same mill continued in service for many years, and was still on duty in 1939 when the plant was closed.

Steel from this plant served the country in the Civil war, the Spanish-American war and the World war. It was in the Pencoyd mill that the first electric incandescent lights in the industry appeared, and also before that the first dynamo and arc lights. Here was the first electric motor used in steel mill service. From this plant came the steel for the first Brooklyn elevated railroad, the Chicago elevated, the Metropolitan Life and other famous skyscrapers, and many notable bridges, including the old Niagara Falls span.

Aside from its pioneering in the use of electricity, the plant also pioneered the use of producer gas-fired furnaces, in 1884.

In 1901 the plant was absorbed by U. S. Steel, becoming a part of American Bridge Co. It remained active under this arrangement until 1936, when it became a part of Carnegie-Illinois Steel Corp.

## To Carry Torpedoes at 60 Miles Per Hour




■ First of 23 new torpedo boats built for the United States navy by Electric Boat Co., Groton, Conn., this rakish vessel carried four torpedo tubes, two machine guns and crew at a speed of 45 miles an hour in recent tests. Top speed is expected to be 60 miles an hour. Boat costs $218,000, is powered by three Packard V-12 engines. NEA photo

## Review Denied in NLRB Case Against Republic

■ United States Supreme Court last week refused to review a national labor relations board order directing Republic Steel Corp., Cleveland, to reinstate with back pay certain employes who had not returned to work after the 1937 strike, and calling for disestablishment of independent unions.

Republic officials stated the company started reinstatement of men who had participated in the strike immediately after the strike and has been continuing since. By far the greater number of those who filed applications for reinstatement have returned to work, a company statement said, adding that no serious re-employment problem is involved.

Before company's annual meeting in Jersey City, N. J., April 10, T. M. Girdler, chairman, told stockholders:

"It is not possible without future study to state accurately the amount of back wages the company will be required to pay pursuant to the board's order. It can be said with confidence, however, that the amounts carried in the newspapers last fall were greatly exaggerated; that the amount ultimately paid will not involve any serious financial problem to the corporation. . . .

"In the handling of the labor relations of your company the management has at all times endeavored to comply with the law and to pursue a course which they sincerely believed to be for the best interests of the corporation. They will, of course, accept and abide by the

final decision of the courts in the labor board case.

"However, the fact that such an order could be made by the labor board and sustained by the courts is eloquent evidence of the need for a revision of the Wagner act so as to change its character from an instrumentality of oppression to a vehicle of fair dealing between employers and their employes.

"This decision will have no effect on Republic's $7,500,000 suit now pending against the CIO, the SWOC, and their officers and lodges, for violation of the federal antitrust laws, in connection with the strike. In this suit Republic for the first time will have the opportunity to show the lawless, ruthless and violent tactics pursued by the union, its officers and members in the conduct of the strike, and you may rest assured that Republic intends to prosecute such suit vigorously."

Mr. Girdler also told stockholders he was hopeful earnings during the current year would be better than those of 1939. Currently Republic is taking orders at about 50 per cent of capacity, he said.

Consolidated net profit for the company and its subsidiaries for first quarter, after deduction of all charges, amounted to $3,111,723.

## Hydraulic Press To Build New Plant

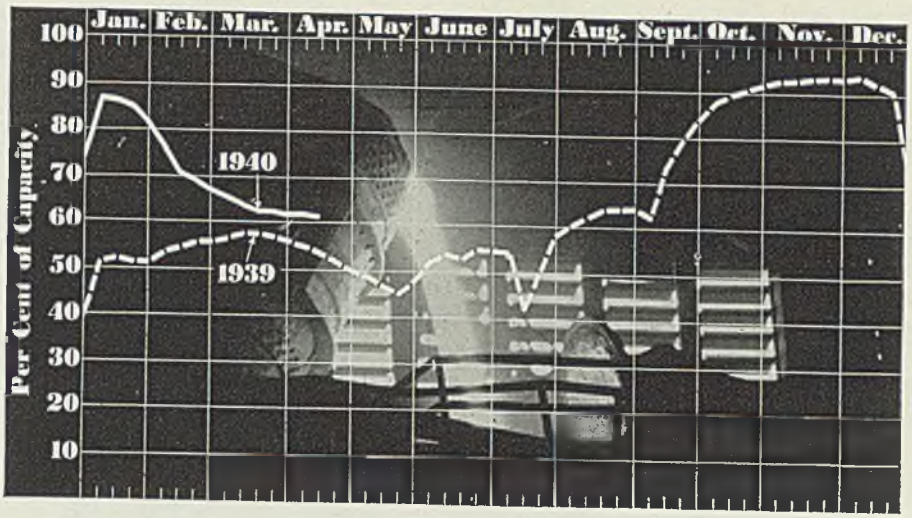
■ Contracts for designing and constructing an integrated modern plant for the Hydraulic Press Mfg. Co., Mt. Gilead, O., have been awarded to the Austin Co., Cleveland. Building and equipment will cost approximately $500,000 and is scheduled for completion in August.

Addition will be devoted exclusively to manufacturing hydraulic presses; present plant will produce hydraulic power and control apparatus used for operating the presses, and other hydraulic products.

Building will be 400 feet long, 50,000 square feet in area, with heavy machine shop and erecting shop aisles served by two 50-ton and two 15-ton cranes. It will be of welded steel construction, will have continuous sash, high-intensity mercury-vapor lighting units and thermostatically controlled unit heaters.

## Machine Tool Builders Activity at New Peak

■ Machine tool builders activity rose to a new peak of 93.4 per cent capacity in March, according to Machine Tool Builders association. February activity was 92.9 per cent, January, 93.3 per cent, being previous peak. March, 1939, activity was at 58.7 per cent capacity.




# PRODUCTION... Down

■ STEELWORKS operations last week declined ½-point to 61 per cent, balancing the rise of the previous week. Three districts showed gains, seven were at a lower rate and two were unchanged. A year ago the rate was 51½ per cent; two years ago it was 32 per cent.

**Chicago**—Increased 1½ points to 59 per cent, three leading producers making gains and two at unchanged schedule.

**Birmingham, Ala.**—Unchanged at 81 per cent, 18 open hearths in production.

**Detroit**—Loss of 2 points to 77 per cent, 21 open hearths in service, one being down several days for repairs.

**New England**—Off 10 points to 55 per cent, two producers shortening schedules.

**Cleveland**—Down 3 points to 65 per cent on curtailment by one producer.

**Cincinnati**—Rose 3 points to 56 per cent, partly to compensate for recent shutdowns for repairs.

**St. Louis**—Slipped 6 points to 45 per cent on reduction at one plant.

**Pittsburgh**—Drop of 4½ points to 53 per cent, with schedule this week indicating a higher rate.

**Wheeling**—Up 12 points to 73 per cent, which probably will hold for this week.

**Central eastern seaboard**—Decline of 2 points to 57 per cent.

**Buffalo**—Reduction of 2½ points to 44 per cent as Bethlehem Steel Co. took off one open hearth.

**Youngstown, O.**—Continued at 42 per cent with 37 open hearths and three bessemers in production. Schedule for this week shows no change. Struthers Iron & Steel Co. has blown in its blast furnace, making 13 active in this district.

### District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

| | Week ended Apr. 13 | Change | Same week 1939 | Same week 1938 |
|---|---|---|---|---|
| Pittsburgh | 53 | — 4.5 | 45 | 30 |
| Chicago | 59 | + 1.5 | 53.5 | 30 |
| Eastern Pa. | 57 | — 2 | 40 | 28 |
| Youngstown | 42 | None | 43 | 31 |
| Wheeling | 73 | +12 | 65 | 31 |
| Cleveland | 65 | — 3 | 39.5 | 23 |
| Buffalo | 44 | — 2.5 | 44.5 | 28 |
| Birmingham | 81 | None | 60 | 66 |
| New England | 55 | —10 | 35 | 30 |
| Cincinnati | 56 | + 3 | 51 | 18 |
| St. Louis | 45 | — 6 | 44.5 | 42.4 |
| Detroit | 77 | — 2 | 59 | 18 |
| Average | 61 | — 0.5 | 51.5 | 32 |

## McKee To Build New Stack For Carnegie-Illinois

■ Arthur G. McKee & Co., Cleveland, engineers and contractors have been awarded contract by Carnegie-Illinois Steel Corp. for the design, fabrication and construction of a new blast furnace, together with a new cast house, gas mains, gas cleaning equipment and certain other accessory equipment, to replace the corporation's present No. 3 blast furnace at its Carrie Furnace plant, Rankin, Pa.

## Shipbuilding Active

■ Shipbuilding activity gained during March, according to the American Bureau of Shipping, New York. According to its classification, 256 vessels aggregating 1,269,375 gross tons were under construction April 1, compared with 249 ships aggregating 1,179,240 gross tons on March 1, and 165 vessels aggregating 678,750 gross tons on April 1, 1939. Added to the list during March were 31 ships with a total of 154,470 gross tons.

# MEN of INDUSTRY

■ FREDERICK R. SCHAEFER, heretofore general manager, Niles Steel Products division of Republic Steel Corp., has been elected general manager of pressed steel operations of Republic and its subsidiaries. He will have jurisdiction of the Niles division, Superior division at Elyria, O., and will also serve as general manager, Pressed Steel division of Truscon Steel Co., Cleveland, the position previously held by Harry Woodhead, who has resigned to become president of Aviation Mfg. Corp., New York.

A graduate of the University of Michigan and the Lewis Institute of Technology, Mr. Schaefer was sales manager, Hydraulic Pressed Steel Co. from 1922 to 1929, when it became part of Truscon. At that time he joined Niles Steel Products Co., where he became vice president and general manager in 1935. This company was acquired by Republic in 1937. Mr. Schaefer is a member, American Society of Mechanical Engineers.

♦

Hugh Gibson has been appointed general superintendent in charge of all operations of the tin plate division of McKeesport Tin Plate Co., McKeesport, Pa. He has been with the company since 1927.

♦

Harry N. Hayes, associated with Coffing Hoist Co., Danville, Ill., a number of years, during which time he served as district sales manager in various territories, has been appointed general sales manager.

♦

Earl E. Thulin has been appointed vice president and general manager of sales, Duff-Norton Mfg. Co., Pittsburgh, maker of lifting jacks. For the present, Mr. Thulin will be located in the Peoples Gas building, Chicago, and later will be transferred to Pittsburgh. C. N. Thulin continues in Chicago as vice president and will act in a sales executive capacity as a special representative in all territories. W. I. Floyd has been named assistant general manager of sales, in addition to his duties as assistant to the president, with headquarters in Pittsburgh.

Frederick R. Schaefer

♦

Roland Whitehurst, the past 20 years manager, Washington branch, Electric Storage Battery Co., Philadelphia, has been appointed assistant general sales manager, with headquarters in Philadelphia. J. A. Klingensmith succeeds Mr. Whitehurst as manager of Washington branch.

♦

Russell M. Allen, heretofore assistant to the president, Allegheny Ludlum Steel Corp., Pittsburgh, has been elected general manager of sales. He joined Allegheny Steel Co. as a laborer at the close of the World war; was made a clerk in the Pittsburgh sales department in 1921, and the following year was transferred to Detroit. In October, 1925, he was transferred to Chicago as district manager of western territory, returning to Pittsburgh as assistant general sales manager in 1934. Following the merger of Allegheny Steel Co. and Ludlum Steel Co., Mr. Allen was made assistant to the president.

♦

W. J. Harradine has been named vice president, general manager and a director of the recently reorganized Keystone Driller Co., Beaver Falls, Pa. Mr. Harradine was a former executive of the company but during the reorganization period was associated with the Buckeye Traction Ditcher Co., in charge of the Washington office.

♦

Henry J. Fischbeck, the past ten years chief metallurgist for Pratt & Whitney Aircraft division of United Aircraft Corp., East Hartford, Conn., has been promoted to process engineer. He joined Pratt & Whitney Aircraft in 1929 to organize the metallurgical and heat treating department.

♦

Harry Woodhead, the past 13 years vice president and general manager, Cleveland plant of Truscon Steel Co., a subsidiary of Republic Steel Corp., has been elected president, Aviation Mfg. Corp., New York. He succeeds W. H. Beal, who has resigned due to ill health. Born and educated in Bradford, England, Mr. Woodhead came to the United States in 1909 and in 1913 became superintendent, Sarnia, Canada,

Earl E. Thulin

Russell M. Allen

Harry Woodhead

plant of Cleveland Metal Products Co. From 1916 to 1920, he was works manager, Parish & Bingham Corp., Cleveland, following which he became vice president, Federal Pressed Steel Co., Milwaukee; general works manager, A. O. Smith Co., Milwaukee; and vice president, Midland Steel Products Co., Cleveland. In 1928 Mr. Woodhead reorganized Hydraulic Pressed Steel Co., which then became Truscon Steel Co., pressed steel division. He continued his duties as vice president and general manager of Truscon when it became a subsidiary of Republic in 1935.

♦

Wallace L. Pond has been appointed director of sales, and William W. Anderson has been named sales manager, Nicholson File Co., Providence, R. I. Mr. Pond has been with the company since 1895 and for many years has served as domestic sales manager. He will continue to head the sales organization and will spend much of his

William W. Anderson

time in study of general sales problems and sales research. Mr. Anderson has been with Nicholson since 1919, spending most of that time with the company's Canadian branch. The past five years he has served as sales manager for the Dominion of Canada. Mr. Anderson will now assume active supervision of all sales representatives and will devote much of his time in the field in company with salesmen and service engineers.

♦

R. M. Paxton Jr. has been appointed manager of the new export office established by Jessop Steel Co., Washington, Pa., at 2 Rector street, New York. Mr. Paxton will remain in charge of domestic business at the same address.

♦

Col. H. W. Alden, since 1922 chairman of the board, Timken-Detroit Axle Co., Detroit, resigned at the annual stockholders meeting last week. He will, however, continue as a director in charge of engineering. Colonel Alden has been succeeded by Willard F. Rockwell. Walter F. Rockwell was elected president; S. W. Warner, secretary and controller, and Ralph H. Trese, a vice president. Officers re-elected are: Vice presidents, R. J. Goldie, R. L. Busse, and L. Ray Buckendale; treasurer, A. I. Hawkins; assistant secretary and assistant treasurer, C. A. Cooper.

Wallace L. Pond

♦

Hugh A. Galt has retired as vice president, Pittsburgh Plate Glass Co., Pittsburgh, after more than 40 years of service with the company and its affiliates. He will, however, continue as a director. He has also resigned as president of Southern Alkali Corp. and Columbia Alkali Corp., subsidiaries of Pittsburgh Plate Glass, and as general manager, Columbia Chemical division, Columbia Cement plant of Pittsburgh Plate Glass.

♦

Ernest E. Swartswelter, Youngstown broker, was elected chairman and president, Aetna Standard Engineering Co., Youngstown, O., at a recent stockholders' meeting which reorganized the roster of officers and directors. He succeeds Jerome R. George. Officers re-elected are: Vice president, C. G. Ohlson; secretary-treasurer, L. L. Dalbey; assistant secretary and assistant treasurer, J. J. Guy. Directors retained on the new board are: Messrs. Swartswelter and Dalbey, E. D. Hopper, and T. Lamer, Jackson. New directors include: Mr. Ohlson, Charles F. Smith, Fred Tod, and William F. Thompson and M. A. Friend, both of New York.

R. M. Paxton Jr.

♦

Frank A. Garvey, formerly assistant superintendent, Union Drawn division, Republic Steel Corp., Massillon, O., has been promoted to superintendent, and Walter C. Gumpf, former assistant service manager, has become assistant superintendent. Mr. Garvey joined Union Drawn in 1936, after having served as an industrial engineer and production executive in both the automotive and machine tool industries 15 years. Mr. Gumpf has been with Union Drawn 28 years, and from 1912 to 1919 was associated with the Beaver Falls, Pa., plant. Harry L. Williams has been promoted from the planning department to assistant service manager, succeeding Mr. Gumpf.

# Died:

■ W. R. ADAMS, president, J. D. Adams Mfg. Co., Indianapolis, April 5 in Los Angeles, while on a brief vacation. Well known in the road machinery industry, Mr. Adams had been active in the development and management of the company since graduation from Purdue university in 1910. He succeeded to the presidency in March, 1938, when his brother, Roy E. Adams, became chairman of the board.

♦

William C. F. Zimmerman, 87, founder and vice president, Zimmerman Steel Co., Bettendorf, Iowa, in that city, March 26.

♦

Charles R. Brothwell, 56, president and general manager, Russell Jennings Mfg. Co., Chester, Conn., maker of auger bits, April 7 in Middletown, Conn.

♦

A. Whiton Vennema, 53, mechanical superintendent, Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J., March 23 in Ridgewood, N. J.

♦

W. H. Meyst, representative in the Chicago territory for Otis Steel Co., Cleveland, in Chicago, recently. He had represented Otis for over 25 years.

♦

Henry M. Chase, 70, for 40 years engineer at Holyoke, Mass., works of Worthington Pump & Machinery Corp., Harrison, N. J., April 6 in Holyoke.

# Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

*WASHINGTON*

■ RESOLUTION has been introduced in the house by Representative Treadway, Massachusetts, ranking Republican member, ways and means committee, for creation of a special committee representing both congress and general public. Committee would formulate and recommend to congress "a permanent tariff and foreign trade program along certain specified lines, to be administered by an independent government agency in compliance with clearly defined instructions from congress."

"It is our thought that such agency," stated Mr. Treadway on introducing his resolution, "should take over tariff and foreign trade functions now exercised by the tariff commission and state department and become administrative agent of congress in carrying out the joint resolution's declared purpose of 'promoting the greatest possible trade with foreign nations,' while at the same time protecting domestic producers 'from unfair foreign competition in the home market'."

Joint resolution provides proposed investigating committee be composed of five senators, selected by senate president; five representatives, selected by speaker of the house; and five members selected by President to represent affected interests, including agriculture, labor, industry and consumers. Committee would be directed to report its recommendations to congress not later than Jan. 15, 1941. Recommendations would be expected to conform with broad policies laid down in the joint resolution.

### HULL REPORTED PLANNING TRADE AGREEMENT REVISIONS

With foreign trade agreements act extended three years from June 12, Secretary of State Hull is planning further trade development program.

State department officials, in charge of trade agreement developments, feel that now congress has extended the act they are free to take up the extraordinary commercial situation created by the war.

It is reported Secretary Hull is planning to complete a new trade agreement with Chile, held up because of the congressional situation, and to revise present agreement with Belgium. Department is also said to be planning extensive revision in many present agreements.

Some action regarding trade agreements with Great Britain and France also seems probable. Both these countries, while buying much more since war began, have discontinued altogether to import certain products. Consequently tariff concessions granted on such products by Great Britain and France are rendered useless. State department, however, has not as yet issued any official statement concerning the matter.

### ALLIES REPORTED READY TO SIGN NEW AIRCRAFT ORDERS

Allied governments' new contracts for 2300 to 3300 Curtiss, Lockheed and Bell pursuit planes were reported, last Friday, ready for immediate signature. Orders, based on individual estimated values placed on type of planes to be ordered, will total between $193,000,000 and $254,000,000, are expected to call for delivery within 12 to 18 months.

Final authorization for the sale had been withheld by Secretary of the Treasury Morgenthau until the Allied governments agreed to pay part of development costs, such as retooling aircraft plants, on still newer planes which United States will buy. With Allied mission's agreement to those terms, war department is permitting manufacturers to sell to the Allies planes originally ordered by the army.

War department and the three companies have completed negotiations on "changeover" contracts. United States air corps, according to the agreement, will receive improved models to replace ships released for Allied governments.

Belief here is that permission has already been granted companies to export, respectively, Curtiss P-40D pursuit, Lockheed P-38 interceptor pursuit and Bell P-39 pursuit planes. Part of Lockheed's business, it is reported, will be for an improved model of light bombing plane sold to Great Britain last year.

France and Great Britain, it is understood, are seeking purchase of 1000 to 1800 Curtiss planes, with valuation estimates ranging from $65,000,000 to $117,000,000; about 300 Bell aircraft, valued at between $18,000,000 and $27,000,000; and approximately 1200 Lockheed planes valued at nearly $110,000,000.

First orders, however, may cover only a fraction of these totals. With aircraft industry hesitating to undertake large-scale expansion it seems likely the Allies will prefer to place contracts for whatever output can be rapidly delivered. Such action, furthermore, would retain possibility of securing still later model planes on repeat contracts.

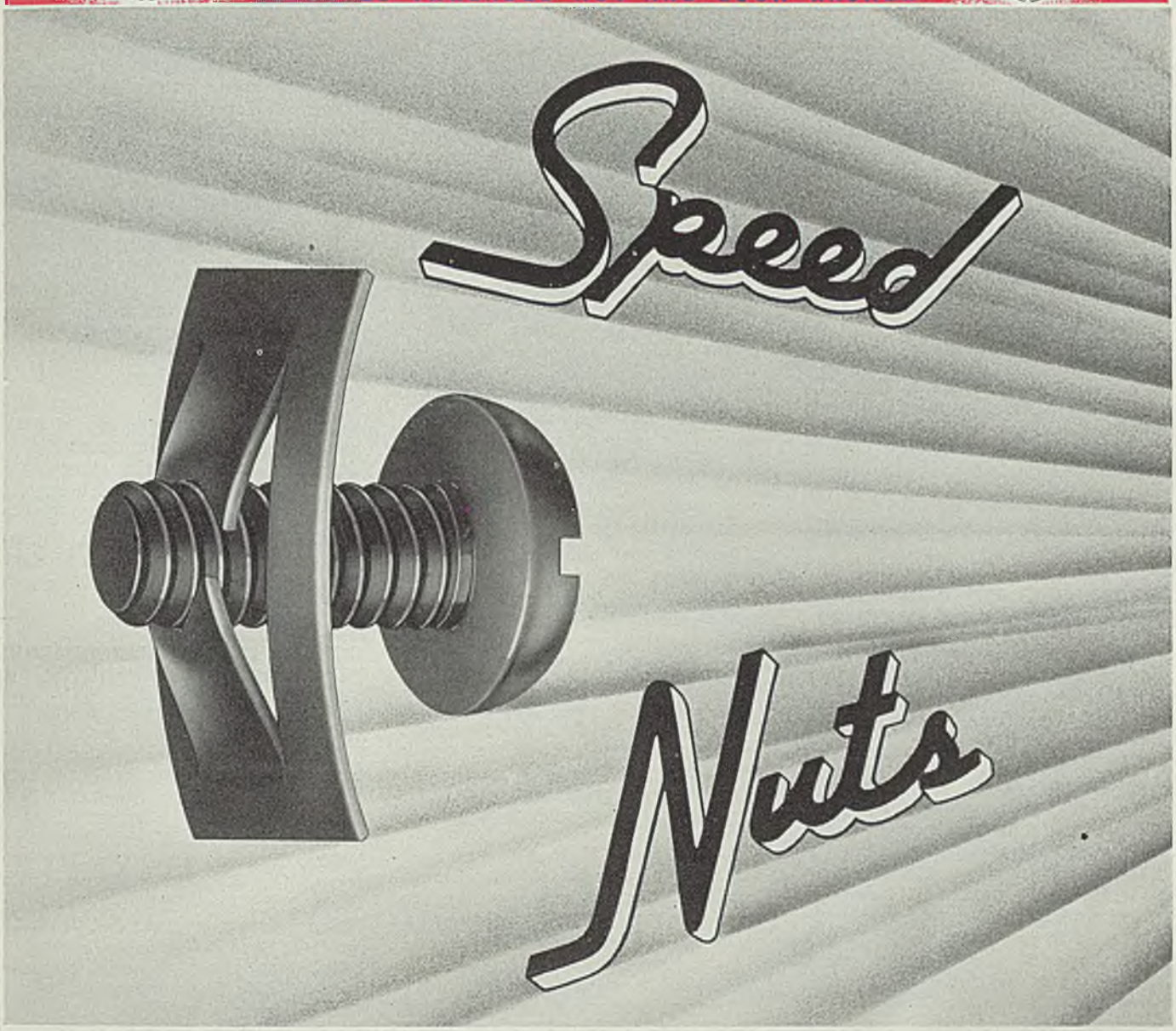
All three models of pursuit ships authorized for sale to France and Britain are designed for the Allison engine, made by Allison Engineering division of General Motors. Engine production capacity, it is understood, will be doubled through utilization of Cadillac plant for parts making, Allison plant for assembly.

### TATA EXPANDS CAPACITY FOR STEEL PRODUCTION

Operations of Tata Iron & Steel Co., India's leading iron and steel producer, will be expanded greatly, particularly in facilities for production of materials required by the army and national railroad systems, according to a re-

Speed Nut System

REPLACES THREADED NUT AND LOCK WASHER

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port from Trade Commisioner Barry T. Benson, Calcutta.

Tata's total pig iron capacity is reported at 1,250,000 tons annually. The company is now installing and equipping a plant for the manufacture of wheels, axles and tires, to permit large-scale manufacture of locomotives in India and production of all types of railroad rolling stock. This plant probably will begin operations within the next 18 months. Plans are completed for installation of a mill to roll billets suitable for several types of small and medium forgings, an ingot mold foundry to increase output of castings, and a plant for extraction of benzol and toluol from coke oven gases.

Estimates Jan. 1 placed Tata's output of steel ingots during the fiscal year ended March 31, 1940, at 1,000,000 tons and of finished steel at 750,000 tons. When the extension program now being carried out is completed the company's output will reach a new record figure of around 1,250,000 tons of steel ingots and 900,000 tons of finished steel.

## BILL LIMITS IMPORTS OF MATERIALS UNDER PATENT

House of representatives last week passed H. R. 8285, a bill in which the steel industry has shown interest, dealing with unfair mining trade practices.

The bill has to do with importation of articles on which there is a patent, in competition with products manufactured in the United States. The bill as it reached the floor dealt merely with minerals processed by the use of the flotation process. However, it was amended to include all articles and products and as it finally passed the house is as follows:

"That it shall be deemed an unfair trade practice and in violation of the right of the patentee to import for use, sale, or exchange any article, mineral, or product produced, processed, or mined by use of any process covered by the claims of any outstanding United States letters patent, or to import for use, sale, or exchange any article, mineral, or product which infringes the right of any patentee under letters patent so issued, except where such articles are produced, processed, mined, or imported under authority of the owner of such process or patent."

## INVENTORY INCREASE SLOWER IN FEBRUARY

Manufacturers' inventories increased less than 1 per cent in value during February, compared with 2.2 per cent rise in January, and 2.8 and 2.7 per cent increases reported in November and December, 1939, respectively, according to the department of commerce.

It is pointed out corporations reported inventory holdings March 1 amounting to $3,700,000,000, or one-third of estimated total inventories of all manufacturing concerns in the United States.

Estimates based on the monthly industry survey data show that during the latter half of 1939 manufacturers increased the value of inventory holdings by about $900,000,000. Two-thirds of this increase occurred during November and December, when the volume of production was unusually high. Value of manufacturers' holdings was further increased during January by about $250,000,000, and during February of this year by somewhat less than $100,000,000.

Data for November and December, 1939, which showed declines in orders, as well as a large increase in inventories, foreshadowed the rapid contraction in the volume of manufacturing production which began at the year-end.

New orders were less in February than in January in most industries, with the aggregate reported, comprising chiefly durable goods lines, down about 4 per cent. Since incoming business failed to equal volume of shipments, there was a further shrinkage of about 5 per cent in total value of unfilled orders March 1.

## MOVES TO END TRADE AGREEMENT WITH RUSSIA

A resolution (H. R. 453) has been introduced by Representative Scrugham, Nevada, calling attention to the fact that the commercial agreement between the United States and Russia expires Aug. 6.

Resolution provides that "in order to protect producers in the United States operating under the competitive system and paying American wages, no agreement shall be entered into or renewed with the Union of Soviet Socialist Republics which extends to that nation reductions in duties granted other nations, through reciprocal trade agreements entered into with nations other than the Union of Soviet Socialist Republics."

The manganese and several other industries expressed much interest in it.

## CONSUMER PROFITS MOST FROM EFFICIENT METHODS

Brookings Institution, Washington, last week made public a study of productivity in relation to distribution of income, in major divisions of American industry accounting for approximately 75 per cent of industrial wages and employment.

The study shows that consumers have received large benefits from increases in productive efficiency since about 1920. Labor received higher hourly wages, but, in consequence of shortened hours and unemployment, aggregate wages did not increase; such gains as labor in general received were thus in the form of lower prices and greater leisure. Return on invested capital declined.

In the iron and steel industry, the study said, "productivity increased 56 per cent, but volume of production increased by less than one-third as much, resulting in substantial reduction in the number of hours of employment. Notwithstanding a large reduction in the length of the working week, there was a slight decrease in the number of wage earners employed.

"Because of the failure of production to be maintained, capital realized no gains from increasing productivity, and labor's chief gain was in the form of greater leisure.

"The consuming public benefited from increased productivity, obtaining about 30 per cent more product for the same money than was formerly the case."

## GOVERNMENT WALSH-HEALEY PURCHASES TOTAL $1,282,271

During the week ended March 30, the government purchased $1,282,271.55 worth of iron and steel products under the Walsh-Healey act as follows: Bethlehem Steel Co., San Francico, $11,500; United States Steel Export Co., Washington, $18,593.93; Truscon Steel Co., Youngstown, O., $26,185.50; Edward G. Budd Mfg. Co., Philadelphia, $10,886.14; Keystone Steel & Wire Co., Peoria, Ill., $115,500 (estimated); Bethlehem Steel Co., Bethlehem, Pa., $29,952; Bethlehem Steel Co., San Francisco, $48,300; Columbia Steel Co., San Francisco, $37,900; Judson Steel Corp., Oakland, Calif., $10,495.87; Midvale Co., Nicetown, Philadelphia, $308,697.08; Erie Forge Co., Erie, Pa.. $54,575.10; Erie Forge Co., Erie, Pa., $72,766.80; Ellicott Machine Corp., Baltimore, $14,340; Wm. Scrimgeour, Washington, $76,284.91; Eastern Rolling Mill Co., Baltimore, $13,860; Western Can Co. (MJB Co owner), San Francisco, $11,681.53; Pittsburgh Screw & Bolt Corp., Pittsburgh, $31,514.97; Yale & Towne Mfg. Co., Stamford, Conn., $11,547.35; Lukens Steel Co., Coatesville, Pa., $46,637.40; Standard Machinery Co., Providence, R. I., $60,356; Gilbert & Barker Mfg. Co., Springfield, Mass., $12,814.80; John Wood Mfg. Co. Inc., Conshohocken, Pa., $168,431.20; Bethlehem Steel Co., Bethlehem, Pa., $19,971; Walworth Co., New York, $23,799.46; Bethlehem Steel Co., Boston, $22,729.30; and Ross Galvanizing Works Inc., Brooklyn, N. Y., $23,401.21.

# AVIATION

### WESTERN PLANEMAKERS TO STANDARDIZE MATERIALS

■ TO REDUCE costs, eliminate confusion in manufacture and assembly of aircraft, standardize tools and simplify repairs, standards engineers of major west coast planemakers are co-operating to standardize basic aircraft materials.

Known as the Western Aircraft Standards committee, the group contemplates standardization of such parts as cable-end bearings, ventilating ducts, universal joints, screws and steel tubing sections. The committee also is trying to work out a code identifying colors on cable wrappings and another on dimensions and specifications for standardized stainless steel sheets and plates.

Already standardized by the committee are de-icer manifolds and countersunk head rivets with 100-degree heads. Heretofore planemakers had used rivets with angle of head from 80 to 120 degrees and of radically different lengths and thicknesses.

Edward J. Kasnicka, Lockheed Aircraft Corp., Burbank, Calif., is committee chairman.

That stainless steel will be supplanted in warplanes by the less expensive low-alloy high yield-strength steels is unlikely, according to a leading maker of warplanes whose principal application of stainless steel is in the power plant where extremely high temperatures are encountered. Low-alloy steels would not be suitable for such service, he says, even for short periods because of their tendency to lose strength and scale at high temperatures. Furthermore, saving in cost of material would be too small a percentage of total cost to justify replacement of stainless steel.

To prevent contamination of zinc used in making dies and to lengthen life of pots in which zinc is melted, Glenn L. Martin Co., Baltimore, has developed and patented a double-pot zinc melter.

Lead is melted in one pot and a second pot holding the zinc is immersed in the molten lead. More even distribution of heat on surface of zinc pot is said to eliminate concentrations of heat, alloying of zinc with steel of pot and consequent erosion of pot. Further savings are claimed because less expensive steel can be used as pot material.

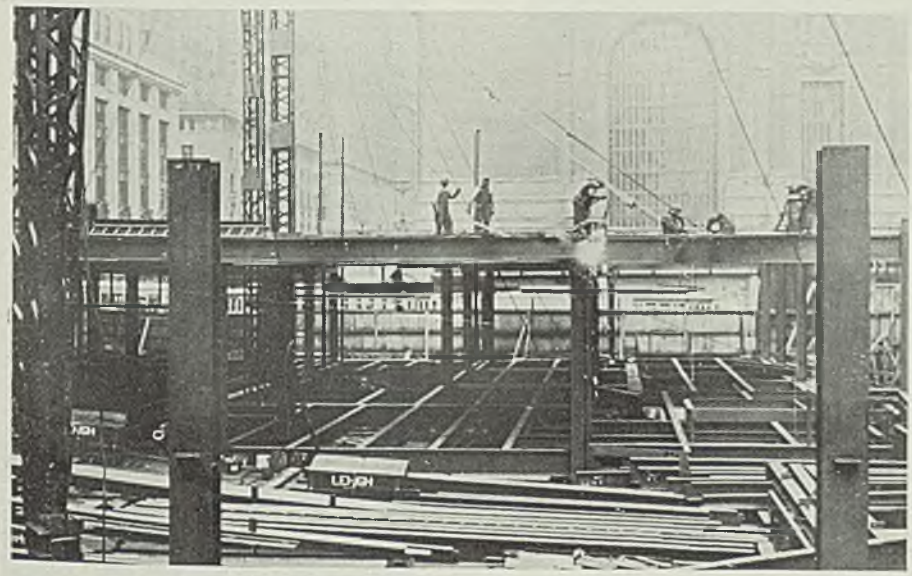
#### Buys Propeller Plant

Last week Hayes Mfg. Corp., Grand Rapids, Mich., bought outstanding capital stock of McCauley Steel Propeller Co., Dayton, O., including license from Ernest G. McCauley, to manufacture in this country and certain foreign countries the McCauley steel propeller, standard on United States army air corps training planes.

John W. Young, president, Hayes Mfg. Corp., says the McCauley unit will be operated as a wholly owned subsidiary with production continuing at Dayton. Additional equipment will be installed to at least treble present capacity inasmuch as a survey of the aircraft industry has disclosed a bottleneck in propellers.

United States war department awarded Boeing Airplane Co., Seattle, an $8,000,000 order for about 50 Flying Fortresses B-17D.

## All-Welded Airline Terminal Uses 70-Foot Trusses



■ An all-welded six-story union air lines terminal is being constructed at Forty-second street and Park avenue, New York, by Bethlehem Engineering Corp., New York. Because there are no supporting columns on first floor, 70-foot 30-ton all-welded trusses and 50-foot 6-ton spans are used. Total steel is 1365 tons. Erection and welding is by Lehigh Construction Co., New York. Photo courtesy Wilson Welder & Metals Co., 60 East Forty-second street, New York

## Warehouse Chapters Elect New Officers

■ American Steel Warehouse association chapters have elected officers as follows, according to W. S. Doxsey, executive secretary, 442 Terminal Tower, Cleveland:

Missouri Valley: President, Arthur W. Williams, Drake-Williams-Mount Co. Inc., Omaha, Nebr.; vice presidents, G. E. Heimovics, Milcor Steel Co., Kansas City, Mo., and E. Anderson, Henry & Robinson Hardware Co., Omaha; secretary-treasurer, F. L. Evans, Steel Mfg. & Warehouse Co., Kansas City, Mo. Mr. Williams will also serve as national director.

Northwest: President, L. H. Williams, Williams Hardware Co., Minneapolis; vice president, Joseph Paper, Paper, Calmenson & Co., St. Paul; secretary, Winter Dean, Nicols, Dean & Gregg, St. Paul. Mr. Williams will also serve as national director.

Northern Ohio: President, F. W. Krebs, Super Steels Inc,; vice president, W. O. Kurtz, Peninsular Steel Co.; secretary-treasurer, R. M. Beutel, Paterson-Leitch Co.; national director, F. A. Michell, S.A.E. Steels, all of Cleveland.

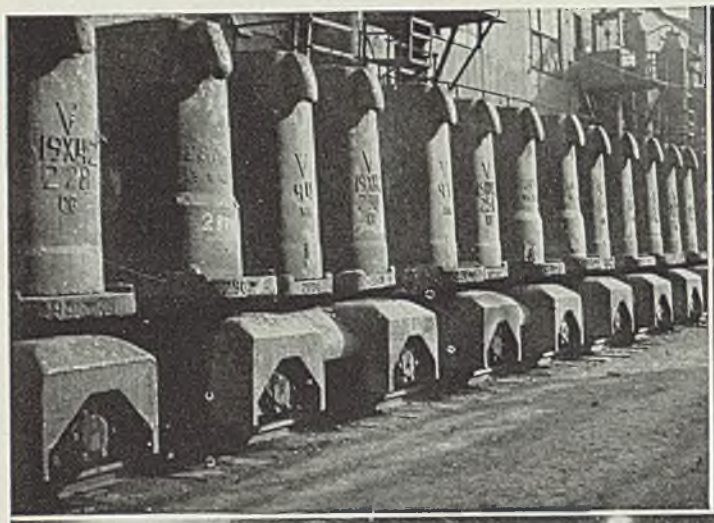
Northern California: President, J. R. Winzeler, Federal Pipe & Supply Co.; first vice president, H. E. Oliphant, Tay-Holbrook Inc.; second vice president, Ralph Petillon, Ducommun Metals & Supply Co.; secretary, R. D. Cortelyou, all of San Francisco. Mr. Winzeler will also serve as national director.

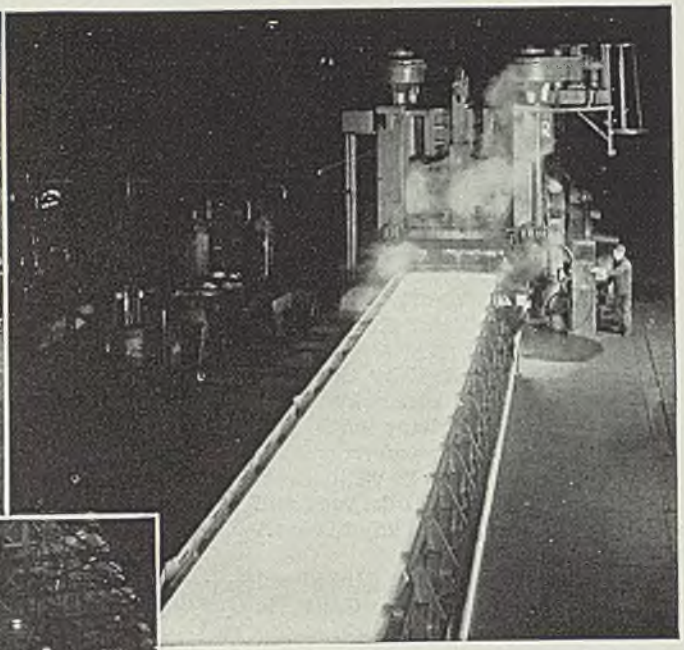
## First Quarter Gear Sales 25.6 Per Cent Over 1939

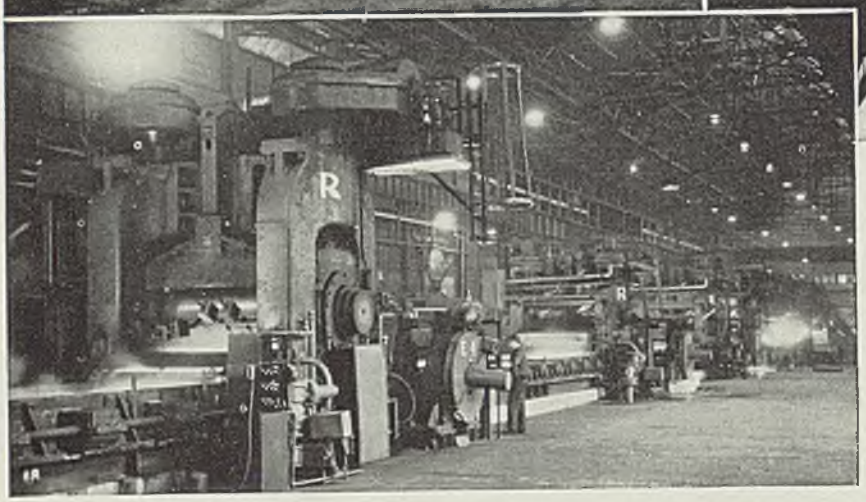
■ March gear sales were slightly less than 2 per cent under February, but were 9.6 per cent above March, 1939, according to American Gear Manufacturers association, Wilkinsburg, Pa. Sales for first quarter this year were 25.6 per cent above the corresponding period in 1939. Comparative index figures:

| | 1940 | 1939 |
|---|---|---|
| January | 123 | 91 |
| February | 116 | 86 |
| March | 114 | 104 |

# *Proudly we point to the Extensive*
# HYATT ROLLER BEARING
## *Applications in Steel Mill Service Like This*





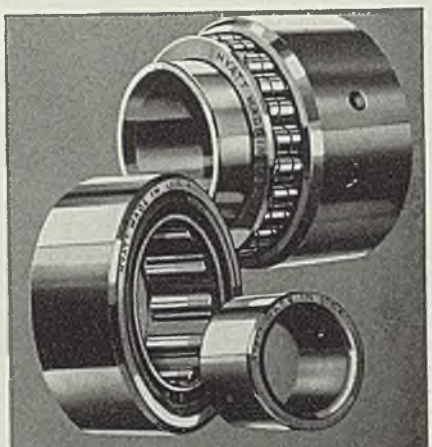


These views, taken in a recently built addition to a prominent rolling mill, show but part of the equipment in which Hyatt Roller Bearings are serving and saving, day in and out.

In the recently completed modernization of this great plant Hyatt Roller Bearings were extensively used. All through the mill Hyatts are employed . . . in the cranes, mill motors, ingot cars, charging cars, and on the tables of the new blooming mill and strip mill.

But proud as we are of these new Hyatt installations, we particularly like to call attention to the fact that years ago this was one of the first plants to completely Hyatt equip all their overhead traveling cranes.

And we like to feel that the splendid performance, the time and money saving these original bearings rendered, have made their continued and greater use possible here, just as they have done in so many other leading mills throughout the country. Where can we serve you? Hyatt Bearings Division, General Motors Sales Corporation, Harrison, N. J., Chicago, Detroit, Pittsburgh, San Francisco.



**HYATT**
**ROLLER**
**BEARINGS**

# Mirrors of MOTORDOM

By A. H. ALLEN
Detroit Editor, STEEL

*DETROIT*

■ METALLURGY and engineering design are blood brothers in the manufacture of motor cars. For proof one has only to note the evolution of various car parts and the types of steel they involve. Unfortunately for the metallurgist, he has been called upon too often to supply a steel which will perform satisfactorily in a part which may be deficient in respect to design. By dint of hard work and co-operation with steel mills, the metallurgist usually has been able to meet designers' demands, but his inability to be a salesman as well as a technical expert, plus his usual low rating in importance with "brass hats," have complicated his problems tremendously.

A large share of the metallurgist's time in recent years has been spent in connection with alloy steels, attempting to meet the constant demands for less costly materials which will perform equally well. Today the use of alloy steels for passenger cars has been pretty well stabilized and there is less avidity to change from one analysis to another without the benefit of a thorough research program, extending perhaps over several years.

For one thing, any production tie-up resulting from a change in steel analysis might more than outweigh the savings possible through the change. Again, even the comprehensive laboratory and road testing program may involve a cost which would overbalance savings made through reduction in an alloy extra.

It was, of course, not always this way. Consider, for example, a manufacturer making 25,000 sets of transmission gears a week, each set weighing perhaps 50 pounds. That is roughly 5,000,000 pounds of steel a month for gears. Suppose that tests had proved that a switch to a new steel analysis could save 65 cents per 100 pounds on alloy extra charges, not an unreasonable figure in the light of what actually has been done. There is a cold cash saving of $32,500 per month, or roughly $325,000 in a model year, a tidy sum as far as steel cost alone is concerned.

Because there has been a fairly general appreciation and realization of the savings possible by changing to steels with lower alloy content in passenger car parts over the past five or six years, the opportunities for further progress in this direction are becoming slimmer, the margin for savings narrower. However, along with the adoption of lower-alloy steels has come improvement in manufacturing processes—machine tools, heat treating furnaces and the like—resulting in far greater accuracy of manufactured parts. In turn, a lower factor of safety or "factor of ignorance" as it is sometimes called has been possible, with resulting reduction in weight of parts and finally less steel needed.

The plain carbon steels have supplanted alloy steels in many automotive applications—propeller shafts, pump shafts, nearly all steel parts in engines except studs and bolts, for example. Alloys still are used in front end suspensions, coil and leaf springs, transmission gears, ring gears and pinions.

In transmission gears, as well as

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## U. S. Army Tests Dodge Trucks

■ Up a steep six-foot bank without losing speed is only one of the tests undergone by this 1½-ton Dodge truck, one of 10,786 recently purchased from Chrysler Corp., Detroit, by United States army. Heavy trucks must climb a 60 per cent grade in low gear with a 3000-pound load, and a 3.5 per cent grade in high gear, same load, plus 4000-pound towing load. Trucks have four-wheel drives and can maintain a top speed of 45 miles per hour

in rear axle gears, there has been a shift from the nickel steels to the less expensive manganese steels, of the S.A.E. T-1350 and T-1320 types. Buick, Olds and Pontiac are using this gear steel, and Packard is using an even less expensive manganese steel for gears, with no apparent sacrifice in performance. Chevrolet and Ford use straight-chromium steels for transmissions, the former continuing with S. A. E. 4615 in ring gears and pinions.

Most of the so-called independents, buying transmissions on the outside, currently are using nickel-molybdenum steel. Chrysler, as is well known, has adopted various grades of Amola steels (different carbon contents principally) to replace former higher alloy types, in gears, springs and other parts.

The quest for cleaner steels and for controlled grain size has of course gone beyond the limits of a mere search and these factors have come to be basic elements of steel specifications. Steel mills, with only slight urging from their best customer, have kept constant watch of their own production methods, to the extent that the carbon steel of today probably is as good if not better in performance than the high-alloy steels of 15 years ago.

### Adaptability May Select Steels

Fifteen years from now, when overhauling and modernization of alloy steel pricing methods probably will have occurred, the auto industry will have seen dissipated the incentive to keep whittling away at alloy content and will select steel on the basis of pure adaptability for the job to be done, with cost only an incidental factor. This is meant as no indictment of present pricing methods, but evolution is certain to come, and alloy steel prices today admittedly are not on the basis solely of cost of the alloy material in the analysis.

A. B. Kinzel of Union Carbide & Carbon Research Laboratories gave one of his usual illuminating discussions of alloys in steel here last week before the local chapter of the American Society for Metals. His audience included about 200 metallurgists and engineers of this district. He grouped alloying elements under three general classifications —carbide-forming and deoxidizing elements in the "ferrite former" group, and a group of four "austenite formers." Chromium, molybdenum, vanadium, tungsten, titanium and columbium are included in the first classification; silicon, aluminum, calcium and zirconium the deoxidizers, and manganese, nickel, copper and cobalt the austenite-stabilizing elements.

This must not be considered a hard and fast segregation, as various elements exert dual effects in instances. The problem, in compounding a suitable alloy steel for a specific purpose, is to get a balance between the various alloy effects by controlling their proportions. Of equal importance is the steelmaking technique, including such factors as deoxidation and cleanliness.

On the matter of cleanliness, Mr. Kinzel pointed out the difficulties of producing a steel which is entirely free of inclusions, and said the trend these days is to make a steel in which the type, size and distribution of inclusions are known and controlled. Some armament steel currently is being purchased with definite inclusion data specified, because of the improved shock resistance effected by proper type of inclusions.

He cited trends toward less costly alloy steels, already mentioned.

Mr. Kinzel examined briefly the high-alloy types of steel, including stainless, and foresaw an important future for a new type of stainless steel with 18 chromium, 11 nickel, 2-2.5 molybdenum, 2.5 manganese, 0.70 columbium and 0.07 per cent carbon. This material is stabilized against intergranular corrosion after welding and is relatively immune to chloride pitting in corrosive atmospheres.

■ SPEAKING before the local chapter of the Society of Automotive Engineers, S. O. White, director of engineering for the Warner Gear division of the Borg-Warner Corp., outlined his conceptions of the desirable characteristics of an automatic transmission for motor cars.

Reviewing some of the objections to present types of automatic transmissions and fluid couplings, he said the next step forward appeared to be toward the use of the fluid torque converter of the turbine type. This is merely an extension of the fluid flywheel or fluid coupling, now offered on Chrysler models, with blades of a more highly developed form and a third member to take the fluid reaction. The torque converter has all the smoothness of the coupling and acts as a coupling, but in addition has properties of torque increase, making it clutch, coupling and transmission all in one. It is an infinitely variable transmission which can be designed for a definite range, starting for example at about a 3 to 1 ratio and working up to nearly 1 to 1 where it functions substantially as a fluid coupling.

### Manual Controls for Safety

On the subject of automatic transmissions in general, Mr. White said, "The complication of parts involved is apt to go beyond anything that would have been considered practical a few years ago, or that seems justified by the results. In making the transmission automatic, we must still leave in the driver's hands over-ruling manual controls to counteract almost everything that the automatic controls do. Criticisms have been made that a fully automatic transmission without these over-ruling controls is an unsatisfactory thing to drive and might, under some circumstances, even be dangerous . . . . In short, making the gear shifting automatic is not enough. We must allow the driver to retain, at will, almost the same amount of control that he has always had."

Chrysler's new transmission plant, now being set up at Highland Park, is said to be planned for output of 1000 fluid flywheel units per day. Whether the above-mentioned "next step" will be taken and the fluid flywheel expanded to a torque converter with gearing eliminated, is not yet known. but Chrysler's vaunted engineering daring should be ample to bridge this seemingly slight gap.

Metamorphosis of a welding equipment business which started in the basement of a house on French road here into a spacious new plant with latest type of manufacturing equipment and sales outlets throughout the world, all within the period of about six years, is a good example of "dynamic Detroit." It is the story of Progressive

(*Please turn to Page* 79)

## Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

| | 1938 | 1939 | 1940 |
|---|---|---|---|
| Jan. | 226,952 | 356,962 | 449,314 |
| Feb. | 202,597 | 317,520 | 421,820 |
| March | 238,447 | 389,495 | ..... |
| April | 237,929 | 354,266 | ..... |
| May | 210,174 | 313,248 | ..... |
| June | 189,402 | 324,253 | ..... |
| July | 150,450 | 218,494 | ..... |
| Aug. | 96,946 | 103,343 | ..... |
| Sept. | 89,623 | 192,678 | ..... |
| Oct. | 215,286 | 324,688 | ..... |
| Nov. | 390,405 | 368,541 | ..... |
| Dec. | 406,960 | 469,120 | ..... |
| Year | 2,655,171 | 3,732,608 | ..... |

Estimated by Ward's Reports

| Week ended: | 1940 | 1939† |
|---|---|---|
| Mar. 16 | 105,720 | 86,725 |
| Mar. 23 | 103,395 | 89,400 |
| Mar. 30 | 103,370 | 85,980 |
| April 6 | 101,655 | 87,019 |
| April 13 | 102,940 | 88,050 |

†Comparable week.

| | Week ended April 13 | Week ended April 6 |
|---|---|---|
| General Motors | 43,755 | 44,000 |
| Chrysler | 24,680 | 24,635 |
| Ford | 22,480 | 20,630 |
| All others | 12,025 | 12,390 |


PRECISION . .
outside and in
Certainly, dimensional accuracy! Also, for under-the-surface precision, as well as endurance, New Departure *forges* both race rings and balls . . . . New Departure, Division of General Motors, Bristol, Connecticut.
NEW DEPARTURE
THE FORGED STEEL BEARING

# Steel's 1939 Earnings Third Best Since 1930, but Still Meager

■ DESPITE 1939's sharply increased operating rate, third highest in past decade, 22 major steel producers, representing a reported 91 per cent of total ingot capacity, earned an aggregate net income, before preferred dividend requirements, of only $130,831,176. This was a return of 3.36 per cent on capitalization totaling $3,885,269,046 in one of three best years since 1929, none of which has enabled steel industry to realize profits sufficient to compensate for extremely low earnings and deficits incurred in other seven.

Operations for the industry in 1938 averaged 39.6 per cent, resulted in $10,646,755 net deficit incurred by the 22 companies. With 72.5 per cent operations for the industry in 1937 the same companies earned a total net income of $211,479,861, equal to 5.3 per cent of their total capitalization, $3,984,383,189. Nineteen producers reporting ingot output last year had 64.6 per cent operating rate, against 39.3 per cent in 1938 and 71.5 per cent in 1937.

STEEL'S fourteenth annual financial analysis shows the 22 companies' 1939 total taxes accrued and paid, $135,267,280, were 3.39 per cent greater than net income available for dividends. In 1938 taxes totaled $94,497,117, more than four times the companies' earnings before dividends and interest on bonds. Taxes in 1937 were $159,992,152, about three-fourths the year's aggregate net income, $211,479,861, earned by the same companies.

### Net Sales, $1,543,932,152, Nearly 50 Per Cent Greater Than in Preceding Year

Per cent of total income on capitalization before dividends and interest on bonds was 4.29 in 1939. This was third highest since 1930, was exceeded only in 1936 with 4.40 per cent, in 1937 with 6.07 per cent, and compares with 0.59 per cent net loss in 1938.

Net earnings per ton of ingots produced last year by 19 companies averaged $2.54, compared to 56 cents net loss per ton produced in 1938. In 1937 net income per ton ingots produced was $3.91.

Total capitalization, including valuation of common and preferred stock, funded debt and surplus last year was $3,885,269,046, an increase of $47,239,461 over $3,838,029,585 in 1938. Total capitalization in 1937 was $3,984,383,189. Surplus for the 22 companies increased $65,767,744 last year, each producer making additions, and aggregated $766,612,239. Funded indebtedness increased only $967,476 from 1938's $830,268,110.

Net sales of 19 companies totaled $1,543,932,152, an increase of nearly 50 per cent over $1,020,966,341 in 1938. Three producers, including the largest, did not report net sales. Net profit margin on net sales for the 19 companies was 5.69 per cent, compared with 0.44 per cent net deficit in 1938 and 6.87 per cent profit in 1937.

### Net Income Averaged $2.43 Per Common Share, Compared to $1.72 Net Deficit in 1938

Average income per common share, after allowance for preferred dividend requirements, was $2.43, compared to $1.72 loss in 1938 and $4.92 net profit in 1937.

Ingot production in 1939 increased 17,884,987 net tons, or nearly 66 per cent, over 1938's 27,135,295 net tons, was proportionately greater than increase in net sales.

All figures in the accompanying tabulation insert are based on a net ton basis rather than gross ton, in accordance with change initiated by American Iron and Steel institute, and being adopted by producers. Comparable statistics from 1938 have been converted to provide an accurate basis for comparison.

Total assets of the 22 producers aggregated $4,379,422,763 in 1939, greater by $173,935,146 than in previous year but less than $4,420,105,857 in 1937. Current assets likewise increased over 1938 nearly 20 per cent, to $1,435,463,470. Current liabilities were $334,793,059, compared to $218,627,378 in 1938 and $293,170,590 in 1937.

STEEL wishes to acknowledge with sincere thanks co-operation of company executives for supplying detailed items used in the tabulation summary. Additional copies of the table at right are available from Readers' Service department, STEEL.

# Financial Analysis of the Steel Industry for 1939

## Earnings, Capitalization, Assets and Liabilities of 22 Producers Having an Aggregate Annual Ingot Capacity of 74,476,160 Net Tons, or 91 Per Cent of the Total

| | No. Shares Common Stock Outstanding | | Common Stock Valuation | | Preferred Stock Valuation | | Funded Debt | | Surplus | | Total Capitalization | | Total Income Before Div. and Int. on Bonds | | Per Cent Total Income on Capitalization | | Net Sales | | Net Profit Margin Per Cent | | Net Income Before Dividends | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | |
| United States Steel Corp. | 8,703,252 | 8,703,252 | $652,743,900 | $652,743,900 | $360,281,100 | $360,281,100 | $216,502,209 | $233,467,373 | $301,782,071 | $285,881,814 | $1,536,454,215 | $1,537,511,238 | $50,432,865 | $544,874 | 3.28 | 0.04 | ..... | ..... | ..... | ..... | $41,119,934 | $7,717,454* | United States Steel Corp. |
| Bethlehem Steel Corp. | 2,984,994 | 3,183,984 | 283,574,430 | 302,478,480 | 112,066,440 | 112,066,440 | 189,886,700 | 170,003,362 | 78,229,111 | 64,863,198 | 663,756,681 | 649,411,480 | 32,132,998 | 12,377,847 | 4.84 | 1.91 | $414,141,087 | $271,192,675 | 5.95 | 1.94 | 24,638,384 | 5,250,239 | Bethlehem Steel Corp. |
| Republic Steel Corp. | 5,833,066 | 5,832,856 | 132,520,020 | 132,516,450 | 40,190,050 | 40,190,050 | 87,527,872 | 89,081,830 | 66,387,346 | 58,711,282 | 326,625,288 | 320,499,612 | 14,956,751 | 3,560,179* | 4.58 | 1.11* | 230,340,805 | 140,879,763 | 4.63 | 5.68* | 10,671,343 | 7,997,825* | Republic Steel Corp. |
| Jones & Laughlin Steel Corp. | 576,320 | 576,320 | 57,632,000 | 57,632,000 | 58,713,900 | 58,713,900 | 45,408,235 | 48,281,353 | 48,380,391 | 45,289,755 | 210,134,526 | 209,917,008 | 5,428,000 | 3,821,747* | 2.58 | 1.82* | 113,323,602 | 75,410,901 | 2.81 | 7.80* | 3,188,944 | 5,879,958* | Jones & Laughlin Steel Corp. |
| National Steel Corp. | 2,202,167 | 2,198,767 | 55,054,175 | 54,969,175 | None | None | 65,603,940 | 62,747,592 | 76,145,939 | 71,389,679 | 196,804,054 | 189,106,446 | 14,992,545 | 9,076,577 | 7.62 | 4.80 | 132,061,908 | 89,503,232 | 9.53 | 7.44 | 12,581,636 | 6,661,652 | National Steel Corp. |
| Youngstown Sheet & Tube Co. | 1,675,008 | 1,675,008 | 105,074,076 | 105,056,800 | 15,000,000 | 15,000,000 | 85,500,000 | 87,000,000 | 24,022,975 | 20,818,752 | 229,597,051 | 227,875,552 | 8,744,086 | 2,426,631 | 3.81 | 1.06 | 117,027,997 | 84,664,566 | 4.28 | 0.78* | 5,004,484 | 658,934* | Youngstown Sheet & Tube Co. |
| American Rolling Mill Co. | 2,868,610 | 2,868,575 | 71,739,009 | 71,739,009 | 45,000,000 | 45,000,000 | 2,000,000 | 2,000,000 | 10,397,164 | 10,192,874 | 129,136,173 | 128,931,883 | 4,095,837 | 1,200,996* | 3.16 | 0.92* | 95,351,230 | 70,441,606 | 4.21 | 1.86* | 4,011,909 | 1,307,880* | American Rolling Mill Co. |
| Inland Steel Co. | 1,624,265 | 1,577,005 | 60,537,310 | 57,464,602 | None | None | 50,700,000 | 51,800,000 | 38,516,030 | 34,098,110 | 149,753,340 | 143,362,712 | 12,770,570 | 6,788,710 | 8.53 | 4.73 | 115,346,665 | 74,058,924 | 9.48 | 6.64 | 10,931,016 | 4,916,203 | Inland Steel Co. |
| Wheeling Steel Corp. | 569,617 | 563,295 | 28,480,825 | 28,164,725 | 37,933,500 | 37,997,600 | 31,500,000 | 32,200,000 | 15,566,898 | 10,901,255 | 113,481,223 | 109,263,580 | 7,041,646 | 2,006,160 | 6.21 | 1.84 | 85,716,689 | 62,420,280 | 6.49 | 0.79 | 5,560,753 | 493,138 | Wheeling Steel Corp. |
| Colorado Fuel & Iron Corp. | 563,620 | 563,620 | 5,636,200 | 5,636,200 | None | None | 15,518,200 | 15,518,200 | 14,179,492 | 12,496,860 | 35,333,892 | 33,651,260 | 2,424,971 | 907,610* | 6.86 | 2.70* | 27,943,062 | 17,200,574 | 5.90 | 9.79* | 1,649,061 | 1,683,520* | Colorado Fuel & Iron Corp. |
| Crucible Steel Co. of America | 445,198 | 445,198 | 44,519,773 | 44,519,773 | 23,880,000 | 23,880,000 | 10,800,000 | 11,500,000 | 28,915,092 | 26,111,495 | 108,114,865 | 106,011,268 | 3,330,679 | 1,827,423* | 3.08 | 1.72* | 47,967,538 | 29,125,598 | 5.84 | 7.68* | 2,803,596 | 2,237,026* | Crucible Steel Co. of America |
| Otis Steel Co. | 915,979 | 915,829 | 4,579,895 | 4,579,145 | 10,309,890 | 10,313,640 | 13,945,000 | 14,106,000 | 5,285,098 | 5,245,272 | 34,119,883 | 34,244,057 | 847,350 | 590,001* | 2.48 | 1.72* | 24,500,022 | 13,718,500 | .... | .... | 214,965 | 1,230,297* | Otis Steel Co. |
| Pittsburgh Steel Co. | 504,292 | 499,442 | 4,815,940 | 4,767,440 | 15,471,000 | 15,475,000 | 4,733,000 | 5,225,000 | 14,729,047 | 14,141,873 | 39,748,987 | 39,605,313 | 894,473 | 126,904* | 2.25 | 0.32* | 28,570,638 | 20,827,882 | 1.98 | 2.35* | 564,870 | 488,423* | Pittsburgh Steel Co. |
| Lukens Steel Co.‡ | 317,976 | 317,976 | 3,179,760 | 3,179,760 | None | None | 3,534,400 | 3,534,400 | 3,636,997 | 3,553,370 | 10,350,657 | 10,267,530 | 294,512 | 80,513* | 2.84 | 0.78* | 11,929,582 | 11,597,016 | 0.70 | 2.49* | 83,127 | 288,505* | Lukens Steel Co.‡ |
| Allegheny Ludlum Steel Corp.† | 1,256,722 | 1,256,722 | 7,854,513 | 7,854,512 | 3,342,600 | 3,342,600 | None | None | 15,911,393 | 14,819,734 | 27,108,505 | 26,016,845 | 2,093,518 | 1,070,186* | 7.72 | 4.11* | 37,332,142 | 18,261,231 | 5.61 | 5.86* | 2,093,518 | 1,070,186* | Allegheny Ludlum Steel Corp.† |
| Sharon Steel Corp. | 392,331 | 391,611 | 3,974,530 | 3,967,330 | 5,972,000 | 5,972,000 | 550,000 | None | 5,594,977 | 5,638,080 | 16,091,507 | 15,577,410 | 296,858 | 95,325* | 1.84 | 0.61* | 16,178,598 | 10,505,879 | 1.58 | 0.91* | 255,497 | 95,325* | Sharon Steel Corp. |
| Granite City Steel Co. | 382,488 | 382,488 | 8,483,821 | 8,483,821 | None | None | 3,576,030 | None | 3,320,286 | 3,020,160 | 11,804,107 | 11,503,981 | 519,428 | 330,231* | 4.40 | 2.87* | 10,212,477 | 6,359,472 | 3.41 | 5.19* | 347,940 | 330,231* | Granite City Steel Co. |
| Continental Steel Corp. | 200,561 | 200,561 | 5,276,243 | 5,276,238 | 1,885,500 | 2,390,859 | 1,800,000 | 1,453,000 | 4,777,721 | 4,221,232 | 13,939,464 | 13,556,329 | 1,266,805 | 687,243 | 9.09 | 5.15 | 18,559,294 | 12,801,105 | 6.51 | 4.94 | 1,208,200 | 632,865 | Continental Steel Corp. |
| Midvale Co. | 200,000 | 200,000 | 10,574,621 | 10,574,621 | None | None | None | None | 2,298,805 | 1,790,797 | 12,873,426 | 12,365,418 | 1,703,771 | 1,244,210 | 13.23 | 10.06 | ..... | ..... | ..... | ..... | 1,703,771 | 1,244,210 | Midvale Co. |
| Keystone Steel & Wire Co.§ | 757,632 | 757,632 | 3,156,800 | 3,156,800 | None | None | 1,400,000 | 1,600,000 | 4,863,870 | 4,757,390 | 9,420,670 | 9,514,190 | 948,636 | 782,880 | 10.07 | 8.23 | 11,040,320 | 9,648,839 | 8.13 | 7.54 | 897,299 | 727,543 | Keystone Steel & Wire Co.§ |
| Laclede Steel Co. | 206,250 | 206,250 | 4,125,000 | 4,125,000 | None | None | 750,000 | 750,000 | 1,796,070 | 1,792,267 | 6,671,070 | 6,667,267 | 230,678 | 353,090 | 3.45 | 5.29 | ..... | ..... | .... | .... | 210,053 | 331,849 | Laclede Steel Co. |
| Rustless Iron & Steel Corp. | 886,547 | 872,237 | 886,547 | 872,237 | 1,189,088 | 1,189,048 | None | None | 1,875,466 | 1,109,246 | 3,949,462 | 3,169,206 | 1,090,876 | 81,110 | 27.72 | 2.56 | 6,388,496 | 2,348,298 | .... | .... | 1,090,876 | 81,110 | Rustless Iron & Steel Corp. |
| Total (or average) | 34,066,895 | 34,188,628 | $1,554,419,388 | $1,569,758,018 | $731,235,068 | $731,812,237 | $831,235,586 | $830,268,110 | $766,612,239 | $700,844,495 | $3,885,269,046 | $3,838,029,585 | $166,537,853 | $22,758,217 | 4.29 | 0.59 | **$1,543,932,152** | **$1,020,966,341** | 5.69 | 0.41* | $130,831,176 | $10,646,755* | Total (or average) |

| | Preferred Stock Dividend Requirements | | Income Per Common Share | | Rated Ingot Capacity Net Tons | | Net Income Per Ton Ingot Capacity | | Capitalization Per Ton Ingot Capacity | | Ingot Production Net Tons | | Operating Rate Per Cent | | Net Income Per Ton Ingots Produced | | Total Taxes | | Total Assets | | Current Assets | | Current Liabilities | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | |
| United States Steel Corp. | $25,219,677 | $25,219,677 | $1.82 | $3.78* | 28,885,000 | 28,885,000 | $1.42 | $0.30* | $53.19 | $53.22 | 17,625,676 | 10,525,056 | 61.0 | 36.4 | $2.33 | $0.82* | $67,017,086 | $48,842,131 | $1,768,523,663 | $1,711,279,006 | $575,877,137 | $482,378,097 | $143,888,691 | $89,506,296 | United States Steel Corp. |
| Bethlehem Steel Corp. | 7,471,096 | 7,471,096 | 5.75 | 0.70* | 11,247,040 | 11,247,040 | 2.19 | 0.46 | 59.02 | 57.74 | 7,958,636 | 4,872,637 | 70.8 | 43.3 | 3.10 | 1.08 | 19,919,900 | 12,120,039 | 732,932,382 | 699,474,044 | 244,226,480 | 180,314,698 | 56,794,601 | 37,503,801 | Bethlehem Steel Corp. |
| Republic Steel Corp. | 2,411,403 | 2,411,403 | 1.42 | 1.78* | 7,280,000 | 7,280,000 | 1.46 | 1.10* | 44.87 | 44.03 | 4,817,867 | 2,761,409 | 66.2 | 37.9 | 2.21 | 2.89* | 9,561,985 | 5,548,309 | 365,049,972 | 348,715,525 | 110,255,374 | 89,566,244 | 20,454,420 | 11,437,304 | Republic Steel Corp. |
| Jones & Laughlin Steel Corp. | 4,109,973 | 4,109,973 | 1.60* | 17.33* | 4,099,200 | 4,099,200 | 0.78 | 1.44* | 51.26 | 51.21 | 2,443,064 | 1,521,661 | 59.6 | 37.1 | 1.30 | 3.87* | 5,797,715 | 4,379,452 | 230,865,299 | 227,653,870 | 70,202,084 | 62,464,373 | 14,354,897 | 10,804,642 | Jones & Laughlin Steel Corp. |
| National Steel Corp. | None | None | 5.71 | 3.03 | 3,808,000 | 3,808,000 | 3.30 | 2.07 | 51.68 | 49.66 | ..... | ..... | .... | .... | .... | .... | 6,337,541 | 5,162,695 | 218,028,076 | 207,144,871 | 59,099,986 | 50,415,375 | 15,296,327 | 12,877,932 | National Steel Corp. |
| Youngstown Sheet & Tube Co. | 825,000 | 825,000 | 2.50 | 0.89* | 3,494,400 | 3,494,400 | 1.43 | 0.19* | 65.71 | 65.21 | 2,250,951 | 1,329,150 | 64.4 | 38.0 | 2.22 | 0.50* | 4,297,206 | 3,684,752 | 247,655,013 | 241,719,671 | 86,209,968 | 93,579,879 | 13,836,154 | 10,204,878 | Youngstown Sheet & Tube Co. |
| American Rolling Mill Co. | 2,025,000 | 2,025,023 | 0.69 | 1.16* | 3,030,182 | 2,989,862 | 1.32 | 0.46* | 42.62 | 43.12 | 1,934,987 | 1,136,834 | 63.9 | 39.4 | 2.07 | 1.15* | 3,046,873 | 2,453,506 | 144,316,643 | 138,849,766 | 52,113,070 | 49,276,850 | 12,899,053 | 8,104,746 | American Rolling Mill Co. |
| Inland Steel Co. | None | None | 6.73 | 3.12 | 3,091,200 | 2,620,800 | 3.54 | 1.88 | 48.45 | 54.70 | 2,408,192 | 1,416,303 | 77.9 | 54.0 | 4.54 | 3.48 | 5,158,640 | 3,249,816 | 166,811,739 | 156,506,609 | 58,497,125 | 48,140,364 | 11,695,416 | 7,686,331 | Inland Steel Co. |
| Wheeling Steel Corp. | 1,915,207 | 1,929,449 | 6.40 | 2.55* | 1,960,000 | 1,960,000 | 2.84 | 0.25 | 57.90 | 55.75 | 1,465,987 | 1,030,350 | 74.8 | 52.6 | 3.79 | 0.48 | 3,202,912 | 1,939,301 | 124,021,444 | 118,136,783 | 45,229,106 | 40,463,915 | 8,136,991 | 6,386,215 | Wheeling Steel Corp. |
| Colorado Fuel & Iron Corp. | None | None | 2.93 | 2.99* | 1,105,440 | 991,245 | 1.49 | 1.70* | 31.96 | 33.95 | 678,444 | 259,153 | 61.4 | 26.1 | 2.43 | 6.50* | 1,382,370 | 1,053,593 | 41,621,000 | 38,895,234 | 15,456,632 | 11,862,276 | 3,434,486 | 2,611,030 | Colorado Fuel & Iron Corp. |
| Crucible Steel Co. of America | 1,671,600 | 1,671,600 | 6.30 | 9.13* | 980,000 | 980,000 | 2.86 | 2.28* | 110.32 | 108.18 | ..... | ..... | .... | .... | .... | .... | 2,329,717 | 1,421,703 | 115,333,652 | 109,276,916 | 27,810,970 | 21,557,916 | 6,701,832 | 2,757,155 | Crucible Steel Co. of America |
| Otis Steel Co. | 756,058 | 756,333 | 0.59* | 2.17* | 977,000 | 977,000 | 0.22 | 1.26* | 34.92 | 35.05 | 744,081 | 403,562 | 76.2 | 41.3 | 0.29 | 3.05* | 887,703 | 682,738 | 37,543,323 | 36,813,020 | 11,499,474 | 9,950,907 | 2,446,158 | 1,696,576 | Otis Steel Co. |
| Pittsburgh Steel Co. | 869,162 | 869,382 | 0.60* | 2.72* | 906,461 | 906,461 | 0.62 | 0.54* | 43.85 | 43.70 | 586,451 | 424,207 | 64.7 | 46.8 | 0.96 | 1.15* | 1,015,437 | 821,326 | 45,794,350 | 44,271,256 | 15,868,851 | 14,005,671 | 5,205,536 | 3,835,469 | Pittsburgh Steel Co. |
| Lukens Steel Co.‡ | None | None | 0.26 | 0.91* | 714,560 | 714,560 | 0.12 | 0.40* | 14.40 | 14.37 | 317,242 | 263,136 | 44.4 | 36.8 | 0.26 | 1.10* | 331,771 | 314,643 | 13,900,073 | 13,290,736 | 4,061,189 | 3,150,037 | 2,994,635 | 2,477,513 | Lukens Steel Co.‡ |
| Allegheny Ludlum Steel Corp.† | 233,982 | 233,982 | 1.49 | 1.04* | 605,360 | 602,000 | 3.46 | 1.78* | 44.78 | 43.24 | 239,074 | 144,866 | 39.5 | 24.1 | 8.81 | 7.40* | 1,509,019 | 657,063 | 33,637,798 | 29,845,719 | 16,742,725 | 12,311,837 | 5,789,690 | 3,201,606 | Allegheny Ludlum Steel Corp.† |
| Sharon Steel Corp. | 298,600 | 298,600 | 0.11* | 1.01* | 560,000 | 560,000 | 0.46 | 0.17* | 28.73 | 27.81 | 443,636 | 272,973 | 79.2 | 48.7 | 0.58 | 0.35* | 357,364 | 367,688 | 18,573,566 | 18,400,293 | 7,888,837 | 7,344,830 | 2,150,059 | 1,543,212 | Sharon Steel Corp. |
| Granite City Steel Co. | None | None | 0.91 | 0.86* | 448,000 | 448,000 | 0.78 | 0.74* | 26.34 | 25.68 | 257,273 | 148,732 | 57.4 | 33.2 | 1.35 | 2.22* | 296,705 | 199,229 | 16,946,342 | 14,346,313 | 5,764,977 | 4,054,401 | 1,297,131 | 1,528,930 | Granite City Steel Co. |
| Continental Steel Corp. | 148,418 | 168,121 | 5.28 | 2.32 | 364,000 | 364,000 | 3.32 | 1.74 | 38.29 | 36.65 | 363,198 | 233,695 | 99.8 | 64.2 | 3.33 | 2.71 | 791,000 | 490,000 | 15,899,857 | 15,008,754 | 7,454,971 | 6,531,463 | 1,357,136 | 1,217,061 | Continental Steel Corp. |
| Midvale Co. | None | None | 8.52 | 6.22 | 300,160 | 300,160 | 5.67 | 4.14 | 42.89 | 41.20 | 97,810 | 61,116 | 32.6 | 20.4 | 17.42 | 20.36 | 1,246,527 | 739,990 | 17,592,498 | 14,765,514 | 10,612,049 | 8,048,354 | 3,294,103 | 1,486,005 | Midvale Co. |
| Keystone Steel & Wire Co.§ | None | None | 1.18 | 0.96 | 280,000 | 280,000 | 3.21 | 2.60 | 33.64 | 33.98 | 235,219 | 174,494 | 84.0 | 62.3 | 3.81 | 4.17 | 410,449 | 294,584 | 10,353,775 | 10,202,466 | 4,306,264 | 4,172,703 | 1,058,114 | 823,503 | Keystone Steel & Wire Co.§ |
| Laclede Steel Co. | None | None | 1.01 | 1.61 | 295,357 | 263,200 | 0.71 | 1.25 | 22.55 | 25.31 | 152,494 | 155,961 | 51.6 | 59.3 | 1.38 | 2.13 | ..... | ..... | 7,259,015 | 7,204,254 | 3,153,674 | 3,133,856 | 493,809 | 419,382 | Laclede Steel Co. |
| Rustless Iron & Steel Corp. | 91,292 | 91,292 | 1.13 | 0.01* | 44,800 | 44,800 | 24.35 | 1.81 | 88.16 | 70.74 | ..... | ..... | .... | .... | .... | .... | 369,360 | 74,559 | 6,763,283 | 3,686,997 | 3,132,527 | 1,527,159 | 1,213,820 | 517,791 | Rustless Iron & Steel Corp. |
| Total (or average) | $48,046,468 | $48,080,931 | $2.43 | $1.72* | 74,476,160 | 73,815,728 | $1.76 | $0.14* | $52.17 | $51.99 | **45,020,282** | **27,135,295** | **64.6** | **39.3** | **$2.51** | **$0.56*** | **$135,267,280** | **$94,497,117** | $4,379,422,763 | $4,205,487,617 | $1,435,463,470 | $1,204,251,205 | $334,793,059 | $218,627,378 | Total (or average) |

‡Fiscal year ended Oct. 14, 1939; Oct. 15, 1938

†Allegheny Steel Co. merged with Ludlum Steel Co. Aug. 16, 1938. Tabulations under 1938 column represent Allegheny Steel Co. for entire year, and Ludlum Steel Co. from date of merger.

§Fiscal year ended June 30.

*Loss.

"Net Income Before Dividends" columns and totals do not take into consideration requirements (not actual payments) for preferred dividends. In computing earnings per common share these totals, adjusted for preferred dividend requirements, are used. In arriving at earnings per common share for individual companies the same method is followed.

Boldface type is used under those columns in which figures from all 22 companies were not available.

**Per Cent Earned on Capitalization**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1925 | 5.61 | 1930 | 4.54 | 1935 | 2.09 |
| 1926 | 6.86 | 1931 | 0.40 | 1936 | 4.40 |
| 1927 | 5.22 | 1932 | 2.85* | 1937 | 6.07 |
| 1928 | 6.55 | 1933 | 0.90* | 1938 | 0.59 |
| 1929 | 9.88 | 1934 | 0.36 | 1939 | 4.29 |

*Loss.

# Current Events in Chicago . . .

By J. F. POWELL, Chicago Editor, STEEL

■ REPLACEMENT of all taxis operated by the two major Chicago companies, Yellow and Checker, will begin within the next month, it was revealed here last week, and eventually will involve some 2500 cabs.

Not since 1935 have new models operated by the companies appeared on the streets, so considerable restyling has been necessary to catch up with the trend in private automobiles, and especially since several more years may elapse before newer taxi models are brought out.

Innovations in design may even take new taxis a bit beyond present passenger cars. Major area of the tops will be of steel, but will also involve a section of glass, while rear of the tops will be of landaulet type, this section capable of being vanished into the rear of the body by a lever in the driver's compartment. Present tendency in passenger cars toward elimination of the radiator lines, setting in of headlights, and general front-end streamlining will be followed in the restyling. Other refinements include improved riding qualities, increased interior ventilation, with special stress on more comfort for the driver himself. General size, power and weight of the new models, however, will vary little from the 1935 units, though more steel will be required, especially since the tops now will be all-steel.

The cabs, several of which have been seen here and a number of which have already been introduced in New York, will be built by Checker Cab Mfg. Co., Kalamazoo, Mich., at a reported price of $1450, f.o.b. Kalamazoo. Entire Yellow fleet of 1595 cabs eventually will be replaced, while new Checker cabs will run to 1000.

♦

### Trend to Diesel Engines

Maintenance on a railroad locomotive for one year runs close to $10,000—and that doesn't include fuel. Average maintenance charges per locomotive during 1939, as revealed in a recent report of Santa Fe lines, were $9,908.20, as compared with $8,934.29 in 1938. Per locomotive mile average 1939 maintenance charges were $0.3053, compared with $0.2965 in 1938.

Reported comparison of equipment retired with equipment additions illustrates a fairly common situation involving necessity for retiring obsolete or worn-out equipment, but at the same time an inability, or at least a hesitancy, to keep additions or replacements on a par with retirements.

For example, in 1939, Santa Fe retired equipment to the original value of $10,376,231.15, compared with additions totaling only $7,982,044.48. Included in these figures were the retirement of 3676 freight cars, but the addition of only 1575. In 1939 the road retired 98 steam locomotives and added 30 diesel-electric locomotives. No diesel-electrics, naturally, were retired and will not be for some years, while it is to be noted no new steam locomotives were added. This helps to illustrate the trend toward diesel-electrics, especially on the western, long-distance roads. Interesting sidelight is that in 1939 Santa Fe retired, under the heading of miscellaneous equipment, 27 automobiles, but added 39 others.

♦

### Tractor Demand Continues

Though production of a number of farm implements has passed its peak, output of farm tractors, particularly the new small-type models, continues at high levels. According to one large manufacturing company here, tractor production is still at the peaks gained last fall, demands from dealers still are urgent, and no notable decrease in tractor output is as yet in sight. Of course, summer will bring lighter output, but there are no indications production will slump to the lows of recent summers nor that plant shutdowns will be necessary. Heavy demand for tractors is attributed both to increasing farm buying power and to encouraging reception of new and recently-improved tractor models.

## Steel Corp. Shipments In March Off 7.6%

■ Shipments of finished steel in March by the United States Steel Corp. totaled 931,905 net tons, a decrease of 77,351 tons from February, 7.6 per cent, but 86,797 tons more than in March, 1939. Shipments for three months this year aggregate 3,086,753 tons, compared with 2,463,401 tons in the first quarter, 1939, an increase of 25 per cent.

**U. S. Steel Corp. Shipments**
(Inter-company shipments not included)

Net Tons

| | 1940 | 1939 | 1938 | 1937 |
|---|---|---|---|---|
| Jan. | 1,145,592 | 870,866 | 570,264 | 1,268,403 |
| Feb. | 1,009,256 | 747,427 | 522,395 | 1,252,845 |
| March | 931,905 | 845,108 | 627,047 | 1,563,113 |
| April | ..... | 771,752 | 550,551 | 1,485,231 |
| May | ..... | 795,689 | 509,811 | 1,443,477 |
| June | ..... | 807,562 | 524,994 | 1,405,078 |
| July | ..... | 745,364 | 484,611 | 1,315,353 |
| Aug. | ..... | 885,636 | 615,521 | 1,225,907 |
| Sept. | ..... | 1,086,683 | 635,645 | 1,161,113 |
| Oct. | ..... | 1,345,855 | 730,312 | 875,972 |
| Nov. | ..... | 1,406,205 | 749,328 | 648,727 |
| Dec. | ..... | 1,443,969 | 765,868 | 539,553 |
| Total, by Months | ..... | 11,752,116 | 7,286,347 | 14,184,772 |
| Adjustment | .. | *44,865 | †29,159 | *87,106 |
| Total | ..... | 11,707,251 | 7,315,506 | 14,097,666 |

†Increase. *Decrease.

## Mural on Stainless

■ Mural for the Hispanic room of the Congressional library, Washington, is painted on 1200-pound stainless steel panel to insure enduring beauty. In preparing the steel for painting, artist roughens surface with a motor-driven emery wheel.
Acme photo

# Sick Absenteeism Can Be Reduced

A STAPLE joke for many years has been the one about the office boy who at least once a year, during the baseball season, takes an afternoon off to attend his grandmother's funeral. This ranks, with the other one about the suit in the salesman's expense account, under the head of office humor.

There is, however, a truly serious form of absenteeism, one which is far from humorous, but toward which—strange as it may seem—industry generally has maintained an attitude literally of indifference. It is that due to so-called "unavoidable" illness, and to "accidental" injuries occurring outside of working hours. Industrial management always has assumed that sickness and disabling mishaps suffered by employes while at home or in public places, are inevitable, that "nothing can be done about it", and therefore that considerable lost time due to these causes is an inescapable penalty on industry.

### Losses From Illness More Than Cost of Industrial Accidents

Facts recently brought to light by the Air Hygiene Foundation of America Inc., as a result of a joint study with the United States public health service and the American Association of Industrial Physicians and Surgeons, indicate clearly that this matter of sickness and accident absenteeism is too important a matter to warrant such any attitude of indifference. Furthermore, they indicate that "something can be done about it".

At a recent meeting of the Foundation, Dr. A. J. Lanza, assistant medical director, and R. J. Vane, statistical bureau, Metropolitan Life Insurance Co., New York, reported that the average toll paid to disabling sickness and injury—not counting industrial injuries—is 8 plus days per male and 12 plus days per female wage earner per year. The cost of such absenteeism is at least five times as much as the corresponding figure for time lost through industrial accidents.

Certain findings are of particular interest. For example, workers in the low income groups have a higher sickness rate than those more favored. Owing to the fact, however, that the unskilled frequently are not paid when they are away, whereas the more skilled employes frequently are paid for such time loss, it may be found that the unskilled have the lower incidence rate. It was indicated also that companies allowing compensation for time lost are likely to have more one and two-day absences than companies that take a less liberal attitude on the payment of salaries and wages during absence for illness, since personal reasons, in addition to actual disabilities, may result in absences.

### Great Possibilities in Effort To Lighten Burden of Sick Layoffs

It was found that a very small percentage of employes swell the total time loss greatly by suffering more than one illness a year. It was found that in plants having medical departments absenteeism due to illness is reduced through prompt medical attention and effort to discourage absences that seem unwarranted.

On the basis of these researches to date, there seems to be a sound basis for the conclusion that the burden of sick absenteeism can be lightened through intelligent effort, that a concerted attack on the problem on a broad front will bring results in this direction comparable to the remarkably favorable consequences of the nationwide drive for industrial safety. Those employers who are interested in the problem will do well to study a bulletin entitled "Sick Absenteeism in Industry" which may be had by writing to the Air Hygiene Foundation of America Inc., 4400 Fifth avenue, Pittsburgh.

# The BUSINESS TREND

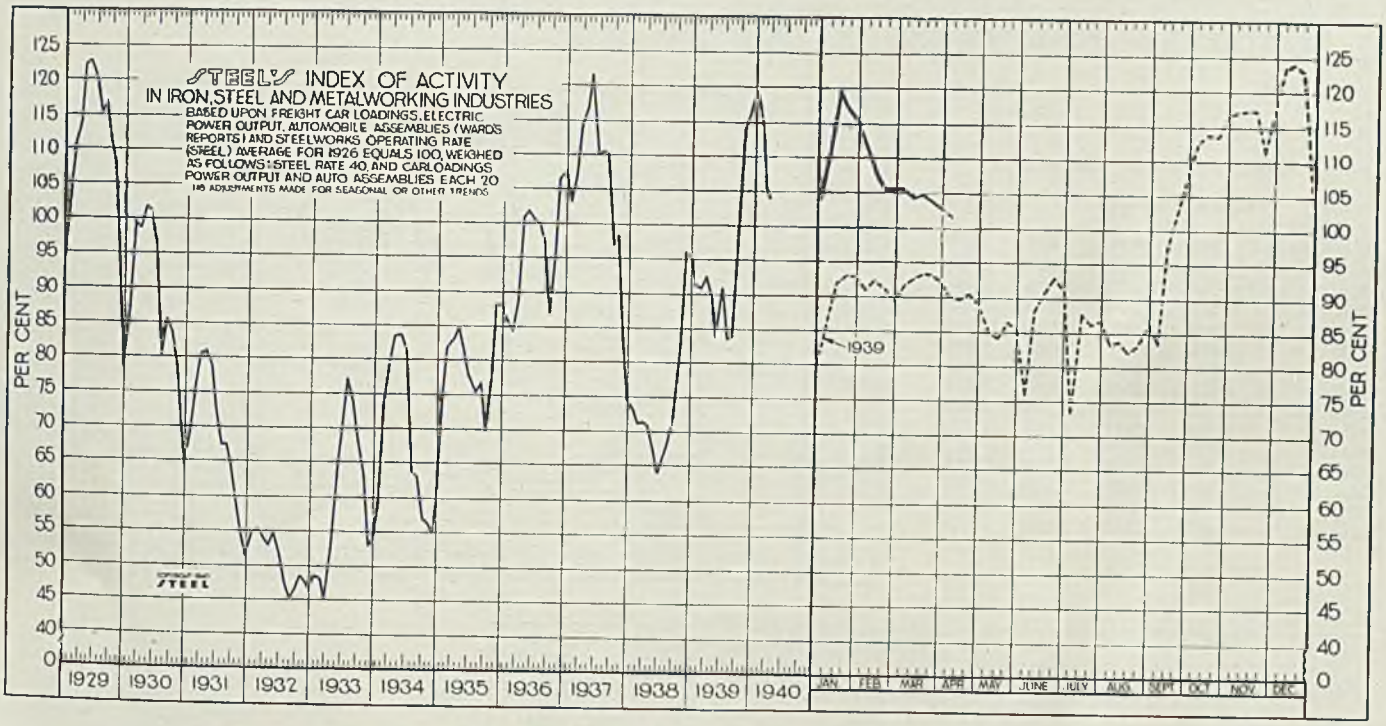
## Better Demand Fails To Halt Downward Tendency

Although a mild increase in new business is developing in some lines, the demand has not yet become strong enough to exert a clear-cut, positive influence upon the trend of industrial activity.

STEEL'S index of activity declined during the week of April 6 to 101.8 from the 103.2 level recorded in the previous period. The national steel rate was the lone business indicator composing the index to register an increase during the period. Moderate declines were recorded in revenue freight carloadings, electric power and automobile output.

The export trade is becoming an increasingly important factor in sustaining industrial production. It is estimated that steel exports now represent about 15 per cent of the total finished and semifinished steel shipments. Iron and steel exports in January and February were three times the volume reported in the corresponding period a year ago.

Inventory accumulation by manufacturers was brought to a halt in February, according to the preliminary index compiled by the division of industrial economics of the National Industrial Conference board. The value of inventories in February was one per cent lower than in January but stood 15 per cent above the corresponding month of 1939. February was the first month since last August that inventories failed to increase.




*STEEL'S index of activity declined 1.4 points to 101.8 in the week ended April 6:*

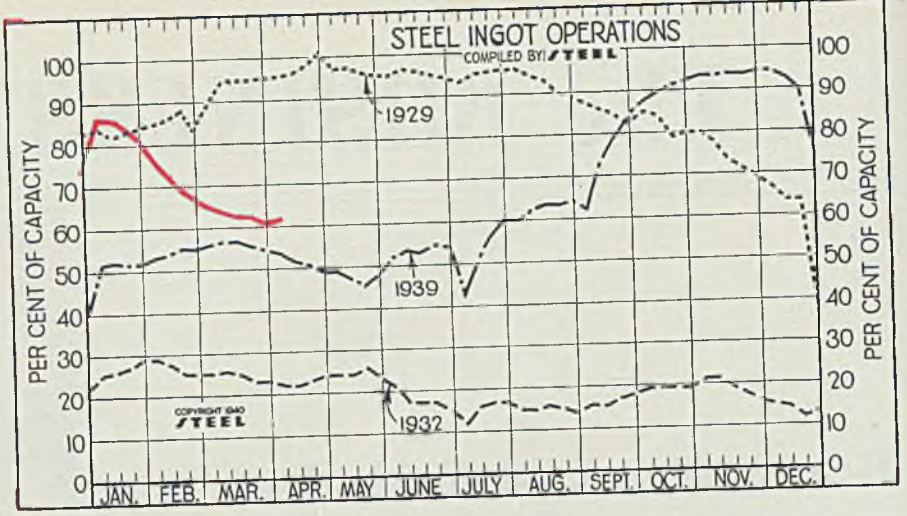
| Week Ended | 1940 | 1939 |
|---|---|---|
| Jan. 27 | 115.4 | 92.9 |
| Feb. 3 | 111.6 | 90.7 |
| Feb. 10 | 107.2 | 92.1 |
| Feb. 17 | 105.1 | 91.1 |
| Feb. 24 | 105.4 | 89.3 |
| Mar. 2 | 105.6 | 91.5 |
| Mar. 9 | 104.7 | 92.7 |
| Mar. 16 | 104.9 | 93.3 |
| Mar. 23 | 103.7 | 93.2 |
| Mar. 30 | 103.2 | 92.2 |
| Apr. 6 | 101.8 | 90.0 |

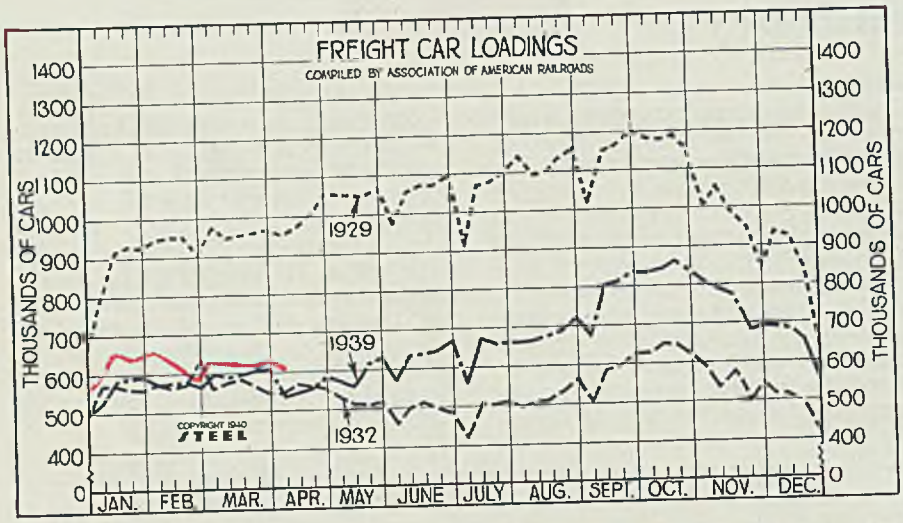
| Mo. Data | 1940 | 1939 | 1938 | 1937 | 1936 | 1935 | 1934 | 1933 | 1932 | 1931 | 1930 | 1929 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | 114.7 | 91.1 | 73.3 | 102.9 | 85.9 | 74.2 | 58.8 | 48.6 | 54.6 | 69.1 | 87.6 | 104.1 |
| Feb. | 105.8 | 90.8 | 71.1 | 106.8 | 84.3 | 82.0 | 73.9 | 48.2 | 55.3 | 75.5 | 99.2 | 111.2 |
| March | 104.1 | 92.6 | 71.2 | 114.4 | 88.7 | 83.1 | 78.9 | 44.5 | 54.2 | 80.4 | 98.6 | 114.0 |
| April | ..... | 89.8 | 70.8 | 116.6 | 100.8 | 85.0 | 83.6 | 52.4 | 52.8 | 81.0 | 101.7 | 122.5 |
| May | ..... | 83.4 | 67.4 | 121.7 | 101.8 | 81.8 | 83.7 | 63.5 | 54.8 | 78.6 | 101.2 | 122.9 |
| June | ..... | 90.9 | 63.4 | 109.9 | 100.3 | 77.4 | 80.6 | 70.3 | 51.4 | 72.1 | 95.8 | 120.3 |
| July | ..... | 83.5 | 66.2 | 110.4 | 100.1 | 75.3 | 63.7 | 77.1 | 47.1 | 67.3 | 79.9 | 115.2 |
| Aug. | ..... | 83.9 | 68.7 | 110.0 | 97.1 | 76.7 | 63.0 | 74.1 | 45.0 | 67.4 | 85.4 | 116.9 |
| Sept. | ..... | 98.0 | 72.5 | 96.8 | 86.7 | 69.7 | 56.9 | 68.0 | 46.5 | 64.3 | 83.7 | 110.8 |
| Oct. | ..... | 114.0 | 83.6 | 98.1 | 94.8 | 77.0 | 56.4 | 63.1 | 48.4 | 59.2 | 78.8 | 107.1 |
| Nov. | ..... | 116.2 | 95.9 | 84.1 | 106.4 | 88.1 | 54.9 | 52.8 | 47.5 | 54.4 | 71.0 | 92.2 |
| Dec. | ..... | 118.9 | 95.1 | 74.7 | 107.6 | 88.2 | 58.9 | 54.0 | 46.2 | 51.3 | 64.3 | 78.3 |

## Steel Ingot Operations

(Per Cent)

| Week ended | 1940 | 1939 | 1938 | 1937 |
|---|---|---|---|---|
| Jan. 6.... | 86.5 | 51.5 | 26.0 | 79.5 |
| Jan. 13.... | 86.0 | 52.0 | 29.0 | 79.0 |
| Jan. 20.... | 84.5 | 51.5 | 30.5 | 80.0 |
| Jan. 27.... | 81.5 | 51.5 | 33.0 | 76.0 |
| Feb. 3.... | 76.5 | 53.0 | 31.0 | 79.5 |
| Feb. 10.... | 71.0 | 54.0 | 30.0 | 81.0 |
| Feb. 17.... | 69.0 | 55.0 | 31.0 | 83.0 |
| Feb. 24.... | 67.0 | 55.0 | 30.5 | 84.0 |
| Mar. 2.... | 65.5 | 56.0 | 29.5 | 86.0 |
| Mar. 9.... | 63.5 | 56.5 | 30.0 | 87.0 |
| Mar. 16.... | 62.5 | 56.5 | 32.0 | 89.0 |
| Mar. 23.... | 62.5 | 55.5 | 35.0 | 90.0 |
| Mar. 30.... | 61.0 | 54.5 | 36.0 | 91.5 |
| Apr. 6.... | 61.5 | 53.5 | 32.0 | 91.5 |




## Freight Car Loadings

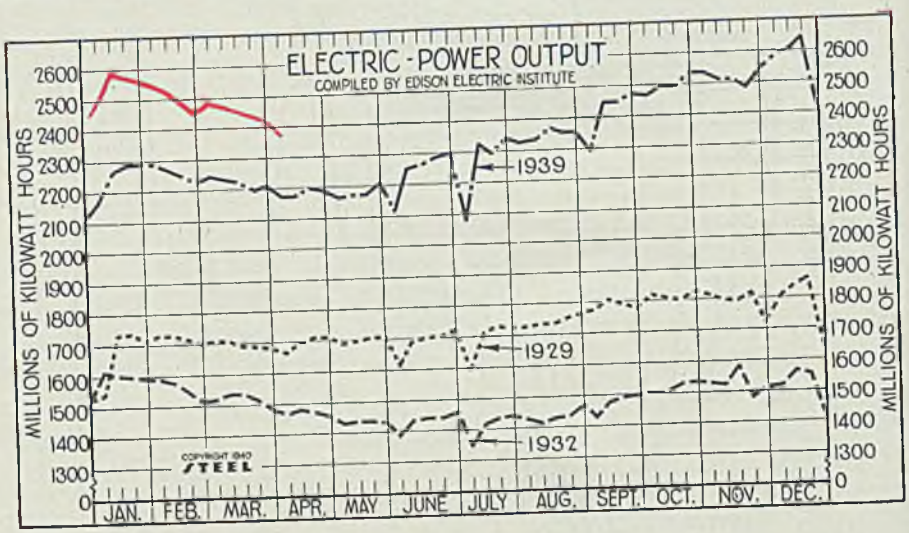
(1000 Cars)

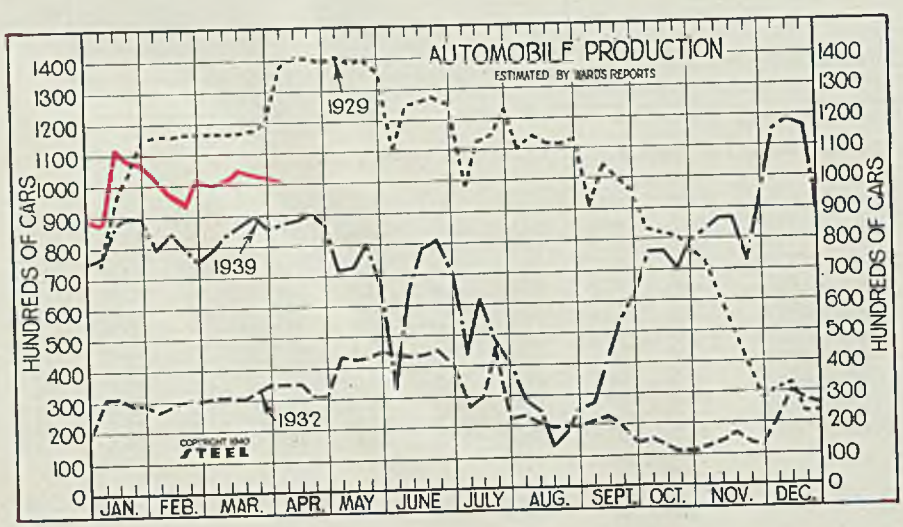
| Week ended | 1940 | 1939 | 1938 | 1937 |
|---|---|---|---|---|
| Jan. 6..... | 592 | 531 | 552 | 699 |
| Jan. 13..... | 668 | 587 | 581 | 700 |
| Jan. 20..... | 646 | 590 | 570 | 670 |
| Jan. 27..... | 650 | 594 | 553 | 660 |
| Feb. 3..... | 553 | 577 | 565 | 675 |
| Feb. 10..... | 627 | 580 | 543 | 692 |
| Feb. 17..... | 608 | 580 | 536 | 715 |
| Feb. 24..... | 595 | 561 | 512 | 697 |
| Mar. 2..... | 634 | 599 | 553 | 734 |
| Mar. 9..... | 621 | 592 | 557 | 749 |
| Mar. 16..... | 619 | 595 | 540 | 759 |
| Mar. 23..... | 620 | 605 | 573 | 761 |
| Mar. 30..... | 628 | 604 | 523 | 727 |
| Apr. 6..... | 603 | 535 | 522 | 716 |

## Electric Power Output

(Million KWH)

| Week ended | 1940 | 1939 | 1938 | 1937 |
|---|---|---|---|---|
| Jan. 6.... | 2,473 | 2,169 | 2,140 | 2,244 |
| Jan. 13 ... | 2,593 | 2,270 | 2,115 | 2,264 |
| Jan. 20.... | 2,572 | 2,290 | 2,109 | 2,257 |
| Jan. 13... | 2,566 | 2,293 | 2,099 | 2,215 |
| Feb. 3... | 2,541 | 2,287 | 2,082 | 2,201 |
| Feb. 10... | 2,523 | 2,268 | 2,052 | 2,200 |
| Feb. 17... | 2,476 | 2,249 | 2,059 | 2,212 |
| Feb. 24... | 2,455 | 2,226 | 2,031 | 2,207 |
| Mar. 2.... | 2,479 | 2,244 | 2,036 | 2,200 |
| Mar. 9.... | 2,464 | 2,238 | 2,015 | 2,213 |
| Mar. 16... | 2,460 | 2,225 | 2,018 | 2,211 |
| Mar. 23... | 2,424 | 2,199 | 1,975 | 2,200 |
| Mar. 30... | 2,422 | 2,210 | 1,979 | 2,147 |
| Apr. 6.... | 2,381 | 2,173 | 1,990 | 2,176 |

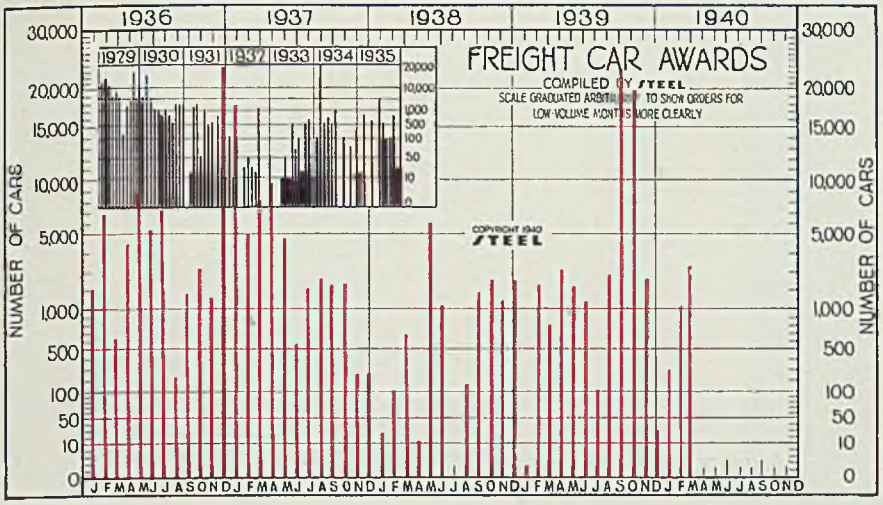



## Auto Production

(1000 Units)

| Week ended | 1940 | 1939 | 1938 | 1937 |
|---|---|---|---|---|
| Jan. 6.... | 87.5 | 76.7 | 54.1 | 96.8 |
| Jan. 13.... | 111.3 | 86.9 | 65.7 | 91.7 |
| Jan. 20.... | 108.5 | 90.2 | 65.4 | 81.4 |
| Jan. 27.... | 106.4 | 89.2 | 59.4 | 74.1 |
| Feb. 3.... | 101.2 | 79.4 | 51.4 | 72.3 |
| Feb. 10.... | 96.0 | 84.5 | 57.8 | 72.8 |
| Feb. 17.... | 95.1 | 79.9 | 59.1 | 95.7 |
| Feb. 24.... | 102.6 | 75.7 | 57.0 | 111.9 |
| Mar. 2.... | 100.9 | 78.7 | 54.4 | 127.0 |
| Mar. 9.... | 103.6 | 84.1 | 57.4 | 101.7 |
| Mar. 16.... | 105.7 | 86.7 | 57.5 | 99.0 |
| Mar. 23.... | 103.4 | 89.4 | 56.8 | 101.0 |
| Mar. 30.... | 103.4 | 86.0 | 57.5 | 97.0 |
| Apr. 6.... | 101.7 | 87.0 | 70.0 | 99.2 |




### Freight Car Awards

(Hundreds of Cars)

| | 1940 | 1939 | 1938 | 1937 |
|---|---|---|---|---|
| Jan. | 3.60 | .03 | .25 | 178.06 |
| Feb. | 11.47 | 22.59 | 1.09 | 49.72 |
| Mar. | 31.04 | 8.00 | 6.80 | 81.55 |
| April | ..... | 30.95 | .15 | 97.72 |
| May | ..... | 20.51 | 60.14 | 47.32 |
| June | ..... | 13.24 | 11.78 | 5.48 |
| July | ..... | 1.10 | .00 | 10.30 |
| Aug. | ..... | 28.14 | 1.82 | 14.75 |
| Sept. | ..... | 230.00 | 17.50 | 12.16 |
| Oct. | ..... | 196.34 | 25.37 | 13.55 |
| Nov. | ..... | 26.50 | 12.32 | 2.75 |
| Dec. | ..... | .35 | 25.81 | 2.75 |
| Total | ..... | 577.75 | 163.03 | 516.11 |

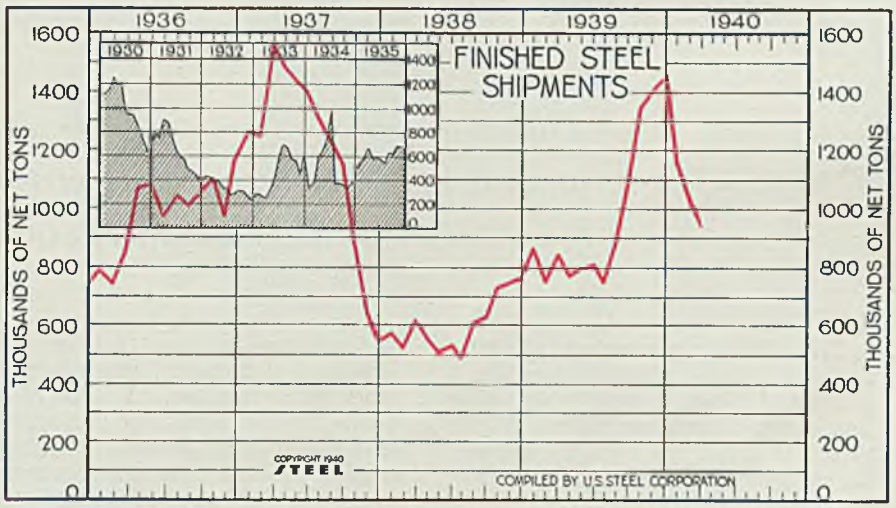
### Finished Steel Shipments

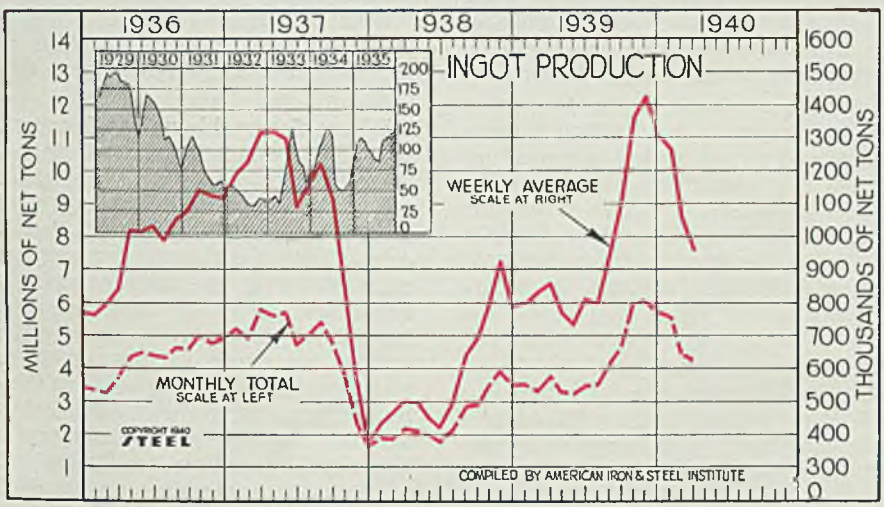
U. S. Steel Corp.

(Unit 1000 Net Tons)

| | 1940 | 1939 | 1938 | 1937 | 1936 |
|---|---|---|---|---|---|
| Jan. | 1145.6 | 870.9 | 570.3 | 1268.4 | 795.2 |
| Feb. | 1009.3 | 747.4 | 522.4 | 1252.8 | 747.4 |
| Mar. | 931.9 | 845.1 | 627.0 | 1563.1 | 863.9 |
| Apr. | ..... | 771.8 | 550.5 | 1485.2 | 1080.7 |
| May | ..... | 795.7 | 509.8 | 1443.5 | 1087.4 |
| June | ..... | 807.6 | 525.0 | 1405.1 | 978.0 |
| July | ..... | 745.4 | 484.6 | 1315.3 | 1050.1 |
| Aug. | ..... | 885.6 | 615.5 | 1225.9 | 1019.9 |
| Sept. | ..... | 1086.7 | 635.6 | 1161.1 | 1060.7 |
| Oct. | ..... | 1345.9 | 730.3 | 876.0 | 1109.0 |
| Nov. | ..... | 1406.2 | 749.3 | 648.7 | 947.3 |
| Dec. | ..... | 1444.0 | 765.9 | 539.5 | 1178.6 |
| Total† | ..... | 11707.3 | 7315.5 | 14097.7 | 11905.0 |

†After year-end adjustments.




### Steel Ingot Production

(Unit 100 Net Tons)

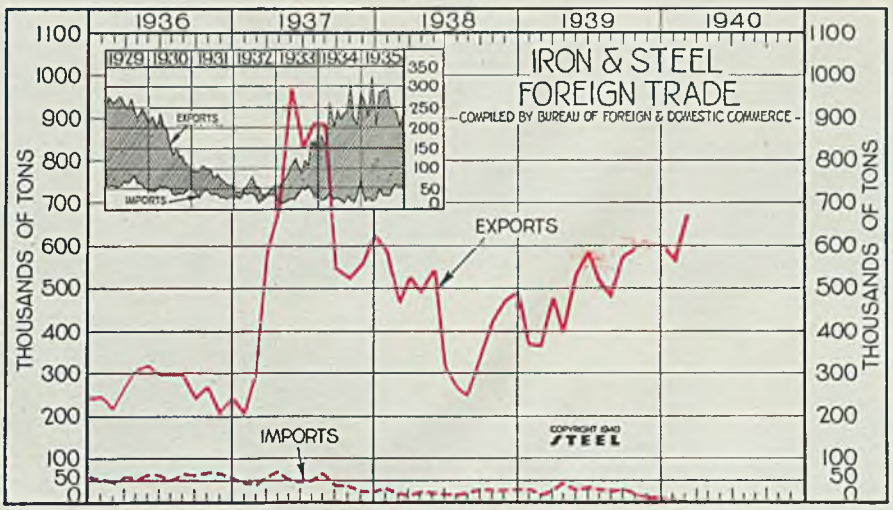
| | Monthly Total | | Weekly Average | |
|---|---|---|---|---|
| | 1940 | 1939 | 1940 | 1939 |
| Jan. | 5,619.7 | 3,555.3 | 1,268.6 | 802.5 |
| Feb. | 4,374.6 | 3,347.3 | 1,056.7 | 836.8 |
| Mar. | 4,236.0 | 3,814.0 | 956.2 | 860.9 |
| Apr. | ..... | 3,331.2 | ..... | 776.5 |
| May | ..... | 3,273.6 | ..... | 739.0 |
| June | ..... | 3,500.3 | ..... | 815.9 |
| July | ..... | 3,542.0 | ..... | 801.4 |
| Aug. | ..... | 4,215.0 | ..... | 951.5 |
| Sept. | ..... | 4,739.1 | ..... | 1,107.3 |
| Oct. | ..... | 6,041.1 | ..... | 1,363.7 |
| Nov. | ..... | 6,118.1 | ..... | 1,426.1 |
| Dec | ..... | 5,784.1 | ..... | 1,308.6 |
| Total | ..... | 51,261.2 | ..... | 983.1† |

†Weekly average.

### Iron and Steel Foreign Trade

(Thousands of Tons)

| | Exports | | | Imports | | |
|---|---|---|---|---|---|---|
| | 1940 | 1939 | 1938 | 1940 | 1939 | 1938 |
| Jan. | 583.6 | 362.7 | 586.3 | 8.3 | 27.7 | 29.6 |
| Feb. | 671.3 | 359.7 | 460.6 | 6.7 | 19.1 | 19.6 |
| Mar. | ..... | 474.4 | 526.9 | ... | 25.4 | 11.8 |
| April | ..... | 394.0 | 489.2 | ... | 44.1 | 21.2 |
| May | ..... | 532.6 | 540.6 | ... | 28.1 | 20.8 |
| June | ..... | 588.9 | 312.0 | ... | 32.6 | 15.9 |
| July | ..... | 513.7 | 263.7 | ... | 30.8 | 14.7 |
| Aug. | ..... | 477.1 | 242.1 | ... | 28.3 | 20.0 |
| Sept. | ..... | 575.6 | 346.1 | ... | 29.9 | 28.0 |
| Oct. | ..... | 591.9 | 425.4 | ... | 19.2 | 26.4 |
| Nov. | ..... | 605.6 | 6.46.2 | ... | 15.2 | 27.6 |
| Dec. | ..... | 600.4 | 490.1 | ... | 14.7 | 28.8 |
| Tot'l. | ..... | 6076.4 | 5152.7 | ... | 315.2 | 264.6 |



By P. W. EBERHARDT
Engineer
Walter Kidde & Co.
New York

# Control of Fire

*Carbon-dioxide systems quickly extinguish fires around dip and quench tanks, spray booths, electrical equipment without damaging parts or contaminating baths. Permit immediate resumption of work*

IN METAL producing, working and fabricating plants there are a number of locations particularly susceptible to disastrous fires. While many of these are well known and so are guarded carefully, there are a number of hazards which could well receive more effective protection.

Possibly these hazards could be divided into those represented by deteriorated electric wiring, flammable liquids, and overheating or ignition of combustible matter.

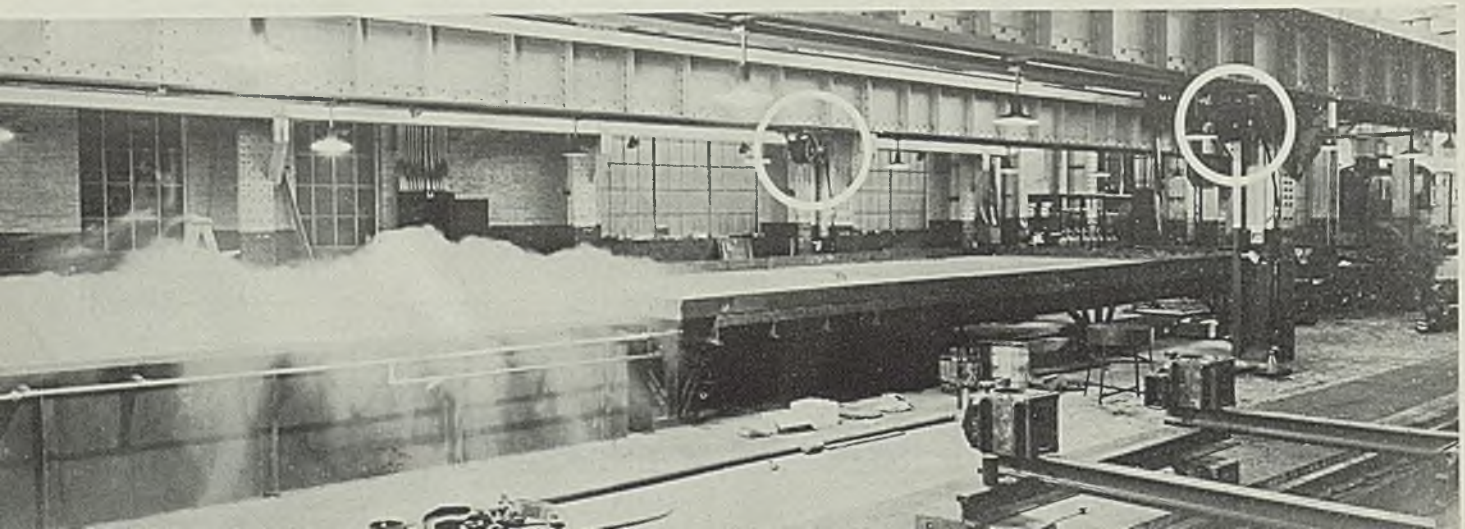
In pickling departments, corrosive atmospheres rapidly attack electric wiring not especially protected against this hazard. Similarly, in cleaning, plating and like operations involving corrosive vapors or much moisture in the air, rapid deterioration of insulation can result in subsequent short circuits and possibility of fires.

Flammable liquids are encountered in paint and lacquer spraying, dipping, baking and drying operations as well as in heat-treating work where oil quenching baths afford another important hazard. Use of dip tanks for application of lacquers or enamels involves an unusually large exposed amount of flammable liquid. Thus common use of paints, varnishes and lacquers which contain flammable solvents readily ignitable at comparatively low temperatures constitutes a marked fire hazard.

The third class, overheating, also is important. Many plating solutions and rinses as well as pickling tanks are heated by gas, the open flame of which again is a danger point. Typical of possible dangers from overheating is the instance of a gas pilot light left burning underneath a tank which accidentally drained out overnight. The tank became red hot and ignited the board catwalk around it, resulting in considerable damage.

Spontaneous ignition of wiping rags used with linseed-oil paint or similar finishes affords another source of fires. Rags used to remove oil from stampings prior to finishing also may ignite spontaneously.

Where flammable paints, lacquers, varnishes, enamels and other finishes are applied by spraying, there often is a great accumulation of overspray in and around the booth. A spark from a shorted lamp socket or a sparking ventilating fan may cause the booth to catch on fire. Results of such a fire can be quite serious as common practice is to store quantities of lacquers and thinning agents near the booth so they are quickly available, a dangerous practice. In only a few cases will isolated storage rooms be provided



This large dip tank and drainboard used for enameling and rustproofing complete railway car trucks is protected by both a built-in carbon-dioxide system and reeled units hung from girders at points encircled. View shows test discharge of gas in tank

# Hazards

Spray booths are ideally suited to carbon-dioxide fire protection

for such lacquers and thinning agents.

Another important hazard is accumulation of fumes from light, flammable solvents evaporated from finishes and trapped in pockets of the work or in the oven. These may form a "bomb" if allowed to concentrate into an explosive mixture, with subsequent serious damage.

In oven drying, it is never known just when a production line will be shut down. Where equipment is completely automatic, it is quite difficult to remove work from the ovens at such a time. In addition to drippings that can easily be ignited, the work itself is apt to catch fire if oven heat is permitted to run too high. Overheating of baking or drying ovens will always remain a possible danger.

### Must Exercise Caution

While use of such solvents as trichlorethylene has greatly lessened the hazard of cleaning operations, there are still many shops which use flammable oil-grease solvents—kerosene, naphtha, etc. These, of course, must be handled with extreme caution.

A study of data compiled during the past three years shows flammable liquids responsible for about one-fifth of annual fire and explosion losses. Roughly, 45 per cent of these occurred in painting occupancies; 30 per cent in manufacturing, mixing and handling; 15 per cent in driers and ovens; and 10 per cent in miscellaneous processes such as heat treating, impregnating and tinning. Loss of flammable liquids in storage is relatively small. The above emphasizes the need for giving special attention to locations where flammable liquids are used, particularly if these liquids are heated, their flash points low, or the quantity considerable. Thus ample protection of heat-treating quench tanks in which large quantities of oil are contained would seem a most important precaution.

Protection against fires is an engineering problem and as such merits the utmost consideration. Modern fire-control systems are available which not only limit the loss to the actual point of ignition, but which also minimize the period of shutdown necessary to extinguish the fire and to resume operations.

An effective method is use of carbon dioxide, especially in controlling Class B fires where flammable oils or other liquids are involved and Class C fires occurring around electrical apparatus. It is not recommended for Class A fires involving carbonaceous materials as these require water-cooling to prevent reflashing of embers after flames are smothered.

Fires in open dip-tanks, drain boards, quenching tanks, etc., are extinguished almost instantly with a carbon dioxide system. A bank of cylinders, each containing about 50 pounds of carbon dioxide under a pressure of about 800 pounds per square inch, is connected by pipes to discharge horns aimed at the points where fire most frequently occurs. These discharge horns may be arranged around diptanks and oil quench tanks to lay a blanket of carbon dioxide gas and snow over the surface of the tank, smothering the fire instantly.

Effectiveness of carbon dioxide as a fire extinguishing agent is extremely high. Known more familiarly as dry ice, carbon dioxide is released from the tanks at a temperature of 110 degrees Fahr. below zero, expanding 450 times its original volume as it leaves the cylinder. By quickly cooling the material and by reducing oxygen content of surrounding atmosphere, the material extinguishes the flames in a few seconds. The "smothering" action which effectively blocks off the supply of oxygen probably is the most important feature.

While the extreme speed with which fires are extinguished is the most important advantage of this method, perhaps of equal importance is the fact that the gas and snow put out the fire without contaminating the contents of the container in any manner. The snow particles evaporate instantly and so permit operation to be resumed five minutes after a fire. This cleanliness factor is extremely important in many finishing operations where a fire may easily run up a $10,000 loss in spoiled parts and finishing materials.

Another important advantage is

(*Please turn to Page* 76)


# Stripsheet Annealing

*Modernization program in annealing department of Cleveland producer meets exacting requirements of new car design and affects improvement in speed, quality and cost of processing sheet and coil stock*

■ WHILE the desire for improvement in the product of a steel mill is an ever-present thought in the minds of its management, the increasing restriction of specifications set up by the users of sheet steel has been a never-resting whip to urge and force the betterment of the product as shipped, and coincidental with this, the improvement of the plant equipment which is used to obtain the product.

With increased demands of the automotive industry, it was inevitable that better sheets would have to be produced faster, and with this came all of the continuous processes of rolling, and improvements in the speed, quality and cost of annealing the sheet metal in final sizes.

The Otis Steel Co., Cleveland, was among the first to sense this change in manufacturing process that would have to come, and the history of the development of the mechanical equipment of this plant has been particularly interesting to follow in the development of its continuous hot and cold mill operations and in the subsequent annealing operations.

Although the program on modernization of the annealing department has not been completed, this company has steadily followed a plan of eliminating a definite part of the older equipment each year and replacing it with the most modern type of annealing furnaces available. At the present time the annealing department of the 77-inch mill, which produces wide sheets, is entirely equipped with new furnaces, while that of the 30-inch mill for coil manufacture has been one-third equipped with furnaces of the latest type.

Fig. 1 illustrates the 77-inch mill annealing department in which there are now installed 12 bell type annealing covers and 30 bases. These units are of the vertical radiant tube type as manufactured by the Lee Wilson Engineering Co., Cleveland, as are the six furnaces in the 30-inch cold mill department. Fig. 4 shows the transfer of a heating furnace unit.

While normally an annealing unit

Fig. 1—Annealing department of 77-inch mill which is equipped with 12 bell-type annealing covers and 30 bases

of this type is composed of a furnace and three bases, the operating department at this mill has found means of cooling the charges sufficiently fast so that several additional furnaces, termed "floaters", are available to be used wherever possible; thus, several additional heats can be picked up every week and, consequently, the operating efficiency of the entire department is raised to an exceptionally high standard.

Truly, it can be said that there is no idle time for any of the annealing furnaces or bases in this mill.

The method of operating a department like this, developed by L. J. Morrisey, annealing superintendent, is extremely interesting. Fig. 3 shows the panel board by which this flexible operation is controlled. The basic idea of operation is that any furnace in the department can be used on any base in the department, and to do this a panel much like a telephone switchboard has been installed so that no matter where a furnace is placed it can be easily connected to a controlling instrument, and in turn to the automatic proportioning type control valves which regulate the firing. All that needs to be noted on the record cards, one of which is kept for the progress of each heat, is the base number and the controller number with which it is to be used. The operator, having been given these instructions, makes the necessary plug-in connections on the panel and the heat is under way. The smooth running operation of this system is indeed a tribute to the operating superintendent who devised it.

### Thermocouples Control Heat

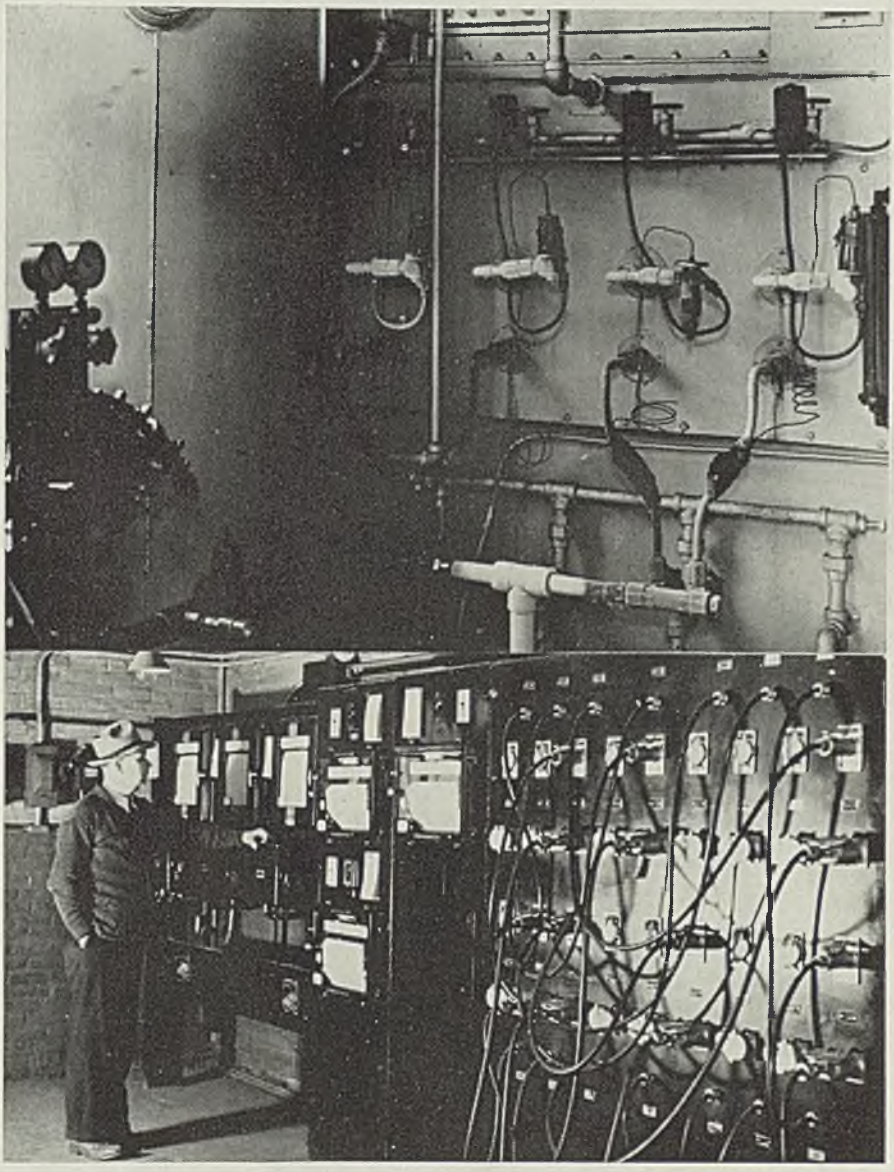
Production of exact requirements in sheet steel, as indicated by the comment that no definite cycles are used but that they are set in accordance with the progress of the temperature records, shows the degree of supervision that is required to produce this high-quality steel. Thermocouples are so placed to control, first, the quantity of heat input, and second, the duration of the cycle. By having thermocouples located at the top and outside of the charge a definite limitation is placed on the temperature potential which is applied to the edge of the sheets to prevent overheating or sticking. By having thermocouples imbedded in the center of the charge and in the bottom center of the charge where the temperature penetrates last, the fact is assured that full penetration has been obtained in all parts of the charge, and that the portion which comes to temperature last is given the full requirement of soaking time before the heating unit is removed. Charges of similar weight, if of a different size sheet and different base loading arrangement, would have a considerably different cycle, but in all cases the soaking time is based on having the coldest part of the charge subjected to the full soaking time requirements.

One fact stands out in consideration of the equipment selected for sheet and coil annealing at the Otis Steel Co., and that is, a standardization of furnace size. While the maximum width of rolling of course enters into the selection of the furnace size, the base plate size, once selected, has been adhered to so that all furnaces in both departments are the same in this respect. While the furnaces in the coil department are made for a greater piling height than those in the sheet mill, it would be entirely possible to load sheets in the coil furnaces or vice versa; and, in fact, if it were ever desired, the portable furnaces could be transferred from one department to the other in case of an emergency. It can be seen that this greatly simplifies the problem of planning production and would allow the mill to lay all of its stress on production of one size of sheets or of coils, if the orders were so constituted.

Although the furnaces in the two departments differ only in their height, their method of heating is identical. Vertical radiant tubes are arranged along both sides of the furnace in sufficient quantity as to provide great flexibility in heat application along the charge. There are enough radiant tubes in each furnace to prevent any localization of heating and at the same time allow adjustment of the heat application to provide for any special arrangement of charge within the

(*Please turn to Page* 72)

**Fig. 2—Refrigerator rotation control equipment which establishes low deoxidizing dew points in winter months. Fig. 3—Recording instruments for checking progress of annealing cycles**




# Speeding Shipments

*Warehouse features highly efficient system carrying large volumes of bulky items to and from storage. Special truck handles large units too heavy for conveyors. Portable conveyors speed loading operations*

By O. J. Greenway
Supervisor
Westinghouse Electric & Mfg. Co.
East Springfield, Mass.*

**PART II**

THE EXPENSE of handling air conditioning units from the manufacturing floor in building "D" shown in Fig. 1, Part I, 400 feet from the warehouse, stocking the warehouse, and loading in trucks or railroad cars has been greatly reduced by the use of a special electric lift truck, Fig. 12.

This lift truck is capable of handling the heaviest 16-cylinder condensing air-conditioning units to a height of 10 feet by means of a telescopic feature. Unit has a capacity of 6000 pounds and is operated by one man.

The renewal parts section, Fig.

*Mr. Greenway is stationed at the East Springfield, Mass. plant rather than at East Pittsburgh, Pa., as indicated in Part 1 of this article which appeared in STEEL of April 8.

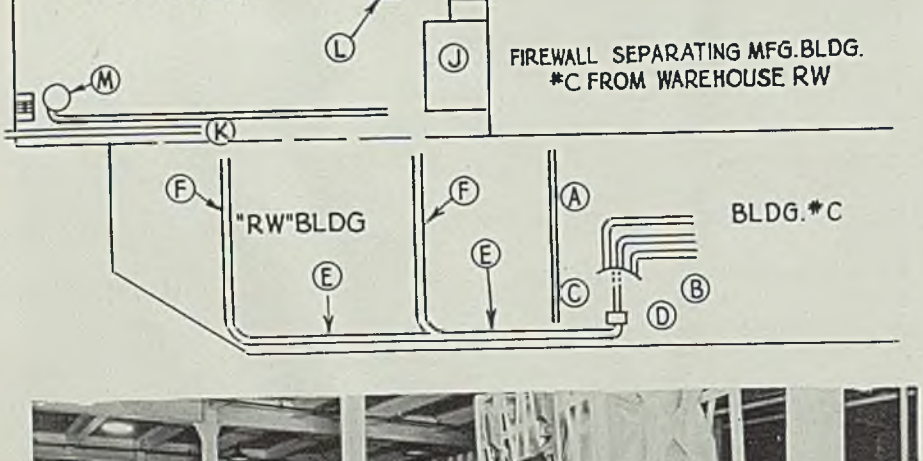



Fig. 10. (Top)—First floor "W" building: A air conditioning storage, B renewal parts storage, C receiving and packing renewal parts, D 2-level conveyors have upper level for outgoing and lower for incoming stock. E is 2-level conveyor to section F where shipments are packed, addressed and sent to section G for checking and weighing, then to section H waiting shipment. Truck dock I, spiral chute K, conveyor L and lift M also shown

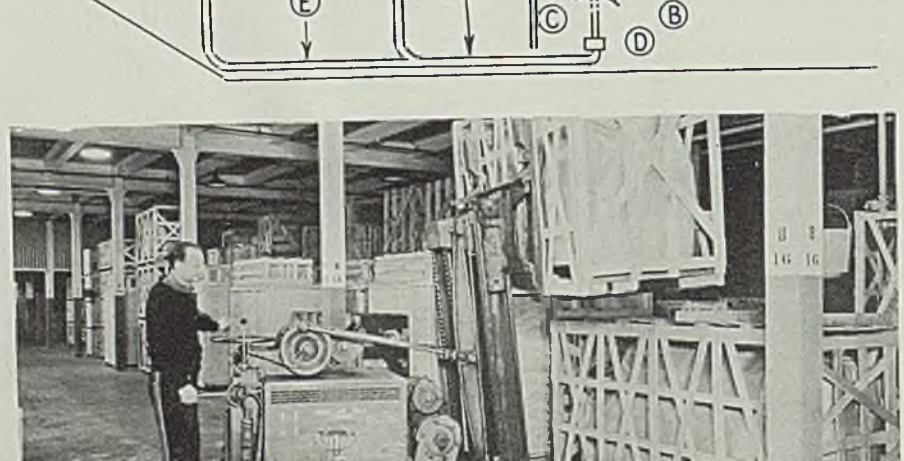


Fig. 11. (Center)—Feeding conveyors: A packing conveyors from building C, B alligator switch, C sloping conveyor from A to C, D automatic lift, E 300-foot belt conveyor from D to F. Portable conveyors take material from F direct to freight cars and trucks at J and K. L is electric lift. M spiral chute

Fig. 12. (Bottom)—6000-pound lift truck lifts products to height of 10 feet


41-Passenger Mack Bus with structural members of "A.W." DYN-EL high strength steel.

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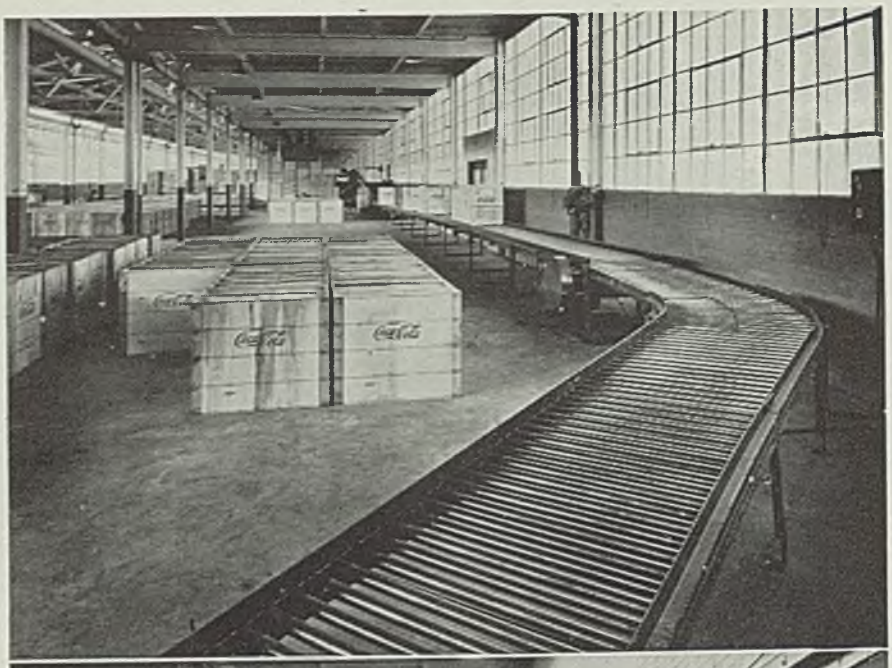
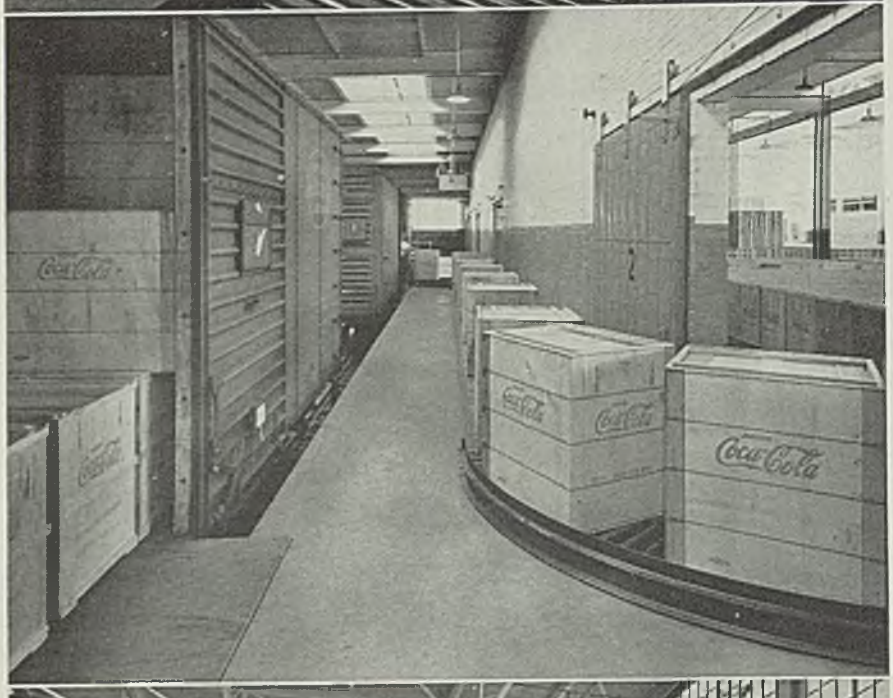
weight . . . faster schedules . . . safe, economical transportation. "A.W". Dyn-el high streng
steel plays an important part in the construction of Mack Buses for 1940. Mack elimi
ates every unnecessary pound of weight with "A.W." Dyn-el. With all its lightne
Dyn-el is stronger than conventional steel, longer lasting and has greater resistance
shock, fatigue and corrosion. *Fewer pounds of steel to buy means fewer pounds of steel to mo*

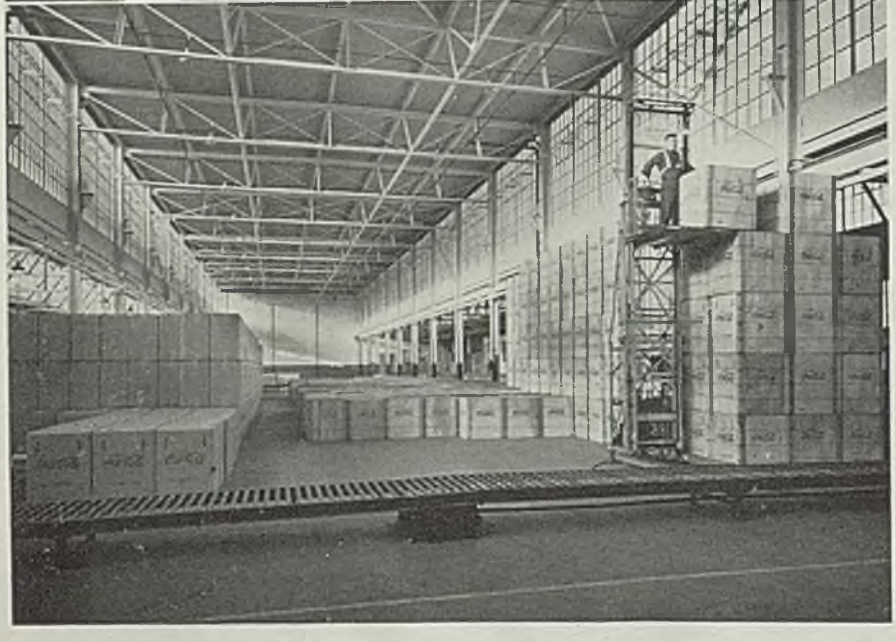
*The 48-page book, "A.W." Presents Dyn-el, gives full details of savings in weight and cost possible with this new high-strength, flat-rolled steel. Write for a copy.*

# ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New Yo
Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N.C., St. Lo
Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : : Shea
Steel Plates : : Hot Rolled Sheets and Strip : : "A.W." Rolled Steel Floor Plates : : Billets, Blooms and Slabs : : "Swede" Pig Iron : : Reading Cut N







10, is adjacent to the shipping section. A conveyor system provides a flow of materials from the renewal parts packing section to the storage bins and from storage to the shipping section with a minimum of handling. Stockroom attendants pick up orders from stock bins in baskets wheeled around on carriages. When order has been accumulated in basket, attendant places basket on top level of 2-level conveyor going to packing section. The location and arrangement of renewal parts section for handling materials incoming for storage and outgoing for shipment, are shown in Fig. 10.

Train shed and truck dock are completely within the warehouse building as diagrammed in Fig. 10. The train shed will accommodate 6 cars. When necessary, we can load as many as 18 cars per day using three freight shifts. The truck dock will accommodate eight of the largest trailer-type motor trucks at one time. Doors to both the train shed and truck dock are electrically operated by push button control. The warehouse floor is at both truck and car height to minimize labor in loading outgoing shipments.

### Three Level Conveyors Utilized

Beverage coolers, water coolers and commercial refrigerating units are produced in the manufacturing building shown as C in Fig. 1, Part I. These products are carried to the packing section by means of level roller conveyors.

The products are packed on the conveyors and then pushed on to a conveyor which takes them directly into the warehouse. This conveyor system is interestingly laid out as shown in Fig. 11. There are three level roller conveyors on which the different products are packed after which they are pushed on to a slightly sloping roller conveyor that connects by means of an alligator switch.

Products roll on by gravity to an automatic lift that elevates and discharges to an overhead power driven belt conveyor which carries the products 300 feet directly through the firewall separating the manufacturing and warehouse sections, into the warehouse. This conveyor declines to floor level and connects

(*Please turn to Page* 84)

**Fig. 13. (Top)—Part of the 300-foot belt conveyor with a section of roller conveyor in foreground connecting to it**

**Fig. 14. (Center)—Trainshed floors are at correct height for loading directly into cars**

**Fig. 15. (Bottom)—This electric stacker permits piling products to a height of about 24 feet**

# YOU TURN ON DAYLIGHT ANYWHERE IN YOUR PLANT— ANYTIME with HYGRADE MIRALUMES!

**What are MIRALUMES?**

Miralumes are complete units of Hygrade Fluorescent Light—wired—ready-to-install—without costly re-wiring.

**More light per watt—without harsh glare or shadow—with only one-fourth* the radiant heat. Instantly steps up plant efficiency!**

*For same amount of light.

MIRALUMES increased foot-candles from 9 to 20, in textile plant of Paul Whitin Manufacturing Co., Northbridge, Mass.

**NOTE**—Extraordinary lighting efficiencies are obtained in fluorescent lamps by tuning the electric discharge to concentrate its ultraviolet energy at the precise 2537 Angstrom Unit wavelength most effective in causing the porous film (Hygrade Patent 2,096,693) to generate light. This achievement, so important to the efficiency of HYGRADE MIRALUME, is described in Patent No. 2,126,787, now controlled in this field by HYGRADE.

## A NEW KIND OF DAYLIGHT—

It will literally take your breath away—the way your lighting is *modernized* by HYGRADE MIRALUMES! Overnight, you will see plant efficiency stepped up... production *increased*... accidents and fatigue *decreased!*

For HYGRADE MIRALUMES bring you the magic of Fluorescent Light at its finest—several times the light per watt—glare-free, shadow-free light—with 75% less radiant heat for equal light intensity.

Changing to this better lighting is simple, inexpensive, swift! HYGRADE MIRALUMES are *complete* units—wired—ready-to-install—without extensive re-wiring. Designed, engineered, built and guaranteed by HYGRADE. Corrected for power factor and stroboscopic effect (flicker).

**WRITE TODAY** or get in touch with your HYGRADE jobber for full information, prices, discounts on MIRALUMES. Address: Hygrade Sylvania Corp., Salem, Mass. But do it now!

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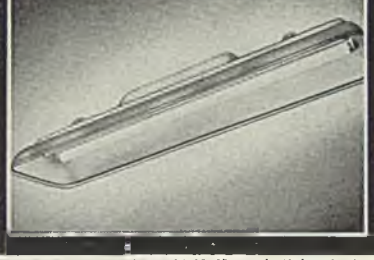
**READY NOW—FOR ALL INDUSTRIES**

COMMERCIAL OR INDUSTRIAL—H F-200 MIRALUME 200 watts; 4 40-watt tubes; approx length, 50 in.

INDUSTRIAL MIRALUME F-100: 100 watts; 2 40-watt tubes; approximate length, 54 inches



*Fluorescent at its Finest—*

# Hygrade Miralumes

Hygrade Sylvania Corp., Est. 1901. Makers of Hygrade Incandescent Lamps and Sylvania Radio Tubes

Copr. 1940 Hygrade Sylvania Corp.

# "Men at Work" Is Theme for Chicago Management Meeting

■ JOB analysis, management problems, employment and labor policies were subjects given special attention at the fourth annual industrial conference of the Industrial Management society in Chicago, April 5-6.

Design of a job specification is of utmost importance if it is to be of maximum usefulness to management, declared Eugene J. Benge, management engineer, in discussing basic job analysis. Analysis, when properly prepared gives full value to such work factors as skill, working conditions, responsibilities, and mental and physical efforts, and is a fundamental instrument to be used in preparing employment specifications, promotional charts, training programs, merit rating plans, and job evaluation schedules.

Speaking of some financial and cost problems of management, G. M. Pelton, comptroller's office, Swift & Co., Chicago, showed how slimmer profit margins and other influences are making maintenance of a successful business more and more difficult. He emphasized importance of proper ratios between sales and money tied up in accounts and notes receivable, between sales and fixed properties, between sales and total assets.

### Price Stabilization Unsound

"It is economically unsound," Mr. Pelton stated, "for any industry to attempt to control production or to stabilize price and profits through unwise legislation or monopolistic control for the purpose of sustaining life by artificial means."

Aims and results of labor laws were explained by John R. Doesburg, attorney, R. R. Donelley & Sons, Chicago. He showed how certain labor laws, in actual practice, do not yield expected benefits, but sometimes work hardships on the very ones the law had proposed to protect.

B. K. Elliott, vice president, Studebaker Corp., South Bend, Ind., spoke on effect of business and economic trends on employment, translating current trends into terms of probable sales and anticipated labor requirements.

Discussing selection of the correct man for a job, Dr. Harold A. Vanachen, Caterpillar Tractor Co., Peoria, Ill., and president, Central States Society of Industrial Physicians and Surgeons, stated that unless some practical method is devised the chances are 10 to 1 against a company picking the correct man for the job when ten men apply for it. Physical examinations are of definite value, while more and more attention is being paid to the mental factors in selecting employes.

Problems of unemployment compensation administration were outlined by Peter T. Swanish, commissioner of placement and unemployment compensation, state of Illinois. Dr. Otto P. Geier, Cincinnati Milling Machine Co., Cincinnati, spoke on the doctor's influence on management's labor policies, stressing the benefits of following industrial doctors' advice in plant health and safety matters. Ralph L. Jacobs, professor of education, University of Cincinnati, Cincinnati, treated with the training a modern supervisor needs.

Noel Sargent, secretary, National Association of Manufacturers, New York, discussed governmental control of employe relations, and described his experiences in Washington as a spokesman for American industry. W. L. McGrath, president, Williamson Heater Co., Cincinnati, described multiple management and how it works.

Under the subject "Profits to Keep Men at Work," Frank C. Everitt, consulting engineer, said: "Continued assurance of profits, as a means of perpetuating work opportunities, justifies the most intense concentration of managerial attention." He showed how successful application of the profit control principle can be applied to almost any business now.

# Power Developments Considered At Annual Midwest Conference

■ SESSIONS of the Midwest Power conference conducted at the Palmer House, Chicago, April 9-10, dealt chiefly with small power plants, electrical transmission, power processes, and fuel problems of power plants. Held annually under sponsorship of Armour Institute of Technology, Chicago, with co-operation of seven midwestern universities and seven engineering societies, this year's conference was attended by close to 500, a figure about 25 per cent better than 1939.

### Discusses Diesel Engine

Herbert W. Dow, executive sales engineer, Nordberg Mfg. Co., Milwaukee, in discussing dual fuel burning diesel engines, pointed out the advantages of injecting a small quantity of fuel oil into each charge of gas. The small amount of fuel oil is used as a kindling and stabilizing medium, insuring every cylinder's igniting its charge of fuel at exactly the same time. Dual fuel burning engines put into service to date all show the same economies, so results on one engine are same as on ten engines.

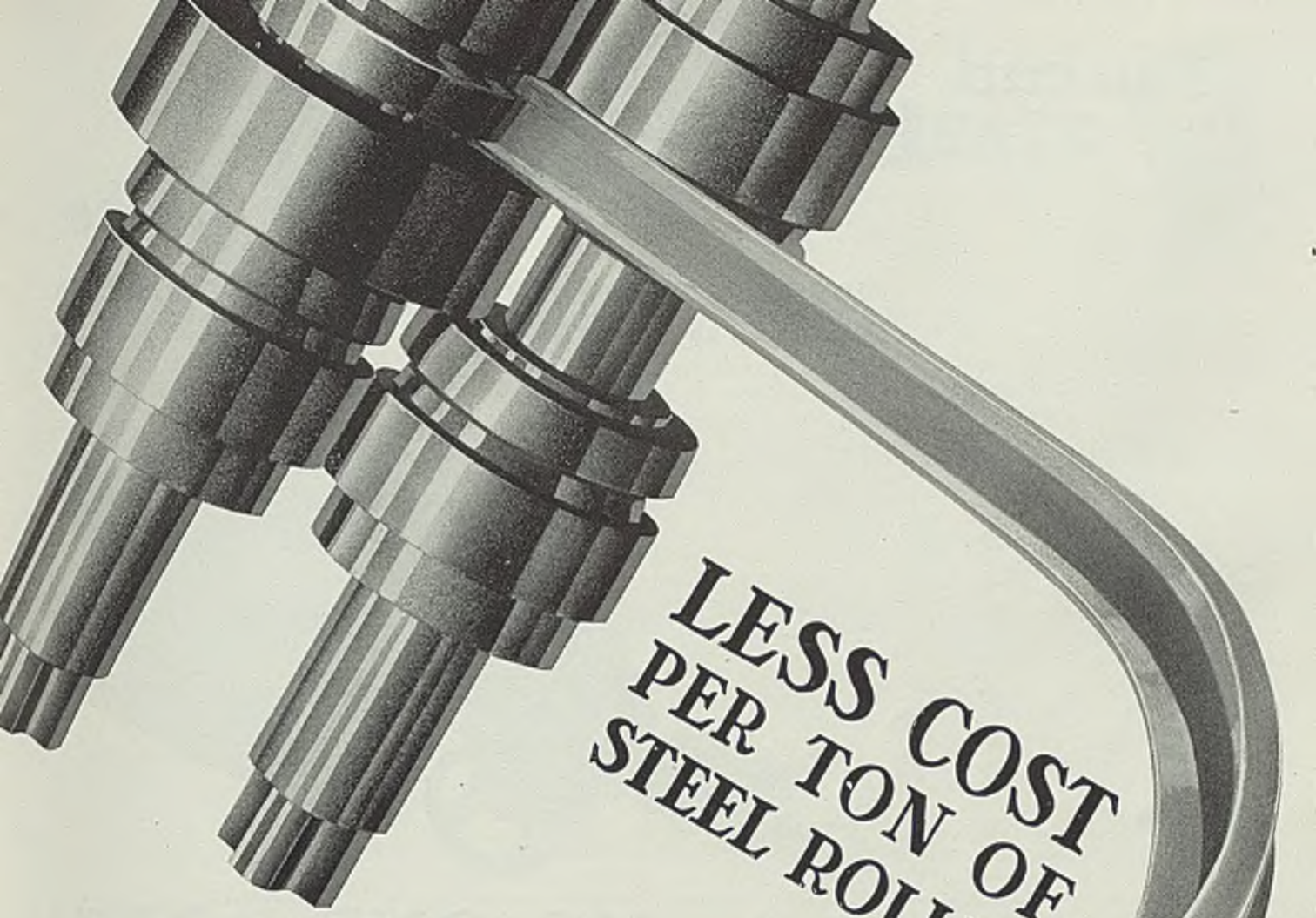
Parker A. Moe, superintendent of power, International Harvester Co., Milwaukee, in speaking of maintaining optimum in steam generator efficiency, stated prime requisite of top performance lies in willingness of operator in charge to strive to attain best results out of his equipment and to maintain it properly and economically. To do this, his efforts will largely be confined to establishing standards and training his men to abide by them, thereafter to follow up his system and delve into the task of improvement.

At the All-Engineers dinner, April 9, F. Malcolm Farmer, president, American Institute of Electrical Engineers, and James W. Parker, vice president, American Society of Mechanical Engineers, addressed the gathering on the engineer and his profession, and the evolution of the engineer, respectively.

Philip W. Swain, editor of Power magazine, discussed at the April 9 session the fallacies that exist concerning the subject of power. Sessions on April 10 were devoted to fuel problems on power plants, hydro power. At luncheon L. W. W. Morrow, McGraw-Hill Publishing Co., Chicago, made an address on trends in power supply. A plant visitation was made to the Electro-Motive Corp., General Motors subsidiary, La Grange, Ill., where diesel-electric locomotives are built.

## Piano Wire Screen Cloth

■ A new type of screen cloth introduced by Jeffrey Mfg. Co., Columbus, O., is made of piano wire strung at a high tension in one direction only with no cross wires. Screen is said to pass undersize particles much more rapidly than the conventional types of cloth and to have unusual capacity and life.



# LESS COST PER TON OF STEEL ROLLED RAILS

Phoenix Rolls stand squarely on their records of service. The most worthwhile recommendations for Phoenix Rolls come directly from men who use them.

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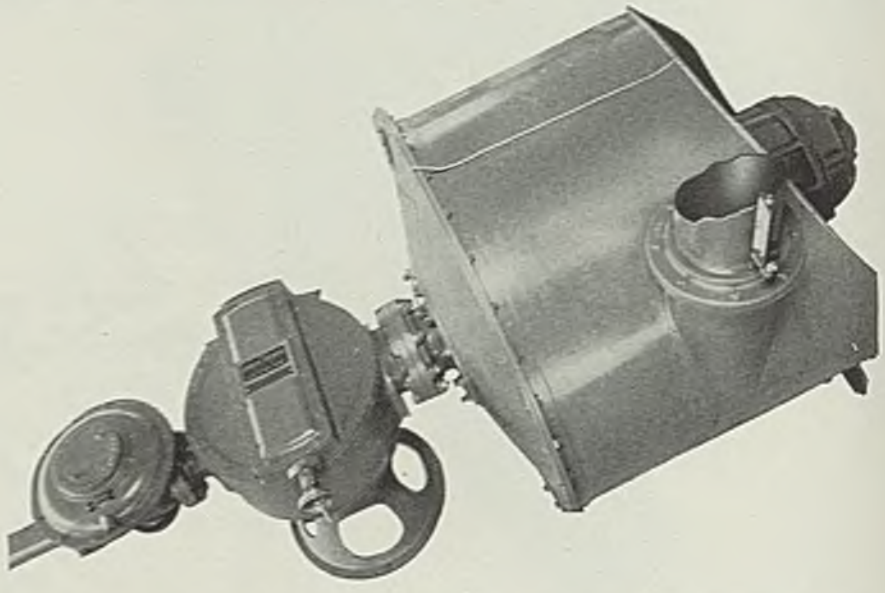
PITTSBURGH ROLLS DIVISION of BLAW-KNOX CO.—"Steel's Partner" • PITTSBURGH, PA.

*You can*

# LOOK DOWN *on the*

# INDUSTRIAL CARBURETOR



## *but . . . NO ONE DOES!*

No, sir . . . not when it saves money, saves fuel, permits more rigid standards . . . produces the same result, day after day, year after year, continuously *doing the job* under varying and extreme conditions.

The function of the Industrial Carburetor is to mix either coke oven or natural gas with air in a predetermined ratio; to produce oxidizing or reducing atmospheres *exactly* as desired . . . to produce complete combustion in firing Swindell-Dressler Recirculating Annealing Covers . . . or in immersion heated tin pots.

Judging from the experience of many of America's greatest steel mills, it is a reasonable certainty there is at least one job in your plant where the Industrial Carburetor can improve quality, safeguard uniformity, increase production, cut costs. A large order? Why not ask? Address **The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore, Md.**

# KEMP of BALTIMORE

# BETWEEN HEATS WITH Shorty

■ Say fellers:

Comin' across the yard from the big boss' office a few minutes ago I bumped into Doc Gilbert. Doc peddles the lubricatin' oil we're usin' over in the 72" mill. He was on his way to look over 'er oilin' system.

"How's tricks, Shorty?" he sez.

"Not so bad," I sez. "We're keepin' up production with the boys alright, and losin' just as much money. How's she goin' with you?"

And say, what he tells me makes my ears ring jus' like as though we were standin' over long side the nail makin' machines. Seems as though some of the wide mills in the country have been pullin' a lot of bearin's and settin' them over agin the wall for the time bein'. The dope is that they're tryin' out some other kinds but don't make sense to me. The ol' ones worked alright up 'till now. And I sez to myself:

"Shorty, yes sir, there's a nigger in the woodpile somewhere."

And by the time we reached the door leadin' into the strip mill he had my ears buzzin' worse 'an ever. And I sez:

"Doc, is all this dope your tellin' me true to form?"

"Shorty," sez he, "you think I'm tryin' to make you believe a dollar is worth more than 59 cents?"

And jus' before he went through the door of the mill he leans over and whispers in my ear and he sez:

"I'll tell you another thing, Shorty," he sez.

"The pots aboilin, and if they don't get the grounds settled pretty soon, look out, for you never can tell when the millrights may be tryin' to anchor some 2-high mills on the shoes."

'Bout this time Pop Sullivan on the ladle engine was shiftin' a drag of empties into the cast house of No. 2 furnace and jus' as he gets where Doc and me was talkin', he lets go with a couple of blasts from 'er whistle, jus' to throw a scare into us. Last I see of Doc he was goin' into the mill like hellsappopin.

And I waves to Pop up in the cab, and sez:

"OK, old timer. You did the trick that time alright. Didn't know you had a couple of wheezes left in the old puffer."

And he makes some deaf-and-dumb signals to me as he turns into the spur goin' to No. 2 and I sends a few back to him in the same language.

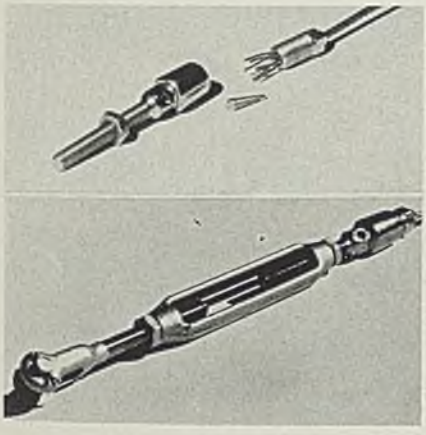
Like to know what we sez? Well sir, can't tell you this time for you haven't got 'nough graphite coverin' your mill clothes to understand.

Well, so long. I'll be seein' you.

"Shorty" Long

## Splicing Time Reduced By Use of Fitting

■ Fiege fitting splicing device for wire ropes, developed by Electroline Co., 4121 South LaSalle street, Chicago, provides a connection having full-rated cable strength and reduces time and trouble involved in splicing.



Plug serves as a wedge holding the strands of wire rope firmly in place. Below fitting is shown attached to a turnbuckle. Where corrosive conditions are encountered, fittings are of Monel. Photo courtesy International Nickel Co. Inc., 67 Wall street, New York

Wire rope is first passed through smaller part of fitting and its strands broomed out or separated as shown in the accompanying illustration. Then a small metal plug is placed in the center of separated strands and smaller part of fitting is screwed securely into the larger. Thus, plug serves as a wedge holding strands firmly in place. To make sure connection has been made properly, it may be inspected through a hole in the fitting. Stud end fitting is shown as part of a turnbuckle; however, either jaw or eye ends for connecting wire rope of 3/16 to 1-inch diameter can be used.

## Process Makes Turbine Shafts Run True

■ In making turbine shafts run true by means of a process developed by S. Homer Weaver, engineer, General Electric Co., Schenectady, N. Y., machined-straight shaft or rotor is suspended in a standard lathe bed and then heated. An electric oven, sectionalized for different length requirements, is closed about the part and controlled heat is applied through wall strip heaters.

The rotor is turned at 2 revolutions per minute and thermocouples riding on it give the temperature readings.

As the heat in the oven is raised, rotor loses its straightness. Sliding rods (see illustration) passed through the wall and riding against the turning rotor indicate increasing shaft deflection as the temperature goes up. Then, at a certain critical temperature, a straightness which is not affected by temperature or temperature changes is restored.

One of the sliding rods which ride against the turning rotor and indicate distortion. Before heat test is started, ends of the oven are well covered by asbestos

The original plant at Pemberwick, Connecticut [near Port Chester, N.Y.] where R B & W EMPIRE bolts and nuts were first made in 1845.

# 95 YEARS of

When, in 1850, the chilled plow came into general use and displaced the iron-bound "sod-buster" on our prairies, R B & W had already been contributing industrial fastenings for 5 years.

In 1855 the Bessemer process made steel available in large quantities for the first time. R B & W, then ten years old, was in a position to contribute substantially to the ensuing metal era.

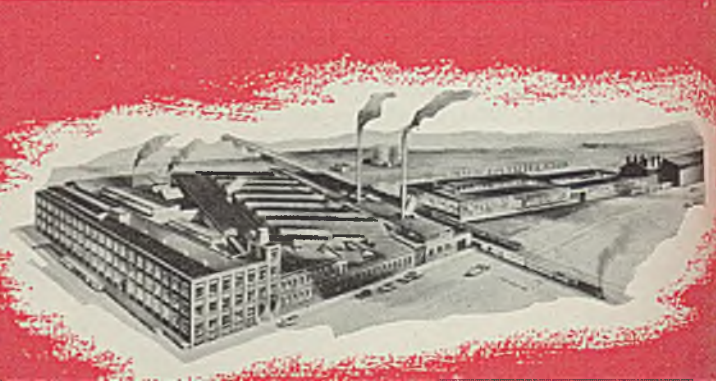
When the transcontinental railroad became a reality in 1869, a new page was written in history. R B & W—then twenty-five years old—was already supplying bolts, nuts and rivets for transportation uses.

Almost a century of experience devoted solely to the advancement and manufacture of bolts, nuts and threaded fastenings.

Industry has seen many changes, and with these changes R B & W has continued to pioneer a quality product through newer materials, improved production methods, more skillful workmanship, higher standards of accuracy, finer finish.

## RUSSELL, BURDSALL BOLT

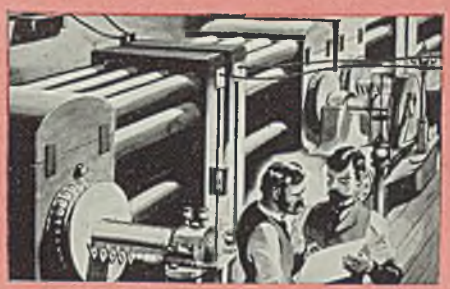
PLANTS AT PORT CHESTER, N. Y.



# 1845 to 1940

# PROGRESS

In Lloyds' Register for 1878, the screw steamer "Annie" was classed as steel—the first ship to be so rated. R B & W—with 33 years of experience—played an important part in shipping growth.



Man's dream of harnessing thunder-bolts was realized when in 1882 the first central station went into service. R B & W—then in business for 37 years—aided materially in developing electrical energy.

In 1891 scoffing bystanders laughed at the high-wheeled buggy powered by a sputtering, asthmatic motor—America's first practical horseless carriage. R B & W products—in use then 47 years—substantially aided the rapid automotive advance.

Thus, pride of age goes hand in hand with pride in advancement of American industry and the constant development of better R B & W products.

In 1940 — our 95th Anniversary — we will continue to help solve the ever-changing problems of threaded fastenings for those who want a broad and tested background of engineering experience, quality-manufacture and satisfactory service.

## & WARD

## AND NUT COMPANY

ROCK FALLS, ILL. CORAOPOLIS, PA.

BOLTS
EMPIRE
NUTS-RIVETS

At the right, the home plant and offices of Russell, Burdsall & Ward Bolt and Nut Company at Port Chester, N. Y. In center, the plant at Rock Falls, Ill. At the left, the plant at Coraopolis, Pa.

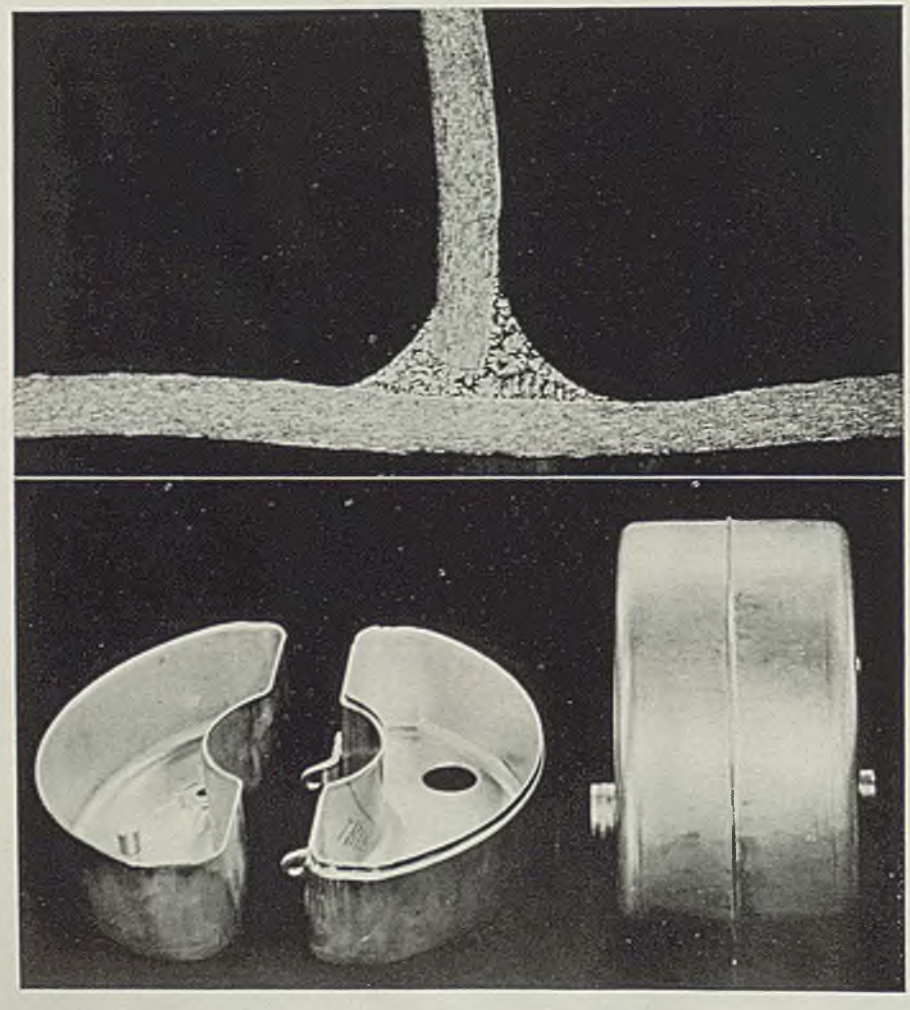

# Brazing Aluminum Alloys

*Much laboratory work and several commercial installations show brazing of aluminum alloys to be a practical joining method. May be done as furnace brazing, dip or torch brazing*

■ COMMERCIAL applications of brazing methods for aluminum and its alloys now are being used successfully in several fields. Research work on a laboratory scale has been carried out over an extended period. While a complete and detailed description of the procedure involved cannot yet be given, it is safe to assert there is a definite place in the metal fabricating field for this technique.

Improvements both in principles and in methods are being developed as a result of commercial applications. Considerable interest has been aroused concerning its possibilities, particularly in applications where batch brazing is possible and desirable. Basic factors surrounding the process have been well developed. Considerable information accumulated from laboratory work indicates the performance to be expected of brazed joints in aluminum.

The underlying principle used in the three basic methods is the same. In either furnace brazing, dip brazing or torch brazing, filler material and fluxes with melting points below that of the parent metal are used, permitting the filler to wet the joint. Primary difference between brazing and welding, of course, is whether or not parent metal is melted in making the joint. If the joint were to be welded, some of the parent metal would be fused or melted in the process.



### Furnace Brazing Economical

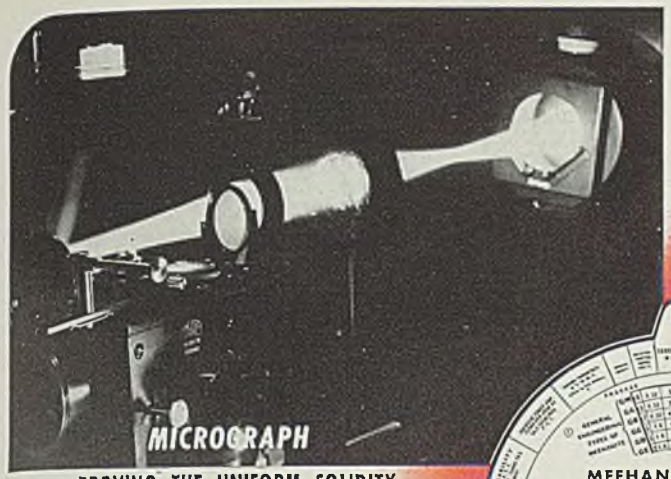
While other methods of application may be, and probably will be developed as commercial use of brazed joints in aluminum is broadened, the above three methods remain the principal current ones. Furnace brazing is the least expensive for mass production of joints because it is only necessary to assemble the parts, flux the joints and bring the assembly to a temperature above melting points of filler and flux, but below that of the parent aluminum. This operation can well be carried out en-masse in a brazing furnace since temperature required is relatively low.

In the torch brazing process, procedure is similar to regular gas welding. Filler and flux of low melting point are used so parent metal is not raised to a temperature near its melting point.

Dip brazing, the third process, requires jigs to hold the parts to be brazed in proper position while the assembly is dipped in a bath of molten flux at a temperature high

Fig. 1 (Upper)—Cross section of furnace-brazed T-joint made with wire filler material in aluminum-manganese alloy sheet

Fig. 2 (Lower)—Gasoline tank in which joints, fittings and brackets are brazed in batch-type furnace

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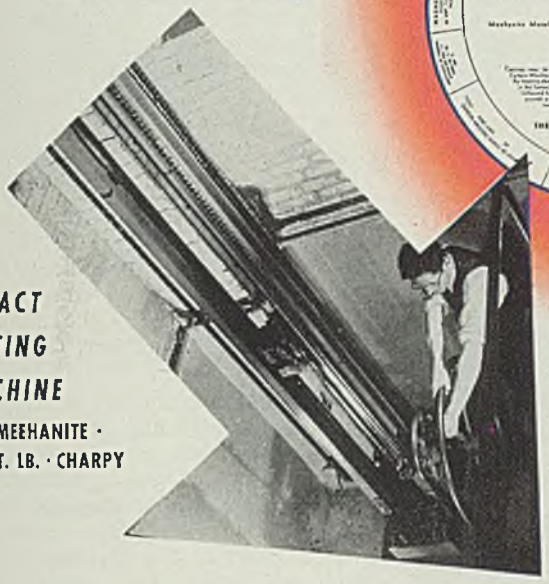

*IMPACT TESTING MACHINE*

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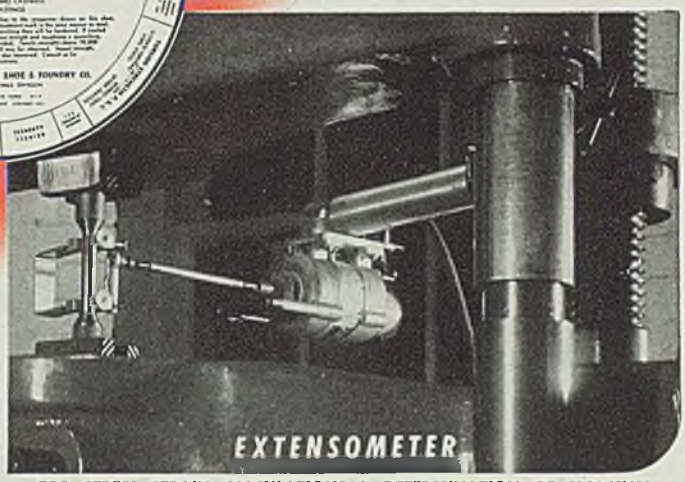


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# You know what you're getting in MEEHANITE

Manufacturing control in the production of ***Meehanite*** castings begins with the careful selection of the correct raw materials and ends in our modern research laboratory where tests like those illustrated above prove the achievement of the engineering properties desired. • A new wheel chart of the physical properties of the engineering and special types of ***Meehanite*** castings has just been published. If you would like to have a copy, write us and we will gladly send you one.

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enough to permit the filler material to flow into the joint and make positive contact.

Thus far brazing has been applied only to four aluminum alloys. Additional work is being done to determine reaction of other alloys to the process but results are not yet conclusive. The current materials include commercial grade aluminum known as 2S, a high purity aluminum, and three other alloys including 3S, an aluminum-manganese alloy; 4S, an aluminum-manganese-magnesium alloy; and 61S, a heat-treatable alloy of aluminum, silicon, magnesium and chromium, which has shown the highest tensile strength in brazed joints. So far strength of brazed joint has been of little importance in choosing the alloys to be brazed, the fabricators having laid particular emphasis on cost, ease of forming and strength of the parent metal rather than on the strength of the joint, over and above a certain reasonable margin.

Some idea of the range in tensile strength covered by these joints can be gained from Table I. This represents work done on furnace-brazed butt joints, using sheets 0.051-inch in thickness. In furnace brazing, the brazing temperature is higher than the annealing temperature. Result is the materials are annealed as a by-product of the brazing process. In using 3S or 4S alloys, they will return to an annealed temper regardless of the amount of cold work in prior production, while the 61S attains maximum strength after heat treatment. Some additional strength can be developed in the first alloys by air or water quenching after brazing. A separate heat treatment after brazing also can be used.

**TABLE I—Typical Values of Strength of Furnace Brazed Butt Joints**

| Alloy | Tensile Strength, p.s.i. | Yield Point, p.s.i. | Elongation, % in. 2 inches |
|---|---|---|---|
| 3S | 15,000 | 9,000 | 7.0 |
| 4S | 19,000 | 12,000 | 3.0 |
| 61S | 34,000 | 30,000 | 3.0 |

In any method, the success of the application depends chiefly on the flux and filler materials used. The flux is of primary importance because of rapid formation of oxide on any aluminum surface. This oxide must be removed fully or the filler will not adhere to the aluminum surface as it does not "wet" the area to be brazed. A number of special brazing fluxes, developed for use in this connection, have the required low melting point and characteristics which will prepare the surface for ready flow of filler material. The fluxes may be applied to the joint either dry or wet. The first commercial applications have sprayed or painted the flux on the joint although there are other possible methods.

**Excess Flux Must Be Removed**

Filler materials have been developed which flow freely far enough below the melting point of the parent metal to permit some flexibility in the brazing temperature. They are applied in the form of wire or a sheet washer, depending on the application.

After completing the brazing operation, excess flux must be removed to prevent possible corrosion and to improve the appearance of the finished part. Since the fluxes thus far developed are soluble in water, most of the material can be removed by a hot water rinse. However, it has been found desirable in most cases to dip in stronger solutions following the water treatment. A preliminary dip in 5 per cent sodium hydroxide at 150 degrees Fahr., followed by a water rinse and a longer dip of approximately 1 to 2 minutes in cold 50 per cent nitric acid with a final cold water rinse has been found satisfactory.

In some cases it has been found desirable to clean parts prior to brazing, particularly to remove dirt and oil or grease when the brazing operation follows a forming or machining operation. Cleaning methods similar to the one outlined above have been satisfactory. In some cases, a simple wash in solvent is sufficient.

There is little difference in the furnace equipment required for aluminum brazing from that used

(*Please turn to Page 78*)

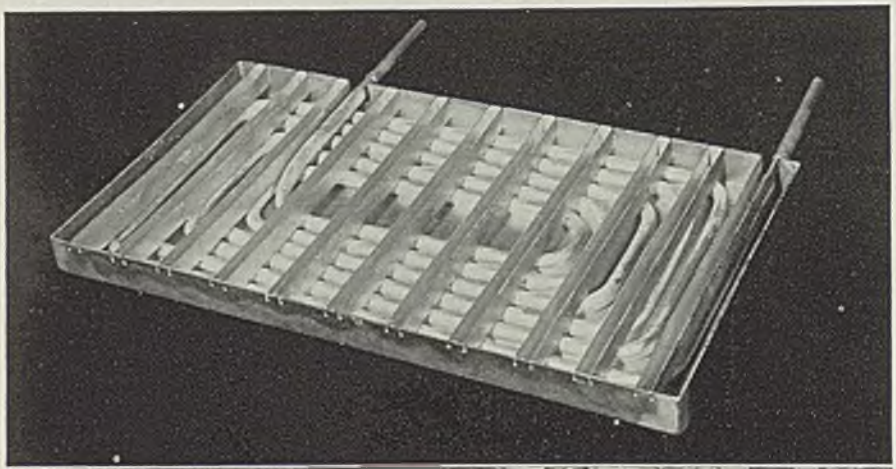


Fig. 3. (Upper)—Assembly of tubing and sheet joined by brazing

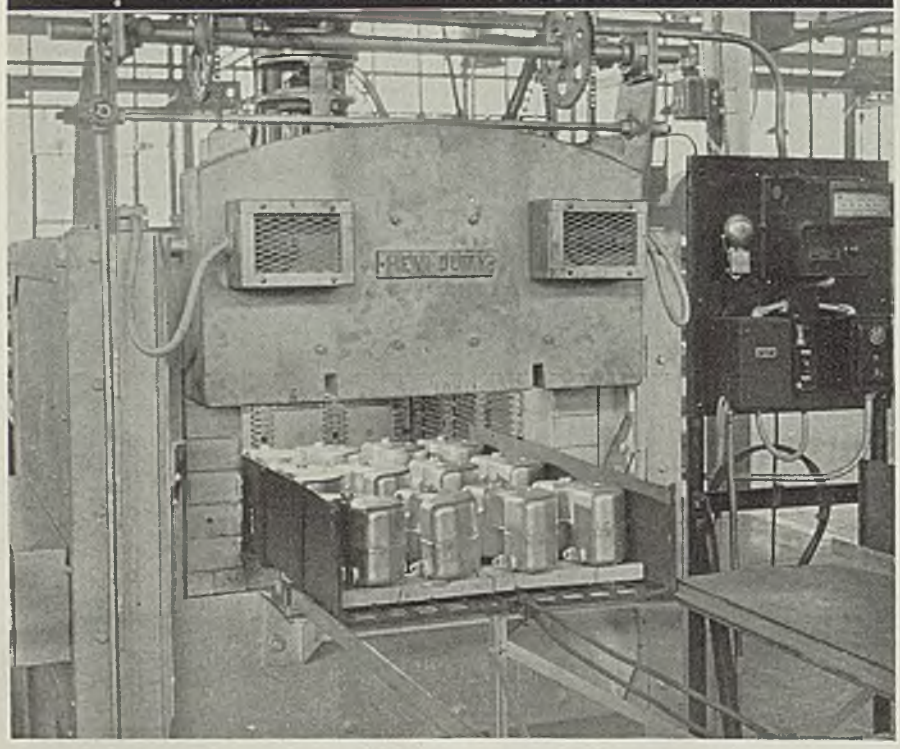
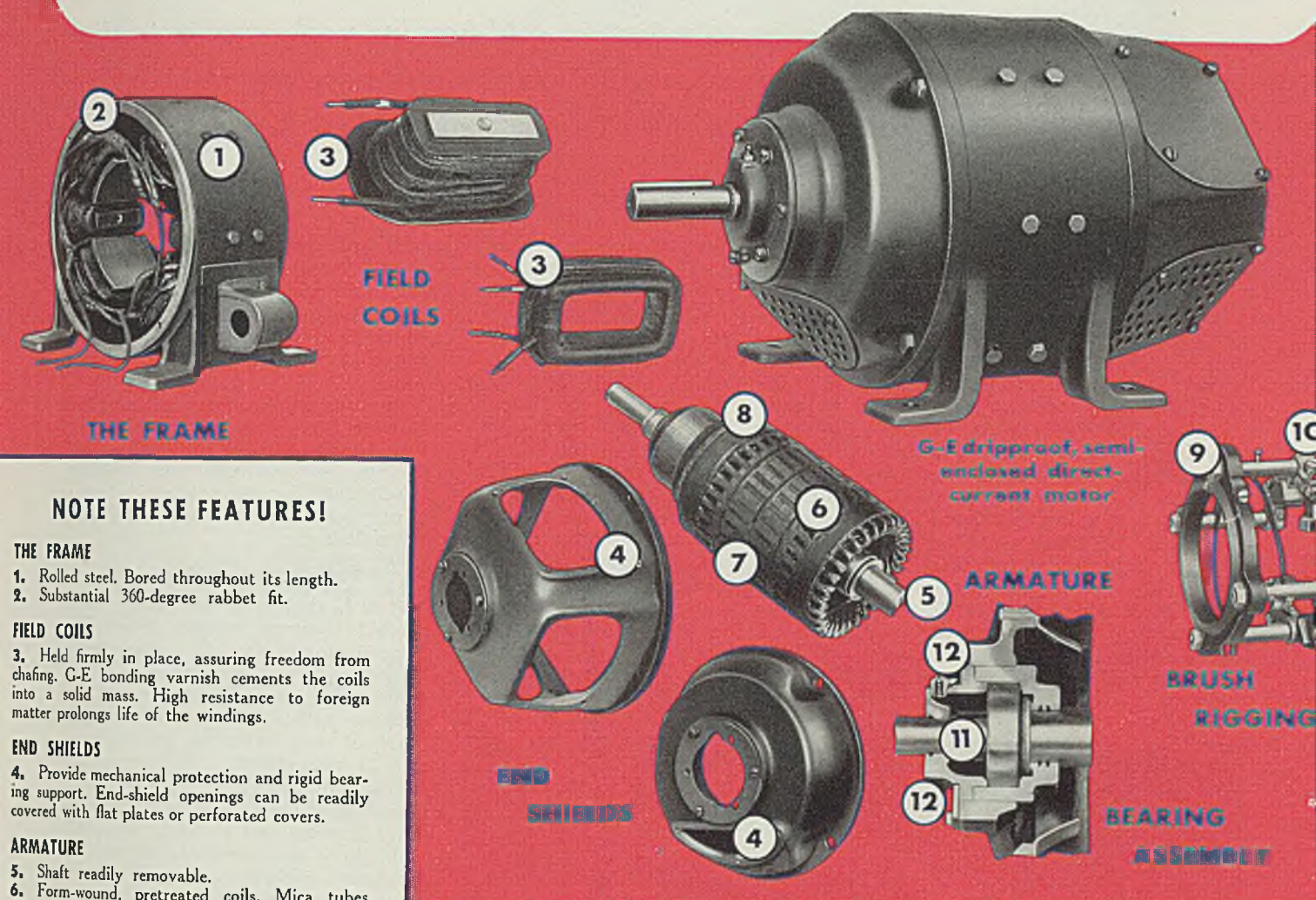



Fig. 4. (Lower)—Furnace setup for handling batch furnace-brazed aluminum alloy parts

# Taken Apart for Your Inspection

## NOW See Why G-E Direct-current Motors Meet the Tough Requirements of Steel Mills




### NOTE THESE FEATURES!

**THE FRAME**

**1.** Rolled steel. Bored throughout its length.
**2.** Substantial 360-degree rabbet fit.

**FIELD COILS**

**3.** Held firmly in place, assuring freedom from chafing. G-E bonding varnish cements the coils into a solid mass. High resistance to foreign matter prolongs life of the windings.

**END SHIELDS**

**4.** Provide mechanical protection and rigid bearing support. End-shield openings can be readily covered with flat plates or perforated covers.

**ARMATURE**

**5.** Shaft readily removable.
**6.** Form-wound, pretreated coils. Mica tubes wrapped around slot portion. Coil receives several impregnations of G-E insulating varnish, which is baked on after each dipping. The result is a heat- and moisture-resisting insulation that is both tough and flexible.
**7.** High-grade, silicon-steel laminations.
**8.** Commutator is built up of copper segments.

**BRUSH RIGGING**

**9.** Brush yoke clamped in position and easily adjustable.
**10.** Brush holders easily adjusted to maintain proper setting.

**BALL-BEARING ASSEMBLY**

**11.** Cartridge-type ball bearings exclude dirt even when the motor is disassembled.
**12.** Convenient pressure-gun fitting and relief plug permit lubrication and flushing of bearings without motor shutdown.

WE WANT you to look at the parts of a typical General Electric d-c motor (Type B, 284 frame) and see for yourself how well suited it is for grueling service in steel mills.

As you study the illustrations, remember that G-E direct-current motors provide such advantages as long bearing life, excellent commutation, a highly protective insulation with remarkable bonding qualities, easily accessible brush rigging, and a convenient lubrication system.

These General Electric motors are available in a wide variety of standard ratings, speeds, and enclosures. Thus they will meet practically any steel mill condition requiring an industrial type d-c motor. Our nearest representative will be glad to give you complete details. General Electric Company, Schenectady, N. Y.

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# Spheroidizing

*To obtain ductility required for cold-heading work, a spheroidizing heat treatment is recommended. Temperatures are 1380 to 1410 degrees Fahr. Heating period about 2 hours, soaking 2½ to 3, cooling 4½ to 5*

■ COLD HEADING or upsetting characteristic of metal is limited by its ductility. Plain low-carbon steel is not difficult to upset but increasing demands for higher tensile strengths in bolts has necessitated larger use of the less-ductile high-carbon and alloy steels.

For cold heading, high carbon and alloy steels must be made sufficiently ductile to withstand the terrific pressures to which they are subjected in shaping the bolt head. This can be done by either a normalizing or spheroidizing heat treatment.

Spheroidization is generally accomplished by heating to and holding at a maximum temperature approaching the critical or Ac-3 point, followed by slow cooling. It is generally recognized that heating much above the critical point seems to retard spheroidization. For this reason, it is important that the furnace be designed for close control of heat input and temperature. While it is desirable to heat rod to temperature as quickly as possible, the furnace must be designed to prevent overheating of outside rods of coils or bundles.

Unless rate of heat input to the work is closely controlled, there is a natural tendency for the outside of closely coiled rod to reach excessive temperatures during the heating-up period. Although temperature of the whole coil evens out during soaking, the fact that a portion has been overheated will retard spheroidization in those sections. Final result, in such a case, is nonuniform spheroidization of the rod. That portion of the rod length which has been overheated will be spheroidized less than the remainder.

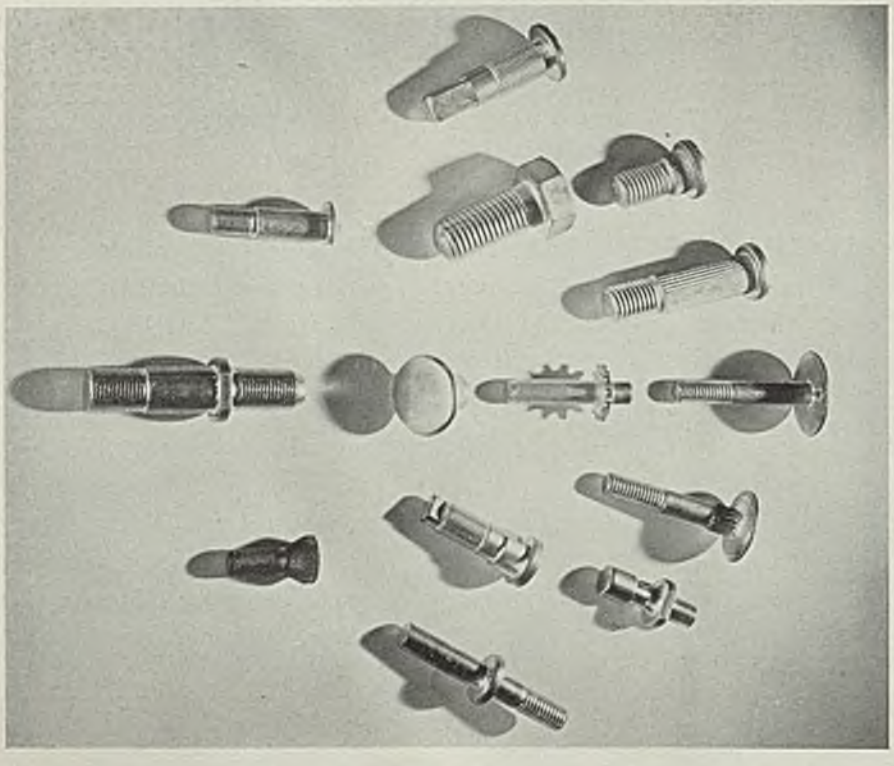
For this work, a new radiant-tube furnace fired with natural gas was recently installed in the plant of an eastern bolt manufacturer. While used chiefly for spheroidizing, it also is employed for both annealing and normalizing.

### Fans Regulate Cooling

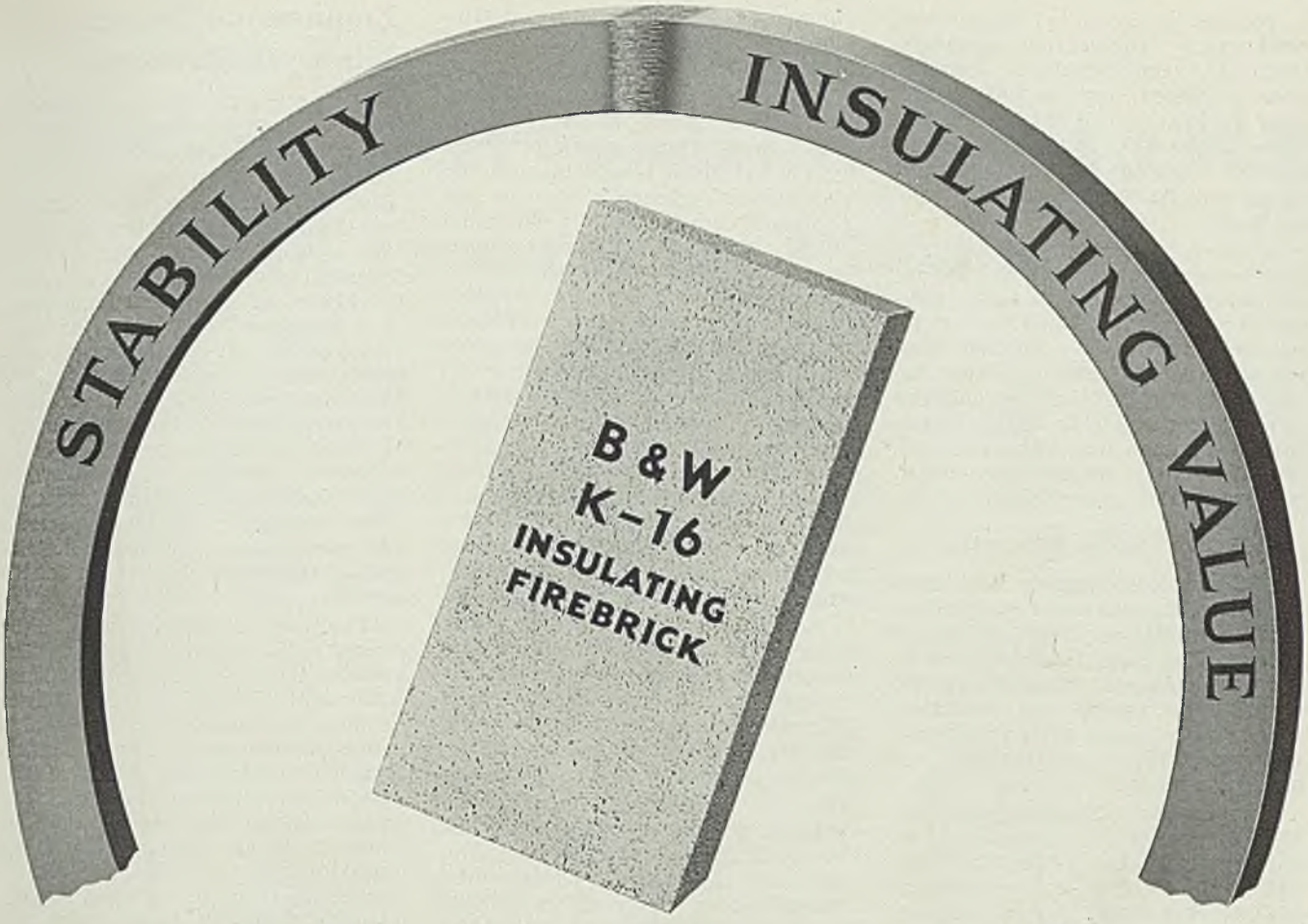
It is heated by automatically controlled U-shape radiant tubes arranged along the side walls. Both burner ends and exhaust ends of all tubes are at top of furnace. This furnace will accommodate a single stack of coils 54 inches in diameter and 70 inches high. There are two furnace bases, each equipped with a recirculating fan to facilitate uniform heating and cooling. In addition, there are two inner covers, an insulated cooling cover and necessary loading spindles.

Sequence of operation is as follows: A loaded spindle is placed on the base and covered with a steel inner cover. The heating cover is lowered over the entire assembly, portable gas and electric connections are made and heating cycle started. After load has been brought to temperature and soaked for desired length of time, heating cover is removed and placed over the second base which has been loaded previously and covered in the same manner as the first base.

Auxiliary facilities make available many different rates of cooling. It



Variety of cold upset parts shown is produced from stock spheroidized as detailed here




# Bonded Together *for* Economy *in* Backing-Up Insulation

Write for Bulletin R-18, containing engineering data regarding B&W K-16's.


R-100

Stability and high insulating value are the chief characteristics of B&W K-16 Insulating Firebrick. They make it possible for the furnace owner or operator to save worth-while sums in the cost of backing-up insulation.

Where interface temperatures are not over 2000 F., and for equal heat-flow through the furnace wall, K-16's save as much as 40 per cent in the cost of insulating material. The details are interesting and will be furnished without obligation.

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is possible to produce various desired grain structures as specified. Normally, the insulated cooling cover is placed over the hot charge after the heating bell has been transferred to the other base. If a slower rate of cooling is required, the charge may be cooled inside the heating bell.

A much faster rate of cooling may be obtained by leaving the inner cover exposed. Still faster cooling can be accomplished by removing the inner cover. Further cooling control is effected by either using or not using the recirculating fan. It is possible to anneal, spheroidize or normalize with close control of heating and cooling cycle to give grain structures desired.

**Furnace Sealed Efficiently**

With various heating and cooling cycles, any degree of spheroidization up to 100 per cent can be obtained. For most requirements, 60 per cent spheroidization is satisfactory. Accordingly, this treatment is generally given to plain carbon rod over 0.25 per cent carbon and all alloy rod.

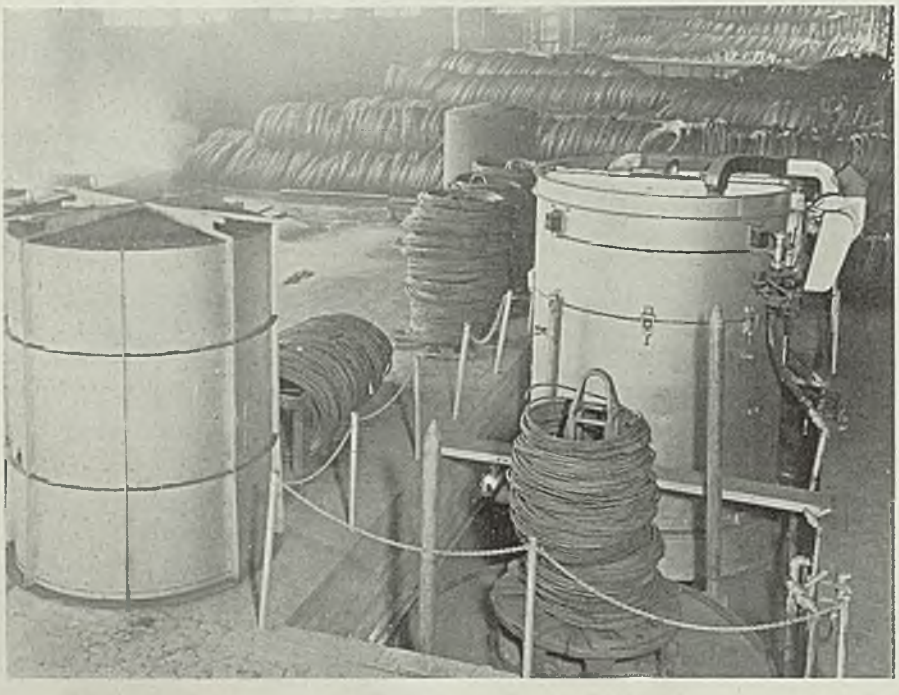
Plain carbon rod is spheroidized at 1380 degrees Fahr. Alloy rod, including SAE 1120, 1335, 2330, 3140, 4140 and 4615, is spheroidized at 1410 degrees Fahr. An average furnace load is 4200 pounds with a maximum of 6000. For plain carbon rod, the heating bell is left over the charge approximately 2½ hours. For alloy rod, this period is increased to 3 hours. Cooling cycle approximates the combined heating and soaking cycle in all cases. After completing a previous heating and cooling cycle, the furnace is thoroughly heated. A charge of 4200 pounds can be brought up to a temperature of 1410 degrees Fahr. in 2 hours.

Although the furnace is designed for special atmospheres, none is used except those gases produced by a wood block placed in with the charge. Experience shows no appreciable decarburization over that already present in the coils as received. Partial decarburization has never run over 0.005-inch. Absence of decarburization is due to efficient sealing methods and to the gases produced by the wood block which is placed on the base. It burns to charcoal when heated to ignition temperature and, in doing so, consumes the small amount of air entrapped under the cover. Seals at bottom of inner cover and heating cover prevent air infiltration or loss of "wood products of combustion" and "natural work gases."

No repairs have been required after approximately 600 heats. Fuel consumption has been low. At fairly continuous operation, fuel consumption is between 900,000 and 1,200,000 B.t.u. per net ton of steel.

Increased ductility of metal from this new furnace has made possible a marked increase in die life. Also accurate control of spheroidization has made it possible to predetermine the best heat treatment for finished bolts. Absence of decarburization permits production of better cold-headed parts to exacting specifications.

Loaded base ready for placement of steel inner cover (in far background). As soon as heating cover is transferred to loaded base, insulated cooling cover (left foreground) will be placed over hot load on rear base. Courtesy Surface Combustion Corp., Toledo, O.



## Engineering Societies' Library Adds Service

■ The Engineering Societies' library, 29 West Thirty-ninth street, New York, a co-operative enterprise embracing American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, The American Society of Mechanical Engineers and American Institute of Electrical Engineers, has broadened its services by making available at cost not only photostats, but also microfilm copies of material contained in the volumes and periodicals in its collection. Regardless of residence, any engineer, library, or company may order a 11 x 14-inch white-on-black (negative) photostat print on bromide paper at 30 cents each, which charge includes ordinary postage to any part of the world.

Positive prints are supplied by copying a negative print, which makes the cost 30 cents additional. Microfilm copies on 35-millimeter film are available at a cost of 4 cents per exposure, with a minimum charge of $1.25 per volume. Each photostat print contains one or two pages of the original article depending on its size. Reductions to approximately one-half or enlargements to twice the original size can be made without extra charge. Unless an enlargement or reduction is specified, prints are made the same size as original.

If a translation or list of references on any particular subject is desired, the library staff will prepare this at cost. For those wishing to photograph material in the library, a photographic copying stand, complete with table and electric lights, is available for use with the visitor's own camera.

## Bearing Adjustment Insures Longer Life

■ A preload adjustment for ball bearings which insures long bearing life and precision performance at a wide variety of speeds has been perfected by Dumore Co., Racine, Wis. The invention compensates for expansion of the quill shaft caused by heat.

Formerly the preload spring was located on the outer edge of outer bearing raceway in the quills.

With present arrangement, amount of preload is determined by a short, stiff spring adjusted by means of an internal nut in the quill tube. The preload spring is located on the inside edge of outer bearing faceway and pressure due to expansion is counteracted by the spring so that now pressure on bearings decreases at high speeds and increases on lower speeds.

# Iron and Steel Committees of A.I.M.E. Will Convene at Pittsburgh

FORMER registration records are expected to be exceeded at the 1940 Open-Hearth and Blast Furnace conferences of the American Institute of Mining and Metallurgical Engineers to be held at the William Penn hotel, Pittsburgh, April 24-26.

As in previous years members and guests of the Open-Hearth committee and the Blast Furnace and Raw Materials committee will hold separate sessions Wednesday and a joint session Thursday, the sessions Friday being confined to the discussion of open-hearth operating problems. This year for the first time those of the open-hearth group interested in acid practice will hold a separate session Wednesday morning and afternoon.

Henry A. Roemer, president, Pittsburgh Steel Co., Pittsburgh, will speak on "Looking Ahead in Steel" at the fellowship dinner, Wednesday evening.

### Gathering To Be Informal

The gatherings of the Open-Hearth committee always have been informal and this year's meeting will be no exception. Details of open-hearth practice are explained and compared by various operators and others associated with the steelmaking industry, impromptu from the floor in the nature of a roundtable discussion. Any operating man in the audience is entitled, and is welcome to engage in the various discussions.

Early in its functioning the Open-Hearth committee has served as the clearing house for ideas and suggestions in connection with increasing tonnage. Many weeks before the annual meeting is held, open-hearth superintendents are called upon to submit questions; these form the basis of discussion at the various sessions. An atmosphere of frankness always has existed at the meetings.

The Blast Furnace and Raw Materials committee began its activities nine years ago. Conferences are held semi-annually for the purpose of discussing technological problems connected with the mining, preparation and beneficiation of raw materials entering into the blast furnace, and with blast furace and coke oven practice.

Three years ago this group met for the first time jointly with the Open-Hearth committee at the Annual Open-Hearth conference in Birmingham, Ala. and with such good results that the practice has continued each year since then.

The program for the fourth such meeting to be held in Pittsburgh has many important topics of mutual interest to those identified with the iron and steel industry and is as follows:

#### WEDNESDAY, APRIL 24

9:00 A.M.—Registration—For all sessions —Silver room—Convention Floor (17th Floor)

#### OPEN HEARTH

9:30 A.M.—Opening Session—Urban room —L. F. Reinartz, general chairman, National Open Hearth Committee, A. I. M. E.—Introductory Remarks—Executive Committee Report—Biographical sketch and memorial resolution for F. B. McKune—Report on Massachusetts Institute of Technology Scholarship.

#### BASIC OPEN-HEARTH SESSION

10:00 A.M.—Urban room—

**Refractories**

Chairman, R. S. Bower, O. H. Supt., Andrews Steel Co., Newport, Ky.
Co-chairman, J. T. Meell, E. J. Lavino & Co., Pittsburgh.

What pouring pit refractory is the worst offender in causing "fire-clay" inclusions in killed steels?
- a. How might they be identified?
- b. Can inclusions in steel be definitely traced to refractories from the furnace, spout, or ladle linings?
- c. Will clay plugs in the bottom of inverted molds cause inclusions?

What is being done to minimize inclusions in steel through:
- a. Improved runner linings.
- b. Improved ladle bricks.
- c. Improved nozzle well material.

Improved nozzle bricks.
- a. How are two different types of materials used in foreign nozzles?
- b. Describe the use of combination large and small nozzles in American foundry practice.
- c. Design of nozzle—straight vs. round-shoulder—clay vs. graphite—method of setting and warming up nozzle.
- d. Size of nozzle for different quality steels? Number of nozzles used?

Pouring pit refractories.
- a. Relative advantage or disadvantage of low and high pyrometric cone equivalent refractories.
- b. What standard tests are most important to determine suitability of these two types of refractories?
- c. What tolerances are being allowed for ladle brick, sleeves, nozzles and stopper heads?

Clyde E. Williams

L. F. Reinartz

Francis H. Crockard

d. What effect has brick composition on ability to resist cutting action of metal and slag?

Olivene-chrome mixture for maintaining front and back wall construction

Use of Ramix refractory in open-hearth furnaces.

Any new information on chrome ramming mixes for bottoms?

What results after a year or more?

Are they more efficient than ramming mixes which more nearly approach the analysis of the hearth of a furnace?

Progress report on hot-top compounds.

a. Lapix, Lumkerite, or others.

### ACID OPEN-HEARTH SESSION

10:00 A.M.—Forum room

Chairman, G. S. Baldwin, O. H. Supt., Standard Steel Works, Burnham, Pa.

Co-chairman, H. G. Grim, Gen. Supt., Heppenstall Co., Pittsburgh.

#### Charging and Melting

What percentages of manganese, silicon and carbon should the acid charge contain for the manufacture of low-, medium, and high carbon steels?

Where is the pig iron charged—bottom, middle or top?

What percentage charged? Analysis of iron. Kind of scrap.

What advantago is there in charging the heat all at one "go" rather than dividing the charge into two or more parts, allowing each part to become thoroughly heated before charging the next part?

What effect does the melting speed have on the ultimate quality of the steel? Does this vary according to the size of the heat?

Describe best way to make low-carbon rimming steel in 0.08 to 0.10 per cent carbon range.

Describe best method for making low-carbon alloy steel in 0.10 to 0.15 per cent carbon range.

What manganese charge gives best results when making 0.50 to 0.80 per cent carbon steels?

Is it better to use silicomanganese or ferromanganese and ferrosilicon additions?

In finishing the heat should the manganese be added before the silicon or vice versa?

#### Refining and Deoxidation

Must the bath attain any specified minimum temperature before oreing commences? What advantage is gained by so doing?

Is the color and fluidity of the melting slag additional help in determining the amounts of ore needed to bring the heat to the desired finishing carbon?

a. What methods of measurement for slag fluidity are in use?

Wm. A. Haven

b. Does anyone use a viscosimeter?

c. What relation exists between the fluidity, the surface and fracture colors and the soundness of a slag sample with the degree of oxidation of the bath?

If limestone is used in the working of a heat, is it used only to control the fluidity of the slag or is it also used as slag deoxidizer?

Should there be a specified time limit past which no ore may be added to the bath?

Is the silicon pickup by the bath in the final stages of the heat an indication of the degree of oxidation of the bath, or can it be an indication that the bath is excessively hot?

What relationship exists between the rate of carbon drop during the final stages of the heat and the degree of oxidation of the bath?

What manganese charge gives best results when making in determining bath temperatures before tapping?

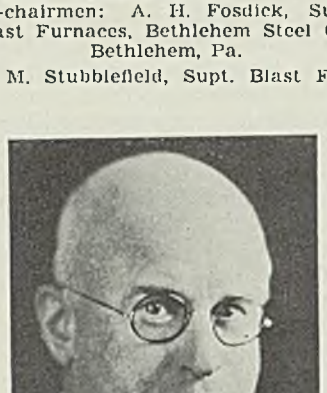
Are ladle deoxidizers necessary?

### BLAST FURNACE AND RAW MATERIALS

9:30 A.M.—Cardinal room

Co-chairmen: A. H. Fosdick, Supt. Blast Furnaces, Bethlehem Steel Co., Bethlehem, Pa.

B. M. Stubblefield, Supt. Blast Furnaces and Coke Ovens, Youngstown Sheet & Tube Co., Youngstown, O.



Ralph H. Sweetser

The Production of Pig Iron in the Electric Blast Furnace—Charles Hart, Pres., Delaware River Steel Co., Chester, Pa.

A New Ore Blending System as Applied to the Preparation of Iron Ores for the Blast Furnace—J. F. Meissner, Robins Conveying Belt Co., Chicago.

### BASIC OPEN-HEARTH SESSION

2:00 P.M.—Urban room

#### Construction

Chairman, A. V. Leun, Refractories Engr., Bethlehem Steel Co., Bethlehem, Pa.

Co-chairman, Alex Morton, Supt. Construction, Pittsburgh Steel Co., Monessen, Pa.

Use of archless door frames. How are extra wide frames maintained?

What is the cause for uptakes of furnaces cutting out unevenly? Is such cutting cumulative, or does the damage often occur on one heat? Is the cutting due to high velocity, high temperature, or erosive influence of gases, or all three combined?

What progress on basic roof construction?

What progress in steamlining furnace

A. J. Boynton

walls, front and back walls, and por in order to eliminate the shar corners that distort the flow of gas through a furnace and prevent goo fuel economy?

What benefits from single uptakes liquid fuel or gas-fired furnaces? there better flame direction? Ho much money is saved in construction How are arches designed and buil

Loftus and Smalley checker designs.

Stud tube water-cooled door design.

Protection of back walls with hot-a tuyeres.

Experience with auxiliary slag pocket Effect of slag pocket capacity on li of furnace.

Report of experience with dished chron brick bottoms.

### ACID OPEN-HEARTH SESSION

2:00 P.M.—Forum room.

#### Operating and Construction Problems

Chairman, George S. Baldwin, O. H Supt., Standard Steel Works, Burn ham, Pa.

Co-chairman, H. G. Grim, Gen. Supt. Heppenstall Co., Pittsburgh

Does the use of compressed air to r move steel from holes in the botto damage the balance of the furnace that the repair time on the subs quent heats may be increased?

What bottom sands are in use? How sand burnt in? Schedule of amount each batch and length of time burn in. Is the bottom sintered befo charging the first heat?

Would an all silica brick bottom, put the same way that the all basic bri bottom was put in the Pittsburgh Ste Co.'s furnace, described in the *Ope Hearth Proceedings* for 1939, be workable proposition?

Would a rammed bottom consisting very high silica sand, fine turnin borings, ore or scale, and an orga binder such as molasses, have a chance of succeeding?

How is the tap hole maintained?

How is the original tap hole installe

How often is it necessary to clean u takes, slag pockets and checkers?

### BLAST FURNACE AND RAW MAT RIALS

2:00 P.M.—Cardinal room

Co-chairmen: C. L. Wyman, Butle Bros., Cleveland

R. C. Allen, Vice Pres., Oglebay Nor ton & Co., Cleveland

Iron Ore Concentration and the La Erie Price (T.P. 1202). By E. Davis, Dir., Mines Experiment Stati Minneapolis, Minn.

The Use of Sinter in Blast Furnace. J. H. Slater, Supt. Blast Furna and Coke Ovens, Corrigan-McKinn Plant, Republic Steel Corp., Clevela

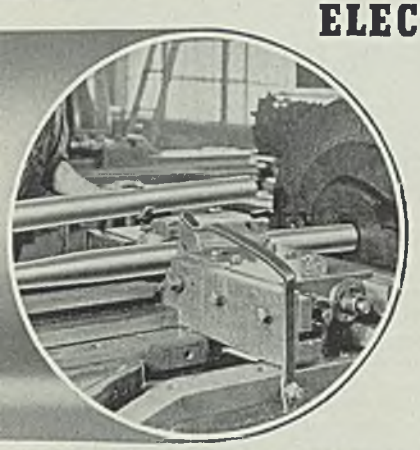
# IT'S EASY TO FABRICATE

## *REPUBLIC*

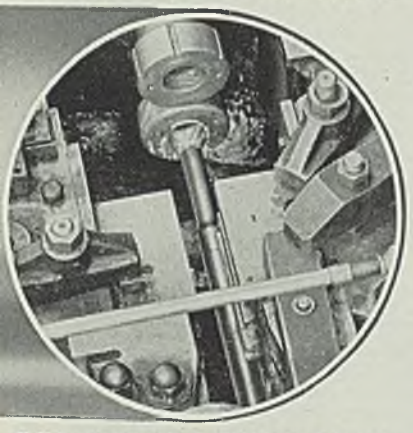
# ELECTRUNITE

REG. U. S. PAT. OFF.

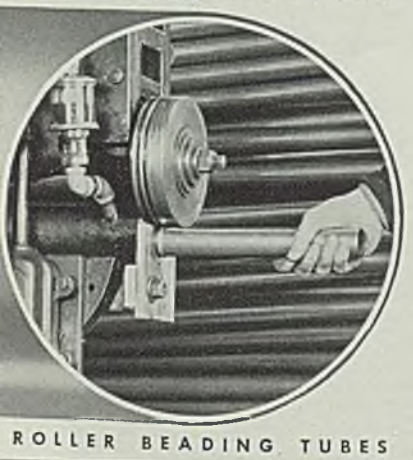
## ELECTRIC RESISTANCE WELDED TUBING



SWAGING PROPELLER SHAFTS



BULLDOZING TUBE ENDS



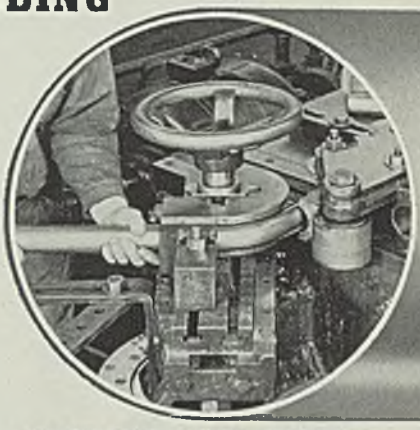
ROLLER BEADING TUBES

● Because of its shape, tubing may be fabricated with less effort than many other sections. And because it is consistently uniform in diameter, wall thickness, concentricity and ductility, Republic ELECTRUNITE Tubing assures unvarying ease of fabrication and perfectly-formed tubular parts.

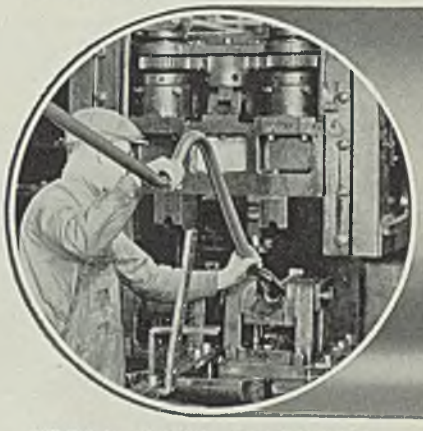
This modern electric resistance welded tubing is cold-formed from *flat-rolled* steel into a butted tube and then electric resistance welded. No heat is applied except at point of weld. Hence, Republic ELECTRUNITE Tubing may be cold-fabricated readily and accurately.

It can be bent, flanged, expanded, swaged, upset, beaded, grooved, rolled, fluted, flattened, coiled and tapered. It can be joined by welding, brazing, threading, bolting, riveting or with sweated-type or threadless compression fittings. Sheets may be attached easily and economically by various methods.

If you're a regular tubing user, give Republic ELECTRUNITE a trial and learn for yourself what its advantages can mean to your product and profits. If you've never used tubing, let our engineers show you how it can be applied to your product, and how best to fabricate it. Write—Steel and Tubes Division, Republic Steel Corporation, Cleveland, Ohio—*world's largest manufacturer of steel and ferrous alloy electric resistance welded tubing.*

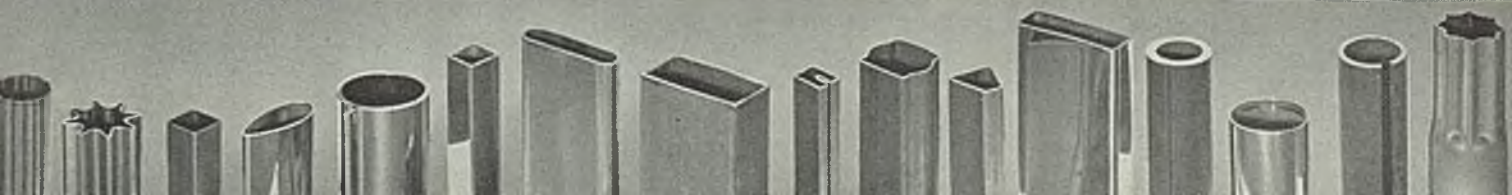


PEDESTAL TYPE BENDING



PRESS TYPE BENDING

HART PROCESS WELDING



Iron Blast Furnace Practice in Foreign Countries (M. and M.). By William A. Haven, Vice Pres., Arthur G. McKee & Co., Cleveland.

7:00 P.M.—Fellowship Dinner—Urban room

Tickets $2.50 — Speaker: Henry A. Roemer, president, Pittsburgh Steel Co., Pittsburgh. — Subject: Looking Ahead in Steel.

**Thursday, April 25**

**JOINT SESSION—OPEN-HEARTH AND BLAST FURNACE AND RAW MATERIALS COMMITTEES**

9:00 A.M.—Urban room.

Chairman for Open Hearth, K. C. McCutcheon, Gen. Supt., Ashland Div., American Rolling Mill Co., Ashland, Ky.

Co-chairman for Open Hearth, L. A. Lambing, Supt. O. H. and Bessemer Depts., Jones & Laughlin Steel Corp., Aliquippa, Pa.

Chairman for Blast Furnace, P. F. Dolan, Asst. Gen. Mgr., Maryland Plant, Bethlehem Steel Co., Sparrows Point, Md.

Co-chairman for Blast Furnace, H. E. McDonnell, Supt., Blast Furnaces, Weirton Steel Co., Weirton, West Va.

What experience in reducing silicon in blast-furnace hot metal by means of scale or other additions to the blast-furnace runner, or in the transfer ladle? How is additional slag handled? What damage to transfer ladles? Any detrimental effects on quality of steel made from such iron?

Does low silicon (0.60-0.80 per cent) hot metal permit the use of a greater percentage of hot metal in the open hearth charge than when using higher silicons—say 1.00 per cent or higher? What per cent increase?

Problems in connection with the use of "Blown Bessemer Metal" in the open-hearth operations.

What is being done to maintain or increase temperature in the hot metal in mixer? Does this practice reduce the silicon content of the hot metal?

What is the best temperature for charging hot metal into open hearth furnaces?

a. Is the Fitterer or other pyrometer used?

b. Where are readings taken and how?

What effect has hot metal, made with 10 per cent scrap iron in the blast furnace charge, on operation and quality control in the open hearth furnace? What kind of scrap used?

How can hot metal analysis be changed to speed up open hearth melting? Discussion of effect of silicon, sulphur, and temperature of the hot metal on open hearth operations.

Effect of coal mix, as well as coke size and its physical constitution on the quality of hot metal made from such coke.

Is pig iron or hot metal, with a high combined carbon content, a hindrance to the time of the open hearth heat?

Is it necessary to remove slag from hot metal after desulphurizing before the iron is poured into the mixer or the furnace?

12:15 P.M.—Parlors B & C (17th floor)—Open-Hearth Executive committee, Luncheon meeting

12:15 P.M.—Parlors E & F (17th floor)—Blast Furnace and Raw Materials committee, luncheon meeting

2:00 P.M.—Inspection trip to Edgar Thomson works, Carnegie-Illinois Steel Corp., Braddock, Pa. Chartered buses leave Hotel William Penn at 2:00 P.M. Tickets should be purchased at registration desk before 11 A.M. Thursday.

**Friday, April 26**

**OPEN-HEARTH SESSION**

9:00 A.M.—Urban room

**Quality**

Chairman, J. H. Nead, Chief Met., Inland Steel Co., East Chicago, Ind.
Co-chairman, J. J. Bowden, Chief Met., Republic Steel Corp., Cleveland.

In production of alloy and forging quality steel, what is the maximum size of ingot used, type of hot-top, minimum percentage of hot-top, and the type of hot-top covering?

What hot-top volume is sufficient for quality steels?

Have FeO results secured by the "Bomb Type" test box been sufficiently consistent to give better correlations in slag-metal studies?

Does anyone use oxygen in the bath for tapping practice control?

When trouble with refractory inclusions is encountered in top-poured ingots with hot-tops, are the inclusions consistently found in any one location in the ingot?

In inclusion studies on low-carbon open-hearth killed steel, have differences in inclusions been found with differing deoxidation practices?

Does residual titanium in sheet steel make for a tighter bond of galvanizing material? How is titanium added, ladle or mold? How much titanium added?

On S.A.E. steels, when the sulphur is 0.045 per cent max. are the etch tests and machinability poor? Is anyone adding sulphur to bring the total sulphur above these limits? What results? Who uses $MoS_2$ instead of sulphur? Residual vs. added sulphur.

Free-machining steel. What effect when silicon is mixed with sulphur?

Finishing, tapping, and teeming practice.

a. What is the best furnace deoxidation?

b. Is the manganese addition best in the bath or ladle?

c. What is the best deoxidation in the ladle?

d. What is the best sequence in the ladle additions?

e. Is any emphasis placed on quick delivery to the soaking pits?

Does the use of extra ferromanganese to maintain high manganese residuals in forging steel produce a cleaner product?

Is residual manganese a better indicator of degree of oxidation than iron content of the slag?

Is ingot aluminum more efficient than shot aluminum as a ladle addition?

Use of small aluminum (pigiets) vs. shot aluminum and relative merits for mold additions.

Does any one use ferroaluminum in place of aluminum for ladle additions?

As speed of chemical reactions within bath is aided by agitation, would later ore additions be more detrimental to quality of steel than longer time required to work heat without ore additions?

Effect of charging light scrap on steel quality.

What is the experience in the use of No. 2 hydraulic compressed sheet scrap (compressed body and fender scrap)?

Prevention skin blowholes—semikilled steel.

What deoxidation practice is best suited to produce killed steel with low-carbon and low-silicon specifications?

a. Do complex deoxidizers show any advantages over standard ferro alloys?

Resume of Howe Memorial Lecture on "Slag Control," Dr. C. H. Herty, Jr.

**OPEN HEARTH SESSION**

2:00 P.M.—Urban room

**Operating Problems**

Chairman, R. Urquhart, Supt. O. H. Dept., Homestead works, Carnegie-Illinois Steel Corp., Homestead, Pa.
Co-chairman, H. F. Hofmann, Asst. Supt. O. H. Dept., Lukens Steel Co., Coatesville, Pa.

Method of keeping checkers clean during the furnace campaign.

Method of cleaning checkers during a major repair.

In the use of fuel oil what are the advantages of using high steam temperatures for atomization? What are the highest temperatures it is possible to use? What type of oil used?

At what temperature (Bunker "C" oil) is the best luminosity and combustion obtained? Also, what is the degree of superheat under such conditions? (Give temperatures at burner mixer or atomizer).

What viscosity oil is more economical where steam is used for atomization?

What data available on use of Carbanalyzer? How accurate? Speed, precautions, limitations, effect of alloys?

How is Carbanalyzer working out in comparison with the Carbometer? Has any difficulty been experienced with the small scale of Carbanalyzer?

The Leeka Process—for determining combustion carbons—residual manganese.

Oven for drying molds. Type burners, etc., used to heat up cold molds.

Discussion of "How soaking pits and mills can help or injure quality of steel produced in ingots."

What precautions, if any, are taken by soaking pit heaters in heating thin-skinned ingots?

What is the best procedure in maintaining tapholes in regard to the following points?

a. How dried out?

b. Closed with what materials?

c. Faced with what materials?

d. Piped with what materials?

e. What method used in opening?

In shops where the majority of heats made are of medium carbon and forging grades, what means are used to combat "high bottoms"?

What are the most advantageous applications for mill scale in the open hearth? To what extent can it be substituted for ore in the charging of high metal heats?

What is the practice in taking open hearth ladle tests on rimming heats; and if killed tests are taken, is any adjustment made on the carbon, sulphur, or phosphorous analysis?

Where are oxygen recorders used? What success using City Service analyzer?

Are dolomite machines in general use? What precautions taken to prevent build-up of bottom when using such machines?

What does automatic control mean to the open hearth operator?

a Value of various steps in automatic control draft regulation, air-fuel ratio, reversals, roof temperature.

Development in furnace pressure control equipment. Principles used in selection of reversal cycles.

**President's Question Box**

Several interesting ideas connected with cost reduction in the open hearth department will be discussed.

**Closing Remarks**

Mr. L. P. Barrett, chairman, Blast Furnace Local Committee on arrangements.
Mr. R. C. Good, chairman, Open-Hearth Local Committee on arrangements.

"What do you desire in Ferro-Alloys?"


Ohio Ferro-Alloys Corporation
Canton, Ohio

## Stripsheet Annealing

(*Concluded from Page 49*)

furnace. The fuel used is natural gas which is available at high pressure at this mill. Fuel rates for sheet annealing vary between 1025 and 1100 cubic feet per ton, and for coil annealing average 1225 cubic feet per ton.

Some operating data on these furnaces follow: In the 77-inch mill department where all large sheets are handled, the charges in the furnace will vary from 170,000 to 240,000 pounds. The heating cycles for these charges vary between 65 and 105 hours, depending upon the product which varies from blue annealed stock, or light gage furniture stock, to heavier gage full-finished deep-drawing quality for intricate auto-body shapes. These charges are cooled down in approximately 72 hours and, as stated previously, heavy-duty mill cooling fans are placed to hasten this cooling cycle. Rockwell hardness, after annealing on these charges, will closely approximate 45 B Scale.

### All Space On the Base Used

In the 30-inch cold mill the charges average well around 59 tons. This is accomplished by utilizing every available bit of space on the base, and Fig. 5 shows just how advantage is taken of the ability to load coils in this manner to get the maximum possible charge into the furnace at one time. It is to be noted that the base plate has been cut out to obtain certain advantages in ease of heat transfer to the center of the coils. Cycles for these charges vary between 36 and 44 hours for heating time, and 48 to 60 hours for cooling time, depending on the finish of the steel desired. The resultant Rockwell hardness is generally softer than obtained in flat annealed sheets and closely approximates 42 B Scale.

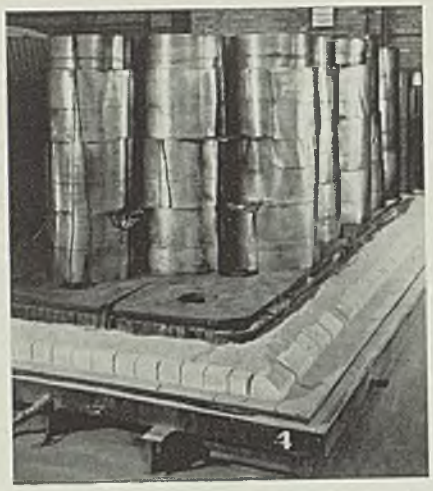


Fig. 5—Typical coil charge on furnace base ready for cover

A great deal of care is taken at this mill to preserve the shape of the inner covers as this has an important bearing on the life of the cover and the prevention of leaks which might later allow air infiltration and oxidation of the edges of the sheet. A special straightening device for inner covers is in use at this mill so that the inner covers used when annealing sheets can be straightened after every fourth heat, and the taller covers for the coils can be straightened after every second heat. In this way the sides of the cover are actually kept further away from the source of heat in the tubes for longer intervals of time and this is a definite contributing factor to longer life of the inner cover.

### Device Lowers Dewpoint of Gas

Of course, deoxidizing gas is supplied to all bases. The generating equipment for this gas is shown in Fig. 2. The gas is distributed over a considerable distance from the point of its manufacture, and in order to prevent the possibility of moisture condensation and freezing in these long lines during the winter months of operation, a special refrigerator apparatus was installed to lower the dewpoint of the gas considerably below zero degrees Fahr. This is done by an automatic rotation of the refrigerator chamber when in use so that the exceptional amount of moisture collected can melt and be drained away before the chamber is next called upon for service. In the summer months when the freezing problem has been eliminated, this apparatus is not used and normal dewpoints of 45 to 50 degrees Fahr. are carried.

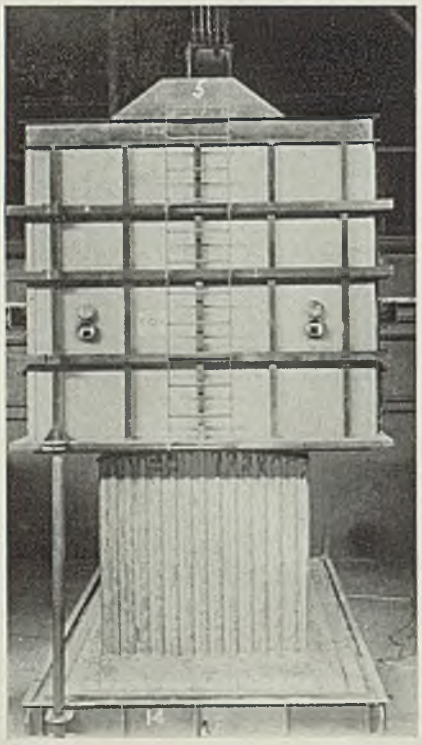


Fig. 4—Radiant tube bell type furnace in process of transfer

The impression obtained by a visitor to this plant is that every point of operation has been carefully considered and provided for, and the maximum efficiency is obtained from all of the equipment which has been installed. Close cooperation exists between the metallurgical and control laboratories and the operating department to produce the streamlined sheets for the streamlined requirements of today.

♦

## Gisholt Issues Booklet On Balancing Machines

■ Line of static and dynamic balancing machines for locating and measuring unbalance in rotating parts, together with detailed explanations of the effects of unbalance are included in a new 32-page booklet issued by Gisholt Machine Co., Madison, Wis. Illustrations and typical installation views of each type of machine also are presented.

## Slide Chart Simplifies Selection of Valves

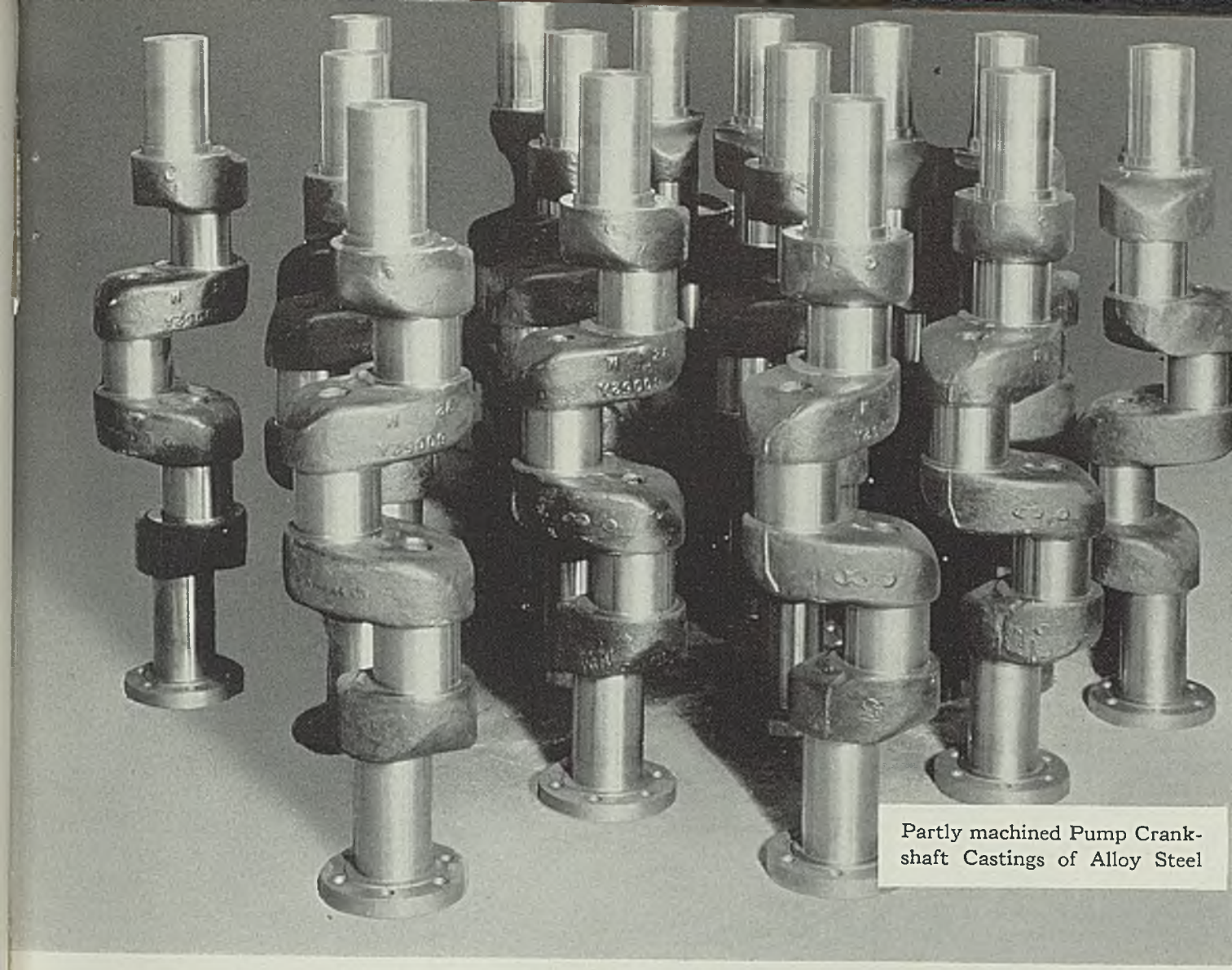
■ Slide chart prepared by engineers of Merco Nordstrom Valve Co., 400 Lexington avenue, Pittsburgh, makes it possible to ascertain instantly the figure number of the valve in any available size for any pressure.

Various tables are made up and remade by sliding a card back and forth under window openings in the slide holder. It also includes information on semisteel, steel and malleable iron valves. Copies of the chart, from V-130, are available upon request.

## Nonslip Floor Paint Dries in Few Hours

■ A nonslip rubber base paint for all kinds of floors, Safe-T-Step, is announced by Truscon Laboratories Inc., Caniff avenue and Grand Trunk railroad, Detroit. Combined with an abrasive, it keeps the floor from being slippery even when surface is wet or oil-splashed.

The material makes a good bond with old paint and prior to application requires no special preparation of the floor aside from having the surface clean, dry and free from oil and grease. It is applied with a brush and dries within 4 or 5 hours. It is available in several colors.



Partly machined Pump Crankshaft Castings of Alloy Steel

**Steel Castings Bring You These Advantages**

1 Uniform structure, for greater strength, shock and stress resistance.

2 Metal distributed where it will do the most good; maximum strength with minimum weight.

3 Widest range of mechanical properties.

4 Good machining qualities, low finishing costs, better streamlined appearance.

5 High rigidity, minimum deflection, accurate alignment, close tolerances and better fit.

6 Readily weldable in composite structures.

7 High fatigue resistance, maximum endurance and longer life—ideal for critically stressed parts.

# *The Least Costly Way*

## TO GET ALL THE ADVANTAGES OF STEEL

In countless instances, the economical way to secure for your product the unquestioned advantages of steel as a material is to use Steel Castings.

They make possible the exact weight distribution that puts extra strength where you need it, without excess metal to pay for and machine off. They afford a wide choice of mechanical properties. Differential hardening is easy, or welding into composite structures.

They cut down machining and assembly time, often by combining many parts into a single steel casting. And their ability to absorb hard knocks and deliver long wear is unquestioned.

Ask your own foundry to show you ways to improve your product or save you money with Steel Castings. Or write to Steel Founders' Society, 920 Midland Bldg., Cleveland, Ohio. No obligation of course.

## IMPROVE YOUR PRODUCT WITH

# STEEL CASTINGS

# Additional Information on New Dustless and Sliverless Copper

■ CONSIDERABLE additional information has been made available concerning the new dustless and sliverless copper announced in STEEL, March 11, p. 78, by Phelps Dodge Copper Corp., 40 Wall street, New York.

Known as PDCP, the new copper is made by an extrusion process in a reducing atmosphere carried on at temperatures below the melting point of the material. The raw material is electrolytic cathode copper, processed as above without remelting. Resultant metal features a high degree of surface perfection as the process eliminates both casting and hot rolling operations and the inherent imperfections in these operations.

Being extruded instead of rolled, there are no slivers to break loose from surface and cause insulation failure when used in electrical equipment.

Tensile strength, yield strength, hardness, elongation and other physical properties are substantially the same as for ordinary copper. Reduction or contraction of area, however, is almost twice that of ordinary copper in the hard drawn condition and about 20 per cent greater than ordinary copper in the soft or annealed state.

By extruding the material, it is entirely free from external defects and internal cuprous oxide inclusions, so there is a lack of focal points for the start of fatigue cracks. Thus, the material in fatigue resistance tests invariably shows considerable superiority over ordinary copper. Actual values vary considerably with the method of test.

**Anneals in Boiling Water**

The greater reduction of area mentioned above, of course, is due to higher degree of ductility of PDCP copper. As measured by the bend-test, where continuous torsional movement is applied in one direction until rupture occurs, the ductility of PDCP copper averages approximately twice that of ordinary copper. As measured by the twisting test, reverse 90-degree bends until rupture occurs, ductility averages slightly less than twice that of ordinary copper.

As to electrical properties, a great many determinations on soft PDCP copper have shown that its average specific resistance is 10.1976 ohm per circular mil foot, equivalent to a conductivity of 101.7 per cent I.A C.S. where the standard for copper is 100 per cent, equivalent to a resistance of 10.371 ohms per circular mil foot.

The new type of copper, in common with all other coppers, is not susceptible to heat treatment in the sense that steels are. However, it can be hardened by cold working, softened by annealing. It anneals at temperatures from 100 to 200 degrees Fahr. lower than other coppers. In fact, protracted tests have shown that it will anneal slowly in boiling water at 212 degrees Fahr.

## Welded Building Trusses Increase Interior Space

■ Complete absence of roof trusses to provide maximum interior space features the recently completed manufacturing building of Western Austin Co., Aurora, Ill. Steel frame was fabricated and erected largely by arc welding. Details of columns can be seen in the upper right illustration.

Featured here is the overhead section which can be fabricated only by welding as it is not available as a standard rolled section. It is composed entirely of plate cut to proper size, shaped and fused together.

Use of flame cutting permits economical production of the Y-shaped web segment, while bending equipment is utilized to obtain proper form in flange members. Flange plates are joined to the web of the section by continuous fillet welds on both sides. In production of columns, sections are arc welded to standard H beams.

Advantage of this design is shown in the lower illustration. The absence of roof trusses permits installation of craneways in the apex of roof. Furthermore, reduced structure height and less cubical content

permits lower building maintenance costs. Additional feature is extensive utilization of natural light. Total area of roof skylights is equal to 30 per cent of interior floor space. Photos courtesy Lincoln Electric Co., 12818 Coit road, Cleveland.

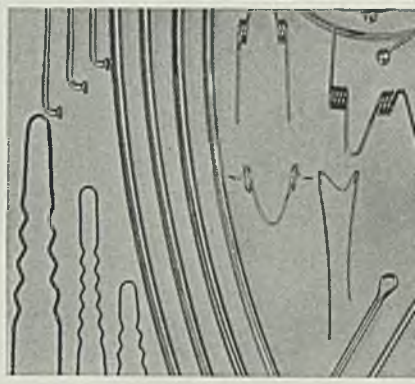
## New Industrial Finish Does Not Powder

■ Ready mixed aluminum industrial finish, No. 1 Chromelume, is announced by Tousey Varnish Co., 520 West Twenty-fifth street, Chicago. It can be used on office equipment, cabinets, machinery, instruments and metal vaults.

The finish will air dry in 15 minutes, will not rub off or powder after aging and covers approximately 2000 square feet of surface per gallon. It does not settle or pack in the container and it can be dipped, sprayed or flow coated. It also retains its elasticity, keeping its brilliant luster.

# NO CHAMPION LASTED LONG ON LUCKY PUNCHES

*. . . and luck didn't build our reputation for putting Quality into Wire*



Premier Spring Wire · Weaving Wire · Pin W
Bolt, Rivet and Screw Wire · Broom and
Wire · Pinion Wire · Basic and Bessemer
Stock · Premier Tested Welding Wire · Fl
Stock · Hair Pin Wire · Mattress Wire · N
Spring Wire · Piano Wire · Amercut Cold Fi
Steel Bars · Pump Rod Bars · Wool Wire ·
Rods · Also U·S·S Stainless and Heat-Resisting

OUR reputation for putting quality into wire is built upon over 100 years of wire-making experience. In that time American Quality Wire has proved its ability to meet the highest quality standards wherever it is used. American Quality Wire is checked at every stage of its manufacture to assure the uniformity that helps to give trouble-free production.

The experience we have had in more than a century of wire making is of value to our customers because our metallurgists are able to work out the most difficult wire problems using past achievements as a background. Our skilled craftsmen are capable of producing uniform wire in any quantity to meet your most unusual requirements.

If you have a problem involving wire, why not call upon our sales department to help you work it out. The strategic location of our plants will be of further assistance to you because deliveries can be made to meet your schedule of production.


**AMERICAN STEEL & WIRE COMPANY**

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

# Fire Hazard Control

(*Concluded from Page 47*)

that the gas will quickly blanket and snuff out a fire despite obstructions formed by parts, conveyor hooks, supports, etc. as the gas flows readily around such obstructions.

Being a nonconductor of electricity, carbon dioxide is extremely effective in extinguishing electrical fires. Carbon dioxide can be turned directly on bare conductors carrying high voltages without any danger to the user as the gas actually is a poorer conductor of electricity than free air. Tests conducted at potentials as high as 85,000 volts have demonstrated this fact.

An advantage exclusive to carbon-dioxide systems is that the extinguishing medium will not freeze at any atmospheric temperature. Also important, the charge does not deteriorate with age and extinguishers need not be recharged annually as is necessary with some systems.

### Enclosure Flooded with Gas

Carbon dioxide fire protection systems applied to enclosed areas such as motor rooms, transformer vaults, switchboards, or large completely enclosed electric motors and generators involve what is known as "total flooding." In such a system, enough gas is stored in cylinders and piped to the room or housing to flood the entire enclosed space from top to bottom with enough carbon dioxide to reduce the oxygen content of the air from the normal 21 per cent to 14 or 15 per cent at which point fire cannot burn. About 17 per cent oxygen is normally required to permit combustion.

Suppose fire breaks out in such a vault. The rapid heat rise actuates a diaphragm instantly opening cylinder valves to permit clouds of compressed carbon-dioxide snow to billow into the room through discharge horns. At the same time, the gas release closes fire doors, windows and ventilating dampers and blocks off ducts by screening jets of gas. Within a few seconds, oxygen content of the room is below 14 per cent and the fire is out. Arrangement of equipment in a typical system for vault protection is shown in Fig. 2.

Special valving arrangements and syphons have been developed to permit complete discharge of any number of 50-pound cylinders in a few seconds. Thus the cylinders can be banked and manifolded to accommodate vaults of any size.

Total-flooding arrangements similar to that described above are used on any enclosed hazard involving flammable liquids or electrical equipment where the volume of the room is not too great. As a guide in estimating sizes, and number of cylinders to use on such applications, National Fire Protection association recommends that 1 pound of carbon dioxide gas be allowed for each 16 cubic feet of room volume in rooms not exceeding a total of 1600 cubic feet; a pound of gas for each 18 cubic feet in rooms up to 4500 cubic feet total; a pound of gas for each 20 cubic feet up to 50,000 total; and a pound of gas for each 22 cubic feet where total is over 50,000 cubic feet.

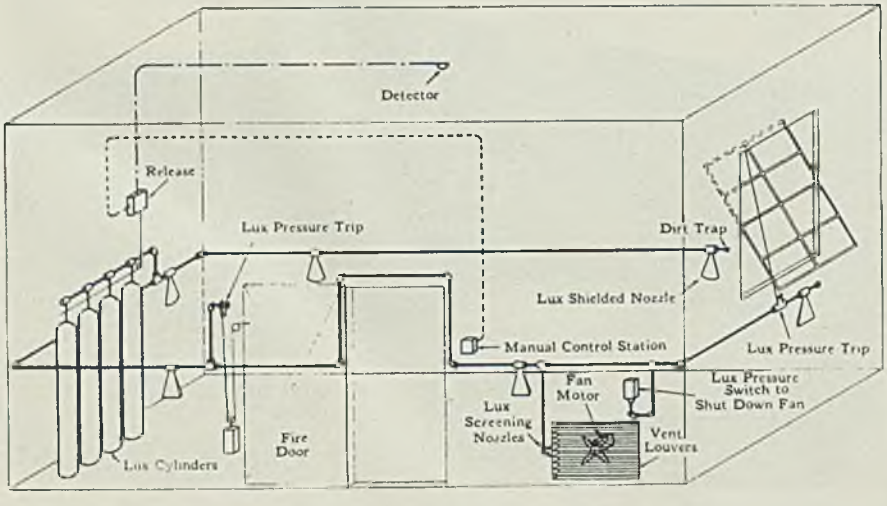
Special conditions affect amount of gas required. For instance, to protect storage or process rooms where flammable liquids are involved, a 15 per cent increase in gas supply must be installed if propane, butane or methane are the hazards. Ether requires a 35 per cent increase, acetylene 75 per cent, carbon bisulphide 175 per cent and hydrogen 275 per cent.

**TABLE I—Minimum Extinguisher Sizes**

| Type of Fire | Size of Fire | $CO_2$ |
|---|---|---|
| Wood, paper, rags, etc. | small | 50 lb. |
| | medium | ..... |
| | surface fire only | 15 lb. |
| Gasoline, kerosene, benzine, naphtha, furnace oil, japan, paint, light oil, fuel oil etc.—In open containers | 1 sq. ft. | 2 lb. |
| | 1½ sq. ft. | 4 lb. |
| | 2½ sq. ft | 7½ lb. |
| | 5 sq. ft. | 10 lb. |
| | 6 sq. ft | 15 lb. |
| | 7 sq. ft. | 20 lb. |
| Heavy oils, grease, tar, asphalt, pitch, transformer oils, etc.—In open containers. | 1 sq. ft. | 4 lb. |
| | 1½ sq. ft. | 7½ lb. |
| | 2½ sq. ft. | 15 lb. |
| | 5 sq. ft. | 20 lb. |
| Alcohols, acetone, ethers, lacquer thinner, acetates, etc.—In open containers | 4 sq. ft. | 2 lb. |
| | 7 sq. ft. | 4 lb. |
| | 10 sq. ft. | 7½ lb. |
| | 15 sq. ft. | 10 lb. |
| | 20 sq. ft. | 15 lb. |
| | 25 sq. ft. | 20 lb. |
| Carbon Disulfide—In open containers | not over 2½ sq. ft. | 20 lb. |
| Sulfur in bulk or bags, flowers of, | medium | 7½ lb. |
| Electrical motors, generators, switches, relays, etc. | dead | 2 lb. |
| | live | 2 lb. |

### Extinguishers Are Portable

Operation of portable carbon dioxide extinguishers is basically the same as fixed-cylinder systems. However, being lighter in weight, they are easily transported directly to the fire. They are equipped with quick-opening and quick-closing valves. Smallest unit holds a 2-pound charge, has a pistol grip 1 foot long with a trigger valve and nozzle, and so handles like a gun. Larger sizes ranging up to 100 pounds capacity have hoses and flared discharge horns. All of them are carried or wheeled to the scene of the fire where they quickly lay down a gas blanket, easily extinguishing the trickiest running or pouring fire. Even flames in a maze of wires or apparatus that ordinarily would obstruct a two-dimen-




**Typical arrangement of equipment in vault protection system using carbon dioxide. Illustrations courtesy of Walter Kidde & Co., 140 Cedar street, New York**

sion medium can be extinguished effectively with carbon dioxide.

Carrying the portable idea still further, large plants are now leaning toward use of trailer-type firetrucks holding several hundred pounds of carbon dioxide in manifolded cylinders. Trailers can be whisked to any part of a far-flung plant where use of a couple hundred feet of extension hose permits quick smothering of fires of large size. Largest "portable" gas extinguisher to date is a 10-ton 85-horsepower firetruck carrying thousands of pounds of carbon dioxide to snuff out gasoline and oil fires in the field.

Table I shows minimum sizes of suitable extinguishers as recommended by Factory Mutual Fire Rating Guide.

### Vault-Fires Controlled Easily

In electrical generating equipment, the ventilation ducts can be flooded automatically upon failure of insulation. The concentration of carbon dioide up to 30 per cent, can be provided thus effectively confining the damage to original point of failure instead of requiring complete rewinding of the machine.

For protecting electrical equipment operated entirely in vaults, it is not difficult to arrange the discharge nozzles to blanket effectively all portions of the machine. For generators with totally enclosed recirculating ventilation systems, no alternations need be made. Where semi-enclosed machines with common intake and exhaust ducts are involved, dampers are used to close automatically at time of carbon dioxide injection so the charge is retained.

In all applications, fire control is accomplished through discharge of a predetermined number of cylinders to produce and maintain desired minimum gas concentration. This is known as the initial-discharge battery. In some installations, a second battery of cylinders known as the delayed-discharge battery is set to discharge either intermittently at predetermined intervals through use of a motor-driven camshaft or simultaneously through a restricted orifice to control the rate of injection.

Control equipment for carbon-dioxide systems is available in a number of types. Tripping the release valve can be done automatically, manually or in combination. Most widely used automatic actuator is rate-of-temperature-rise type. This consists of a diaphragm which expands with sudden abnormal heat rises but is vented sufficiently to prevent slow or normal heat increases from tripping the mechanism. Thermostat and fusible link devices also can be used.

In case of manual operation, a break-glass control box is usually installed well out of range of the actual fire hazard, a cable connecting the release valves with the pull-out handle so the system can be actuated at a distance in event of fire.

In protecting electrical equipment, release valves can be connected electrically to protective relays of the generator or motor so short circuits evidenced by abnormal current will actuate the equipment. Fixed-temperature thermostats located in exhaust air ducts also are used frequently.

Supplementary operations to protect equipment can be done simultaneously with release of carbon dioxide. A pressure switch in the carbon dioxide piping system can be arranged to disconnect oil circuit breakers, field switches and to operate brakes on hydroelectric machines. In case of steam-driven turbine generators, the steam throttle also can be closed.

Pilot lights can be connected across tripping circuits to afford visual indication that the system has been placed into operation.

### Gas Can Be Diverted

One bank of cylinders can be used to provide protection at a number of different points by use of electrically operated directional valves to divert the gas automatically to the point desired. Thus ovens used in conjunction with dip tanks can be protected by the same carbon-dioxide supply, using directional valves to shunt the gas to either ovens or tanks.

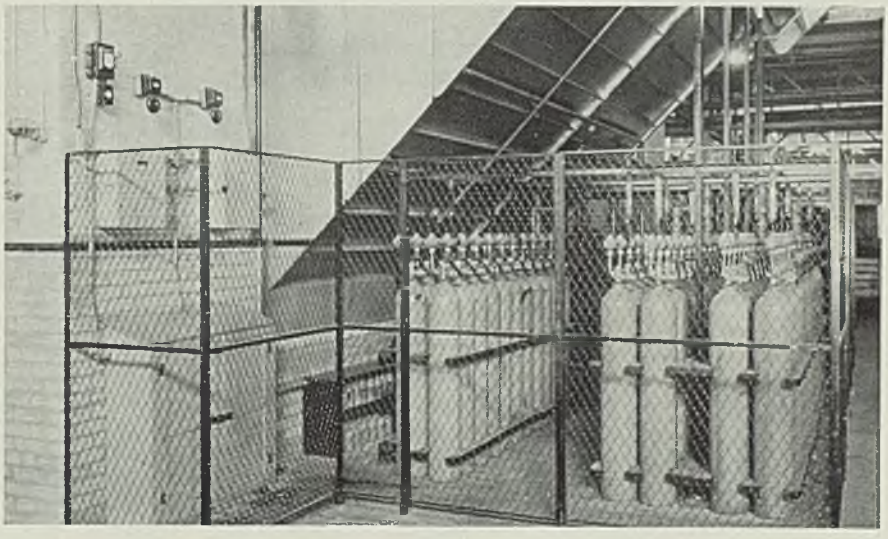
In oil switch and transformer applications in enclosed or semi-enclosed spaces, the basic type of fire to be controlled is oil and no uncontrollable forced draft or windage is introduced. Thus it is unnecessary to compensate for leakage as is the case for rotating machines. Amount of gas for such protection is basically 50 pounds of carbon dioxide for every 1000 cubic feet of contained air within the space.

### System Is Speedy

Here again it is only necessary to design for the largest room or largest piece of equipment and to provide for diversion of the gas into the required spaces through directional valves.

A telephone exchange switchboard gave the method its industrial send-off as these delicate mechanisms are extremely susceptible to electrical fires and are damaged seriously by the least moisture. Today, small slow-discharge gas cylinders are a standard accessory in almost every exchange.

Advantages of carbon-dioxide fire-fighting systems thus boil down to: Extreme speed, resulting in extinguishing of fire before much damage occurs; cleanliness, avoiding damage to materials in process and assuring immediate resumption of production after fire; high resistance to flow of electric current, thus permitting effective operation on live electrical equipment; ability to flow around obstructions, to blanket quickly an area or surface, and to penetrate crevices, joints and low points for effective flooding action; ease of operation and flexibility of application of control systems; immunity to freezing at atmospheric temperatures; maintenance of effectiveness over long periods since charge does not deteriorate with age; flooding action which makes it easy to control running gasoline and similar fires.



A large carbon-dioxide installation in a Chrysler Motors plant. It is connected to discharge into a large dip tank and drainboard, and also is used to flood a baking oven in event of fire

## Brazing Aluminum Alloys

(*Concluded from Page 62*)

in other brazing operations. Principally it is in control equipment, since the temperatures range from 1000 to 1200 degrees Fahr. with a permissible variation of plus or minus 10 degrees Fahr. Existing equipment has been employed in most cases since furnaces thus far used have been mainly the electrically heated batch type. Gas-fired equipment and continuous conveyor-type furnaces work equally well if the correct temperature is maintained.

Baffle equipment is to be desired since it is important to prevent hot spots which might raise the temperature of the parent metal too high. It also is important to prevent molten flux from reaching heating units since these fluxes are corrosive and an occasional drop may fall from the assemblies. Uniform temperature through air circulation is desirable but not necessary.

Research has been done on furnace atmospheres employing all common materials such as partially-burned natural gas, coke-oven gas, butane and propane. No apparent advantages over the air atmosphere have been noted. Thus far all commercial applications have used air-atmosphere furnaces with good results. In the laboratory, a hydrogen atmosphere worked well but no commercial application requiring this has been set up yet.

There are no fumes or gases formed during the brazing operation to demand ventilating equipment for their dispersion. However, it has been discovered that small quantities of hydrogen are evolved when the flux is applied wet. In some cases where assemblies are closed as in small tank construction, it has been found necessary to provide for removal of the hydrogen to prevent explosions within the part. This is unnecessary, of course, with open assemblies.

### Brazing Time Varies

Variables affecting time required for the operation include composition and thickness of parent metal. Lead temperature depends on the same set of variables. With materials now available, the range is from 1050 to 1185 degrees Fahr. Exact temperatures must be obtained by trial on the specific job involved. Actual brazing time varies from 3 to 8 minutes, in addition to the period in which the parts attain brazing temperature. The time primarily depends on thickness of parts.

Alignment of parts in the furnace is important since it is desirable to avoid the use of jigs or fixtures whenever possible as considerable heat is lost in bringing the jigs up to furnace temperature. It also is difficult to find a suitable material for jigs since nonferrous materials have a strong tendency to alloy with the aluminum at brazing temperatures and since the difference in thermal coefficient of expansion between ferrous jigs and aluminum is so great that damage or misalignment of parts may occur.

It is considerably more satisfactory to use aluminum rivets to align the parts to be brazed or to spot weld the pieces where possible or to fasten by beading or clinching them together. If possible, parts should be made to fit without external aid.

For the most part, joint clearances should be slightly larger than those used in ferrous brazing. As yet there is not enough material assembled on this subject to permit the establishment of specific tables to show actual clearances. Similarly, there is not yet enough actual data to permit establishment of definite standards as regards strength of brazed joints or resistance of the materials to corrosion. Pressure tests likewise do not permit conclusive statements although consistent results have shown good resistance to air pressures at 90 pounds per square inch and hydrostatic pressures up to 1700 pounds per square inch.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## Canadian Provinces Adopt Boiler Code

■ Provinces of Ontario and Manitoba in Canada recently passed orders-in-council providing for adoption of several sections of the A.S.M.E. boiler code as part of their laws.

Already adopted in the United States by 24 states, the Hawaiian Islands, Panama Canal Zone and 18 municipalities, the Code, which is being revised continually by a committee of American Society of Mechanical Engineers, provides a standard of safety in design, construction and operation of boilers and pressure vessels.

Passage of the laws in Canada followed the approval of the Canadian Engineering Standards association which studied the subject during the past three years. Sections of the code adopted deal with power, low-pressure heating and miniature boilers, material specifications, unfired pressure vessels and rules for the care of power boilers. Sections not yet approved in Canada are those covering locomotive boilers and rules for inspection.

## Mirrors of Motordom

(*Concluded from Page* 38)

Welder Co. which a week ago formally opened its long-planned new headquarters on East Outer drive, far from the hub-bub of its old location on Piquette avenue in the heart of the city.

Progressive builds heavy multiple-spot welding machinery of the "hydromatic" and "ultraspeed" types, portable welding guns, hydraulic punching machines, a new type of forge welding unit and related devices. Having a high degree of flexibility or a high "salvage" value, the equipment is ideally suited to automotive needs, where yearly changes of models require frequent redesign of equipment.

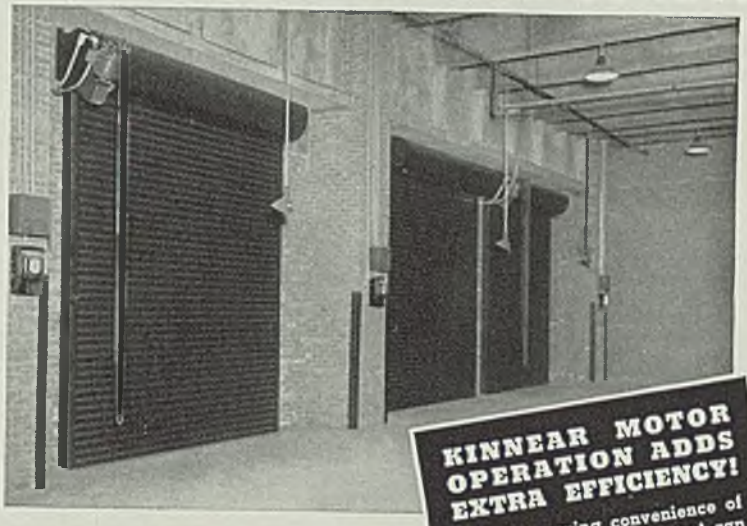
The company's portable welding guns and suspended transformers are seen on many a subassembly line in this district. A novel improvement recently has been introduced in this equipment by placing a swivel joint at the back of the gun to permit it to be moved into different positions without having to flex the attached heavy cables.

Managed by W. H. Martin and F. H. Johnson, Progressive does about 60 per cent of its business in the automotive industry, is rapidly expanding into other fields such as farm equipment manufacture, and hopes some day to see its equipment adaptable to aircraft manufacture. Messrs. Martin and Johnson also supervise a number of other small companies allied with the interests of Progressive.

There is some interesting background on the subject of the "ultraspeed" type of welding unit, which essentially involves interruption of current on both primary and secondary sides of welding transformers connected to the welding electrodes. Developed originally by H. W. Roth, who operated the old Roth Welding Engineering Co. here, the process later was assigned to an Ohio welding machine builder which in turn licensed members of the welding machine manufacturers' association. Roth has vanished from the local scene and now is reportedly active with the German government in technical phases of aircraft manufacture.

■ ONE logical explanation of the continued high rate of new car sales throughout the country has been offered. It is reasoned that many persons with available funds can find no suitable investment outlet for their capital so they decide to place it in a new automobile, feeling that such an investment is at least tangible and relatively free from the vagaries of government investigation, regulation or defamation.


Save... WITH RUGGED STEEL DOORS THAT COIL ABOVE THE OPENING!



KINNEAR MOTOR OPERATION ADDS EXTRA EFFICIENCY!

The time saving convenience of electric push-button control can easily be added to any Kinnear Rolling Door. With motor control, doors can be opened quickly from any number of convenient points. The heavy-duty, soundly engineered Kinnear Motor Operator is built to serve economically, for years!

It's easy to see **why** the coiling, upward action of Kinnear Rolling Doors saves you money. Kinnear's rugged all-steel curtain of strong, interlocking slats can't warp, sag, split, or pull out of shape. It defies weather, repels fire, prevents intrusion, and resists wear! The doors operate quickly, smoothly and easily all year long, because they open over snow, ice and swollen ground. They require no usable space, and they open out of reach of damage by wind or vehicles. You get all these advantages—and many others—with Kinnear Rolling Doors. It will pay you to know more about the economies they afford . . . to learn why so many industrial firms are specifying Kinnear Rolling Doors. Write for the complete Kinnear catalog!

Kinnear also makes STEEL ROLLING FIRE DOORS — approved by Underwriters' Laboratories—for safe, automatic fire protection . . . STEEL ROLLING GRILLES for positive, convenient protection without sacrifice of light, air or vision . . . WOOD and ALL-STEEL RoL-TOP DOORS, rugged, dependable, sectional-type upward-acting doors. Full details in the Kinnear catalog!

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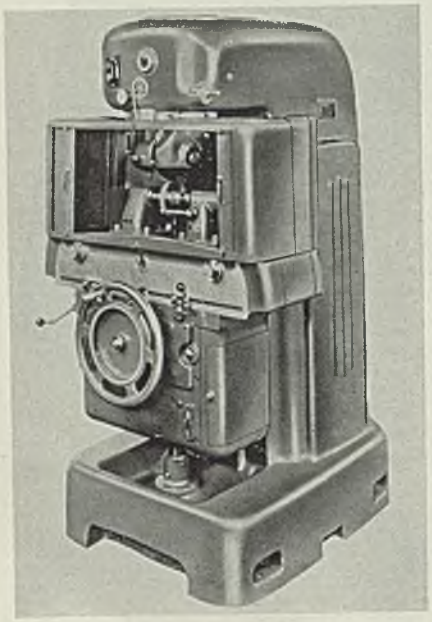
KINNEAR ROLLING DOORS


## Shaving Machine

■ National Broach & Machine Co., Shoemaker and St. Jean streets, Detroit, has developed an extra-heavy-duty Red Ring shaving machine featuring a 1-piece C-type frame. Cuts of 0.002-inch over pins, which is approximately 0.0003-inch on a side, can be taken with exact measurements after each cut. Shaver utilizes a gashed helical gear form tool in mesh with work gear, with axes of work gear and cutter crossed at an angle. Cutter gear drives work gear, as latter is traversed back and forth across cutter. Stock is removed in fine shavings. Horizontal serrations (wash-board effect) are eliminated. Profile is corrected by generating action to within 0.0001-inch of that desired, it is claimed. Machine also provides for crowning gear teeth by means of a cam operating the table. Cam tilts table slightly making it follow a curved instead of a straight path. This makes teeth thinner by a slight amount at the end than the middle. Knee is supported by a 2½-inch feed screw. Cutter head has solid support on both sides of cutter to prevent spring. Work table is of box construction, 7½ inches deep, and has an upper surface 10 x 35 inches. Individual motor drives are used on cutter spindle, table and oil pump. Automatic feed is cut in or out by a second lever on the knee. Cycling of machine can be set for automatic operation.



## Single-Speed Fan

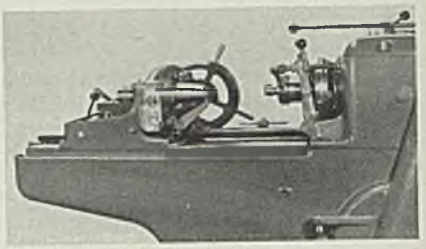
■ Wagner Electric Corp., 6400 Plymouth avenue, St. Louis, offers its 1940 model 10-inch single-speed oscillating fan. Motor and base are finished in crackle-brown finish, blades in soft lustrous brown, guard in silver gray. Fan is built in four models: 8-inch and 10-inch non-oscillating, 10-inch and 12-inch oscillating, ranging in price from $3.95 to $16.95.

## Immersion Heaters

■ Westinghouse Electric & Mfg. Co., Mansfield, O., announces Corox immersion heater for oil tempering baths. It is made of steel tubing and has a low watt density of approximately 11 watts per square inch of active tube surface. Heaters are available with an effective heating depth of either 5 or 10 inches. The 5-inch units have a rating of 2000 watts at 115 or 230 volts, and the 10-inch units have a rating of 4000 watts at 115 or 230 volts. Any of these models may be connected in series on 440 volts.

## Threading Machine

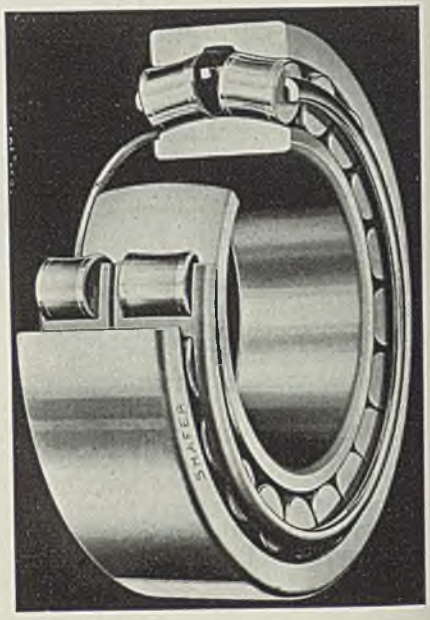
■ Landis Machine Co., Waynesboro, Pa., announces a threading machine equipped with a Style ALT collapsible tap to permit cutting of internal threads on the fuse plug end of shells. Special accessories for this arrangement include a gage arm, special round grips and a work supporting cradle. Gage arm protrudes beyond carriage front and provides a definite stop against which work is located before it is clamped into carriage front. Special round grips are employed to assure correct alignment of work with center of rotation of tap. These grips are wide faced and are ground

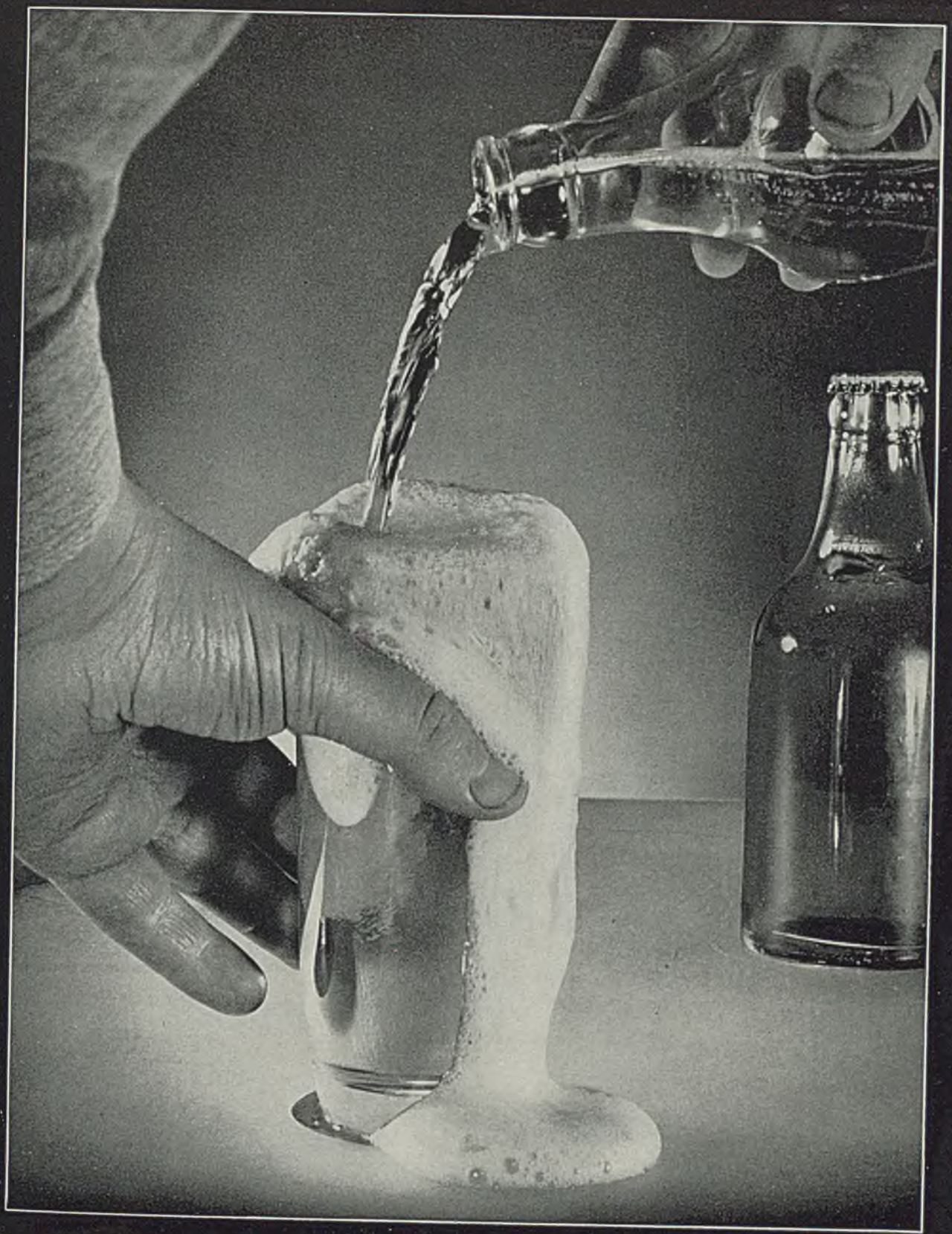


to conform to diameter of work. The special work supporting cradle is located on carriage directly back of carriage front. In operating, work is laid on the cradle and is then pushed forward through the grips to the stop. Grips are then closed on the work and lead screw is engaged. When the predetermined thread length has been cut, tap collapses automatically and work can be withdrawn.

## Roller Bearing

■ Shafer Bearing Corp., 35 East Wacker drive, Chicago, announces double-row roller bearing available in DE 200 series, sizes from 3.1490 to 5.9045-inch bore; and DE 300 series, sizes from 1.9680 to 5.1171-inch bore. The DE series is a self-contained double-row angular contact type. Concave rollers operate between convex races, one piece outer race having two ground raceways. Concave roller design provides self-alignment within bearing itself, and capacity for radial loads,





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## . . . unsuspected waste caused by poor lubricants curtailed production until TYCOL GREEN CAST GREASES revealed the loss

"We have tried several kinds of greases on the bearings in our mills without much success. One would feed too freely—it was ineffective and wasteful. Another highly recommended grade was too stringy—it pulled out of the cups quickly. Still another type fed too slowly, frequently not at all. With each of these greases overheated bearings often necessitated closing down a mill for an hour or more—slowed production materially. Our mills are hooked in groups of eight, so seven others had to sit idle while the one cooled off. » » » "Then on the recommendation of Tide Water engineers we switched to Tycol Green Cast Greases. Our greasing problem has been reduced to simply filling the cups every eight hours with minimum attention for application which has resulted in not a single overheated bearing." » » » The superintendent, like many others using Tycol Green Cast Greases, gets better protection—more effective lubrication per pound of grease. Here's the reason: The finest cylinder oil is compounded with a minimum of soap in Tycol Green Cast Greases. More oil, less soap. More lubricating oil per pound means more economical lubrication. Less friction . . . maximum production. » » » There is a Tycol Grease or Oil scientifically engineered to fit every industrial requirement. Drop us a line. We will be glad to show how Tycol "engineered lubrication" can prevent waste—and save you money and worry.

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INDUSTRIAL TYCOL OILS-GREASES

# TIDE WATER GREEN CAST GREASES

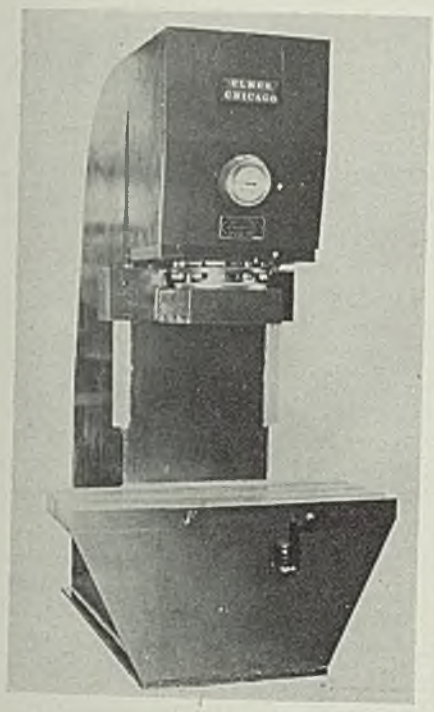
COMPLETE LINE OF TYCOL LUBRICANTS SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE

thrust loads in either direction, or any combination of radial and thrust loads.

## Hydraulic Press

■ Charles F. Elmes Engineering Works, 230 North Morgan street, Chicago, announces general purpose open side hydraulic press which features steel construction and reinforced frame.

Bed is placed at convenient working height from floor and is provided with slots for fastening jigs or fixtures. Control equipment is located within housing. Only operating levers and motor starter button are exposed. Push-button con-

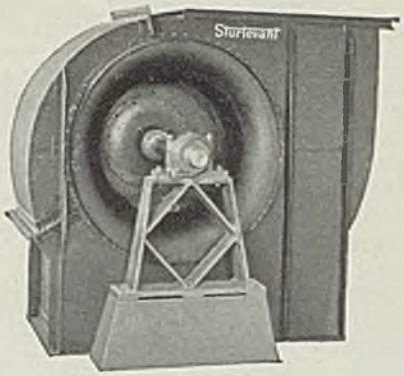


trol may be provided if desired. Operation of press is by lever on righthand side of press. Lever advances platen at high rate of speed, and when work is reached, platen automatically slows down. By movement of a rod, stroke of moving platen can be decreased to cut down idle movement of platen. Louvres in rear of press provide ventilation to motor.

## Ventilating Fan

■ B. F. Sturtevant Co., Hyde Park, Boston, announces new fan for heating and ventilating.

Its various efficient features include duced power consumption, quieter operation, less maintenance. Known as Silentvane 7, fan is of heavy steel plate reinforced with angles. Comparative freedom from dust loading makes it applicable for practically any dust handling application. It is available in all standard discharges, single and double width, single and



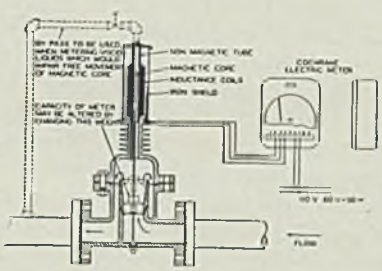

double inlet, with wheel diameters from 14⅝ to 87 inches.

## Crawler-Mounted Crane Has Four Cable Drums

■ Northwest Engineering Co., 28 East Jackson boulevard, Chicago, announces Model 71 crawler-mounted crane having four drums and a capacity of 40 tons for handling and setting steel, handling piling, setting stone and other work requiring versatility of boom position and line control. Folding gantry that can be lowered is said to provide ample overhead clearance when traveling under obstructions.

## Fluid Meter

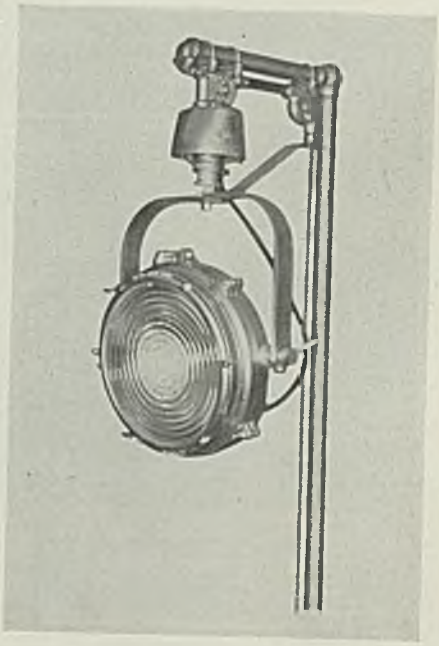
■ Cochrane Corp., Seventeenth street and Allegheny avenue, Philadelphia, announces new Linameter, for measuring fluids such as fuel oil, ammonia and hot tar. Meter is installed as an integral part of pipe line, and recording instrument



measures by use of galvanometer null principle. Among other features of the Linameter are omission of U-tubes, mercury and pressure connecting lines, uniformly graduated indicator and chart scales and means of conveniently changing capacity range. Meter is made in different combinations of indicating, recording and integrating features to suit particular conditions and may be equipped with pressure and temperature elements. Styles are available for wall, column or flush panel mounting.

## Floodlight Projector

■ Pyle-National Co., 1334 North Kostner avenue, Chicago, announces heavy-duty floodlight projector for installation with lamp lowering hanger. Illustrated is the 14-inch totally enclosed cast aluminum projector equipped with circular divergence lens giving a wide spread circular light beam. Projector door and door glass joints are tightly sealed. Trunnion mounting is adjustable, and provided with locking device and register for returning to original



position after servicing. Installation with the lamp lowering hanger is readily adapted to any requirements of yard, platform, driveway and similar outdoor lighting. Projectors are available in a full range of sizes, with glass or Alzak reflectors, and either plain, rectangular, circular or fan type light control lenses.

## Height and Depth Gage

■ Continental Machines Inc., 1301 Washington avenue, Minneapolis, has introduced a Doall height and depth gage for easy reading with micrometer accuracy in places difficult to reach. Gage is furnished with rods which measure up to 6 inches. As a depth gage, the measuring rods are locked into position after the measurement is taken. In measuring height, height pin is inserted in the gage in place of the measuring rods. It then can be used for making accurate layout lines. Height and depth gage is available in the deluxe set, complete with the disk scriber and measuring rods in a velvet lined case.

## Speeding Shipments

(*Concluded from Page 52*)

to two connecting cross spur level power roller conveyors 150 feet long that carry the products to storage and from storage to freight cars and motor trucks for shipment. In Fig. 13 a section of the warehouse end of the building is shown and the 300-foot power belt conveyor handling delivery of the merchandise from the manufacturing section.

About 200 feet of portable conveyor on wheels is used to convey apparatus to and from these main conveyors. Portable conveyors also connect to main conveyors, permitting direct loading into freight cars and trucks for shipment, see Fig. 14.

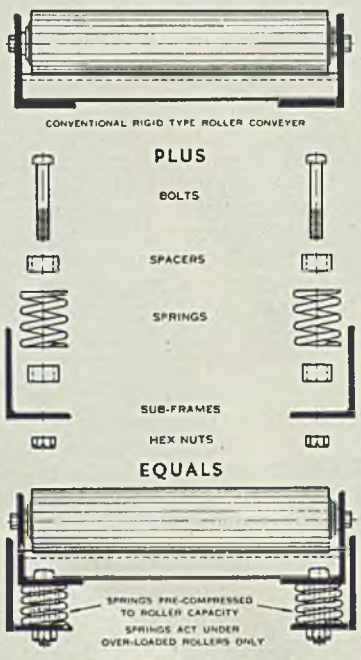
An electric stacker, Fig. 15, piles the products. It is a telescopic type that reaches 21 feet permitting storage to a height of 24 feet. It has a speed of 70 feet per minute, capacity of 700 pounds and is equipped with all known safety devices, including life belts for operators.

On the second floor of the main warehouse building, W in Fig. 1, part I, is the mailing, order service, traffic, invoice and claim departments for increasing overall efficiency in handling customers' orders. Workers' desks are in sequence according to the flow of work. The office location is shown in Fig. 5, Part I. The orders received in the mailing department are delivered to the order service department, where they clear through from record clerk to correspondent, to typist, to ledgerman, to traffic clerk, and then the orders are carried in groups to the dispatching office on the first floor for shipment.

When shipped, the orders then are carried to invoice department where they are cleared through the operations of pricing and typing of invoice. Invoices then go through the distributing clerk and are given to the mailing department. Mail is bagged, carried downstairs to the shipping department, and thence by messenger to the post office.

The order is completely handled in the warehouse—received, interpreted, shipped, invoiced and filed. By this arrangement we are able to ship and invoice better than 90 per cent of the orders within 24 hours after receipt.


MATHEWS SPRING MOUNTED CONVEYERS




SPRING MOUNTED CONVEYER

CUT MAINTENANCE COSTS

THE principle is simple; the roller axles are rigidly locked in the frame as in the conventional "rigid type" construction, but the conveyer frame which retains the rollers is carried on pre-compressed coil springs. The springs are held in compression equal to the rated safe load of each roller. Under impact conditions or excessive loads the springs absorb the overload.

This construction represents the greatest improvement in roller conveyer in many years. Its application will reduce maintenance costs by prolonging the life of the equipment. When conditions are severe, "spring mounted" is the practical conveyer construction for the job.

Capacities from 150 lbs. to 8000 lbs. per roller available.

*Ask for Illustrated Folder*

MATHEWS CONVEYER COMPANY
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CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS


## New Volume Treats Merchandising Policies

■ *Manufacturers' Product Package and Price Policies*, by Albert Wesley Frey, cloth, 429 pages, 5¾ x 8½ inches; published by the Ronald Press Co., New York; supplied by STEEL, Cleveland, for $4.50.

This book analyzes policies and practices which manufacturers have developed in their solution of vital product, price and package problems. These are considered as constituting an activity termed merchandising. It is treated here as a division of management distinct from sales management, advertising and production management.

While many books have been written on advertising, selling and production, business literature dealing with merchandising management has been relatively limited. The author believes his volume fills a need felt by executives who wish to review his own merchandising organization, policies and procedures and those faced by specific problems in merchandising.

## Many Scales Inaccurate

■ Almost four out of five of the vehicle scales tested are found to be inaccurate, according to a bulletin issued by United States department of commerce, national bureau of standards, Washington.

Results of 1449 tests, made in cooperation with states from November, 1936, to April, 1939, show the highest percentage of scales found inaccurate is in the scrap materials group with the building materials group a close second.

# Price Weakness Hits Flat Rolled Markets

***Most sheet and strip grades cut $4 a ton. Buying hesitancy interrupts expansion in finished steel demand***

**MARKET I TABLBID**

*Demand*

*Expanding more rapid prior to price reductions.*

*Prices*

*Sheets and strip reduced $4 ton. Scrap still easy.*

*Production*

*Down ½-point to 61 per ce*

■ PRICE weakness in flat-rolled products overshadows appearance of more definite improvement in steel demand and has tended to interrupt buying.

Irregularity which had prevailed in sheet and strip quotations for a relatively brief period became pronounced recently. It was brought into the open late last week when Carnegie-Illinois Steel Corp. stated it was recognizing this weakness by reductions of $4 a ton from previously announced prices for second quarter on hot-rolled sheets and strip, enameling sheets and cold-rolled sheets. Other producers have followed suit, likewise lowering cold-rolled strip.

While this cut brings prices $5 to $7 a ton below levels of a year ago, the market at the latter time was heading into the May price war which developed temporary concessions of $8 a ton or more. As in the price disturbance a year ago, shading on automotive orders recently was the important factor in causing last week's general reduction.

Most other steel quotations are comparatively steady, although the average realized mill price on new business has declined gradually so far this year compared with levels of late 1939. STEEL'S finished steel price composite is off 80 cents to $55.30, compared with $56.50 a year ago.

Additional betterment in steel buying prior to the hesitation induced by the flat-rolled price cut largely is traceable to seasonal influences and to inventory replacement. Export markets also continue an important source of business. Influence of recent European developments as yet is somewhat uncertain, but possibility is seen more intensive warfare will stimulate orders from abroad for material and equipment. On the other hand, foreign trade with Scandinavian countries has been crippled.

Building construction is accounting for somewhat larger steel orders, but the season is opening slowly and awards of structural shapes and concrete reinforcing bars so far this year lag behind the volume for the corresponding 1939 period despite recent gains in private work. Outstanding in recent orders is 10,000 tons of concrete bars for the Red river dam, Texas. Pending shape business includes 2500 tons for a Cincinnati foundry and 2200 tons for a New York city bridge.

Steel pipe business shows further gains. Line pipe orders are fairly active, headed by 12,000 tons for an Indiana line, with other oil country products in unchanged demand.

Ingot production has yet to reflect betterment in finished steel buying, other than a tendency to level off around its recent 60 to 65 per cent pace. The national average last week is estimated at 61 per cent, off ½-point. This compares with a 2-point drop to 51½ per cent a year ago, when operations were declining steadily. New business is bringing a closer balance between demand and production, although stocks of some consumers still are regarded as excessive and will be reduced further before buying is adjusted to current needs.

Principal reduction in steelmaking last week was 4½ points to 53 per cent at Pittsburgh. Chicago was up 1½ points to 59, Wheeling rose 12 points to 73 and Cincinnati gained 3 points to 56. Other decreases were 2 points to 57 in eastern Pennsylvania, 3 points to 65 at Cleveland, 2½ points to 44 at Buffalo, 10 points to 55 in New England, 6 points to 45 at St. Louis and 2 points to 77 at Detroit. Unchanged were Youngstown at 42 and Birmingham at 81.

Tin plate orders and releases are increasing more slowly than usual for this period, although relatively active consumption is in prospect and some mills are adding to stocks in anticipation of expanding needs during the canning season. Production is up 1 point to 61 per cent.

Automobile production is steady. Last week's output of 102,940 units showed a gain of 1285 over the week before and compares with 88,050 a year ago. Motor car assemblies have been unusually steady for six weeks, and brisk retail demand points to possibility of sustained operations through May.

Railroad equipment orders include 500 small freight cars for Siam, 100 freight cars for the Denver & Rio Grande Western and 160 for the Chicago, Burlington & Quincy.

Scrap markets continue dull and generally easy, with the price composite down 13 cents to a new 1940 low at $15.96.

# COMPOSITE MARKET AVERAGES

| | Apr. 13 | Apr. 6 | Mar. 30 | One Month Ago Mar., 1940 | Three Months Ago Jan., 1940 | One Year Ago Apr., 1939 | Five Years Ago Apr., 1935 |
|---|---|---|---|---|---|---|---|
| Iron and Steel .... | $36.32 | $36.83 | $36.81 | $36.83 | $37.09 | $36.34 | $32.29 |
| Finished Steel .... | 55.30 | 56.10 | 56.10 | 56.10 | 56.10 | 56.50 | 54.00 |
| Steelworks Scrap.. | 15.96 | 16.09 | 16.17 | 16.47 | 17.48 | 14.64 | 10.05 |

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

# COMPARISON OF PRICES

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

## Finished Material

| | Apr. 13, 1940 | Mar. 1940 | Jan. 1940 | Apr. 1939 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.15c | 2.15c | 2.15c | 2.25c |
| Steel bars, Chicago | 2.15 | 2.15 | 2.15 | 2.25 |
| Steel bars, Philadelphia | 2.47 | 2.47 | 2.47 | 2.57 |
| Iron bars, Chicago | 2.25 | 2.25 | 2.30 | 2.15 |
| Shapes, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.10 |
| Shapes, Philadelphia | 2.215 | 2.215 | 2.215 | 2.215 |
| Shapes, Chicago | 2.10 | 2.10 | 2.10 | 2.10 |
| Plates, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.10 |
| Plates, Philadelphia | 2.15 | 2.15 | 2.15 | 2.15 |
| Plates, Chicago | 2.10 | 2.10 | 2.10 | 2.10 |
| Sheets, hot-rolled, Pittsburgh | 1.90 | 2.10 | 2.10 | 2.15 |
| Sheets, cold-rolled, Pittsburgh | 2.85 | 3.05 | 3.05 | 3.20 |
| Sheets, No. 24 galv., Pittsburgh | 3.50 | 3.50 | 3.50 | 3.50 |
| Sheets, hot-rolled, Gary | 1.90 | 2.10 | 2.10 | 2.15 |
| Sheets, cold-rolled, Gary | 2.85 | 3.05 | 3.05 | 3.20 |
| Sheets, No. 24 galv., Gary | 3.50 | 3.50 | 3.50 | 3.50 |
| Bright bess., basic wire, Pitts. | 2.60 | 2.60 | 2.60 | 2.60 |
| Tin plate, per base box, Pitts. | $5.00 | $5.00 | $5.00 | $5.00 |
| Wire nails, Pittsburgh | 2.55 | 2.55 | 2.55 | 2.45 |

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, Pittsburgh, Chicago | $34.00 | $34.00 | $34.00 | $34.00 |
| Slabs, Pittsburgh, Chicago | 34.00 | 34.00 | 34.00 | 34.00 |
| Rerolling billets, Pittsburgh | 34.00 | 34.00 | 34.00 | 34.00 |
| Wire rods, No. 5 to ⅜-inch, Pitts. | 2.00 | 2.00 | 2.00 | 1.92 |

## Pig Iron

| | Apr. 13. 1940 | Mar. 1940 | Jan. 1940 | Apr. 1939 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh | $24.34 | $24.34 | $24.34 | $22.34 |
| Basic, Valley | 22.50 | 22.50 | 22.50 | 20.50 |
| Basic, eastern, del. Philadelphia | 24.34 | 24.34 | 24.34 | 22.34 |
| No. 2 foundry, Pittsburgh | 24.21 | 24.21 | 24.21 | 22.21 |
| No. 2 foundry, Chicago | 23.00 | 23.00 | 23.00 | 21.00 |
| Southern No. 2, Birmingham | 19.38 | 19.38 | 19.38 | 17.38 |
| Southern No. 2, del. Cincinnati | 22.89 | 22.89 | 22.89 | 20.89 |
| No. 2X, del. Phila. (differ. av.) | 25.215 | 25.215 | 25.215 | 23.215 |
| Malleable, Valley | 23.00 | 23.00 | 23.00 | 21.00 |
| Malleable, Chicago | 23.00 | 23.00 | 23.00 | 21.00 |
| Lake Sup., charcoal, del. Chicago | 30.34 | 30.34 | 30.34 | 28.34 |
| Gray forge, del. Pittsburgh | 23.17 | 23.17 | 23.17 | 21.17 |
| Ferromanganese, del. Pittsburgh | 105.33 | 105.33 | 105.33 | 85.33 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melt. steel, Pitts. | $16.25 | $17.05 | $18.15 | $15.50 |
| Heavy melt, steel No. 2, E. Pa. | 15.50 | 15.90 | 16.80 | 13.65 |
| Heavy melting steel, Chicago | 15.25 | 15.50 | 16.45 | 13.35 |
| Rails for rolling, Chicago | 18.75 | 18.25 | 19.05 | 17.25 |
| Railroad steel specialties, Chicago | 18.00 | 18.35 | 18.50 | 15.35 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, furnace, ovens | $4.75 | $4.75 | $4.75 | $3.75 |
| Connellsville, foundry, ovens | 5.75 | 5.75 | 5.75 | 5.00 |
| Chicago, by-product fdry., del. | 11.25 | 11.25 | 11.25 | 10.50 |

# STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

## Sheet Steel

**Hot Rolled**

| | |
|---|---|
| Pittsburgh | 1.90c |
| Chicago, Gary | 1.90c |
| Cleveland | 1.90c |
| Detroit, del. | 2.00c |
| Buffalo | 1.90c |
| Sparrows Point, Md. | 1.90c |
| New York, del. | 2.14c |
| Philadelphia, del. | 2.07c |
| Granite City, Ill. | 2.00c |
| Middletown, O. | 1.90c |
| Youngstown, O. | 1.90c |
| Birmingham | 1.90c |
| Pacific Coast points | 2.40c |

**Cold Rolled**

| | |
|---|---|
| Pittsburgh | 2.85c |
| Chicago, Gary | 2.85c |
| Buffalo | 2.85c |
| Cleveland | 2.85c |
| Detroit, delivered | 2.95c |
| Philadelphia, del. | 3.17c |
| New York, del. | 3.19c |
| Granite City, Ill. | 2.95c |
| Middletown, O. | 2.85c |
| Youngstown, O. | 2.85c |
| Pacific Coast points | 3.45c |

**Galvanized No. 24**

| | |
|---|---|
| Pittsburgh | 3.50c |
| Chicago, Gary | 3.50c |
| Buffalo | 3.50c |
| Sparrows Point, Md. | 3.50c |
| Philadelphia, del. | 3.67c |
| New York, delivered | 3.74c |
| Birmingham | 3.50c |
| Granite City, Ill. | 3.60c |
| Middletown, O. | 3.50c |
| Youngstown, O. | 3.50c |
| Pacific Coast points | 4.00c |

**Black Plate, No. 29 and Lighter**

| | |
|---|---|
| Pittsburgh | 3.05c |
| Chicago, Gary | 3.05c |
| Granite City, Ill. | 3.15c |

**Long Ternes No. 24 Unassorted**

| | |
|---|---|
| Pittsburgh, Gary | 3.80c |
| Pacific Coast | 4.50c |

**Enameling Sheets**

| | No. 10 | No. 20 |
|---|---|---|
| Pittsburgh | 2.55c | 3.15c |
| Chicago, Gary | 2.55c | 3.15c |
| Granite City, Ill. | 2.65c | 3.25c |
| Youngstown, O. | 2.55c | 3.15c |
| Cleveland | 2.55c | 3.15c |
| Middletown, O. | 2.55c | 3.15c |
| Pacific Coast | 3.15c | 3.75c |

## Corrosion and Heat-Resistant Alloys

*Pittsburgh base, cents per lb.*

**Chrome-Nickel**

| | No. 302 | No. 304 |
|---|---|---|
| Bars | 24.00 | 25.00 |
| Plates | 27.00 | 29.00 |
| Sheets | 34.00 | 36.00 |
| Hot strip | 21.50 | 23.50 |
| Cold strip | 28.00 | 30.00 |

**Straight Chromes**

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| Bars | 18.50 | 19.00 | 22.50 | 27.50 |
| Plates | 21.50 | 22.00 | 25.50 | 30.50 |
| Sheets | 26.50 | 29.00 | 32.50 | 36.50 |
| Hot strip | 17.00 | 17.50 | 24.00 | 35.00 |
| Cold stp. | 22.00 | 22.50 | 32.00 | 52.00 |

## Steel Plate

| | |
|---|---|
| Pittsburgh | 2.10c |
| New York, del. | 2.29c |
| Philadelphia, del. | 2.15c |
| Boston, delivered | 2.46c |
| Buffalo, delivered | 2.33c |
| Chicago or Gary | 2.10c |
| Cleveland | 2.10c |
| Birmingham | 2.10c |
| Coatesville, Pa. | 2.10c |
| Sparrows Point, Md. | 2.10c |
| Claymont, Del. | 2.10c |
| Youngstown | 2.10c |
| Gulf ports | 2.45c |
| Pacific Coast points | 2.60c |

**Steel Floor Plates**

| | |
|---|---|
| Pittsburgh | 3.35c |
| Chicago | 3.35c |
| Gulf ports | 3.70c |
| Pacific Coast ports | 3.95c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh | 2.10c |
| Philadelphia, del. | 2.21½c |
| New York, del. | 2.27c |
| Boston, delivered | 2.41c |
| Bethlehem | 2.10c |
| Chicago | 2.10c |
| Cleveland, del. | 2.30c |
| Buffalo | 2.10c |
| Gulf ports | 2.45c |
| Birmingham | 2.10c |
| St. Louis, del. | 2.34c |
| Pacific Coast points | 2.70c |

## Tin and Terne Plate

**Tin Plate, Coke (base box)**

| | |
|---|---|
| Pittsburgh, Gary, Chicago | $5.00 |
| Granite City, Ill. | 5.10 |

**Mfg. Terne Plate (base box)**

| | |
|---|---|
| Pittsburgh, Gary, Chicago | $4.30 |
| Granite City, Ill. | 4.40 |

## Bars

**Soft Steel**

(*Base, 20 tons or over*)

| | |
|---|---|
| Pittsburgh | 2.15c |
| Chicago or Gary | 2.15c |
| Duluth | 2.25c |
| Birmingham | 2.15c |
| Cleveland | 2.15c |
| Buffalo | 2.15c |
| Detroit, delivered | 2.25c |
| Philadelphia, del. | 2.47c |
| Boston, delivered | 2.52c |
| New York, del. | 2.49c |
| Gulf ports | 2.50c |
| Pacific Coast points | 2.75c |

**Rail Steel**

(*Base, 5 tons or over*)

| | |
|---|---|
| Pittsburgh | 2.05c |
| Chicago or Gary | 2.05c |
| Detroit, delivered | 2.15c |
| Cleveland | 2.05c |

| | |
|---|---|
| Buffalo | 2.05c |
| Birmingham | 2.05c |
| Gulf ports | 2.40c |
| Pacific Coast points | 2.65c |

**Iron**

| | |
|---|---|
| Chicago | 2.25c |
| Philadelphia | 2.37c |
| Pittsburgh, refined | 3.50-8.00c |

**Reinforcing**

*New Billet Bars, Base*

| | |
|---|---|
| Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts. | 1.70-1.90c |
| Gulf ports | 2.05-2.25c |
| Pacific Coast ports | 2.05-2.25c |

*Rail Steel Bars, Base*

| | |
|---|---|
| Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm. | 1.70-1.90c |
| Gulf ports | 2.05-2.25c |
| Pacific Coast ports | 2.05-2.25c |

*The above represent average going prices. Last quotations announced by producers were 2.15c, mill base, for billet bars and 2.00c for rail steel.*

## Wire Products

*Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads*

| | |
|---|---|
| Standard and cement coated wire nails | $2.55 |
| (Per pound) | |
| Polished fence staples | 2.55c |
| Annealed fence wire | 3.05c |
| Galv. fence wire | 3.30c |
| Woven wire fencing (base C. L. column) | 67 |
| Single loop bale tie, (base C.L. column) | 56 |
| Galv. barbed wire, 80-rod spools, base column | 70 |
| Twisted barbless wire, column | 70 |

**To Manufacturing Trade**

*Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)*

| | |
|---|---|
| Bright bess., basic wire | 2.60c |
| Galvanized wire | 2.60c |
| Spring wire | 3.20c |

Worcester, Mass., $2 higher on bright basic and spring wire.

## Cut Nails

Carload, Pittsburgh, keg..$3.85

## Cold-Finished Bars

| | Carbon | Alloy |
|---|---|---|
| Pittsburgh | 2.65c | 3.35c |
| Chicago | 2.65c | 3.35c |
| Gary, Ind. | 2.65c | 3.35c |
| Detroit | 2.70c | *3.45c |
| Cleveland | 2.65c | 3.35c |
| Buffalo | 2.65c | 3.35c |

* Delivered.

## Alloy Bars (Hot)

(Base, 20 tons or over)

| | |
|---|---|
| Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem | 2.70c |
| Detroit, delivered | 2.80c |

| Alloy | Diff. | Alloy | Diff. |
|---|---|---|---|
| S.A.E. | | S.A.E. | |
| 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. 1.50-2.00 Ni. | 1.10 |
| 5100 0.80-1.10 Cr. | 0.45 |
| 5100 Cr. spring flats | 0.15 |
| 6100 bars | 1.20 |
| 6100 spring flats | 0.85 |
| Cr. N., Van. | 1.50 |
| Carbon Van. | 0.85 |
| 9200 spring flats | 0.15 |
| 9200 spring rounds, squares | 0.40 |

Electric furnace up 50 cents.

## Strip and Hoops

*(Base, hot strip, 1 ton or over; cold, 3 tons or over)*

**Hot Strip, 12-inch and less**

| | |
|---|---|
| Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham | 1.90c |
| Detroit, del. | 2.00c |
| Philadelphia, del. | 2.22c |
| New York, del. | 2.26c |
| Pacific Coast points | 2.50c |
| Cooperage hoop, Youngs., Pitts.; Chicago, Birm. | 2.00c |

Cold strip, 0.25 carbon and under, Pittsburgh.

| | |
|---|---|
| Cleveland, Youngstown | 2.60c |
| Chicago | 2.70c |
| Detroit, del. | 2.70c |
| Worcester, Mass. | 2.80c |

| Carbon | Cleve., Pitts. |
|---|---|
| 0.26—0.50 | 2.60c |
| 0.51—0.75 | 4.30c |
| 0.76—1.00 | 6.15c |
| Over 1.00 | 8.35c |

Worcester, Mass. $4 higher.

**Commodity Cold-Rolled Strip**

| | |
|---|---|
| Pitts.-Cleve.-Youngstown | 2.75c |
| Chicago | 2.85c |
| Detroit, del. | 2.85c |
| Worcester, Mass. | 3.15c |

Lamp stock up 10 cents.

## Rails, Fastenings

*(Gross Tons)*

| | |
|---|---|
| Standard rails, mill | $40.00 |
| Relay rails, Pittsburgh 20—100 lbs. | 32.50-35.50 |
| Light rails, billet qual., Pitts., Chicago, B'ham. | $40.00 |
| Do., rerolling quality | 39.00 |

*Cents per pound*

| | |
|---|---|
| Angle bars, billet, mills | 2.70c |
| Do., axle steel | 2.35c |
| Spikes, R. R. base | 3.00c |
| Track bolts, base | 4.15c |
| Car axles forged, Pitts., Chicago, Birmingham | 3.15c |
| Tie plates, base | 2.15c |

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 plates 20 tons.

## Bolts and Nuts

*F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.*

**Carriage and Machine**

| | |
|---|---|
| ½ x 6 and smaller | 68.5 off |
| Do. larger, to 1-in. | 66 off |
| Do. 1⅛ and larger | 64 off |
| Tire bolts | 52.5 off |

**Stove Bolts**

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

| | |
|---|---|
| Step bolts | 60 off |
| Plow bolts | 68.5 off |

**Nuts**

| Semifinished hex. | U.S.S. | S.A.E. |
|---|---|---|
| ½-inch and less. | 67 | 70 |
| ⅝-1-inch | 64 | 65 |
| 1⅛-1½-inch | 62 | 62 |
| 1⅝ and larger | 60 | .. |

**Hexagon Cap Screws**

Upset, 1-in., smaller 70.0 off

**Square Head Set Screws**

Upset, 1-in., smaller 75.0 off
Headless set screws 64.0 off

## Piling

| | |
|---|---|
| Pitts., Chgo., Buffalo | 2.40c |
| Gulf ports | 2.85c |
| Pacific coast ports | 2.90c |

## Rivets, Washers

*F.o.b. Pitts., Cleve., Chgo., Bham.*

| | |
|---|---|
| Structural | 3.40c |
| ⅞-inch and under | 65-10 off |

Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

## Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

**Butt Weld**

**Steel**

| In. | Blk. | Galv. |
|---|---|---|
| ½ | 63½ | 54 |
| ¾ | 66½ | 58 |
| 1—3 | 68½ | 60½ |

**Iron**

| | | |
|---|---|---|
| ¾ | 30 | 13 |
| 1—1¼ | 34 | 19 |
| 1½ | 38 | 21½ |
| 2 | 37½ | 21 |

**Lap Weld**

**Steel**

| | | |
|---|---|---|
| 2 | 61 | 52½ |
| 2½—3 | 64 | 55½ |
| 3½—6 | 66 | 57½ |
| 7 and 8 | 65 | 55½ |
| 9 and 10 | 64½ | 55 |
| 11 and 12 | 63½ | 54 |

**Iron**

| | | |
|---|---|---|
| 2 | 30½ | 15 |
| 2½—3½ | 31½ | 17½ |
| 4 | 33½ | 21 |
| 4½—8 | 32½ | 20 |
| 9—12 | 28½ | 15 |

**Line Pipe**

**Steel**

| | |
|---|---|
| 1 to 3, butt weld | 67½ |
| 2, lap weld | 60 |
| 2½ to 3, lap weld | 63 |
| 3½ to 6, lap weld | 65 |
| 7 and 8, lap weld | 64 |
| 10-inch lap weld | 63½ |
| 12-inch, lap weld | 62½ |

**Iron**

| | Blk. | Galv. |
|---|---|---|
| ¾ butt weld | 25 | 7 |
| 1 and 1¼ butt weld | 29 | 13 |
| 1½ butt weld | 33 | 15½ |
| 2 butt weld | 32½ | 15 |
| 1½ lap weld | 23½ | 7 |
| 2 lap weld | 25½ | 9 |
| 2½ to 3½ lap weld | 26½ | 11½ |
| 4 lap weld | 28½ | 15 |
| 4½ to 8 lap weld | 27½ | 14 |
| 9 to 12 lap weld | 23½ | 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 Welded**

| Sizes | Gage | Steel | Charcoal Iron |
|---|---|---|---|
| 1½" O.D. | 13 | $ 9.72 | $23.71 |
| 1¾" O.D. | 13 | 11.06 | 22.93 |
| 2" O.D. | 13 | 12.38 | 19.35 |
| 2¼" O.D. | 13 | 13.79 | 21.68 |
| 2¼" O.D. | 12 | 15.16 | ..... |
| 2½" O.D. | 12 | 16.58 | 26.57 |
| 2¾" O.D. | 12 | 17.54 | 29.00 |
| 3" O.D. | 12 | 18.35 | 31.36 |
| 3½" O.D. | 11 | 23.15 | 39.81 |
| 4" O.D. | 10 | 28.66 | 49.90 |
| 5" O.D. | 9 | 44.25 | 73.93 |
| 6" O.D. | 7 | 68.14 | ..... |

**Seamless**

| Sizes | Gage | Hot Rolled | Cold Drawn |
|---|---|---|---|
| 1 "O.D. | 13 | $ 7.82 | $ 9.01 |
| 1¼"O.D. | 13 | 9.26 | 10.67 |
| 1½"O.D. | 13 | 10.23 | 11.79 |
| 1¾"O.D. | 13 | 11.64 | 13.42 |
| 2" O.D. | 13 | 13.04 | 15.03 |
| 2¼"O.D. | 13 | 14.54 | 16.76 |
| 2¾"O.D. | 12 | 16.01 | 18.45 |
| 2½"O.D. | 12 | 17.54 | 20.21 |
| 2¾"O.D. | 12 | 18.59 | 21.42 |
| 3" O.D. | 12 | 19.50 | 22.48 |
| 3½"O.D. | 11 | 24.62 | 28.37 |
| 4" O.D. | 10 | 30.54 | 35.20 |
| 4½"O.D. | 10 | 37.35 | 43.04 |
| 5" O.D. | 9 | 46.87 | 54.01 |
| 6" O.D. | 7 | 71.96 | 82.93 |

## Cast Iron Pipe

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in., & over, Birm. | $45.00-46.00 |
| 4-in., Birmingham | 48.00-49.00 |
| 4-in., Chicago | 56.80-57.80 |
| 6-in. & over, Chicago | 53.80-54.80 |
| 6-in. & over, east fdy. | 49.00 |
| Do., 4-in. | 52.00 |

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

## Semifinished Steel

**Rerolling Billets, Slabs**

*(Gross Tons)*

| | |
|---|---|
| Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point | $34.00 |
| Duluth (billets) | 36.00 |
| Detroit, delivered | 36.00 |

**Forging Quality Billets**

| | |
|---|---|
| Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm. | 40.00 |
| Duluth | 42.00 |

**Sheet Bars**

| | |
|---|---|
| Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago | 34.00 |
| Detroit, delivered | 36.00 |

**Wire Rods**

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅝-inch incl. (per 100 lbs.) $2.00
Do., over ⅝ to 41/64-in. incl. 2.15
Worcester up $0.10; Galveston up $0.25; Pacific Coast up $0.45.

**Skelp**

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt. 1.90c

## Coke

*Price Per Net Ton*

**Beehive Ovens**

| | |
|---|---|
| Connellsville, fur. | $4.35- 4.60 |
| Connellsville, fdry. | 5.00- 5.75 |
| Connell. prem. fdry. | 5.75- 6.25 |
| New River fdry. | 6.25- 6.50 |
| Wise county fdry. | 5.50- 6.50 |
| Wise county fur. | 5.00- 5.25 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del. | 11.38-11.85 |
| Chicago, outside del. | 10.50 |
| Chicago, delivered | 11.25 |
| Terre Haute, del. | 10.75 |
| Milwaukee, ovens | 11.25 |
| New England, del. | 12.50 |
| St. Louis, del. | 11.75 |
| Birmingham, ovens | 7.50 |
| Indianapolis, del. | 10.75 |
| Cincinnati, del. | 10.50 |
| Cleveland, del. | 11.05 |
| Buffalo, del. | 11.25 |
| Detroit, del. | 11.00 |
| Philadelphia, del. | 11.15 |

## Coke By-Products

*Spot, gal., freight allowed east of Omaha*

| | |
|---|---|
| Pure and 90% benzol | 16.00c |
| Toluol, two degree | 25.00c |
| Solvent naphtha | 27.00c |
| Industrial xylol | 27.00c |

*Per lb. f.o.b. Frankford and St. Louis*

| | |
|---|---|
| Phenol (less than 1000 lbs.) | 14.75c |
| Do. (1000 lbs. or over) | 13.75c |

*Eastern Plants, per lb.*

| | |
|---|---|
| Naphthalene flakes, balls, bbls. to jobbers | 6.75c |

*Per ton, bulk, f.o.b. port*

| | |
|---|---|
| Sulphate of ammonia | $28.00 |

## Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

| Basing Points: | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Bethlehem, Pa. | $24.00 | $24.50 | $23.50 | $25.00 |
| Birdsboro, Pa. | 24.00 | 24.50 | 23.50 | 25.00 |
| Birmingham, Ala.§ | 19.38 | ..... | 18.38 | 24.00 |
| Buffalo | 23.00 | 23.50 | 22.00 | 24.00 |
| Chicago | 23.00 | 23.00 | 22.50 | 23.50 |
| Cleveland | 23.00 | 23.00 | 22.50 | 23.50 |
| Detroit | 23.00 | 23.00 | 22.50 | 23.50 |
| Duluth | 23.50 | 23.50 | ..... | 24.00 |
| Erie, Pa. | 23.00 | 23.50 | 22.50 | 24.00 |
| Everett, Mass. | 24.00 | 24.50 | 23.50 | 25.00 |
| Granite City, Ill. | 23.00 | 23.00 | 22.50 | 23.50 |
| Hamilton, O. | 23.00 | 23.00 | 22.50 | ..... |
| Neville Island, Pa. | 23.00 | 23.00 | 22.50 | 23.50 |
| Provo, Utah | 21.00 | ..... | ..... | ..... |
| Sharpsville, Pa. | 23.00 | 23.00 | 22.50 | 23.50 |
| Sparrow's Point, Md. | 24.00 | ..... | 23.50 | ..... |
| Swedeland, Pa. | 24.00 | 24.50 | 23.50 | 25.00 |
| Toledo, O. | 23.00 | 23.00 | 22.50 | 23.50 |
| Youngstown, O. | 23.00 | 23.00 | 22.50 | 23.50 |

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

**Delivered from Basing Points:**

| | | | | |
|---|---|---|---|---|
| Akron, O., from Cleveland | 24.39 | 24.39 | 23.89 | 24.89 |
| Baltimore from Birmingham | 24.78 | ..... | 23.66 | ..... |
| Boston from Birmingham | 24.12 | ..... | ..... | ..... |
| Boston from Everett, Mass. | 24.50 | 25.00 | 24.00 | 25.50 |
| Boston from Buffalo | 24.50 | 25.00 | 24.00 | 25.50 |
| Brooklyn, N. Y., from Bethlehem | 26.50 | 27.00 | ..... | ..... |
| Canton, O., from Cleveland | 24.39 | 24.39 | 23.89 | 24.89 |
| Chicago from Birmingham | †23.22 | ..... | ..... | ..... |
| Cincinnati from Hamilton, O. | 23.24 | 24.11 | 23.61 | ..... |
| Cincinnati from Birmingham | 23.06 | ..... | 22.06 | ..... |
| Cleveland from Birmingham | 23.32 | ..... | 22.82 | ..... |
| Mansfield, O., from Toledo, O. | 24.94 | 24.94 | 24.44 | 24.44 |
| Milwaukee from Chicago | 24.10 | 24.10 | 23.60 | 24.60 |
| Muskegon, Mich., from Chicago, Toledo or Detroit | 26.19 | 26.19 | 25.69 | 26.69 |
| Newark, N. J., from Birmingham | 25.15 | ..... | ..... | ..... |
| Newark, N. J., from Bethlehem | 25.53 | 26.03 | ..... | ..... |
| Philadelphia from Birmingham | 24.46 | ..... | 23.96 | ..... |
| Philadelphia from Swedeland, Pa. | 24.84 | 25.34 | 24.34 | ..... |
| Pittsburgh district from Neville Island | Neville base, plus 69c, 84c, and $1.24 freight. | | | |
| Saginaw, Mich., from Detroit | 25.31 | 25.31 | 24.81 | 25.81 |

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| St. Louis, northern | 23.50 | 23.50 | 23.00 | .... |
| St. Louis from Birmingham | †23.12 | .... | 22.62 | .... |
| St. Paul from Duluth | 25.63 | 25.63 | .... | 26.13 |

†Over 0.70 phos.

**Low Phos.**

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

| Gray Forge | | Charcoal | |
|---|---|---|---|
| Valley furnace | $22.50 | Lake Superior fur. | $27.00 |
| Pitts. dist. fur. | 22.50 | do., del. Chicago | 30.34 |
| | | Lyles, Tenn. | 26.50 |

**†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. | $60.80 |

*First Quality*

| | |
|---|---|
| Pa., Ill., Md., Mo., Ky. | 47.50 |
| Alabama, Georgia | 47.50 |
| New Jersey | 52.50 |

*Second Quality*

| | |
|---|---|
| Pa., Ill., Ky., Md., Mo. | 42.75 |
| Georgia, Alabama | 34.20 |
| New Jersey | 49.00 |

**Ohio**

| | |
|---|---|
| First quality | 39.90 |
| Intermediate | 36.10 |
| Second quality | 31.35 |

**Malleable Bung Brick**

| | |
|---|---|
| All bases | $56.05 |

**Silica Brick**

| | |
|---|---|
| Pennsylvania | $47.50 |
| Joliet, E. Chicago | 55.10 |
| Birmingham, Ala. | 47.50 |

**Ladle Brick**

*(Pa., O., W. Va., Mo.)*

| | |
|---|---|
| Dry press | $28.00 |
| Wire cut | $26.00 |

**Magnesite**

| | |
|---|---|
| Domestic dead - burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk | 22.00 |
| net ton, bags | 26.00 |

**Basic Brick**

*Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.*

| | |
|---|---|
| Chrome brick | $50.00 |
| Chem. bonded chrome | 50.00 |
| Magnesite brick | 72.00 |
| Chem. bonded magnesite | 61.00 |

## Fluorspar

| | |
|---|---|
| Washed gravel, duty pd., tide, net ton | $25.00-$26.00 |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail. | 22.00 |
| Do. barge | 22.00 |
| No. 2 lump | 22.00 |

## Ferroalloy Prices

**Ferromanganese, 78-82%,** lump and bulk, carlots tide., duty pd. $100.00
Ton lots 110.00
Less ton lots 113.50
Less 200 lb. lots 118.00
Do., carlots del. Pitts. 105.33

**Spiegeleisen, 19-21% dom.**
Palmerton, Pa., spot 32.00
Do., 26-28% 39.50

**Ferrosilicon, 50% freight allowed, c.l.** 69.50
Do., ton lot 82.00
Do., 75 per cent 126.00
Do. ton lots 142.00
Spot, $5 a ton higher.

**Silicomanganese, c.l., 2½** per cent carbon, 103.00
2% carbon, 108.00; 1%, 118.00
Contract ton price $12.50 higher; spot $5 over contract.

**Ferratungsten, stand., lb.** con. del. cars 1.90-2.00

**Ferrovanadium, 35 to 40%, lb., cont.** 2.70-2.80-2.90

**Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3** unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% $3 unitage 75.00

**Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del.** carlots 11.00c
Do., ton lots 11.75c
Do., less-ton lots 12.00c

67-72% low carbon:

| | Carloads | Ton lots | Less ton |
|---|---|---|---|
| 2% carb. | 17.50c | 18.25c | 18.75c |
| 1% carb. | 18.50c | 19.25c | 19.75c |
| 0.10% carb. | 20.50c | 21.25c | 21.75c |
| 0.20% carb. | 19.50c | 20.25c | 20.75c |

Spot ¼c higher

**Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.** 0.95

**Calcium molybdate, lb. molyb. cont., f.o.b. mill** 0.80

**Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots** $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do. less-ton lots 1.40
Spot 5c higher

**Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls** $2.25
Do., less-ton lots 2.30
Spot is 10c higher

**Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill** 0.80

**Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton** $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots. 160.00
Do, spot, ton lots 165.00

**Alsifer, contract carlots, f.o.b. Niagara Falls, lb.** 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

**Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk** 7.00c
Do., ton lots 7.50c
Do., less-ton lots 7.75c
Do., less 200 lbs. 8.00c
Spot, ¼c higher.

**Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.** $2.50
Do., smaller lots 2.60

**Vanadium Pentoxide, contract, lb. contained** $1.10
Do, spot 1.15

**Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome** 84.00c
Do., spot 89.00c
88% chrome, contract 83.00c
Do., spot 88.00c

**Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb.** 14.00c
Do., 2% 12.50c
Spot ¼c higher

**Silicon Briquets, contract carloads, bulk, freight allowed, ton** $69.50
Ton lots 79.50
Less-ton lots, lb. 3.75c
Less 200 lb. lots, lb. 4.00c
Spot ¼-cent higher.

**Manganese Briquets, contract carloads, bulk freight allowed, lb.** 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

**Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton** $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

**Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb.** $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

**Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant** 80.00c

# WAREHOUSE STEEL PRICES

*Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials*

| | Soft Bars | Bands | Hoops | Plates ¼-in. & Over | Structural Shapes | Floor Plates | Sheets: Hot Rolled | Sheets: Cold Rolled | Sheets: Galv. No. 24 | Cold Rolled Strip | Cold Drawn Bars: Carbon | Cold Drawn Bars: SAE 2300 | Cold Drawn Bars: SAE 3100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boston | 3.98 | 4.16 | 5.16 | 3.85 | 3.85 | 5.66 | 3.81 | 4.78 | 4.86 | 3.46 | 4.13 | 8.63 | 7.23 |
| New York (Met.) | 3.84 | 3.96 | 3.96 | 3.76 | 3.75 | 5.56 | 3.58 | 4.60 | 4.50 | 3.51 | 4.09 | 8.59 | 7.19 |
| Philadelphia | 3.85 | 3.85 | 4.35 | 3.55 | 3.55 | 5.25 | 3.55 | 4.55 | 4.75 | 3.51 | 4.06 | 8.56 | 7.16 |
| Baltimore | 3.95 | 4.05 | 4.45 | 3.70 | 3.70 | 5.25 | 3.55 | .... | 5.05 | .... | 4.05 | .... | .... |
| Norfolk, Va. | 4.15 | 4.25 | .... | 3.90 | 3.90 | 5.45 | 3.75 | .... | 5.40 | .... | 4.15 | .... | .... |
| Buffalo | 3.35 | 3.82 | 3.82 | 3.62 | 3.40 | 5.25 | 3.35 | 4.55 | 4.45 | 3.42 | 3.75 | 8.15 | 6.75 |
| Pittsburgh | 3.35 | 3.60 | 3.60 | 3.40 | 3.40 | 5.00 | 3.35 | .... | 4.75 | 3.35 | 3.65 | 8.15 | 6.75 |
| Cleveland | 3.25 | 3.50 | 3.50 | 3.40 | 3.58 | 5.18 | 3.35 | 4.05 | 4.72 | 3.20 | 3.75 | 8.15 | 6.75 |
| Detroit | 3.43 | 3.43 | 3.68 | 3.60 | 3.65 | 5.27 | 3.43 | 4.50 | 4.84 | 3.40 | 3.80 | 8.45 | 7.05 |
| Omaha | 3.90 | 4.00 | 4.00 | 3.95 | 3.95 | 5.55 | 3.75 | .... | 5.00 | .... | 4.42 | .... | .... |
| Cincinnati | 3.60 | 3.67 | 3.67 | 3.65 | 3.68 | 5.28 | 3.42 | 4.37 | 4.67 | 3.45 | 4.00 | 8.50 | 7.10 |
| Chicago | 3.50 | 3.60 | 3.60 | 3.55 | 3.55 | 5.15 | 3.35 | 4.30 | 4.60 | 3.50 | 3.75 | 8.15 | 6.75 |
| Twin Cities | 3.75 | 3.85 | 3.85 | 3.80 | 3.80 | 5.40 | 3.60 | 4.95 | 5.00 | 3.83 | 4.34 | 8.84 | 7.44 |
| Milwaukee | 3.63 | 3.73 | 3.73 | 3.68 | 3.68 | 5.28 | 3.48 | 4.43 | 4.73 | 3.54 | 3.88 | 8.38 | 6.98 |
| St. Louis | 3.62 | 3.72 | 3.72 | 3.47 | 3.47 | 5.07 | 3.38 | 4.32 | 4.95 | 3.61 | 4.02 | 8.52 | 7.12 |
| Kansas City | 4.05 | 4.15 | 4.15 | 4.00 | 4.00 | 5.60 | 3.90 | . | 5.00 | .... | 4.30 | .... | .... |
| Indianapolis | 3.60 | 3.76 | 3.76 | 3.70 | 3.70 | 5.30 | 3.51 | .... | 4.76 | .... | 3.97 | .... | .... |
| Memphis | 3.90 | 4.10 | 4.10 | 3.95 | 3.95 | 5.71 | 3.85 | .... | 5.25 | .... | 4.31 | .... | .... |
| Chattanooga | 3.80 | 4.00 | 4.00 | 3.85 | 3.85 | 5.68 | 3.75 | .... | 4.40 | .... | 4.39 | .... | .... |
| Tulsa, Okla. | 4.44 | 4.54 | 4.54 | 4.33 | 4.33 | 5.93 | 4.24 | .... | 5.71 | .... | 4.69 | .... | .... |
| Birmingham | 3.50 | 3.70 | 3.70 | 3.55 | 3.55 | 5.88 | 3.45 | .... | 4.75 | .... | 4.43 | .... | .... |
| New Orleans | 4.00 | 4.10 | 4.10 | 3.80 | 3.80 | 5.75 | 3.85 | .... | 4.80 | 5.00 | 4.60 | .... | .... |
| Houston, Tex. | 4.05 | 6.20 | 6.20 | 4.05 | 4.05 | 5.75 | 4.20 | .... | 5.25 | .... | .... | .... | .... |
| Seattle | 4.00 | 3.85 | 5.20 | 3.40 | 3.50 | 5.75 | 3.70 | 6.50 | 4.75 | .... | 5.75 | .... | .... |
| Portland, Oreg. | 4.25 | 4.50 | 6.10 | 4.00 | 4.00 | 5.75 | 3.95 | 6.50 | 4.75 | .... | 5.75 | .... | .... |
| Los Angeles | 4.15 | 4.65 | 6.45 | 4.00 | 4.00 | 6.40 | 4.30 | 6.50 | 5.25 | .... | 6.60 | 10.65 | 9.80 |
| San Francisco | 3.50 | 4.00 | 6.00 | 3.35 | 3.35 | 5.60 | 3.40 | 6.40 | 5.15 | .... | 6.80 | 10.65 | 9.80 |

| | SAE Hot-rolled Bars (Unannealed): 1035-1050 | 2300 Series | 3100 Series | 4100 Series | 6100 Series |
|---|---|---|---|---|---|
| Boston | 4.18 | 7.50 | 6.05 | 5.80 | 7.90 |
| New York (Met.) | 4.04 | 7.35 | 5.90 | 5.65 | .... |
| Philadelphia | 4.10 | 7.31 | 5.86 | 5.61 | 8.56 |
| Baltimore | 4.10 | .... | .... | .... | .... |
| Norfolk, Va. | .... | .... | .... | .... | .... |
| Buffalo | 3.55 | 7.10 | 5.65 | 5.40 | 7.50 |
| Pittsburgh | 3.40 | 7.20 | 5.75 | 5.50 | 7.60 |
| Cleveland | 3.30 | 7.30 | 5.85 | 5.85 | 7.70 |
| Detroit | 3.48 | 7.42 | 5.97 | 5.72 | 7.19 |
| Cincinnati | 3.65 | 7.44 | 5.99 | 5.74 | 7.84 |
| Chicago | 3.70 | 7.10 | 5.65 | 5.40 | 7.50 |
| Twin Cities | 3.95 | 7.45 | 6.00 | 6.09 | 8.19 |
| Milwaukee | 3.83 | 7.33 | 5.88 | 5.63 | 7.73 |
| St. Louis | 3.82 | 7.47 | 6.02 | 5.77 | 7.87 |
| Seattle | 5.85 | .... | 8.00 | 7.85 | 8.65 |
| Portland, Oreg. | 5.70 | 8.85 | 8.00 | 7.85 | 8.65 |
| Los Angeles | 4.80 | 9.40 | 8.55 | 8.40 | 9.05 |
| San Francisco | 5.00 | 9.65 | 8.80 | 8.65 | 9.30 |

**BASE QUANTITIES**

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 300-4999 in San Francisco, Portland; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, any quantity in New York, 150-1499 pounds in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga, Philadelphia; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

# CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, April 11

## Export Prices f.o.b. Port of Dispatch—

*By Cable or Radio*

| | British gross tons U. K. ports: £ s d | Quoted in dollars at current value | Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling: £ s d |
|---|---|---|---|
| Foundry, 2.50-3.00 Si. | $21.36 6 0 0 | $33.23 | 3 18 0 |
| Basic bessemer | ..... ..... | ..... | ..... |
| Hematite, Phos. .03-.05 | 22.25 6 5 0 | ..... | ..... |
| Billets | ..... ..... | $31.95 | 3 15 0 |
| Wire rods, No. 5 gage | ..... ..... | 58.58 | 6 17 6 |
| Standard rails | $37.38 10 10 0 | $48.99 | 5 15 0 |
| Merchant bars | 2.14c 13 9 0 | 2.74c | 7 4 0 |
| Structural shapes | 1.93c 12 2 6 | 2.77c | 7 6 0 |
| Plates, ¼ in. or 5 mm. | 2.04c 12 17 6 | 3.40c | 8 19 0 |
| Sheets, black, 24 gage or 0.5 mm | 2.70c 17 0 0 | 3.00c | 7 18 0° |
| Sheets, gal., 24 ga., corr. | 3.10c 19 10 0 | 4.29c | 11 6 0 |
| Bands and strips | ..... ..... | 2.66c | 7 0 0 |
| Plain wire, base | ..... ..... | 3.23c | 8 10 0 |
| Galvanized wire, base | ..... ..... | 3.90c | 10 5 0 |
| Wire nails, base | ..... ..... | 3.71c | 9 15 0 |
| Tin plate, box 108 lbs. | $ 5.79 1 12 6 | ..... | ..... |

British ferromanganese $100.00 delivered Atlantic seaboard duty-paid.

## Domestic Prices at Works or Furnace—

*Last Reported*

| | £ s d | | French Francs | | Belgian Francs | | Reich §§Mar | |
|---|---|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5. | $19.76 | 5 11 0(a) | $15.92 | 788 | $31.87 | 940 | $25.33 | 63 |
| Basic bess. pig iron | 18.60 | 5 4 6(a) | ..... | ..... | 30.51 | 900 | 27.94 | (b) 69.50 |
| Furnace coke | 5.63 | 1 11 8 | 4.55 | 225 | 11.18 | 330 | 7.64 | 19 |
| Billets | 33.38 | 9 7 6 | 23.49 | 1,163 | 43.22 | 1,275 | 38.79 | 96.50 |
| Standard rails | 1.77c | 11 3 0 | 1.43c | 1,588 | 2.06c | 1,375 | 2.38c | 132 |
| Merchant bars | 2.23c | 14 0 0†† | 1.31c | 1,454 | 2.06c | 1,375 | 1.98c | 110 |
| Structural shapes | 1.97c | 12 8 0†† | 1.27c | 1,414 | 2.06c | 1,375 | 1.93c | 107 |
| Plates, †¼-in. or 5 mm. | 1.99c | 12 10 6†† | 1.66c | 1,848 | 2.42c | 1,610 | 2.29c | 127 |
| Sheets, black | 2.78c | 17 10 0§ | 1.97c | 2,193‡ | 2.85c | 1,900‡ | 2.59c | 144‡ |
| Sheets, galv., corr., 24 ga. or 0.5 mm. | 3.18c | 20 0 0 | 3.23c | 3,588 | 4.80c | 3,200 | 6.66c | 370 |
| Plain wire | 3.10c | 19 10 0 | 2.11c | 2,340 | 3.00c | 2,000 | 3.11c | 173 |
| Bands and strips | 2.35c | 14 15 0†† | 1.47c | 1,632 | 2.18c | 1,450 | 2.29c | 127 |

†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. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

# 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 |
| Bos. dock No. 1 exp. | 15.00 |
| New Eng. del. No. 1 | 14.00 |
| Buffalo, No. 1..... | 15.50-16.00 |
| Buffalo, No. 2 ..... | 14.00-14.50 |
| Chicago, No. 1..... | 15.00-15.50 |
| Chicago, auto. no alloy ..... | 14.00-14.50 |
| Chicago, No. 2 auto | 12.00-12.50 |
| Cincinnati dealers.. | 12.25-12.75 |
| Cleveland, No. 1 ... | 15.50-16.00 |
| Cleveland, No. 2 ... | 14.50-15.00 |
| Detroit, No. 1 ..... | †12.75-13.25 |
| Detroit, No. 2 ..... | †11.75-12.25 |
| Eastern Pa., No. 1.. | 16.50-17.00 |
| Eastern Pa., No. 2.. | 15.50 |
| Federal, Ill. No. 2.. | 12.50-13.00 |
| Granite City, R. R.. | 13.75-14.25 |
| Granite City, No. 2. | 12.50-13.00 |
| Los Ang., No. 1, net | 11.50-12.00 |
| Los Ang., No. 2, net | 10.50-11.00 |
| N. Y. dock No. 1 exp. | 13.75 |
| Pitts., No. 1 (R. R.). | 17.50-18.00 |
| Pittsburgh, No. 1.. | 16.00-16.50 |
| Pittsburgh, No. 2.. | 15.00-15.50 |
| St. Louis, R. R. .... | 13.50-14.00 |
| St. Louis, No. 2.... | 12.50-13.00 |
| San Fran., No. 1, net | 11.50-12.00 |
| San Fran., No. 2, net | 10.50-11.00 |
| Seattle, No. 1 ..... | 14.50-15.50 |
| Toronto, dlrs., No. 1 | 11.00 |
| Valleys, No. 1..... | 16.00-16.50 |

### COMPRESSED SHEETS

| | |
|---|---|
| Buffalo, new ..... | 14.50-15.00 |
| Chicago, factory... | 14.25-14.75 |
| Chicago, dealers... | 13.00-13.50 |
| Cincinnati, dealers.. | 11.75-12.25 |
| Cleveland ..... | 15.00-15.50 |
| Detroit ..... | †13.50-14.00 |
| E. Pa., new mat. .. | 16.50-17.00 |
| E. Pa., old mat. ... | 14.00-14.50 |
| Los Angeles, net... | 9.00- 9.50 |
| Pittsburgh ..... | 16.00-16.50 |
| St. Louis ..... | 10.50-11.00 |
| San Francisco, net.. | 9.00- 9.50 |
| Valleys ..... | 15.50-16.00 |

### BUNDLED SHEETS

| | |
|---|---|
| Buffalo, No. 1..... | 14.00-14.50 |
| Buffalo, No. 2..... | 12.50-13.00 |
| Cleveland ..... | 11.00-11.50 |
| Pittsburgh ..... | 15.00-15.50 |
| St. Louis ..... | 8.50- 9.00 |
| Toronto, dealers ... | 9.75 |

### SHEET CLIPPINGS, LOOSE

| | |
|---|---|
| Chicago ..... | 10.00-10.50 |
| Cincinnati, dealers.. | 7.75- 8.25 |
| Detroit ..... | †9.50-10.00 |
| St. Louis ..... | 7.50- 8.00 |
| Toronto, dealers... | 9.00 |

### BUSHELING

| | |
|---|---|
| Birmingham, No. 1. | 13.00 |
| Buffalo, No. 1..... | 14.00-14.50 |
| Chicago, No. 1..... | 14.00-14.50 |
| Cincin., No. 1, deal. | 8.75- 9.25 |
| Cincin., No. 2 deal... | 2.75- 3.25 |
| Cleveland, No. 2 | 9.50-10.00 |
| Detroit, No. 1, new | †12.25-12.75 |
| Valleys, new, No. 1 | 14.75-15.25 |
| Toronto, dealers ... | 5.50- 6.00 |

### MACHINE TURNINGS (Long)

| | |
|---|---|
| Birmingham ..... | 5.00 |
| Buffalo ..... | 10.00-10.50 |
| Chicago ..... | 8.50- 9.00 |
| Cincinnati, dealers.. | 4.75- 5.25 |
| Cleveland, no alloy. | 8.50- 9.00 |
| Detroit ..... | †7.50- 8.00 |
| Eastern Pa. ..... | 9.50-10.00 |
| Los Angeles .. | 4.00- 5.00 |
| New York ..... | †6.50- 7.00 |
| Pittsburgh ..... | 10.00-10.50 |
| St. Louis ..... | 6.00- 6.50 |
| San Francisco | 5.00 |
| Toronto, dealers ... | 7.00- 7.25 |
| Valleys ..... | 10.00-10.50 |

### SHOVELING TURNINGS

| | |
|---|---|
| Buffalo ..... | 11.50-12.00 |
| Cleveland ..... | 9.50-10.00 |
| Chicago ..... | 9.50-10.00 |
| Chicago, spcl, anal. | 12.50-13.00 |
| Detroit ..... | †8.00- 8.50 |
| Pitts., alloy-free ... | 12.00-12.50 |

### BORINGS AND TURNINGS

*For Blast Furnace Use*

| | |
|---|---|
| Boston district.... | †3.00 |
| Buffalo ..... | 9.50-10.00 |
| Cincinnati, dealers.. | 3.50- 4.00 |
| Cleveland ..... | 9.50-10.00 |
| Eastern Pa. ..... | 9.00- 9.50 |
| Detroit ..... | †7.75- 8.25 |
| New York ..... | †5.25- 5.75 |
| Pittsburgh ..... | 8.75- 9.25 |
| Toronto, dealers ... | 6.75 |

### AXLE TURNINGS

| | |
|---|---|
| Buffalo ..... | 15.50-16.00 |
| Boston district .... | †8.00- 8.50 |
| Chicago, elec. fur... | 15.50-16.00 |
| East. Pa. elec. fur... | 16.00-16.50 |
| St. Louis ..... | †9.25- 9.75 |
| Toronto .. | 6.00- 6.50 |

### CAST IRON BORINGS

| | |
|---|---|
| Birmingham ..... | 7.50 |
| Boston dist. chem... | †7.75- 8.00 |
| Buffalo ..... | 9.50-10.00 |
| Chicago ..... | 9.00- 9.50 |
| Cincinnati, dealers.. | 3.50- 4.00 |
| Cleveland ..... | 9.50-10.00 |
| Detroit ..... | †7.75- 8.25 |
| E. Pa., chemical | 14.50-15.00 |
| New York ..... | †7.00 |
| St. Louis ..... | †5.00- 5.50 |
| Toronto, dealers ... | 6.75 |

### RAILROAD SPECIALTIES

| | |
|---|---|
| Chicago ..... | 17.75-18.25 |

### ANGLE BARS—STEEL

| | |
|---|---|
| Chicago ..... | 18.00-18.50 |
| St. Louis ..... | †15.00-15.50 |

### SPRINGS

| | |
|---|---|
| Buffalo ..... | 19.50-20.00 |
| Chicago, coil ..... | 19.00-19.50 |
| Chicago, leaf ..... | 17.50-18.00 |
| Eastern Pa. ..... | 20.00-20.50 |
| Pittsburgh ..... | 20.50-21.00 |
| St. Louis ..... | †16.00-16.50 |

### STEEL RAILS, SHORT

| | |
|---|---|
| Birmingham ..... | 16.50 |
| Buffalo ..... | 21.50-22.00 |
| Chicago (3 ft.) .... | 18.00-18.50 |
| Chicago (2 ft.) .... | 18.50-19.00 |
| Cincinnati, dealers.. | 17.75-18.25 |
| Detroit ..... | †19.50-20.00 |
| Pitts., 3 ft. and less | 20.50-21.00 |
| St. Louis, 2 ft.& less | †18.00-18.50 |

### STEEL RAILS, SCRAP

| | |
|---|---|
| Birmingham ..... | 16.00 |
| Boston district .... | †14.50-15.00 |
| Buffalo ..... | 17.00-17.50 |
| Chicago ..... | 15.50-16.00 |
| Cleveland ..... | 18.50-19.00 |
| Pittsburgh ..... | 17.50-18.00 |
| St. Louis ..... | 15.00-15.50 |
| Seattle ..... | 18.00-18.50 |

### PIPE AND FLUES

| | |
|---|---|
| Chicago, net ..... | 10.50-11.00 |
| Cincinnati, dealers.. | 9.50-10.00 |

### RAILROAD GRATE BARS

| | |
|---|---|
| Buffalo ..... | 13.00-13.50 |
| Chicago, net ..... | 9.50-10.00 |
| Cincinnati, dealers.. | 8.25- 8.75 |
| Eastern Pa. ..... | 15.00-15.50 |
| New York ..... | †10.50-11.00 |
| St. Louis ..... | 9.50-10.00 |

### RAILROAD WROUGHT

| | |
|---|---|
| Birmingham ..... | 14.00 |
| Boston district .... | †9.50-10.00 |
| Eastern Pa., No. 1.. | 18.00-18.50 |
| St. Louis, No. 1.... | 10.00-10.50 |
| St. Louis, No. 2.... | 12.50-13.00 |

### FORGE FLASHINGS

| | |
|---|---|
| Boston district ... | †10.00 |
| Buffalo ..... | 14.00-14.50 |
| Cleveland ..... | 14.50-15.00 |
| Detroit ..... | †12.00-12.50 |
| Pittsburgh ..... | 15.00-15.50 |

### FORGE SCRAP

| | |
|---|---|
| Boston district .... | †7.00 |
| Chicago, heavy .... | 18.50-19.00 |

### LOW PHOSPHORUS

| | |
|---|---|
| Cleveland, crops.... | 21.50-22.00 |
| Eastern Pa. crops.. | 20.00-20.50 |
| Pitts., billet, bloom, slab crops ..... | 21.50-22.00 |

### LOW PHOS. PUNCHINGS

| | |
|---|---|
| Buffalo ..... | 19.50-20.00 |
| Chicago ..... | 17.50-18.00 |
| Cleveland ..... | 17.00-17.50 |
| Eastern Pa. ..... | 21.00-21.50 |
| Pittsburgh ..... | 20.00-20.50 |
| Seattle ..... | 15.00 |
| Detroit ..... | †13.75-14.25 |

### RAILS FOR ROLLING

*5 feet and over*

| | |
|---|---|
| Birmingham ..... | 16.50 |
| Boston ..... | †15.75-16.00 |
| Chicago ..... | 18.50-19.00 |
| New York ..... | 15.50-16.00 |
| Eastern Pa. ..... | 20.00-20.50 |
| St. Louis ..... | 17.50-18.00 |

### STEEL CAR AXLES

| | |
|---|---|
| Birmingham ..... | 18.00 |
| Boston district .... | †16.00-16.50 |
| Chicago, net ..... | 20.00-20.50 |
| Eastern Pa. ..... | 22.00 |
| St. Louis ..... | †18.00-18.50 |

### LOCOMOTIVE TIRES

| | |
|---|---|
| Chicago (cut) ..... | 18.50-19.00 |
| St. Louis, No. 1.... | 14.75-15.25 |

### SHAFTING

| | |
|---|---|
| Boston district .... | †17.00-17.50 |
| New York .... | †18.00-18.50 |
| Eastern Pa. ..... | 22.50-23.00 |
| St. Louis, 1¼-3¾" | †16.50-17.00 |

### CAR WHEELS

| | |
|---|---|
| Birmingham, iron.. | 13.00 |
| Boston dist., iron | †13.00-13.25 |
| Buffalo, steel ..... | 21.00-21.50 |
| Chicago, iron ..... | 16.50-17.00 |
| Chicago, rolled steel | 17.50-18.00 |
| Cincin., iron, deal... | 16.25-16.75 |
| Eastern Pa., iron | 20.00-20.50 |
| Eastern Pa., steel.. | 20.00-20.50 |
| Pittsburgh, iron ... | 18.50-19.00 |
| Pittsburgh, steel .. | 20.50-21.00 |
| St. Louis, iron ..... | 14.50-15.00 |
| St. Louis, steel..... | 15.50-16.00 |

### NO. 1 CAST SCRAP

| | |
|---|---|
| Birmingham ..... | 15.50 |
| Boston, No. 1 mach.. | †15.00-15.50 |
| N. Eng. del. No. 2 | 14.00-14.50 |
| N. Eng. del. textile | 17.75-18.25 |
| Buffalo, cupola .... | 17.00-17.50 |
| Buffalo, mach. .... | 18.00-18.50 |
| Chicago, agri. net | 12.50-13.00 |
| Chicago, auto net | 14.50-15.00 |
| Chicago, railroad net | 14.00-14.50 |
| Chicago, mach. net. | 14.75-15.25 |
| Cincin., mach. deal.. | 15.75-16.25 |
| Cleveland, mach. .. | 20.00-21.00 |
| Detroit, cupola, net. | †15.00-15.50 |
| Eastern Pa., cupola. | 19.00-20.00 |
| E. Pa., No. 2 yard.. | 16.50 |
| E. Pa., yard fdry. . | 16.50-17.00 |
| Los Angeles .. | 16.50-17.00 |
| Pittsburgh, cupola . | 17.50-18.00 |
| San Francisco ..... | 14.50-15.00 |
| Seattle ..... | 14.00-16.00 |
| St. Louis, breakable | 13.50-14.00 |
| St. Louis, agri. mach. | 15.75-16.25 |
| St. L., No. 1 mach.. | 15.75-16.25 |
| Toronto, No. 1 mach., net dealers | 16.50 |

### HEAVY CAST

| | |
|---|---|
| Boston dist. break.. | †12.75-13.25 |
| New England, del. . | 15.00-15.50 |
| Buffalo, break .... | 15.00-15.50 |
| Cleveland, break. net | 15.25-15.75 |
| Detroit, auto net.. | †16.00-16.50 |
| Detroit, break ..... | †11.50-12.00 |
| Eastern Pa. ..... | 18.50 |
| Los Ang., auto, net. | 13.00-14.00 |
| New York break ... | †14.00 |
| Pittsburgh, break .. | 15.00-15.50 |

### STOVE PLATE

| | |
|---|---|
| Birmingham ..... | 10.00 |
| Boston district .... | †10.50-11.00 |
| Buffalo ..... | 14.00-14.50 |
| Chicago, net ..... | 9.00- 9.50 |
| Cincinnati, dealers.. | 8.00- 8.50 |
| Detroit, net ..... | †9.50-10.00 |
| Eastern Pa. ..... | 15.00-15.50 |
| New York fdry. .... | 10.75-11.25 |
| St. Louis ..... | 10.50-11.00 |
| Toronto dealers, net | 12.00 |

### MALLEABLE

| | |
|---|---|
| New England, del... | 21.00 |
| Buffalo ..... | 19.00-19.50 |
| Chicago, R. R. ..... | 19.00-19.50 |
| Cincin., agri., deal.. | 13.00-13.50 |
| Cleveland, rail ..... | 20.50-21.00 |
| Eastern Pa., R.R.... | 21.00-21.50 |
| Los Angeles ..... | 12.50 |
| Pittsburgh, rail ... | 21.00-21.50 |
| St. Louis, R. R. .... | †15.75-16.25 |

## Ores

### Lake Superior Iron Ore

*Gross ton, 51½ %*

*Lower Lake Ports*

| | |
|---|---|
| Old range bessemer .... | $5.25 |
| Mesabi nonbessemer..... | 4.95 |
| High phosphorus ..... | 4.85 |
| Mesabi bessemer ..... | 5.10 |
| Old range nonbessemer.. | 5.10 |

### Eastern Local Ore

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56-63%, contract. | 9.00-10.00 |

### Foreign Ore (Prices nominal)

*Cents per unit, c.i.f. Atlantic ports*

| | |
|---|---|
| Manganiferous ore, 45-55% Fe., 6-10% Mn. .. ..... | 14.00-15.00 |
| Swedish low phos. . | 14.00 |
| North African low phos. ..... | 14.00 |
| Spanish, No. African basic, 50 to 60%.. | 14.00 |
| Chinese wolframite, short ton unit, duty paid ..... | $23.50-24.00 |
| Scheelite, imp. .... | $25.00 |
| Chrome ore, Indian, 48% gross ton, cif. | $26.00-28.00 |

### Manganese Ore

*Including war risk but not duty, cents per unit cargo lots.*

| | |
|---|---|
| Caucasian, 50-52%.. | 48.00-50.00 |
| So. African, 50-52% | 48.00-50.00 |
| Indian, 49-50% .... | nom |
| Brazilian. 48-52%.. | 46.00-48.00 |
| Cuban, 50-51%, duty free | 61.20 |

### Molybdenum

| | |
|---|---|
| Sulphide conc., per lb., Mo. cont., mines ..... | $0.75 |

*—The Market Week—*

# Sheets, Strip

Sheet & Strip Prices, Pages 86, 87

**Pittsburgh**—Hot and cold rolled sheets and strip have been cut $4 a ton. Irregularity in the market for several weeks was brought into the open late last week when Carnegie-Illinois Steel Corp. made the following announcement:

"A weakness has developed in prices of hot and cold-rolled sheets. Carnegie-Illinois Steel Corp. is meeting the competitive situation by immediately reducing prices of hot and cold-rolled sheets $4 from the announced prices for delivery in the second quarter."

This lowers hot-rolled sheets to 1.90c at Pittsburgh and other leading basing points and cold-rolled sheets to 2.85c, base. Compared with prices a year ago the new quotations represent reductions of $5 a ton on hot-rolled and $7 a ton on cold-rolled.

Producers generally have joined in the $4 cut, which also applies to hot and cold rolled strip and enameling sheets.

Lower sheet quotations come in the face of gradual improvement in demand, a trend which has become more noticeable the past few days. Buying is well scattered rather than from a few large sources. Agricultural demand has been good and automotive needs steady. Household equipment manufacturers also have been a sizable outlet. Mill operations have moved up slightly after leveling off recently at moderately above 50 per cent.

**Cleveland**—Open reduction of $4 a ton in leading sheet and strip grades follows moderate price irregularity which became intensified recently with concessions on automotive orders. Weakness has occurred at almost the same time as in 1939, when a price war eventually resulted in cuts of $8 a ton or more, and has been accompanied by a fairly definite upturn in buying. Ford Motor Co. was expected to close late last week on 30,000 tons or more.

**Chicago** — Sheet and strip bookings retain recent slight gains, with no more than a small additional betterment seen the remainder of April. Automotive needs are steady, but farm machinery requirements are lighter in some directions. Miscellaneous manufacturers are the chief support to demand.

**Boston**—Users of Swedish steel, employed largely in narrow cold strip specialties, expect imports to be curtailed sharply if not stopped completely. However, supplies in this country are somewhat larger than usual. Prices have advanced


● Shaft 57 feet long, largest diameter 11¾ inches, weight 17,300 pounds — forged and rough machined by Standard Steel Works Company.

STANDARD is equipped to produce steel forgings and castings of any size and shape to suit your requirements. • • • The steel used in Standard's forgings and castings is acid open hearth, produced in our own furnaces under close metallurgical control.

CASTINGS • FORGINGS • WELDLESS RINGS • WROUGHT STEEL WHEELS

STANDARD STEEL WORKS CO.

Subsidiary of

THE BALDWIN LOCOMOTIVE WORKS

THE BALDWIN GROUP

PHILADELPHIA

sharply since last fall. Domestic buying has increased only slightly, orders averaging about 55 per cent of capacity. Prompt delivery is asked on most orders, especially from the automotive trade.

**New York**—Specifications are improving gradually, though demand from warehouses is light. Manufacturing consumers, particularly electrical refrigerator makers, are increasing releases, and direct business from the building trades is a little better. Sheet deliveries show little change. Narrow cold strip orders are about 55 per cent of capacity, fairly close to operations. Releases generally are small.

**Philadelphia**—Production of auto frames and body parts will continue substantial at least through this month, according to the estimated scrap output of one large interest. Die work for 1941 cars is progressing rapidly but other than for trial runs new models are not likely to account for much steel consumption until August. Miscellaneous sheet buying is gaining slightly.

**Buffalo**—Shrinkage in mill backlogs has resulted in a slight reduction in sheet output, despite a small increase in buying. Operations previously had been in excess of the national average and now are in line with the rate in other centers.

**Cincinnati**—Shipments are steady, with demand expanding in some directions. Requirements of stove makers are heavier, but automotive needs are less active than is indicated by assemblies. Galvanized business holds recent marked gains.

**Birmingham, Ala.** — Although there has been some improvement in buying of sheets no large orders are in evidence. Production is consistent at approximately 85 per cent, and there has been a slight gain in output of strip.

**Toronto, Ont.** — Demand for sheets continues in good volume. The automotive industry is placing larger orders mostly in the United States, and household equipment makers, electric products manufacturers and implement makers also show more interest.

# Tin Plate

Tin Plate Prices, Page 86

Releases and orders are slightly heavier, and with mills increasing stocks in anticipation of better activity among canners tin plate production continues to expand. Last week the rate is estimated at 61 per cent, up 1 point. A proposed increase in the marine freight rate to west coast points, planned for May 1, is expected to increase westward shipments this month. Export business is growing as British mills find it difficult to meet schedules. Export prices have moved slightly above the domestic level.

# Plates

Plate Prices, Page 86

**Cleveland** — Miscellaneous plate orders hold near the rate of recent weeks, though total tonnage is improved over March. Prospects for railroad orders are somewhat indefinite. A large-diameter pipe line for this city will take 100 tons of plates. Prices are irregular.

**Chicago**—Orders increased noticeably last week, and at the same time firmer prices are evident. Government dam work, pipe lines, heavy machinery and bridges are prominent plate outlets. Heavy industrial equipment is especially active in some quarters.

**Boston**—Market is sluggish. Demand for shipbuilding is steady, but larger fabricators are placing little tonnage. Most orders, largely in less-than-car lots, come from miscellaneous consumers. Tank and large-diameter pipe requirements are few. Several dike, dam and equipment projects to be placed by the district engineer, Providence, R. I., bids in, take a small volume of plates. B. F. Sturtevant Co., Boston, is low at $539,213, on blowers and spares for ships under construction at the Brooklyn and Philadelphia navy yards.

**New York**—Market is slow except for requirements for New York Central railroad equipment placed recently. Miscellaneous demand is slightly improved and is expected to be sustained as the construction season gets under way. Oil company needs, mainly for maintenance work, have shown a mildly consistent gain. Export orders have declined, following active buying prior to the recent price increase. Principal concern of exporters is the moving of tonnage already ordered by Scandinavian countries. as the Norwegian crisis may delay shipments indefinitely.

**Philadelphia** — Specifications are expected shortly against navy yard requirements placed with two mills, as it is understood the yards are short of steel. Despite large private shipyard backlogs plate releases are disappointing and considerable tonnage is yet to be bought. About 1200 tons of plates for 50 New York Central locomotives placed with American Locomotive Co., and Lima Locomotive Works has not yet been allocated. The Scandinavian situation is disturbing to eastern mills as considerable tonnage has been placed here in the past few months. At least one shipment en route to Norway has been turned back and some steel now loaded on cars can not be shipped. South African railways take bids April 15 on 4300 tons of plates for cars and locomotives, supplementing 1400 tons bought late in March. Most low-priced export business has been cleared and the trade generally is quoting 2.15c, f.a.s.

**Birmingham, Ala.** — Plates are active, largely because of demand from producers of tanks, some railroad business and shipbuilding.

**Seattle**—Bids are in at Cle Elum, Wash., for proposed water supply pipe line, 5½ miles of 16-inch, 3/16-inch steel plate, no decision being announced. Consideration is being given to concrete pipe. Fabricating shops report a fair volume of seasonal jobs involving small tonnages.

**San Francisco** — Plate lettings were the third largest for the year, 1700 tons. This brought the total to date to 12,180 tons, compared with 15,492 tons for the corresponding period in 1939. Worth Steel Co., Claymont, Del., secured 1000 tons for tanks for the Hawaiian Dredging Co., Honolulu, T. H.

**Toronto, Ont.** — Plate requirements continue to expand for shipbuilding. It is reported that a new Toronto company, Dufferin Ship Building Co. Ltd., has just been formed, and has received an order for minesweepers valued at $3,500,000, and has awarded steel for one or two of these craft. Tank builders and boiler makers are active.

## Plate Contracts Placed

1000 tons, tanks for Hawaiian Dredging Co., Honolulu, T. H., to Worth Steel Co., Claymont, Del.

700 tons, tanks for Aluminum Co. of America, Vancouver, Wash., to Puget Sound Machinery Depot, Seattle.

160 tons, tanks, Mathieson Alkali Works, Lake Charles, La., to Ingalls Iron Works, Birmingham, Ala.

## Plate Contracts Pending

850 tons, 86-inch diameter welded conduit, Leevining creek to Grant lake reservoir, for water and power department, Los Angeles; general contract to A. Teichert & Son, 1846 Thirty-seventh street, Sacramento, Calif., at $806,355.

850 tons, welded pipe for Stone canyon intake for Los Angeles; Macco-Robertson, Paramount building, Clearwater, Calif., low on general contract at $286,042.

600 tons, welded pipe for Stone canyon outlet for Los Angeles; general contract low bidder, Warren Southwest Inc., 2145 East Twenty-fifth street, Los Angeles, at $117,785.

100 tons, water pipe, Edgewater park, Cleveland.

# Pipe

Pipe Prices, Page 87

**Pittsburgh**—Pipe production and sales show signs of a definite gain. However, the increase does not include much from the oil country, except line pipe, where tonnages are somewhat better. Standard pipe buying has increased rapidly in some sections. Prices are still reported weak in secondary markets, particularly in the East.

**Boston**—Merchant steel pipe demand is held back by lagging construction and in some districts resale prices are still being shaded. Piping connections for a pumping station, Northampton, Mass., bids on which are in, take a small tonnage. More cast pipe inquiry is appearing and additional blanket contracts are being placed. Indications are spring purchases will be under those of recent years and limited mostly to small diameters.

**Birmingham, Ala.** — Pipe maintains a fairly satisfactory schedule even in absence of large orders. Plants report some increase in inquiries.

**Seattle**—Several sizeable contracts are pending, bids in, including 300 tons, 4 to 8-inch, at Cle Elum, Wash.; 220 tons at Metzger, Oreg., Hugh G. Purcell, Seattle, and Pacific States Cast Iron Pipe Co., low, awaiting finances, and 150 tons at Ontario, Oreg., Hugh G. Purcell, low.

**San Francisco** — Awards of cast iron pipe were second largest for any week this year, aggregating 1722 tons, bringing the total for the year to date to 9406 tons, compared with 6670 tons for the corresponding period in 1939.

## Steel Pipe Placed

11,000 tons, 24-inch line pipe, to be laid between Montezuma and Crawfordsville, Ind., to loop line of Michigan Gas Transmission Co., to National Tube Co., Pittsburgh.

400 tons, 21,000 linear feet, 10-inch i.d. steel pipe, Bush street underpass, Queens, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh; Tully & Di-Napoli Inc., Long Island City, N. Y., general contractor.

## Cast Pipe Placed

550 tons, 6 to 12-inch cast iron pipe, Pasadena, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

400 tons, Ontario, Oreg., to United States Pipe & Foundry Co., Burlington, N. J.

300 tons, 4 to 10-inch, Cle Elum, Wash., to French interests.

300 tons, 8 to 14-inch for Vancouver, Wash., to Hugh G. Purcell, Seattle, for United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6 and 8-inch, Walnut Park, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

## Cast Pipe Pending

900 tons, 8-inch, Los Angeles; bids opened.

342 tons, 8 to 20-inch, Glendale, Calif.; American Cast Iron Pipe Co., Birmingham, Ala. and National Cast Iron Pipe Co., Birmingham, Ala., low.

325 tons, 4 and 6-inch, Spokane, Wash.; bids April 18.

220 tons, Metzger, Oreg., Hugh G. Purcell, Seattle, and Pacific States Cast Iron Pipe Co., Provo, Utah, low.

220 tons, 12-inch, East Fullerton creek dam, for Los Angeles; bids April 25.

# Bars

Bar Prices, Page 86

**Chicago**—Carbon and alloy bar sales show encouraging improvement in some quarters. Automotive and farm machinery needs are still among the most prominent. Tractor production accounts for most farm equipment requirements.

**Boston** — Individual orders are generally small, but more numerous. Recent slight improvement in volume is maintained. Fill-in pur-


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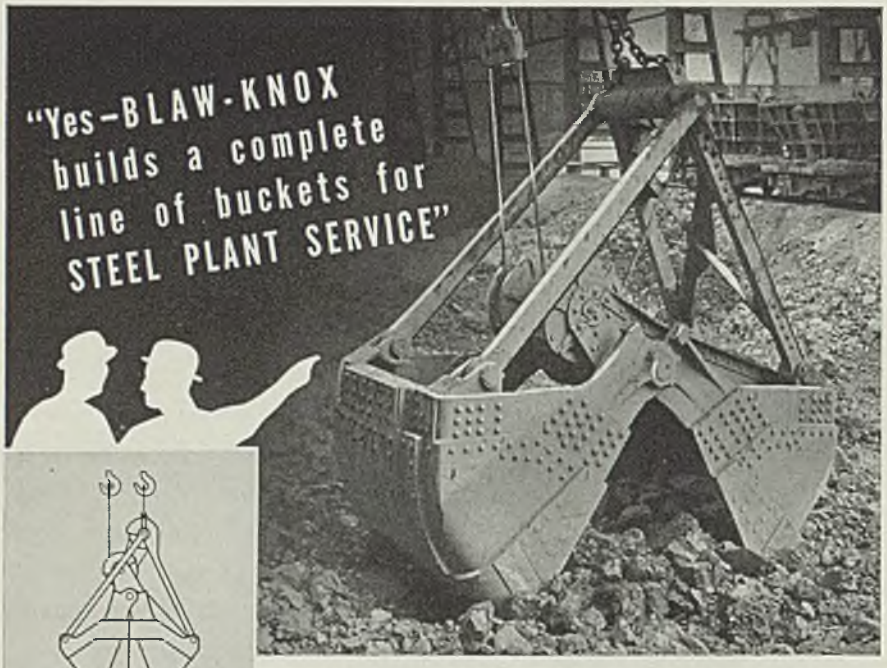
chases predominate, with an occasional release for general replenishment. Consumption by larger consumers such as machine tool builders, shipyards and government shops is holding and in spots is rising. For induction furnace melting, the Watertown, Mass., arsenal is placing 250 tons of carbon steel bar stock. Alloys continue to move well.

**New York**—Bar business is fairly active. Machine tool builders are specifying freely, and bolt and nut makers are better buyers than in several weeks. Considerable tonnage is moving to shipyards, government shops and aircraft manufacturers. Railroad orders are slightly better. Carbon bar deliveries are two to three weeks, cold-drawn about three to four weeks and special alloy bars three months or more.

**Philadelphia**—Demand for steel bars displays moderate improvement in releases and new orders. The machine tool trade is well booked through 1940 and is showing renewed interest in steel requirements. Screw machine products makers are more active. Jobbers are more inclined to replenish stocks.

**Birmingham, Ala.** — Although bar production continues in excess of current bookings, because of a carry-over from last year, an upward trend is noted. Production is about 80 per cent.

**Buffalo**—A small pickup in buying has prevented bar mill schedules from receding despite further curtailment in backlogs. Aircraft manufacturers are expected to require larger tonnages in the near future. Automotive orders show little change.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# Rails, Cars

**Track Material Prices, Page 87**

Between 4500 and 5000 tons of steel products, including trucks, will be required for 500 all-steel covered goods wagons of 20 tons capacity booked by Magor Car Corp., Passaic, N. J., for the Rail State Railways, Thailand (Siam). This, with tonnage still pending for the New York Central rolling stock, for which construction contracts were recently let, covers most steel tonnage being figured for railroad equipment.

Action on the Gulf, Mobile & Northern list, involving 1000 box cars and either 200 seventy-ton or 250 fifty-ton hopper cars, on which bids were recently opened, will not be taken before at least June 1, according to current information.

Denver & Rio Grande has placed 100 stock cars and 10 caboose cars with its Denver shop, and Chicago, Burlington & Quincy 160 freight cars with its own shops.

## Car Orders Placed

Chicago, Burlington & Quincy, 160 freight cars, to its shops.

Denver & Rio Grande, 100 stock cars and 10 caboose cars, to its own shops, Denver, Colo.

State Railways, Thailand (Siam), 500 twenty-ton all-steel covered goods wagons, to Magor Car Corp., Passaic, N. J.

## Car Orders Pending

Gulf, Mobile & Northern, 1000 box cars, and either 200 seventy-ton or 250 fifty-ton hopper cars, on which bids were recently opened; action deferred until at least June 1, according to trade information.

# Wire

**Wire Prices, Page 87**

**Chicago**—Wire and wire product buying has expanded slightly but generally is little changed. Auto partsmaker and tractor manufactur-

ers are among heaviest takers. Road building mesh is becoming more active.

**Boston**—Wire mill operations in most departments tend lower with slight improvement in buying of specialties and manufacturers' wire. Prompt delivery is asked on current orders, which are mostly for fill-in needs with few general replacement orders While specifications are fairly numerous, releases are small. Backlogs, except for scattered specialties, are practically depleted. Pressure for rod deliveries has eased.

**New York**—Little improvement is noted in wire buying with spring material showing a slight betterment. Among heavier goods rope is making relatively a good showing. Buying to round out stocks continues to predominate small, but fairly numerous, orders for prompt delivery.

**Birmingham, Ala.** — Wire products are active. While there still is some backlog, current bookings have improved somewhat, and production is about 85 per cent.

**St. Louis** — Following slight improvement in demand for nails and fencing, there has been a falling off within the last two weeks. Jobbers are not expected to re-enter the market for large quantities until inventories are further depleted.

# Shapes

Structural Shape Prices, Page 86

**Pittsburgh**—Placements are lighter although pending tonnage remains fairly large. It is expected April orders will run about the same as in March. Prices are steady in most sections, but keen competition on smaller jobs has weakened warehouse prices in places. Inquiries for private construction continue more active than public projects.

**Chicago** — Demand has shown moderate gains on an increase in construction activity. Additional improvement is expected more from privately-financed projects than from public works. Besides numerous small jobs, inquiries include 400 tons for a Kansas City, Mo., highway bridge.

**Philadelphia** — New bids were taken April 11 on the national airport, Gravelly Point, Va., but steel requirements were practically unchanged at 2500 tons of shapes and 1300 tons of bars. Several smaller jobs are up but volume is scarce and even further price weakness has developed.

**Boston**—Contracts are fewer, following the recent flurry, and inquiry is limited mostly to small projects with private construction more in evidence. Lack of bridge tonnage has kept down volume thus far this year as practically all such inquiry is for I-beam and stringer spans. Vermont, however, has bids on a two-span plate girder bridge in Springfield, taking 225 tons of shapes.

**New York**—Plans for the Battery-Brooklyn tunnel are on the boards and first bids on the project, taking a large tonnage of structural steel and rings, will be taken in about two months. Requiring 2200 tons, superstructure, East Chester creek bridge, New York, closes April 26. Awards are light, including no large tonnages, although a 350-ton underpass in Queens, went to American Bridge Co., Pittsburgh.

**Buffalo**—Little gain is noted in structural steel but recent tonnage placed and aggregate pending are considered fairly good. Several small private industrial projects are still on the drawing boards.

**Seattle** — Public works projects are furnishing most present volume, private construction lagging. Local bidders are interested in 900 tons involved in caissons for Puget Sound


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navy drydock No. 5, bid at Washington, April 24. J. R. Ummel, purchasing agent, Seattle, will receive bids April 24 for 100 tons shapes and sheet piling for a bridge for the Alaska road commission near Nome, Alaska.

**San Francisco** — While structural awards were not large, over 17,000 tons is pending. Awards for the past week totaled 2097 tons, bring ing the year's aggregate to 55,920 tons, compared with 43,529 tons for the same period a year ago. Consolidated Steel Corp. took 600 tons for an addition for General Motors Corp., Los Angeles. Columbia Steel Co. booked 427 tons of bearing piles and 105 tons of sheet steel piling for Los Angeles county, Calif. Golden Gate Iron Works secured 300 tons for a prison addition at San Quentin, Calif.

**Toronto, Ont.** — New business in structural steel is moving ahead steadily. Awards for the past week were about 2000 tons and pending projects for early closing are in excess of 3000 tons. Other projects for which structural steel will be required will add about 8000 tons. Business for first quarter is well ahead of the corresponding months of 1939.

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## Shape Contracts Placed

1010 tons, pot shells and cradles, Aluminum Co. of America, Vancouver, Wash., to Puget Sound Machinery Depot, Seattle.

623 tons, marine hospital buildings and appurtenances, Carville, La., to Jones & Laughlin Steel Corp., Pittsburgh; A. Farnell Blair, Decatur, Ga., general contractor.

600 tons, addition, General Motors Corp., 2700 Tweedy boulevard, Los Angeles, to Consolidated Steel Corp., Los Angeles.

570 tons, state bridge, PSC-4666, Cheektowaga, N. Y., to Bethlehem Steel Co., Buffalo.

532 tons, bearing piles, including 105 tons sheet piling, for Los Angeles county, Calif., to Columbia Steel Co., San Francisco.

525 tons, bridge FAP-8 (5), Hays county, Texas, to Alamo Iron Works, San Antonio, Tex.

500 tons, office building addition, Ontario Hydro Electric commission, University avenue, Toronto, Ont.; to Dominion Bridge Co. Ltd., Toronto.

500 tons, twelve radial gates, Parker, Ariz., for department of the interior, to American Bridge Co., Pittsburgh.

420 tons, steel piling, flood control plant, Kansas City, Mo., to Inland Steel Co., Chicago.

370 tons, civil aeronautics administration building, New York, for treasury department, to Bethlehem Fabricators Inc., Bethlehem, Pa.

350 tons, Bush street underpass, Queens, N. Y., to American Bridge Co., Pittsburgh; Tully & Di Napoli Inc., Long Island City, N. Y., contractor.

300 tons, plant addition, Anaconda American Brass Ltd., at New Toronto, Ont.; to Dominion Bridge Co., Toronto.

300 tons, industrial building, San Quentin prison, Calif., to Golden Gate Iron Works, San Francisco.

250 tons, building 107, die storage, for Aluminum Co. of America, Cleveland, to Ingalls Iron Works, Birmingham, Ala.

200 tons, state highway bridge, Joyce, Pa., to American Bridge Co., Pittsburgh.

200 tons, state highway bridge, Fairmont City, Ill., to Midland Structural Steel Co., Cicero, Ill.

195 tons, bridge, Lawrence county, Pennsylvania, to American Bridge Co., Pittsburgh.

190 tons, building, Dow Chemical Co.,

## Shape Awards Compared

| | Tons |
|---|---|
| Week ended April 13 | 7,960 |
| Week ended April 6 | 14,226 |
| Week ended March 30 | 9,917 |
| This week, 1939 | 36,266 |
| Weekly average, year, 1940 | 17,673 |
| Weekly average, 1939 | 22,411 |
| Weekly average, March | 19,759 |
| Total to date, 1939 | 357,313 |
| Total to date, 1940 | 265,098 |

Includes awards of 100 tons or more.

Velasco, Tex., to Consolidated Iron Co., Houston, Tex.

180 tons, elephant building, Philadelphia zoo, to Bethlehem Fabricators Inc., Bethlehem, Pa.

180 tons, city garage, Pittsburgh, to Keystone Engineering Co., Pittsburgh.

180 tons, building Elyria Foundry Co., Elyria, O., to Republic Structural Iron Works, Cleveland.

170 tons, bridge FAP-1018-C (1), Scurry county, Texas, to Fort Worth Structural Steel Co., Fort Worth, Tex.

130 tons, bridge project 562, Salem, Va., to Virginia Bridge Co., Roanoke, Va.

130 tons, state hospital building, Peoria, Ill., to Illinois Steel Bridge Co., Jacksonville, Ill.

120 tons, state bridge, PSC-5386, Lackawanna, N. Y., to Bethlehem Steel Co., Buffalo.

110 tons, factory building, All-Steel Equipment Co., Aurora, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

105 tons, reconstructing grade elimination, Delaware & Hudson railroad, Malta-Ballston Spa, Saratoga county, New York, project RC-40-8, to Fort Pitt Bridge Works, Pittsburgh; Bero Engineering & Construction Co., North Tonawanda, N. Y., contractor, $110,248.30, bids March 20, Albany.

## Shape Contracts Pending

2500 tons, national airport, Gravelly Point, Va., hangars and buildings, also 1300 tons bars; new bids opened April 11.

2500 tons, foundry buildings, for Cincinnati Milling Machine Co., Cincinnati.

2200 tons, superstructure, bridge, East Chester creek, N. Y.; bids April 26.

1000 tons, medical center buildings, Washington; bids April 23.

750 tons, coating building No. 95, for Armstrong Cork Co., Lancaster, Pa.

650 tons, viaduct, for state, Harrisburg, Pa.

600 tons, normal school and convent for Roman Catholic parish, Amos, Que.; Jules Caron, 324 Bonaventure street, Three Rivers, Que., architect.

600 tons, hospital and sanitorium for Hotel Dieu, Bowen street South, Sherbrooke, Que.; L. N. Audet, 39 Wellington street North, architect.

550 tons, heating and seat plate assemblies, specification 907, Odair, Wash., for bureau of reclamation.

540 tons, penstock coaster gates, specification 905, Odair, Wash., for bureau of reclamation.

540 tons, factory and office building, for Soss Mfg. Co., Macomb county, Michigan.

550 tons, building, Armstrong Cork Co., at Millville, N. J.; Irwin & Layton, Philadelphia, general contractors.

550 tons, apartment building, for E. J. Frankel, Wilmington, Del.

500 tons, hospital, Vancouver, B. C., for Dominion department public works, Ottawa; J. M. Somerville, secretary.

450 tons, bridge, over Blue river, Kansas City, Mo., for city.

400 tons, schools, St. Hyacinthe, Que., for Roman Catholic school commission, Laframboise street.

361 tons, reconstruction, bridge carrying tracks of Delaware, Lackawanna & Western railroad across route 6, section 13, at Fox Hill, Parsippany, N. J.; bids April 26, to E. Donald Sterner, state highway commissioner, Trenton, N. J.

300 tons, school at Cap de la Madeleine, Que., for Roman Catholic school commission; Amyot, Bouchard & Rinfret, 105 Mountain Hill, Quebec, Que., architects.

300 tons, school at Surrey, B. C., for Surrey school board; Harold Cullerne, 325 Howe street, Vancouver, architect.

300 tons, hangar No. 7, Oakland, Calif.; bids postponed from April 1 to April 8.

275 tons, overpass, Raton, N. Mex., for state.

250 tons, floating bulkhead gates, Earp, Calif., bids April 29.

220 tons, department store building, for Prudential Life Insurance Co., Newark, N. J.

200 tons, St. Louis, overpass at Missouri Pacific tracks and Gravois avenue; bids April 26.

180 tons, pumping stations, Wilkes-Barre, Pa., for United States government.

176 tons, including bearing and sheet steel piling, East Fullerton creek dam, Mono county, California, for Los Angeles; bids April 25.

175 tons, theater building, for Royal Theatre Co., Detroit.

125 tons, bridge, Jennings road, Cleveland, for Cuyahoga county, Ohio.

120 tons, bulkhead gate tracks, specification 1351-D, Odair, Wash., for bureau of reclamation.

120 tons, office, service and garage building, for Ohio Power Co., Newark, O.

100 tons, shapes and sheet piling, bridge


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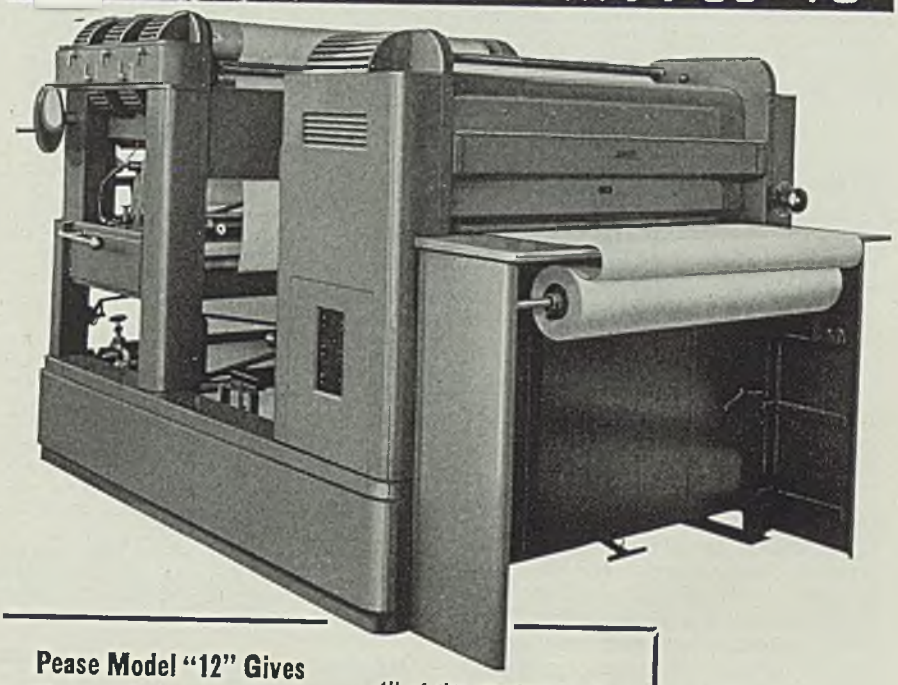

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for Alaska road commission; bids to J. R. Ummel, purchasing agent, Seattle, April 24.

Unstated, overhead traveling crane for Minidoka power plant, Idaho, bids to Denver, April 18.

Unstated, three radial gates for Vallecito dam, Idaho; bids to Denver, April 22, spec. 1353-D.

Unstated, steel frame and trusses for fish hatchery structure, Winthrop, Wash.; bids to reclamation bureau, Coulee dam, April 29; spec. 908.

# Reinforcing

Reinforcing Bar Prices, Page 87

**Pittsburgh** — Reinforcing bar prices are weak and vary widely. Several awards lately have brought less than 1.70c, the bottom of the range now quoted.

Rail bars have, on the average, brought less than new billet steel, but in some cases new billet bars have been quoted as low as the rail steel. There is little hope for clarification of this situation immediately, although apparently business is increasing and it is possible that heavy orders would cut down competition.

**Chicago**—Pending tonnage is sustained in the face of fairly large orders. Outstanding in awards is 957 tons for the Wesley Memorial hospital here. Prospective business includes requirements for a Sears, Roebuck & Co. store addition, Milwaukee, and a pumping plant, Hammond, Ind. Small inquiries are fairly numerous. Prices continue irregular.

**New York**—Grade crossings under consideration aggregate 3500 tons, including 2000 tons for the Atlantic avenue project, Brooklyn, closing April 23. Prices are soft for both billet and rail steel bars. While most purchases are small, awards include 460 tons placed with Jones & Laughlin Steel Corp.

**Philadelphia** — Fabricators report further weakness in reinforcing bar prices with fabricated material several dollars lower on jobs quoted the past few days. Several thousand tons are pending for housing and institutional jobs.

**Seattle**—Volume of small lots of 50 tons and less has improved but important projects are few. Mills are operating on reduced schedules. Mercer Steel Co., Portland, is reported to have been awarded 500 tons for the Aluminum Company of America's plant at Vancouver, Wash.

**San Francisco** — The reinforcing bar market was active and 8124 tons was placed, bringing the year's aggregate to 39,413 tons, compared with 58,927 tons for the same period last year. Bethlehem Steel Co. took 6000 tons for barracks at the Panama Canal.

**Toronto, Ont.** — While there was some tapering in sales, prospective business indicates heavy buying later. Sales for the week were chiefly in lots of 50 to 200 tons, for small plant additions and other limited construction jobs.

## Reinforcing Steel Awards

10,000 tons, Denison, Tex., Red River dam, to Sheffield Steel Corp., Kansas City, Mo.

1373 tons, marine hospital buildings and appurtenances, Carville, La., to Truscon Steel Co., Youngstown, O. (through Atlanta office); A. Farnell Blair, Decatur, Ga., general contractor.

957 tons, Wesley memorial hospital, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

770 tons, improvement Los Angeles river channel between Downey road and Randolph street, Los Angeles, to unstated interest.

460 tons, Bush street underpass, Queens, N. Y., to Jones & Laughlin Steel Corp., Long Island City, N. Y.; Tully & Di Napoli Inc., Long Island City, N. Y., contractor.

395 tons, custom house addition, Chicago, to Calumet Steel Co., Chicago.

385 tons, projects at Coulee and Roza, Wash., to Bethlehem Steel Co., Seattle, by reclamation bureau.

360 tons, filtration plant, Muskegon Heights, Mich., to Truscon Steel Co., Youngstown, O.

359 tons, procurement invitation 18171, United States treasury, Lansing, Mich., to Republic Steel Corp., Cleveland, low bidder.

325 tons, parking garage, Dearborn street, Chicago, to Calumet Steel Co., Chicago; Patterson-Hartwick, contractors.

130 tons, Spencer-Kellog Co., Des Moines, Iowa, to Calumet Steel Co., Chicago.

125 tons, grain storage, Swift & Co., Champaign, Ill., to Calumet Steel Co., Chicago.

115 tons, hangars, naval air station, Jacksonville, Fla., to Virginia Steel Co., Richmond, Va.; Virginia Engineering Co., Newport News, Va., general contractor.

112 tons, public opening of March 29, Akron, O., to Truscon Steel Co., Youngstown, O.

## Reinforcing Steel Pending

2500 tons, superstructure, East river houses, New York; bids April 30.

1050 tons, subway, section D-6-E, Chicago; bids April 18.

400 tons, and 100 tons shapes, Lamokin village housing project, Chester, Pa.; bids April 23.

375 tons, for public health building, Lexington, Ky., general contract awarded.

360 tons, flood wall, army engineers, Indianapolis; bids April 24.

350 tons, St. Louis, overpass at Missouri Pacific tracks and Gravois avenue; bids April 26.

200 tons, and 100 tons shapes, Susquehanna flood control project, Wilkes-Barre, Pa.; bids April 20, United States engineer, Baltimore.

180 tons, Ogontz terrace apartment, Ogontz and Chew streets, Philadelphia; bids April 20.

140 tons, state highway and bridge projects, three contracts, New Jersey; bids April 26, to E. Donald Sterner, state highway commissioner, Trenton, N. J.

Unstated, navy buildings, Tongue Point, Oreg., air base; Western Construction Co., Seattle, general contractor.

Unstated, addition to Swedish hospital, Seattle; Teufel & Carlson, Seattle, general contractors.

Unstated, ten concrete storage bins; bids to Port of Longview, Wash., early in May.

## Concrete Bars Compared

| | Tons |
|---|---|
| **Week ended April 13** | **15,866** |
| **Week ended April 6** | **10,972** |
| **Week ended March 30** | **11,495** |
| **This week, 1939** | **10,900** |
| **Weekly average, year, 1940** | **8,340** |
| **Weekly average, 1939** | **9,197** |
| **Weekly average, March** | **7,469** |
| **Total to date, 1939** | **157,689** |
| **Total to date, 1940** | **125,102** |

Includes awards of 100 tons or more.

# Pig Iron

Pig Iron Prices, Page 88

**Pittsburgh** — Merchant iron demand is light. Releases are slightly better, but buying is light, with some foundries well stocked. Prices generally are holding well, although the going market in some cases is below the published price, as a result of continuation of contracts placed last fall.

**Chicago** — Sales have increased somewhat but shipments are about the same as a month ago. Sellers feel shipments will equal March. Foundry melt is unchanged, but low steel mill operations in some sections are holding back increased demand for iron. Sales are mostly small lots, with buying chiefly for fill-in. By-product foundry coke shipments are slightly heavier.

**Boston**—With foundry melt tending downward, notably with textile mill equipment builders and some jobbing foundries, pig iron buying is confined mostly to small lots for prompt delivery. Shipments against orders are steady and generally maintained. Shops producing castings for the machine tool trade are still making relatively the best showing.

**New York**—Export shipment of a fairly large pig iron tonnage apparently will be delayed by recent events in Scandinavia. Norway and Sweden have been increasingly large buyers so far this year, and much tonnage on order remains to be shipped. Extension of the neutrality act zone to Norwegian wa-

ters is a complicating factor, although previous iron deliveries had been in other than American ships. Domestic buying is spotty, although specifications are a trifle heavier.

**Philadelphia**—Inventories of some large pig iron melters are being worked down and sellers expect further buying soon. Two or three lots of 100 tons each have been placed during the past few days. Two inquiries for 10,000 tons each for Sweden have been held up but it is understood Greece is interested in substantial tonnage. Shipments to England are delayed due to shortage of ships.

**Buffalo**—Shipments are up slightly and there has been a flurry of small orders, despite no marked change in foundry operations. Pig iron production holds at 64 per cent of capacity, with demand still sufficient to maintain this rate.

**Cincinnati** — Shipments approximate the March volume. Stove foundries are more active. Steady and heavy demand for machine tool castings, augmented by expansion in stove and farm equipment plant needs may bring improvement in iron deliveries as the quarter progresses. Little forward business is being booked.

**St. Louis**—Buying consists mostly of carloads for spot shipment. Shipments are about the same as a month ago. While there has been a falling off in melt by district steelworks, consumption by foundries has shown marked increase.

**Toronto, Ont.** — Movement of pig iron shows better tonnage, largely the result of increased spot buying. Smaller melters are enlarging operations. Difficulty in obtaining No. 1 cast scrap has been a factor in increased iron sales.

# Scrap

Scrap Prices, Page 90

**Pittsburgh**—Scrap markets have weakened further on open-hearth grades, with No. 1 steel quoted at $16.00 to $16.50, off 50 cents. Mill buying in small quantities has been done at that range and below, and there is no tendency to resist the movement.

Brokers are actively covering all short sales, indicating an increase may be expected. Railroad lists brought higher prices on specialty grades, with steel clinging to the same levels as last month.

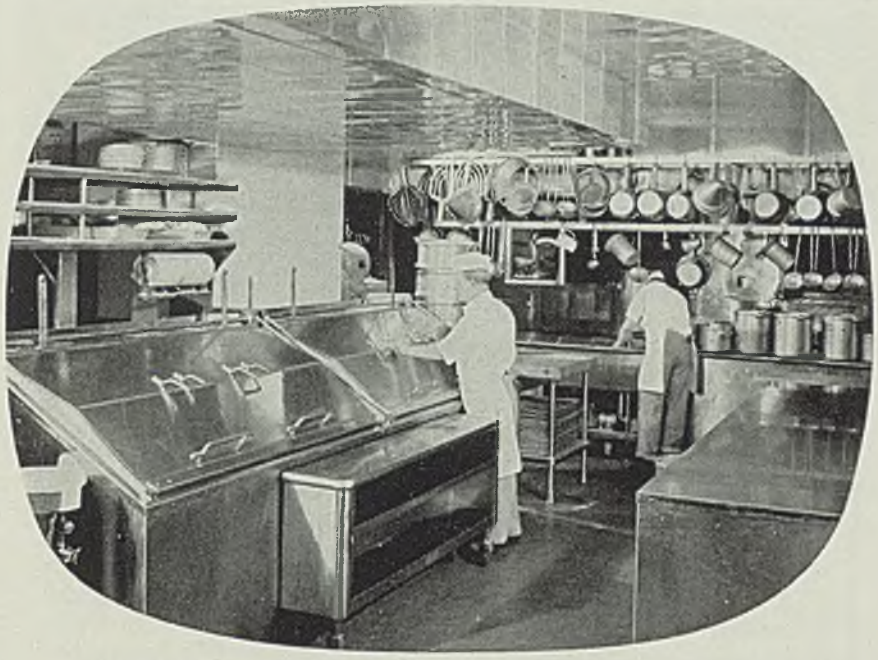
**Chicago**—Mill purchases have been reported at $15.50 for No. 1 heavy melting steel and present quotations are $15 to $15.50, with dealers in some instances getting the top figure. No buying from dealers is reported at less than $15.25.

**Cleveland**—Scrap continues quiet, mill consumers taking no interest. Steelmaking grades have slipped about 50 cents, others nominally unchanged. Factory scrap production is about equal to shipments to melters.

In past few days market has strengthened and a number of items are higher. Outlook is brightened by higher ingot operations and indications of some improvement in general steel business.

**Boston**—Scrap buying by district consumers, both steelworks and foundries, still lags with most prices unchanged. Consumers and sellers of cast grades, notably No. 1 machinery, are apart as to delivered quotations and buying is held to a minimum Little scrap is moving to eastern Pennsylvania, with a range of $3.75 to $4.25 quoted for machine shop turnings, f.o.b. cars. Watertown, Mass., arsenal takes bids May 3 on 325 tons of turnings.

**New York**—Due to the rather substantial export movement of scrap from here earlier in the month, dealers assert they are lit-

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• Here indeed is a chef's inspiration for fine cooking; and a thrifty manager's delight. Nearly everything in the modern kitchen of this new metropolitan cafeteria is made of glistening ARMCO Stainless Steel.

These food storage compartments and work tables are a good pictorial story of the uniform forming and welding qualities of ARMCO Stainless. Any fabricator would be proud of their efficient design.

Your needs may be far removed from spic-and-span kitchens; yet it's likely you can benefit in some way from using ARMCO Stainless Steels. You may not be seeking sanitation or even the inviting appearance of an ever-bright finish. You may in fact want grades for he-man jobs where corrosion and heat-resistance are most important. *Whatever* your requirements, you can be sure of the excellent fabricating qualities of this rustless metal.

Just let us know what you make or intend to make. We'll tell you frankly whether ARMCO Stainless can help you achieve shop savings and more durable or saleable products. Write to: The American Rolling Mill Co., 1250 Curtis St., Middletown, O.

**ARMCO STAINLESS STEELS**

# Behind the Scenes with STEEL

### January In April

■ All last week we slowly worked ourselves into a frenzy of ambition to go to work on the yard over the week-end with a vengeance. And so what happens? The galoshes are brought back out of storage; the furnace starts to roar again; the sniffles pay us a return visit and we get out and struggle with another beautiful six inch snow. If this weather keeps up we'll be celebrating the Fourth with Tom & Jerry's.

### On The Run

■ These *Blitzkriegs* certainly affect a lot of things you'd never think of. A few days ago we happened to run across this advertisement for permanent wave equipment in England's *Hairdressers' Weekly Journal*, trade paper for beauty shop operators: *In case of air-raid warning, your client is always free to move instantly!*

### Mystery Man

■ Advertising, of course, is the "angel" for a publication like STEEL and particularly for its readers. Without the support of leading manufacturers selling through STEEL's pages, the same complete editorial service (24 full-time editors) would cost subscribers ten times or more the present subscription rate. But just plain "advertising" to "keep our name before the public" is, and has long been, one of our pet gripes. The other day at lunch we heard a good reason why we may be right. Twenty-two million people every day carry a package of cigarettes in their pockets and handle them as high as twenty times daily. And on every one of those 22 million packages there is a portrait of a gentleman and his name. Who is it?

### Coming

■ Next week in STEEL Dale Augsburger, engineer, Duriron Co. Inc., Dayton, O., will run a very interesting article on *Heating Solutions*. If you are doing any pickling, cleaning, electroplating, bonderizing or other finishing you won't want to miss it.

### Tantalizingly Simple

■ J. C. Farrell, one-time Yale man, and now V. P. of Easton Car & Construction Co., got quite a kick out of our composite financial report of a couple of weeks ago. To thank us he sent along a clever little jig saw puzzle with just four pieces. Par on it is two minutes but we were hooking our woods and took a five. Since there's something on it about Easton trucks he has plenty more. Write and get one.

### Change of Pace

■ All you have to know is your alphabet to work this one. The first three letters of the word given below and the last three are the same letters in the same order. What's the word?

— — — ERGRO — — —

### Nice Fellow

■ How do you like our friend, "Shorty" Long by now? The guy really knows his stuff, and we suggest you read between his lines pretty carefully because he's telling you a lot of things sometimes that aren't right on the surface.

### For The Asking

■ This week STEEL presents its financial analysis of the steel industry for 1939. If you want some extra copies of the fold-out insert, just let us know. Last year they went like hot cakes so we're well stocked this time.

### Surprise

■ We're itching to tell you about a surprise package you're going to get from STEEL one of these days before long but every time we go to mention it the boss gives us a long cold stare, so we'll have to wait. It's something you've wanted and needed, though, and it doesn't rattle. That's all we can say just now.

SHRDLU



tle handicapped by the disruption of ocean shipping which has accompanied the Norwegian crisis. Only a small accumulation of scrap for export is on hand. Domestic shipments are little changed, with demand only moderately active. Heavy breakable cast is up 50 cents.

**Philadelphia** — Scrap melters are pressing for deliveries on contracts but have placed little new tonnage. One mill is now negotiating for additional material. Several price adjustments are noted but the market is not regarded as weak. No. 2 heavy melting steel is expected to go at $15.50 on the next sale, although some was sold a few weeks ago at $15. Cast grades are strong and higher prices seem near. Two boats will load 10,000 tons for export during the next few days.

E. G. Budd Mfg. Co. sold 1500 tons of new bundle scrap April 12 for the latter half of April, supplementing an earlier offering of 4000 tons.

**Buffalo**—Except for Canadian export demand for cast material, the scrap market is marking time. Canadian buyers continue to take whatever available cast scrap local dealers can offer at prevailing ranges. Prices were raised during the past week, with cupola cast bringing $17 to $17.50 a ton and No. 1 machinery $18 to $18.50.

**Detroit**—The market again is quiet. Prices are firm, although some interests believe higher figures should obtain. Ford is reported entering the market for small fill-in tonnages but is not expected to be an active buyer.

**Cincinnati** — Dealers have reduced buying prices 25 cents, reflecting easiness prevailing for several weeks. Shipments to mills are steady but insufficient to support recent prices. Buying generally is light.

**St. Louis**—Prices dropped 25 cents to $1, with most items down 25 or 50 cents. Market was affected by the recent sale of No. 2 heavy melting steel. Bundled and compressed sheets are off 50 cents. Mills show interest and are willing buyers if brokers will make price concessions. Demand for malleable has improved, although quantities are not large.

**Birmingham, Ala.** — Scrap is quiet but has registered no change with the exception of a 50-cent drop in No. 1 cast.

**Toronto, Ont.** — Scrap prices continue firm, with some dealers looking for early advances. Offerings show improvement, with local auto wreckers again making deliveries. No. 1 cast continues practically absent from the market, and stove plate is in small supply. Large tonnages still are held in the north-

ern section of Ontario, but is expected to start moving within the next few days. Demand for both steel and iron materials is active with brisk market expected soon.

**Seattle**—The market is weak and inactive. Japan would buy in better volume except for scarcity of trans-Pacific space, freights being at record high levels. Tidewater stocks are fairly large. Present prices are unattractive to interior shippers. Rolling mills, operating far below capacity, are not interested.

**San Francisco** — Scrap movement has slowed and from present indications further price recession is not looked for. No. 1 heavy melting steel, f.o.b. cars metropolitan district of Los Angeles and San Francisco, continues at $11.50 to $12.00 a net ton with No. 2 at $10.50 to $11.00 a net ton. No change in compressed sheet prices is noted. Some indications of Japanese buying are seen and present quotations, apparently, are based on $31.50 f.a.s. Japan. Whether this will hold depends upon ocean freight.

# Warehouse

**Warehouse Prices, Page 89**

**Chicago** — Sales are unchanged but fairly encouraging, with rather good prospects for increased demand this month compared with March.

**Boston**—Volume about parallels that of last month, with alloys and specialties most active products. Alloy prices are firm. Hot-rolled and galvanized sheet prices are shaky, as some distributors overbought and are seeking to liquidate with shaded quotations. Sheet seconds also have an adverse influence.

**Philadelphia** — Comparatively little distress selling is noted and prices are fairly well maintained, with the exception of galvanized sheets. New business this month is about on a par with March.

**Buffalo** — Business about equals pace a month ago. Some unsettlement is noted in galvanized and cold-rolled sheet prices.

**Detroit** — Sales hold near the March rate which showed a fair gain over February. Business is supported by increasing needs of tool and die shops.

**Cincinnati**—Warehouse sales are holding the level of March with no unusual developments. Building items tend to be more active although in small tonnages. Prices are firm and unchanged.

**Seattle**—Seasonal improvement is reported although sales are in small lots for immediate use, with no forward buying. Sheets, bars and light plates are in good demand, other items also moving freely. Local prices are stable.

## Bolts, Nuts, Rivets

**Bolt, Nut, Rivet Prices, Page 87**

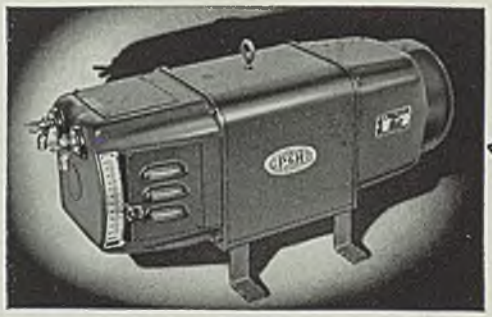
Bolt and nut demand reflects better activity in building trades as well as some improvement in miscellaneous consumption. Stocks of both users and distributors have declined, and this is expected to become an increasingly important factor in buying. April bookings have fairly good prospects of being the best so far this year.

# Steel in Europe

**Foreign Steel Prices, Page 89**

**London** — (*By Cable*) — Priority orders continue to expand in Great Britain and further restrictions have been placed on commercial users and exports of steel and iron. Armament makers and shipyards are largest present consumers. Con-


A GREAT *NEW* IDEA *in* Welding Equipment!



## Welding Range Down to 15 Amps

***Amazing*** **- - -** the only machine of its kind... brings new ease... new flexibility... new economy to all types and classes of welding! **Each unit provides a welding range from 15 to 200 amps.** A simple parallel hook-up provides two or more separate services (multiple service) for individual operators or a combined higher amperage service for one operator.

*Single or multiple units are available with either stationary or portable mountings.*

### Unequalled Arc Performance With One Simple Arc

The Compact, square frame design accentuates the advantages of the P&H-Hansen welding generator in providing the finest known arc characteristics. Single control for one, two or more units is provided by the P&H "Multiple Shifter." Current selection is simplified and foolproof.

A production line, precision built — saves you money. Fine workmanship is combined with the practical economies of mass production to make this welder surprisingly moderate in cost.

**Send for literature** — write for Bulletin K-28 giving complete information on this new and remarkable welder and welding service.

*General offices:* **4411 West National Avenue, Milwaukee, Wisconsin**

HARNISCHFEGER CORPORATION

ARC WELDERS • EXCAVATORS • ELECTRIC CRANES P&H MOTORS • HOISTS • WELDING ELECTRODES

tinuation of large supplies of semi-finished steel enables rerollers to increase their output. Tin plate demand is quieter but works are well booked and operate at 70 to 72 per cent of capacity.

Belgium and Luxemburg report large Dutch inquiry for shipbuilding steel. Belgian mills have withdrawn from the merchant steel markets.

## TNEC Hearing

(*Concluded from Page 25*)

tinuous rolling mills, Mr. Hook declared the process has lowered fabrication costs, consequently prices. Latter decreased, for his company, 31.1 per cent on the average, between 1926-1939. Sheet metal quality and properties, resulting from continuous rolling process, has made possible extensive improvements in many widely used consumer articles, at a steadily reduced price.

Mr. Hook said workers have benefited from lightening of their task, formerly one of the most arduous and difficult of any in the industry, and from improvement of general working conditions in rolling mills. Broadening markets, resulting from improved quality, have likewise been to the workers' benefit. Large tonnages of sheet steel are being used for manufacture of products, such as steel auto tops, wholly non-existent before appearance of the continuous mill.

Summarizing his contention continuous rolling mills have not created widespread and lasting unemployment, Mr. Hook said: "Hot-rolled production of other than light flat-rolled products in the years 1926-1927 shows a reduction of 11 per cent, or approximately 3,000,000 tons, while at the same time the light flat-rolled products increased approximately 4,500,000 tons, requiring about 45,000 men. This number of men is more than was previously employed on all the sheet mills in 1926."

Dr. Charles F. Kettering, research chief, General Motors Corp, told the committee industry is contributing to "an immense effort to readjust our economic system so as to put to work our excesses of men, money and materials." He stated that if 1 per cent of the research projects now occupying experts in metals, fuel, ceramics, rubber and plastics are successful, thousands of new jobs will be created.

Dr. Kettering testified he is confident the 1940's will see progress in motor transportation accelerated beyond last decade's pace. This progress, in turn, he said, will prove a powerful stimulus to allied industries of steel, oil, chemicals and rubber. He vigorously rejected the theory that "too many inventions are producing unemployment."

Dr. T. J. Kreps, committee's economic adviser, outlined progress made during last few decades in industrial technique. He said that industry is equipped to produce a national income of $90,000,000,000 or more.

### Murray Testifies

Philip Murray, head of Steel Workers Organizing committee, told the committee machines have displaced from 1,000,000 to 2,500,000 workers in the past ten years. In the steel industry alone, he said, 30,000 have been displaced in that time, with 40,000 more to lose their jobs in next few years.

SWOC does not oppose technological advances, he said. "SWOC approves them and conducts a continuous educational campaign among its members in favor of technological improvements."

He told the committee that strip mills are displacing 83,970 workers, 37,020 of whom have already been disconnected from the steel industry.

Mr. Murray cited New Castle, Pa., as showing effect of unemployment through technology. In the last three years there, he said, 4500 hand mill workers "have been permanently displaced and a few years earlier 1200 bessemer steel workers were displaced, total of 5700 victims of technology during the 1930's in a single town."

---

■ Tin plate mill of Tennessee Coal, Iron & Railroad Co., Fairfield, Ala., will be expanded by a $5,000,000 equipment program which will add to annealing, shearing, tinning, assorting and warehouse facilities. Program will begin immediately and be completed in about ten months.



PAGE HI-TENSILE

● Page Hi-Tensile "F" gives you a strong, ductile weld. It helps the welder make time. It is adaptable to a wide range of work. It is a quiet-running rod that has exceptionally low spatter and slag losses. Page Hi-Tensile "F" meets the requirements on horizontal, vertical and overhead jobs. It is recommended for work in Cro-Man-Sil, Cor-Ten, HT50, and other new alloy steels. . . . Your local Page distributor will be glad to give you all the facts about Hi-Tensile "F" and other Page electrodes.

BUY ACCO QUALITY in Page Welding Electrodes, Page Wire Fence, Lay-Set Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Abrasive Cutting Machines, American Chains and Ford Hoists, Cranes, and Trolleys.

PAGE STEEL AND WIRE DIVISION
MONESSEN • PENNSYLVANIA

AMERICAN CHAIN & CABLE COMPANY, Inc.

AMERICAN CHAIN DIVISION · AMERICAN CABLE DIVISION · ANDREW C. CAMPBELL DIVISION · FORD CHAIN BLOCK DIVISION
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In Canada: DOMINION CHAIN COMPANY, LTD. In England: BRITISH WIRE PRODUCTS, LTD. · THE PARSONS CHAIN COMPANY, LTD.

# Activities of Steel Users and Makers

■ BENNETT Drum Co. has been formed by S. A. Bennett, former president of Wilson & Bennett Mfg. Co., Chicago, to manufacture steel drums and containers. Incorporated under laws of state of Illinois, the new company has constructed a plant in New Orleans on a seven and one half acre tract of land. Other officers are: Vice president, Maumus Claverie; secretary-treasurer, John Gifford; superintendent, A. Claverie.

♦

Sales and service on Keller and Kellerflex diesinking and toolroom equipment have been taken over by sales offices of Pratt & Whitney Co., division of Niles-Bement-Pond Co., West Hartford, Conn. Pratt & Whitney bought out the Keller division about eight years ago, but hitherto sales and service have been handled by separate machinery sales organizations. Pratt & Whitney personnel has been expanded to handle additional work entailed by absorption of the Keller division.

♦

Jessop Steel Co., Washington, Pa., has completed a new building to house electroplating and arc welding equipment used in production of composite steels. Building is of Robertson sheet metal with aluminum finish on inside for better lighting. It is insulated throughout and equipped with modern ventilating system.

♦

Contract has been awarded to Blaw-Knox Co., Pittsburgh, by McKenna Metals Co., Latrobe, Pa., for construction of a new research laboratory adjacent to its plant No. 1. It will be used for development of new applications of Kennametal, and for investigation of new intermetallic compounds. A large quartz spectrograph, microscopes, high temperature electric furnaces, chemical balances, a technical library and special tools and dies are among equipment to be placed in the laboratory when it is completed.

♦

Robins Conveying Belt Co., for 40 years located in the Park Row building, New York, has built a three-story office building in Passaic, N. J., to house its executive, engineering, sales and other departments, and will move to the new location May 1. A New York sales office will be maintained at 70 Pine street.

♦

Sales and service departments of Link-Belt Co.'s stoker division in Detroit have been moved to new quarters at 2885 East Grand boulevard, with James G. Cunningham in charge.


# CUPRODINE

## COPPER-COATS WITHOUT CURRENT

By a simple immersion process CUPRODINE produces a fine bright copper coating that is denser and more adherent than usual—on wire and strip in the mills—for masking surfaces prior to carburizing—as a foundation for rubber.

CUPRODINE is simply added to the sulphuric acid solution. The coating time is measured in seconds, and the process is also economical of labor and materials.

CUPRODINE is made by the manufacturers of RODINE, a standard inhibitor wherever steel is pickled. Write for particulars on either or both of these products.

CHEMICALS ACP PROCESSES

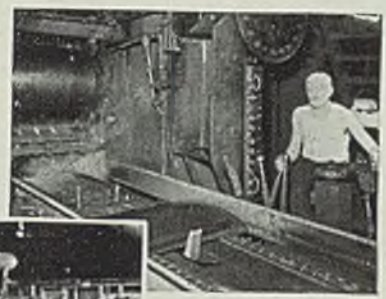
AMERICAN CHEMICAL PAINT CO.
AMBLER, PENNA.

Detroit, Michigan Dept. 310 Walkerville, Ont.



# CHAINS BUILT TO TAKE SEVERE PUNISHMENT...HEAT

Because of their high inherent strength and superior wear-resisting features, Jeffrey chains are found on hundreds of steel mill applications where high unit loads must be handled under intense heat. Three applications are illustrated here. Jeffrey chains excel in this kind of severe service.

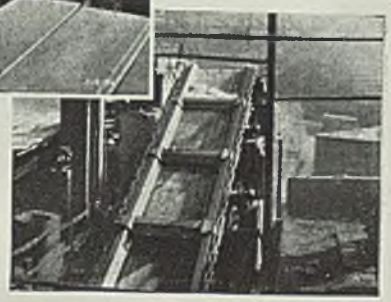


*Top — Jeffrey steel thimble roller chain on feeder and catcher table.*

*Lower right — Jeffrey No. 1348 chain in 24-hour crop conveyor service.*

*Also chains for every conveying, elevating and transmission need.*

*Jeffrey No. 1380 chain is giving excellent service on this continuous furnace job (left) where intense heat is prevalent.*



Jeffrey engineers approach steel mill conveyors with a complete understanding of the special problems . . . know that unit loads are high and that heavy weights are concentrated on small areas . . . and build chains accordingly. Write for data.

**The Jeffrey Manufacturing Company**
**889-99 North Fourth Street, Columbus, Ohio**

## Nonferrous Metal Prices

| April | Copper Electro. del. Conn. | Copper Lake, del. Midwest | Copper Casting, refinery | Straits Tin, New York Spot | Straits Tin, New York Futures | Lead N. Y. | Lead East St. L. | Zinc St. L. | Aluminum 99% | Antimony Amer. Spot, N.Y. | Nickel Cathodes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | *11.25 | 11.50 | 11.00 | 45.50 | 45.25 | 5.00 | 4.85 | 5.75 | 19.00 | 14.00 | 35.00 |
| 8 | *11.25 | 11.50 | 11.00 | 46.00 | 45.75 | 5.00 | 4.85 | 5.75 | 19.00 | 14.00 | 35.00 |
| 9 | 11.50 | 11.50 | 11.12½ | 47.00 | 46.75 | 5.00 | 4.85 | 5.75 | 19.00 | 14.00 | 35.00 |
| 10 | 11.50 | 11.50 | 11.12½ | 47.50 | 47.25 | 5.10 | 4.95 | 5.75 | 19.00 | 14.00 | 35.00 |
| 11 | 11.50 | 11.50 | 11.12½ | 47.50 | 47.12½ | 5.10 | 4.95 | 5.75 | 19.00 | 14.00 | 35.00 |
| 12 | 11.50 | 11.50 | 11.12½ | 47.25 | 46.87½ | 5.10 | 4.95 | 5.75 | 19.00 | 14.00 | 35.00 |

*Based on sales by custom smelters; mine producers unchanged at 11.50c.

**MILL PRODUCTS**

*F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 11.50c Conn. copper*

**Sheets**

Yellow brass (high) .....18.31
Copper, hot rolled .....20.12
Lead, cut to jobbers .....8.25
Zinc, 100 lb. base .....11.00

**Tubes**

High yellow brass .....21.06
Seamless copper .....20.62

**Rods**

High yellow brass .....14.26
Copper, hot rolled .....16.62

**Anodes**

Copper, untrimmed .....17.37

**Wire**

Yellow brass (high) .....18.56

**OLD METALS**

*Nom. Dealers' Buying Prices*

**No. 1 Composition Red Brass**

New York .....7.12½-7.37½
Cleveland .....8.00-8.25
Chicago .....7.37½-7.62½
St. Louis .....7.75-8.25

**Heavy Copper and Wire**

New York, No. 1 .....8.87½-9.12½
Cleveland, No. 1 .....9.00-9.25
Chicago, No. 1 .....8.75-9.00
St. Louis .....8.75-9.25

**Composition Brass Turnings**

New York .....6.87½-7.12½

**Light Copper**

New York .....6.87½-7.12½
Cleveland .....7.00-7.25
Chicago .....6.75-7.00
St. Louis .....6.75-7.00

**Light Brass**

Cleveland .....4.00-4.25
Chicago .....4.62½-4.87½
St. Louis .....4.50-4.75

**Lead**

New York .....4.50-4.75
Cleveland .....3.90-4.15
Chicago .....4.00-4.15
St. Louis .....4.00-4.25

**Zinc**

New York .....3.00-3.25
Cleveland .....2.75-3.00
St. Louis .....3.25-3.50

**Aluminum**

Misc., cast, Cleveland .....8.00
Borings, Cleveland .....6.50
Clips, soft, Cleveland .....14.00
Misc. cast, St. Louis .....7.75-8.00

**SECONDARY METALS**

Brass ingot, 85-5-5-5, less carloads..11.75
Standard No. 12 aluminum...14.25-14.50

## Nonferrous Metals

**New York**—Intensification of hostilities in Europe had an immediately stimulating effect on major nonferrous metal markets. Copper, lead and tin prices advanced last week while sales of all metals increased.

**Copper**—Electrolytic copper on the outside, custom smelter and export markets rose to the producers' level of 11.50c, Connecticut, on Tuesday when sales jumped to 7784 tons Export demand continued active throughout the week. Uncertainty regarding the outcome of the Norwegian campaign caused consumers here to adopt a cautious policy and as a consequence sales declined steadily after mid-week. Refined stocks of copper in the United States increased 14,402 tons during March as apparent consumption increased 1161 tons to a total of 64,376 tons while exports fell 2077 tons to 7517 and refined output increased 3534 tons to 86,295.

**Lead** — Leading sellers easily equalled their day's intakes early in the week but buying interest waned as the week drew to a close. Buying pressure lifted prices 10 points on Wednesday to the basis of 4.95c, East St. Louis, and 5.10c, New York, with St. Joseph Lead


CHAIRS SMARTLY STYLED IN STEEL

**Modern Office Chairs— Built to Endure**

Harter Steel Chairs, for fine offices, are noteworthy for their ease and comfort—for their modern flowing lines and for their sturdiness.

Chairs in the Columbian Suite, illustrated above, are equipped with moulded form rubber cushions. This is in line with the latest trend, for wherever comfort is of paramount importance in seating, there you will now find foam rubber in use.

More and more business leaders are turning to Harter. They know that in so doing they will get smartly styled steel chairs—chairs that offer the last word in comfort plus extra long wear.

These business leaders also know that Harter Posture Chairs are outstanding in the posture chair field. Harter Posture Chairs are designed to make good sitting posture easy and natural. There is a Harter chair for every type of seated work. The Harter Corporation, Sturgis, Michigan.

HARTER




Our aim is to render service. A little more complete... more hospitable... more pleasing ... than even the most exacting guest expects.

CHAS. H. LOTT
*Manager*

*Every Room Outside with Private Bath*
Single from $2.50
Double from $4.00

DETROIT LELAND HOTEL

CASS AT BAGLEY AVE.
GARAGE IN CONNECTION

Co. still asking a premium of $1 a ton on certain brands in the later market.

**Zinc** — A strong undertone developed early in the week on moderate demand but this was not sustained. Prices closed steady on the basis of 5.75c, East St. Louis, for prime western.

**Tin**—Straits spot advanced rather sharply to 47.50c before easing ¼-cent on Friday compared with the previous week's close of 45.50c. Turnover for the week was heavy in all leading markets.

**Antimony** — Only routine buying was reported at the unchanged price levels of 14.00c, New York, for American spot and nominally 16.50c, duty paid New York, for Chinese spot.

# Equipment

**Seattle**—Wire rope agencies report the price situation has been stabilized after several months of cutting. Volume of sales was active during that period, buyers stocking in advance. Old commitments are now being filled but new business is small. Broderick & Bascom is low to Bonneville project for furnishing 126,000 feet of steel strand for St. Johns, Astoria, Yakima and Ellensburg substations. General Electric Co. is low at $59,334 to Bonneville project for 12 transformers for Astoria station. Navy department will call bids soon for furnishing 36 dry dock capstans, spec. 9678, for Pacific Coast navy yards, cost $150,000. Peerless Pump Co., Los Angeles, is low at $15,055 to furnish Tacoma with three turbine pumps. Seattle will receive bids April 19 for five rectifier units.

## Ferroalloys

**Ferroalloy Prices, Page 88**

**New York**—While at one time considerable ferromanganese was imported from Norway, little or none has come from this or any other European country since the outbreak of the war. Consequently, the Norwegian war crisis has had no effect on movement of ferromanganese from Scandinavia. Norway is not a producer of manganese ore, certainly of no important amount, and has been relying principally upon shipments from Russia, it is said, for production of ferromanganese, with the aid of cheap water power.

## Semifinished

**Semifinished Prices, Page 87**

**Pittsburgh** — Although semifinished buying is hand-to-mouth, releases from nonintegrated mills have been larger over the past two weeks and shipments have moved up considerably. Buyers state this represents an increase in their own orders and not an attempt to build up stocks. Mills are still running on a basis of production after placements, with little stock of semifinished material being produced for the merchant market.

# Construction and Enterprise

### Pennsylvania

ALLENTOWN, PA.—Lehigh Portland Cement Co. plans improvements to cost about $100,000.

BROCKWAY, PA. — Brockway Glass Co., R. L. Warren, president, Beadle building, Brockway, plans a 1 and 3-story glass factory 110 x 632 feet. Frazier Simplex Inc., 436 East Beau street, Washington, Pa., engineer, to cost about $500,000.

MOHNTON, PA. — Leininger Knitting Mills Co., L. A. Lutz, president, will build a brick and steel boilerhouse and power plant addition, to cost $40,000, with equipment.

OIL CITY, PA.—Plans being made by chief engineer, P. M. Robinson, Drake building, Philadelphia, for enlargement of cracking plant and installation of new boiler at local plant of Pennzoil Co.

PITTSBURGH — O. Hommel Co., 209 Fourth avenue, ceramic supplier, will build warehouse with 10,000 square feet floor space, and one-story office addition. Gray porcelain enamel will be used in both structures.

PITTSBURGH—Pittsburgh Plate Glass Co., E. D. Griffin, vice president and general manager, paint division, will build a paint plant at Houston, Tex., on 21-acre site and will include three main buildings, auxiliary units and storage tanks. Will produce full line of paint, varnishes and lacquers. Plans are by Albert C. Finn.

READING, PA.—Carpenter Steel Co., River road and Exeter street, is having plans made by Muhlenberg, Yerkes & Muhlenberg, Ganster building, for a 1-story tube mill addition, to cost about $40,000 with equipment.

ST. MARY'S, PA.—Stackpole Carbon Co. plans erection of three 1-story additions to its plant, to cost about $60,000.

ZELIENOPLE, PA. — Johns-Manville Corp., is having plans made by L. H. Brown, 22 East Fortieth street, New York, for a factory for manufacture of refractory and acoustical products.

### Maine

PORTLAND, ME.—American Can Co. is building a 1-story brick and steel plant addition.

### New York

FAIRPORT, N. Y.—American Can Co., 230 Park avenue, New York, is building a warehouse to cost about $50,000.

OSWEGO, N. Y.—Central New York Power Co., Electric building, Buffalo, is expanding its steam generating plant. Stone & Webster Engineering Corp., 90 Broadway, New York, is designer. Entire project will cost about $7,000,000.

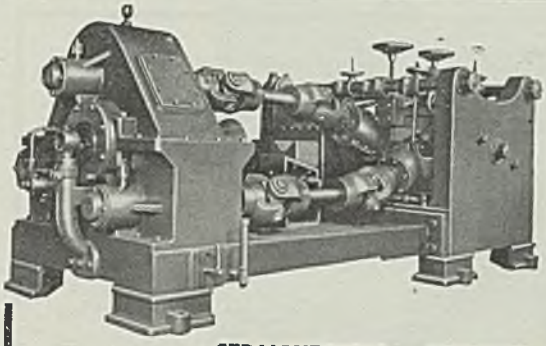
SYRACUSE, N. Y.—Roth Bros. Metal Co. Inc., 815 South State street, is having plans made by W. Markham, Evenson building, for a 1-story 50 x 240-foot warehouse, to cost about $40,000.

### New Jersey

BLOOMFIELD, N. J.—Universal Alloys Inc. has been incorporated with 1000 shares no par value. William Huck Jr. is agent.

HARRISON, N. J.—Woburn Industries, care M. D. L. VanOver, president, Harrison, plans plant at Brownsville, Tex., to process castor beans and their by-products, to cost about $500,000.

NEWARK, N. J.—Uptown Steel & Iron Works Inc. has been incorporated with

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THE MEDART CO. • 3520 De Kalb St., St. Louis, Mo.

MEDART

2500 shares no par value. Harry H. Koehler is agent.

### Ohio

AKRON, O.—Mechanical Mold & Machine Co., 946 South High street, is adding to its shop.

AKRON, O.—Ohio Edison Co., 41 North Main street, care Commonwealth & Southern Co., Jackson, Mich., J. H. Foote company engineer, Jackson, will build outdoor-type electrical distribution station for outdoor switch equipment and busses; steel frame on concrete piers.

BEREA, O.—City, John R. Baesel, mayor, plans improvements to municipal electric light plant, probably including 1500 or 2000-kilowatt generator costing $80,000, high-efficiency boiler costing $100,000 and building to house equipment. Plans by William C. Kammerer & Associates, 1900 Euclid avenue, Cleveland, ready for bids about May 1.

CLEVELAND—Watson & Blom Appliance Co. has been organized to market a double action ventilation window lock, by Alexander Watson, 3070 Essex road, and Gordon Brom, 2011 Staunton road, Cleveland.

MT. GILEAD, O.—Hydraulic Press Mfg. Co. has given contract to Austin Co., Cleveland, for construction of integrated modern plant on 60-acre site, to cost about $500,000. Howard F. McMillan is president. Plant will be 400 feet long with heavy machine shop and erecting shop aisles served by two 50-ton and two 15-ton cranes. Total area 50,000 square feet, welded steel construction, continuous sash, high-intensity mercury-vapor lighting, thermostatically controlled unit heaters, boiler plant and water supply system.

WELLINGTON, O.—Village, J. T. Duff, clerk, will take bids until April 22 for 1000 kilowatt turbogenerator and auxiliaries, estimated cost $75,000. William C. Kammerer, & Associates, 1900 Euclid avenue, Cleveland, engineers.

WELLINGTON, O.—Sterling Foundry Co., Ray E. Clisby, president, plans 50 per cent enlargement to keep pace with demands of Warner & Swasey Co., Cleveland, its principal customer. First construction will be replacing present wooden cleaning room with fireproof structure and addition 70 x 100 feet, west of cleaning room.

### Michigan

ALPENA, MICH.—Plant of Huron Industries Corp. damaged by fire, foundry principal sufferer.

COLDWATER, MICH. — Homer Furnace & Foundry Co., suffered fire damage to two-story office building.

DEARBORN, MICH.—Standard Automatic Products Corp., 22340 Michigan avenue, Dearborn, has been incorporated with $50,000 capital to manufacture parts, by M. R. Hannum, 54 West Main street, Milan, Mich.

DETROIT—Zenith Screw Products Co., 134 Woodmere street, has been incorporated to manufacture screw machine products, with $18,000 capital, by Fred Jones, 8905 Armour street, Detroit.

DETROIT — Schmidt Brewing Co., Brewster and Wilkens streets, has plans by Harley & Ellington, engineers, 1507 Siroh building, for a 2-story reinforced concrete bottling plant addition, to cost about $150,000.

JACKSON, MICH.—McCluskey-Adams Co., Joseph McCluskey, 128 North Horton street, will open new plating plant at 654 Hupp avenue, within next week. Equipment being installed for plating automobile parts and accessories with copper, bright nickel, chromium or cadmium.

SAGINAW, MICH.—Saginaw Steering Gear Co. is building an addition to its plant.

### Illinois

CENTRALIA, ILL.—Bids will be taken about May 15 for a steel tank on steel tower to cost about $30,000. Greeley & Hansen, 6 North Michigan avenue, Chicago, engineers.

### Indiana

FORT WAYNE, IND.—Rolling Mill Scrap Baling Corp., 1709 McKinley street, has been incorporated to deal in steel and iron scrap, with 120 shares no par value, by Elmer J. Wunderlin, 601 South Lafayette street, and associates.

SHELBURN, IND.—Lane Motors Inc. has been organized to manufacture the Lane applied power engine, with 10,000 shares $50 par, by Glen MacDaniel, Fred A. Lane and Oliver Cromwell.

SPEEDWAY CITY, IND.—Allison Engine Co., division of General Motors Corp., General Motors building, Detroit, is having plans made for a 1-story concrete and steel airplane engine manufacturing plant to cost about $750,000. J. Lloyd Allen, 634 Architects and Engineers building, Indianapolis, is engineer.

### Delaware

WILMINGTON, DEL.—Everbrite Stainless Steels Inc. has been incorporated with 450,000 shares par value $1 and 50,000 shares no par value, to operate an iron foundry and steel plant, by S. L. Mackey, J. Slaughter and H. Kennedy, Wilmington.

### Maryland

BALTIMORE — Plans for municipal hangar being made, bids about May 1, by W. W. Pagon, Lexington building. Building of runways, field lighting system, laying of water and electric mains and paving to follow.

HAGERSTOWN, MD.—R. H. Sweeney, mayor, purposes installation of new boilers in the municipal electric generating plant.

### District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will open bids April 19, schedule 1213, for motor-driven geared-head toolmakers' precision lathe, for Mare Island, Calif.; schedule 1214, floor-type contour metal-sawing, filing and polishing combination machine, for San Diego, Calif.; April 23, schedule 1224, variable voltage motor drive double-housing planer, for Mare Island, Calif.; schedule 1241, motor-driven 16-inch heavy duty universal table metal shaper, for Quantico, Va.; schedule 1242, motor-driven sprue cutter; schedule 1245, motor-driven back geared upright stationary head electric drill; schedule 1247, two motor-driven bench valve facing machines, for Alameda, Calif.; April 19, schedule 1275, motor-driven 9-inch, 3-foot ram, 12-speed, radial drill, delivery New York; April 26, schedule 1268, motor-driven rotary swaging machine; schedule 1270, two motor-driven portable pipe threading machines, for Mare Island, Calif.; April 19, schedule 1276, motor-driven disc-cutter type rotary automatic milling machine for Alexandria, Va.; April 26, schedule 1278, motor-driven light type vertical milling machine for Mare Island, Calif.; schedule 1294, pneumatic squeeze riveting machine for Alameda, Calif.; schedule 1296, two electric box-type heat-treating furnaces, for San Pedro, Calif.; schedule 1305, twelve pneumatic scaling hammers, for Key West, Fla.

### Kentucky

LOUISVILLE, KY. — Kentucky Macaroni Co. is erecting a factory building for which various lines of equipment will be required.

### Florida

DELAND, FLA. — Babcock Aircraft


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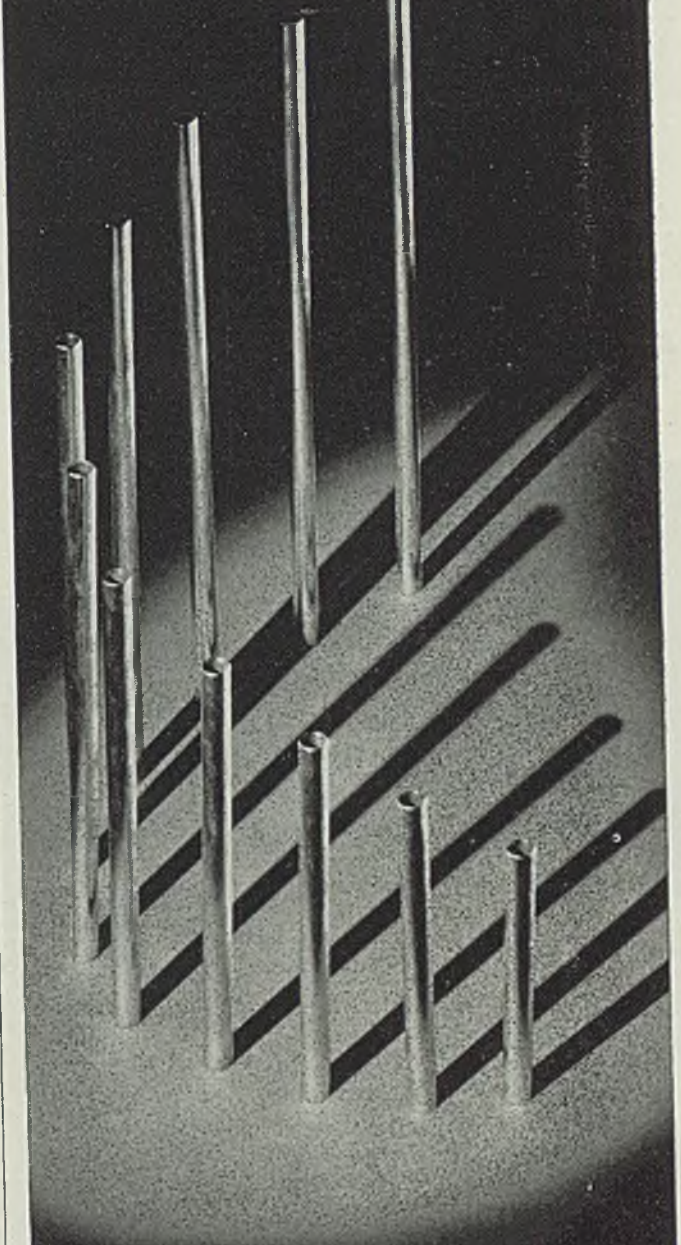

Steel tubing, copper coated inside and out

BUNDY TUBING CO. • DETROIT

Corp., Major Fred L. Foster, president, Akron, O., negotiating purchase of 10 acres adjacent to municipal airport for permanent factory site. Has leased 3500 square feet office space in Conrad building for general offices, and a building for temporary production, starting by May 1. Output 100 Babcock planes scheduled for first year.

### Missouri

KANSAS CITY, MO.—Butler Mfg. Co., manufacturer of steel tanks and other steel products, has let contract to Swenson Construction Co., for an additional plant building 44 x 290 feet, 125 feet being two stories. Will be used for machine shop and shipping room with engineering and research laboratories on second floor. Cost about $40,000.


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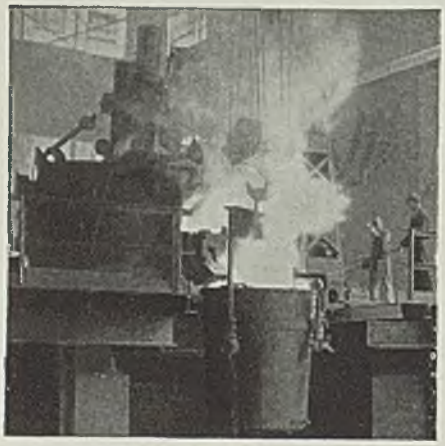
FORGINGS



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### Oklahoma

TULSA, OKLA.—Franks Mfg. Corp., manufacturer of portable truck-mounted well-servicing winch units, will build second story to its plant.

### Wisconsin

GREEN BAY, WIS.—Hudson & Sharp Machine Co., 1207 Main street, will build a 1-story machine shop addition 108 x 120 feet.

MILWAUKEE—Square D Co. is building an addition to its plant for manufacture of electrical equipment.

### Minnesota

CEDAR, MINN.—Harry Edmunds, city clerk, will take bids to April 19 on three diesel engines, 1500-horsepower each, with generating equipment. Stanley Engineering Co., Muscatine, Iowa, is consulting engineer.

HUTCHINSON, MINN.—City, Eben R. Dennis clerk, plans expansion of municipal electric generating plant to cost about $300,000, contingent on enlarged business from REA co-operatives.

KEEWATIN, MINN.—Election May 13 on $38,000 bond issue to finance sewage disposal plant. John Rebrovich is village recorder.

### Texas

FORT WORTH, TEX.—United Tool Co. has been formed with $1000 capital to deal in steel and iron materials, by Arthur Teague and associates.

### South Dakota

BIG STONE CITY, S. DAK.—Citizens by election have approved construction of municipal electric light plant.

SIOUX FALLS, S. DAK.—C. M. Whitfield, city auditor, takes bids to April 26 for three 1600-gallons-per-minute sewage pumps and motors. Greeley & Hansen, 6 North Michigan avenue, Chicago, are consulting engineers.

### Nebraska

HEBRON, NEBR.—REA has approved contract to Roberts Construction Co., Lincoln, Nebr., for 175 miles transmission lines to serve 248 customers, for Thayer county rural public power district, Francis C. Cederholm, superintendent. Davis & Schwab, 825 East Twelfth street, Crete, Nebr., are consulting engineers.

### Iowa

ATLANTIC, IOWA—City, Fred Herbert, clerk, is preparing plans for sewage disposal plant to cost $120,000. Buell & Winter, 508 Insurance Exchange building, Sioux City, Iowa, are consulting engineers.

CEDAR FALLS, IOWA—C. H. Streeter, city engineer, plans hydroelectric plant to cost $200,000, including building and stationary equipment $102,000; two water wheels, two generators and switchboard, $72,000; groundwork and race construction, $10,000.

JEFFERSON, IOWA — Greene county rural electric co-operative, Clifford E. Unz, superintendent, has REA approval for contract to Hoak Construction Co., Des Moines, Iowa, at $87,400, for construction of 153 miles transmission lines to serve 350 customers. Kenneth R. Brown, 802 Valley Bank building, Des Moines, is consulting engineer.

VICTOR, IOWA—Power Alcohol Co-operative association, care W. H. Schwiebert, president, plans a plant to manufacture alcohol from corn for blending with gasoline for motor fuel, to cost about $200,000.

WATERLOO, IOWA—John Deere Tractor Co., L. A. Rowland, general manager, is building a 1-story steel and concrete building, 96 x 320 feet for developing and testing tractors, to cost about $85,000.

### Idaho

ASHTON, IDAHO—A. A. Electric Co., Cicero, Ill., has been given REA contract at $119,266 for building 191 miles transmission lines for Fall River rural electric co-operative.

WALLACE, IDAHO—Coeur d' Alene Mines Corp. has plans under way for construction of $100,000 stamp mill in McFarren Gulch, daily capacity 300 tons, with modern machinery and latest flotation equipment.

### California

LONG BEACH, CALIF. — Palst Tool Co., 2750 Cherry avenue, has been formed by Harry B. Palst.

LOS ANGELES—Southern California Gas Co. will spend about $6,000,000 for additions, and betterments during 1940, largest in recent years.

LOS ANGELES — Alloy Die Casting Corp. has been formed with 7500 shares no par value, by G. W. Cagnon, W. E. Holmes and C. W. Monk, Los Angeles. A. B. Monk, 800 William Fox building, is representative.

LOS ANGELES—Central Metal Products Co., has been formed with 2500 shares no par value by Harry Asimow, Morris Wakeher and Robert Ontell, Los Angeles. Louis Ellowitt, Subway Terminal building, is representative.

LOS ANGELES — Aluminum Co. of America will build plant here for manufacture of aluminum rivets for airplane construction and for extruded aluminum shapes for aircraft. Site of 30 acres adjoining present plant at Vernon, Los Angeles suburb, has been bought and new plant will be double size of present factory. Capacity will be about 200,000 pounds per month. Cost estimated at about $2,000,000.

SAN DIEGO, CALIF.—Star Machine Works, 418 Tenth avenue, has been formed by Clarence R. Peterson.

### Washington

BENGE, WASH.—Benge Elevator Co. has given $17,000 contract to Con Eckhardt, Odessa, Wash., for an 85,000-bushel grain elevator, with new equipment and machinery.

COLVILLE, WASH. — REA has approved contract to Homer G. Johnson, Portland, Oreg., for 292 miles transmission line for Stevens county electric co-operative.

LONGVIEW, WASH.—Port of Longview will receive bids in May for ten concrete and steel storage bins, addition to public elevator, each 26 x 92 feet, for Continental Grain Co., lessee. Cost about $120,000.

NEWPORT, WASH.—Bennett & Taylor, Los Angeles, have been given contract by REA for 189 miles of power lines for Pen d' Oreille electric co-operative.

### Canada

TORONTO, ONT.—Aluminum Co. of Canada Ltd., 158 Sterling road, will build a plant near its smelting works at Arvida for production of Alpaste, a pigment for use in paint. Cost about $100,000.

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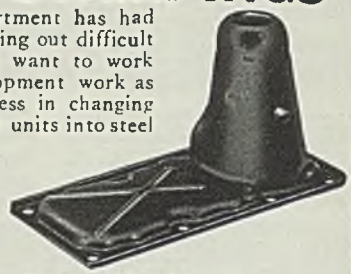

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## Bids Wanted

Federal Works Agency, Public Buildings Administration, Washington, D. C., March 23, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, April 24, 1940, for construction of the U. S. P. O., Bluffton, Ohio. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

Federal Works Agency, Public Buildings Administration, Washington, D. C., March 22, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, April 26, 1940, for construction of the U. S. P. O. at Jenkins, Ky. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

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**HORN PRESS**

10-3 Minster, Plain., stroke 4" with swing table. Weight 3500 lbs. Condition good as new.

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## Bids Wanted

Federal Works Agency, Public Buildings Administration, Washington, D. C., April 4, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1. P. M., Standard Time, May 3, 1940, for construction of the U. S. P. O. at Waverly, Ohio. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

# ADVERTISING INDEX

**Where-to-Buy Products Index carried in first issue of month.**

# ✦ ✦ ADVERTISING INDEX ✦ ✦

**Where-to-Buy Products Index carried in first issue of month.**

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## ...✓ check with your Graybar lighting specialist

When the eyes and efficiency of your employees are at stake, why delay consideration of new sight-saving lighting improvements? Right now is the time to check on possible applications in your plant of the modern fluorescent lamps that give more light of daylight quality — better seeing — without increasing energy costs.

To be fully informed on fluorescent lamps, lighting units, reflectors and accessories, check with your local GRAYBAR lighting specialist. He'll tell you frankly where the new fluorescents fit — and where you'll be better served by other modern forms of lighting. He'll help you decide on the type and location of units that will best meet individual lighting problems in the shop or office. What's more, you'll have a full range of the newest, soundest products to choose from, all backed by the satisfaction-insurance of the GRAYBAR tag.

Why waste time and risk mistakes trying to "pick up" the story on fluorescents by piecemeal inquiry? For a *fully enlightened* view — go fluorescent via GRAYBAR! Call your local GRAYBAR lighting specialist or write direct for information, mentioning type of application.

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18-inch (15 watts); 24-inch (20 watts); 36-inch (30 watts); 48-inch (40 watts). In white, "daylight," and a wide range of colors for special purposes.

**RLM FLUORESCENT REFLECTORS**

Including twin-lamp unit (using two 48-inch tubes) with built-in auxiliary for general illumination of industrial areas. Other reflectors for local bench lighting, including vapor-proof units. Also, all types of office and drafting room fixtures.

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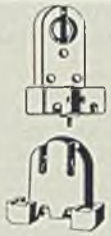

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