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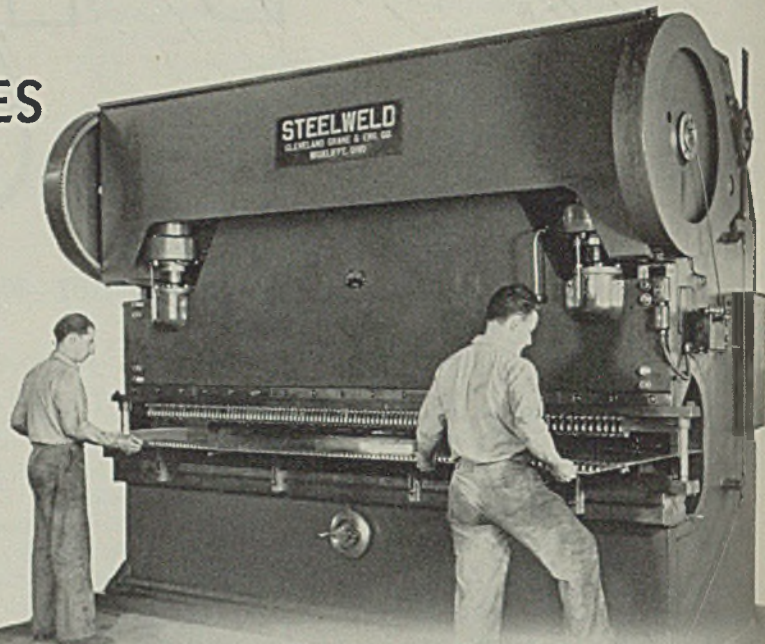
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PRODUCTION • PROCESSING • DISTRIBUTION • USE

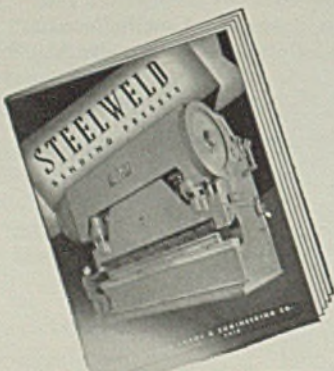
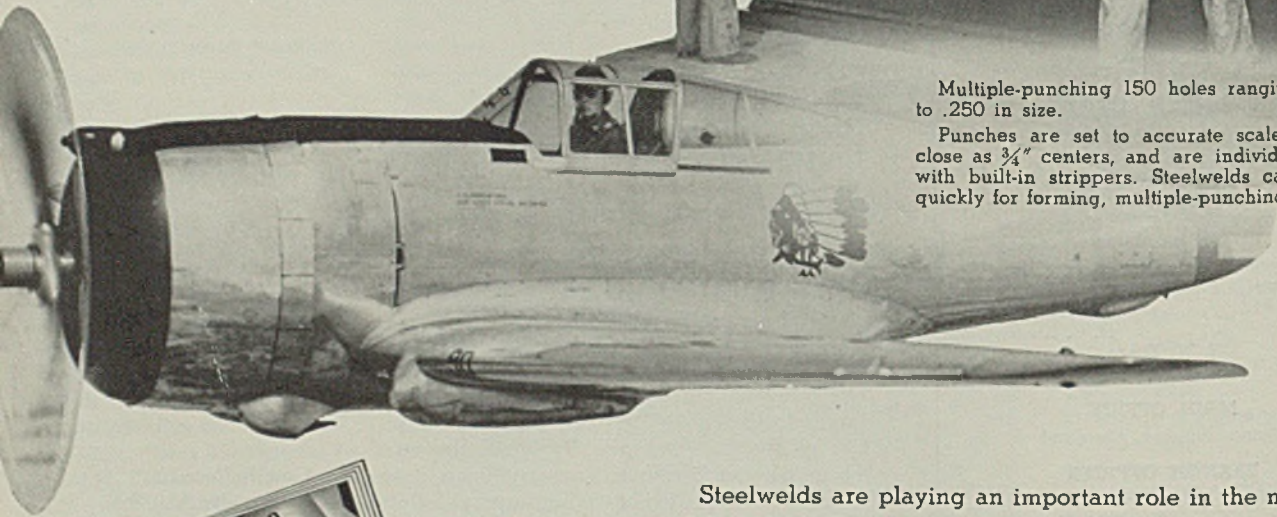
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HIGHLIGHTING THIS ISSUE

■ STEELMAKING units last week began to feel the effects of the strain of recent activity, and shutdowns for repairs prevented a further gain in production. Output was unchanged (p. 29) at 90½ per cent of ingot capacity. The unfilled order backlogs, instead of being reduced by recent heavy shipments (p. 95), are as large as before and tend to become larger. Deliveries of certain products have fallen somewhat farther into the future. With defense needs increasing and with the bulk of 1941 automobile requirements still to be purchased more extended deliveries by fall seem certain. Despite expectations, dealers are having no trouble in exporting No. 1 heavy melting steel under licenses (p. 23); they report new Japanese orders.

Government armament awards continue to gain in volume and last week's list (pp. 25-26) was impressive. General Motors Corp. and Chrysler Corp. have been asked (p. 34) to operate two proposed, government-owned, aircraft cannon plants. The war department's six ordnance manufacturing arsenals (p. 23) now are operating with three shifts. Canadian industrial expansion for purposes of war (p. 27) is being accelerated. . . Anaconda Copper Mining Co. (p. 23) will furnish 240,000 gross tons of concentrated manganese ore to the government. . . A. B. Einig and Donald M. Lafin (p. 34) have been appointed machine tool technicians of the national defense commission, under Mr. Knudsen.

Arsenals on Three Shifts

United States, using nearly 50 per cent of the world's virgin tin and producing virtually none, apparently (p. 21) is getting ready to have a tin smelting industry of its own; in the meantime no impending shortage of this strategic metal is seen. . . Senate labor committee will begin hearings Aug. 13 (p. 32) on the house amendments to the national labor relations

Smelting Tin in U. S.

act. . . Hearings on the contemplated excess profits bill were begun last week (p. 24) before a joint committee of the house and senate. . . Finished steel exports in June comprised (p. 40) 15.8 per cent of output. . . Scrap prices are up (p. 94) for the second successive week. . . Newly arrived commission in New York (p. 27) wants assistance in building a steel plant in Brazil.

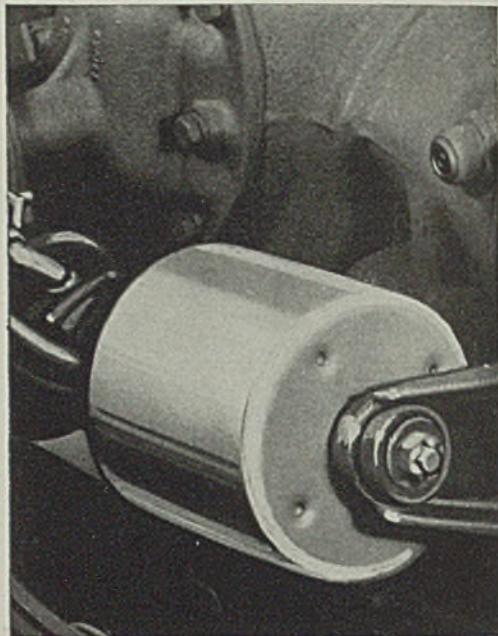
In designing to produce failure the engineer's approach is entirely different than when he is interested in preventing failure. R. V. Sutherland (p. 46) discusses the procedure followed in producing "bursting disks". . . By a new control system ingots at an eastern steel plant (p. 49) are maintained at soaking temperature within plus or minus 5 degrees Fahr. . . W. A. Sandberg (p. 50) describes the use of hydraulic jacks in aligning parts of huge tanks during field erection; the method permits turning the tanks for downhand welding. . . F. A. Buldra (p. 64) cites examples to show that large profits can be made through a systematic plan for salvaging waste materials in manufacturing operations.

Design for Failure

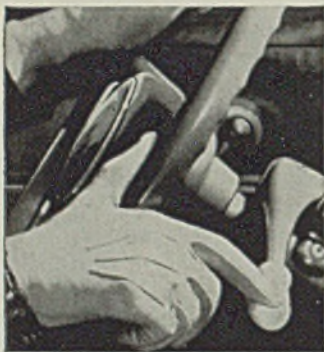
E. W. P. Smith (p. 62) discusses design changes which reduce costs through utilizing more forming and less welding. . . James Kniveton (p. 70) discusses recent developments which make it possible to get better results with radiant heating units. . . A new control system (p. 76) permits automatic correction of variations in the air-gas ratio of protective atmospheres used in bright annealing. . . V. H. Ericson (p. 80) shows how longer life of cutting tools more than compensates for the expense of giving them a higher surface finish. . . Modern in every detail (p. 54) is a new porcelain enameling plant at Mansfield, O. . . A new 15-ton mine-haulage locomotive (p. 69) is only 26 inches high.

Reducing Costs

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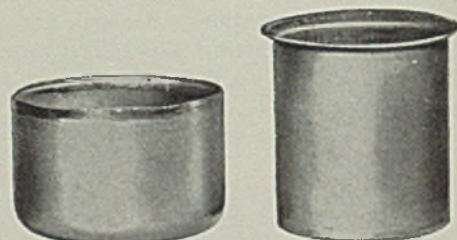
Heart of the newest Automatic Gear Shift is this vacuum cylinder, a 4-inch diameter cup, drawn to a 4½-inch depth. And the call is for 8000 parts per day.

Ordinary sheets caused tremendously high breakage rates. An acceptable rejection figure was fixed at three per cent. When Inland Hot Rolled Sheets were used, the breakage was brought

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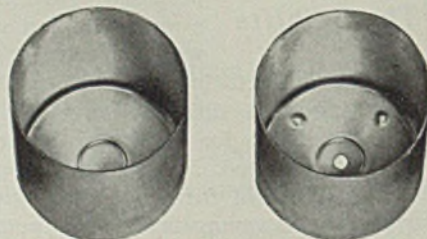
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Building Up American Tin Smelting Industry. In National Defense Plan

*Bolivian Ore, One of Chief Sources, Now Shipped to Britain, May
Come Here Direct—Nation Requires Half of World's Production,
Produces Practically None—50 Per Cent of U.S. Consumption Used
In Making Tin Plate*

NEW YORK

■ ALTHOUGH the United States normally accounts for nearly 50 per cent of the world's consumption of virgin tin—while producing little or none—no serious shortage of this strategic metal is in prospect.

Plans apparently are under way for establishing a full-fledged tin smelting industry in this country. In addition, the government sponsored Metals Reserve Co. has concluded arrangements (STEEL, July 29, p. 23) with the international tin cartel for 75,000 tons of tin at 50.00c per pound, c.i.f. American ports, for national defense.

Position of the United States on tin is readily discernible by noting it used 70,460 gross tons out of the world total of 166,500 tons last year, while producing a mere 34 tons from virgin materials out of 183,800 tons. Control of the producing industry, in which United States had no part, was inaugurated approximately seven years ago and resulted in lifting tin prices from a low of around 18.50c to more than 50.00c.

Control by the International Tin committee, representing leading tin producing countries, including Malaya, Siam, Dutch East Indies, Bolivia and Nigeria, covers approximately 90 per cent of world producing capacity. Furthermore, about 43 per cent of the world's developed capacity is regulated under British political control and is the principal basis for the dominant position of Great Britain in the tin industry.

Dependence of the United States upon the outside world made it imperative, as a preliminary step to the national defense program, to set up reserves of tin as well as

other strategic materials such as manganese, chromium and rubber. The agreement signed with the International Tin committee provides for the purchase of 75,000 tons of metal within one year and as rapidly as it can be made available. The committee also agrees to maintain production until July 1, 1941, at 130 per cent of so-called standard tonnages which were fixed at 207,970 tons July 1, 1938, as the basis for controlling production.

The Metals Reserve Co. will release tin from its stock upon request for use by the United States government and to private consumers in event of a national emergency which in the opinion of the company requires such release. After three years the company will be free to

liquidate its stocks through sales to private consumers but at the rate of no more than 5000 tons per quarter.

Smelters in England, of course, account for a large part of the tin produced, but in the event that country is invaded it is believed deliveries could be maintained from plants in Malaya and Dutch East Indies, which now are the principal sources for the type of tin required in the United States. These plants are taxed to capacity since the ore from Dutch East Indies formerly treated by the large smelter in Arnhem, Holland, now is being diverted to them. Ore from Siam and French Indo-China also is smelted in Malaya. Production facilities are being increased in the Belgian Congo to treat local ores formerly shipped to Hoboken, Belgium. The Congo interest already has an annual capacity of 10,000 to 12,000 tons.

The last complete investigation of the tin situation by a congressional committee brought forth the recommendation the United States should conduct a thorough prospecting of possible sources for tin in this country, as well as the establishment of a tin smelting industry and a government-financed research for substitutes.

As for tin supplies from domestic ore, prospects appear slim. Alaska supplied almost the entire output of 34 gross tons and it is indicated the present known properties will be exhausted within four or five years. Small quantities of ore also have been produced in South Dakota, Montana and New Mexico.

For years Straits brands produced in Malaya have been preferred by users of tin plate in the United



Charles B. Henderson

President of the RFC-sponsored Metals Reserve Co. He also is a director of the Reconstruction Finance Corp. and a former United States senator from Nevada.

States. Other grades, such as Dutch and English refined, are said to be suitable but Straits brands generally are specified.

The bureau of mines reports the tin plate trade purchased 41,492 tons of tin in 1939, of which 83 per cent or 34,410 tons was Straits, 10 per cent or 4,170 tons English refined, and 3 per cent or 1,167 tons Katanga (Belgium Congo). Banka tin accounted for 905 tons and Tulip for 545. Both are Dutch brands. Chinese metal was sixth at 153 tons.

When tin was produced in this country from Bolivian ores at the time of the last war, most of it went into babbitt, solder and the like and comparatively little to the tin plate trade which now accounts for more than half of total used. Now, some tin consumers at least regard Bolivian ore fully suitable for tin plate. Although the ore is high in arsenic and antimony, one large user points out that conversion into acceptable tin is simply a matter of good smelting practice. English tin smelted from Bolivian ore has been used in conjunction with Straits metal without difficulty although the former ran high in arsenic.

Fears that outside supplies might be cut off are linked with reports that the materials division of the national defense advisory commission already has held conferences with four leading metal producing companies working toward the erection of a tin smelting plant in the United States.

So far, it is reported, plans for such a smelter have not reached the formative stage. It is considered more likely that moves would be made in the direction of expanding small production facilities recently set up in the United States. Late in 1939 it was reported that Phelps Dodge Corp. and the American Metal Co. Ltd. were establishing plants for treatment of Bolivian and other available ores.

Large Ore Supply in Bolivia

At the same time it was said contracts had been concluded for importing several thousand tons of ore. From the amount of ore brought in so far, however, it is evident production has been small. It is understood that each of these plants has a capacity of about 50 tons monthly and is capable of producing metal acceptable to the tin plate industry.

Bolivia is one of the leading tin producing countries and would be the logical source for ore. In 1939, Bolivia accounted for production of 27,215 tons of tin compared with 55,590 tons for Malaya and 31,281 tons for Dutch East Indies. Bolivian production probably could be stepped up if necessary as indicated by the

fact that it has been running below the permissible total set up under the cartel scheme.

Whether Bolivian ores can be made available in quantity, remains a question inasmuch as the 50 per cent of the properties involved are controlled by Patino Mines & Enterprises Consolidated, closely affiliated with Consolidated Tin Smelters Ltd., large British refining interest.

"Still Cheaper in England"

Particularly significant is the statement made recently by Simon I. Patino, president, Patino Mines: "Our company's tin, together with that of other companies in which I am personally interested, as well as practically all the high-grade concentrates produced in Bolivia, continues to be smelted in England, where in spite of increased costs caused principally by insurance against war risks, it is still cheaper than elsewhere to smelt and refine tin. This only serves to emphasize the fact that in normal times tin smelting in England is far more economical than in any other center."

Despite the above statement, it is indicated that Senor Patino, who also is Bolivian minister to France, shortly will arrive in the United States for the express purpose of discussing erection of a smelter, in-

asmuch as shipment of ore to England may be interrupted by the war. Reports from Bolivia also indicate the government favors direct shipment of ore to the United States, thus short-circuiting the trip to Britain. In any event, it is believed ore supplies could be obtained from independent mines.

The United States actually has produced no primary tin on a quantity basis since the period during and just after the World war. In 1916 the American Smelting & Refining Co. placed a plant in operation at Perth Amboy, N. J., with a capacity of about 11,000 tons per year. The company employed a fire-refining method with a secondary electrolytic process for the production of high-grade metal.

American Smelting made a determined effort to establish itself as a tin smelter and refiner over a period of nine years from 1916 to 1924, producing 45,190 tons of marketable tin, of which 7,452 tons was smelter production and 37,738 tons was first smelted and then electrolytically refined.

According to Charles Earl, vice president, operations were profitable in 1916 and 1917 but were decidedly unprofitable during the remaining seven years due to inability to meet competition of foreign smelters by reason of higher labor costs. For

Tin Consumption in United States

Year	Gross Tons					Total
	Tin, Terne Plate	Babbitt	Solder	Bronze, Tubes and Foil	Other	
1929	28,620	10,100	14,800	14,200	19,280	87,000
1930	26,795	6,300	11,500	10,900	16,105	71,600
1931	23,320	3,900	8,500	9,000	11,080	55,800
1932	16,130	2,400	5,200	7,600	9,270	40,600
1933	28,910	2,640	7,080	9,630	12,800	61,060
1934	25,080	2,810	8,620	10,400	6,370	53,280
1935	30,085	3,700	11,480	7,900	8,775	61,940
1936	36,975	5,000	11,880	10,300	9,855	74,010
1937	42,575	4,500	11,780	10,000	9,295	78,150
1938	25,475	2,810	7,820	7,000	7,515	50,620
1939	40,500	3,760	10,090	7,870	8,400	70,620
1940						
May	3,700	310	970	680	700	6,360
April	3,300	270	820	670	700	5,760
March	3,000	310	880	650	700	5,540
Feb.	3,200	280	800	630	700	5,610
Jan.	3,900	370	970	740	700	6,680

American Bureau of Metal Statistics.

World Production of Tin

(Expressed in terms of metal obtainable from ore in gross tons)

	1931	1932	1933	1934	1935	1936	1937	1938	1939
Malaya	54,908	29,742	24,904	34,059	45,955	66,806	77,542	43,247	55,945
Bolivia	30,739	20,584	14,725	20,634	27,168	24,074	25,024	25,371	27,185
Dutch E. I.	27,480	15,683	14,406	18,678	24,719	31,684	39,825	21,024	31,281
Siam	12,447	9,261	10,324	10,587	9,779	12,678	16,494	13,520	16,991
Nigerlat	7,772	4,263	3,762	4,996	7,029	9,634	10,468	7,305	10,855
China	6,236	7,125	8,200	7,878	9,500	10,500	10,500	11,000	11,540
Belgian Congo		689	1,956	4,356	6,118	7,302	9,024	7,471	9,778
India (Burma)	2,979	3,168	3,153	4,061	4,102	4,547	4,636	4,000	4,600
Australia	1,750	2,138	2,810	2,986	3,130	3,028	3,253	3,500	3,435
Great Britain	598	1,337	1,543	1,999	2,050	2,099	1,987	2,010	1,890
Others	4,741	4,866	4,897	5,598	7,422	8,057	9,524	9,412	9,670
Totals	149,650	98,856	90,680	115,832	146,972	180,409	208,277	147,860	183,170

Exports reported by International Tin Research and Development council; 1939 partly estimated.

the entire period the tin smelting operations resulted in a loss of \$2,160,085, and electrolytic refining in a loss of \$292,705.

In 1918, Williams, Harvey & Co., a New York corporation, placed a smelter in operation at Jamaica Bay on Long Island using Bolivian ore, with an annual output of about 12,000 tons of tin. Williams, Harvey & Co. Ltd., of England, National Lead Co., New York, and the Patino interests were associated with this project. The plant is reported to have achieved a high degree of technical efficiency but finally was closed in 1923 when it was decided various interests could be served to better advantage by producing metallic tin in the plants of Williams, Harvey & Co. in England. The English company now is associated with Consolidated Tin Smelters Inc., with plants both in England and Penang, Straits Settlement.

In case of an extreme emergency it is indicated production of metallic tin from secondary sources could be stepped up sharply for a short time. Tin has been recovered from tin plate scrap for many years, the principal interests being the Metal & Thermit Corp., New York, and the Vulcan Detinning Co., Sewaren, N. J. Last year detinners recovered 4200 tons, of which 3600 was in the form of metallic tin and 600 tons in chemicals.

Approximately 20,000 tons of secondary tin also is recovered annually from other sources such as babbitt and solder, but only about 70 per cent of this total is in the form of metallic tin, remainder being combined with other metals or in the form of chemicals. It is indicated that if necessary a larger proportion of metallic tin could be turned out. Germany, which had access to some Bolivian ore before the war, is deriving most of its tin requirements from secondary sources, it is said.

Tin Substitutes Sought

As more than 50 per cent of the tin imported into the United States is consumed in the tin plate trade, technical developments affecting containers are especially important. Considerable experimental work is under way looking toward the development of satisfactory substitutes for tin-coated steel for containers. So far no satisfactory substitute has been found for general adoption.

However, it appears a number of developments may have a cumulative effect on the consumption of tin, particularly in the event of an emergency.

At least two companies now are producing plate with the tin applied by electrodeposition which permits

coatings as light as 0.5 pound per base box compared with 1.5 pounds for standard plate, representing a saving of two-thirds. Some of the large can companies have been using this light-coated plate for two years in the making of cans for such purposes as paints, oils and other liquids of a noncorrosive nature and dry-pack products, including drugs, cocoa, coffee, tea and the like. The same plate is said to have even wider application if the interiors of the containers are coated with lacquer.

It also is reported that lacquer-coated steel may be used for many purposes, permitting the complete elimination of the tin under-coat. The steel is given a bright finish with tungsten carbide or other types of hard rolls and subsequently lacquered.

At least one of the can companies is producing beer containers fabricated from black plate and coated with a clear lacquer inside and aluminum-base lacquer outside. Experiments also have been made with silver nickel and aluminum coatings. Germany is reported to be using the latter metal successfully.

Progress also has been made outside the tin plate field. As an example, Buick will use steel-backed sintered copper-nickel connecting rod bearings with a thin wearing surface of high lead-babbitt in its 1941 engines. Cadmium and copper-lead bearings also are proving successful.

Substitutes are important, but at their present stage of development are far from solving the problem of tin supplies in case of an emergency. It is an essential metal in the manufacture of certain munitions and ordnance for the army and navy among which are a number of specific items as follows:

Army equipment—Machine guns, pistols, rifles, projectors, gun carriages, wagons, cars, fuse setters, adjustment and deflection boards, height and range finders, angle and observation instruments, repair kits, sound locators, gun predictors, time interval recorders, telescopes, tanks, trailers, tripods, trumpets, boilers and covers, dippers, refrigerators, cameras, thermometers, compasses, tractors, helmets, band instruments, water bags, buckets, tableware, engines, batteries, tachometers, machine gun mounts.

Navy equipment—Engines; bronzes for journals, gun mounts, rods, pipes, bomb fuses, propeller shafts, radio condenser casings, condenser heads, binnacles, cables, condenser tubes, torpedo tubes, valves, food containers, bomb cases, electrical connections, generators, radio circuits, compasses.

In addition there are many other

products common to commercial manufacture, from containers on through a long list of items for defense purposes, all requiring tin.

MANGANESE ORE ORDERED FOR GOVERNMENT STOCK

Anaconda Copper Mining Co., Anaconda, Mont., has received contract to furnish 240,000 gross tons of concentrated manganese ore to Metals Reserve Co., a government corporation, delivery to be at the rate of 80,000 tons annually. The ore will come mainly from Emma mine in Butte, operated under lease by Anaconda but owned by Butte Copper & Zinc Co. Arrangements have been made to ship the ore to government supply depots to establish a stock pile of manganese concentrates.

Anaconda will begin constructing immediately a \$1,000,000 smelting plant at Anaconda, and will be in production on the contract in six to nine months. The plant will have an annual capacity of approximately 100,000 tons of concentrates.

Continue Exporting No. 1 Scrap; Japan Buys More

PHILADELPHIA

While independent steel producers last week were preparing to petition the government to place all scrap exports under license control, dealers reported they had no difficulty in obtaining licenses to export No. 1 heavy melting, as covered in President Roosevelt's recent proclamation.

Japan has purchased several additional round lots, paying \$18.50 for No. 1 heavy melting, and \$17.50 for No. 2. The domestic market shows further strength.

An official definition of "No. 1 heavy melting scrap" makes it clear no other grade was intended to be included in license requirements. The definition was issued through the state department last week to collectors of customs. It is the same as that contained in a booklet on simplified commercial practice published by the bureau of standards, department of commerce, entitled "Classification of Iron and Steel Scrap."

This booklet prepared in co-operation with representatives of the scrap industry was issued originally in 1928, and the recommendations were reaffirmed in October, 1935, and again in January this year. The definition follows:

"No 1 heavy melting steel scrap: Steel scrap 1/2-inch and over in thickness, not over 18 inches in width, and not over 5 feet long. Individual pieces must be cut into such shape that they will be free from attachments and will lie flat in a charging

box. Cut boiler plate must be practically clean and free from stay bolts and not over 3 feet long and lie reasonably flat in charging box. Smaller dimensions of plate scrap may be required upon mutual agreement between buyer and seller.

"May include structural shapes, angle bars and plates, steel castings, heavy chain, carbon tool steel, heavy forgings, forge butts and similar heavy material.

"This grade may also include new mashed pipe ends, original diameter 4 inches and over, thoroughly flattened, sheet bars, billets, blooms, rail ends, railroad steel, and wrought scrap, such as angles, splices, couplers, knuckles, short rails, draw bars, cut cast-steel bolsters, coil and leaf springs (all coil springs $\frac{3}{4}$ -inch or larger in diameter).

"Does not include needle or skeleton plate scrap, agricultural shapes,

annealing pots, boiler tubes, grate bars, cast iron, malleable iron, or curly or unwieldy pieces."

3,526,000 TONS OF SCRAP CONSUMED IN JULY

■ Domestic consumption of iron and steel scrap in July, estimated at 3,526,000 gross tons by the Institute of Scrap Iron and Steel Inc., New York, practically equaled the 1940 monthly high of 3,581,000 tons in January. In July, 1939, the melt was only 2,247,000 tons.

Average monthly consumption thus far in 1940 has been 3,165,000 tons, compared with 2,703,000 tons in 1939, and 1,794,000 tons in 1938. Indications are that 1940 consumption will be close to the prior record of 38,006,000 tons, established in 1937.

Excess Profits Tax Expected To Apply to Only 70,000 Companies

WASHINGTON

■ Hearings on the excess profits tax bill were begun last week before a joint committee of the house ways and means committee and the senate finance committee. The bill is expected to provide for five-year amortization and to repeal the Vinson-Trammell act limiting profits on airplanes and naval vessels. It is understood the bill proposes to collect \$300,000,000 during the first year, and more in later years. Effort is being made to expedite passage, on urgent appeal from the national defense advisory committee.

Tax plan agreed upon by the ways and means subcommittee will apply to corporations alone, and only to about 70,000 of the nation's 475,000 corporations. Most of them will escape the heavy levy by exemption of the first \$5000 excess profits.

Alternative Plan Offered

Taxpayer would have the choice of two plans, one offered by experts of the joint congressional committee on internal revenue taxation and the other by the treasury.

Under the first alternative a corporation would pay the excess profits levy on those profits in excess of average profits for the base period 1936-1939 inclusive.

Under the second plan, offered by the treasury, a corporation would not have to pay excess profits taxes on earnings less than 6 per cent of the first \$500,000 of invested capital and 4 per cent of capital beyond that.

Aside from these minimum ex-

emptions of 6 and 4 per cent, the excess profits rates would apply to profits exceeding the average profit for the base period 1936-1939, if that average profit was not more than 10 per cent of capital. The new rates would apply to profit above the 10 per cent level, irrespective of past earnings.

Rates which would be applicable to whichever of the two plans the taxpayer might choose begin at 25 per cent of the excess profits in the first bracket, are 30 per cent in the second, and 40 per cent after that.

Brackets are based on the amount of excess profits credit which is granted to the taxpayer. Excess profits not above 10 per cent of the excess profits credit are in the first bracket, those not above 20 per cent are in the second, and the balance are in the third.

"Immediate amendment of the tax law to allow companies to recover the cost of special plants and equipment needed to meet our military and naval needs and to prevent 'profiteering' would remove a serious bottleneck now holding back progress in the defense program," it was stated last week by the National Association of Manufacturers.

H. W. Prentis Jr., president, transmitted the association's views to the members of the house committee. The statement continued:

Prompt passage of a nine-point cost-recovery amortization provision would encourage the erection of factories and machinery which must be built to satisfy urgent national defense needs although these new facilities would be entirely worth-

less at the end of the emergency period.

If the pending excess-profits tax cannot be hastened because of its complex nature, a sound amortization provision should be considered the first order of business and put into law at once. It is generally accepted that the recovery of capital losses on defense facilities and the tax upon excess profits will both apply to this year's earnings so that they need not necessarily be linked together in a single bill.

Since the very beginning of the national emergency, business men have made clear their objections to "profiteering." A new excess profits tax unless carefully drawn with due consideration for all the factors involved, might not necessarily prevent "profiteering," and could seriously interfere with production . . .

An N. A. M. government finance subcommittee after careful study suggests as a necessary safeguard to companies who during recent depression years have suffered losses or had abnormally low earnings that an option be granted of computing excess profits on the basis of either invested capital or prior earnings. Invested capital should take into consideration all actual capital used in the business, with proper protection given to companies financing operations with borrowed funds.

INTEREST COST ALLOWED IN NAVY, AIRCRAFT CONTRACTS

Secretary of the Treasury Morgenthau last week announced a bureau of internal revenue ruling affecting the Vinson-Trammell act that will enable contractors to include as a cost the interest paid on money borrowed for the acquisition of special facilities in connection with contracts under the national defense program. The Vinson-Trammell act limits the profits on contracts and subcontracts for naval vessels, army and navy aircraft and portions thereof.

Ruling, covering circumstances not contemplated when the original regulations governing the act were issued, is expected to facilitate the furnishing of capital and credit to industries desiring to participate in the defense program. It also will make it possible for small contractors to receive the same net profit on emergency orders for the war and navy departments as contractors with ample liquid capital. Interest on working capital necessarily required to operate emergency facilities also will be allowed as a cost, with the rate limited in both cases to 4 per cent.

For the interest cost to be allowed, the bureau of internal revenue will require certification from the secretary of war or the secretary of the navy that the money has been borrowed to pur-

chase equipment or erect facilities necessary during the existence of the national emergency declared by the President on Sept. 8, and that the government will have priority in the use of such facilities throughout their life.

COMMERCIAL TREATY WITH RUSSIA RENEWED FOR YEAR

Commercial agreement between United States and Union of Soviet Socialist Republics which became effective Aug. 6, 1937, and was twice renewed for successive periods of one year was again continued, last week, until Aug. 6, 1941.

As in previous agreements, the Soviet government stated its economic organizations intend to purchase during the next 12 months American goods to the value of at least \$40,000,000. The agreement takes into account possibility various export restrictions imposed by United States in carrying out its national defense program may make it impossible for these organizations to carry out their intentions.

United States undertakes to continue according Soviet Union commerce unconditional most-favored-nation treatment, with a reservation in respect to coal, deemed neces-

sary because of coal-tax provisions in the revenue act of 1932.

Pittsburgh Coke & Iron Increases Ore Holdings

■ Pittsburgh Coke & Iron Co., Pittsburgh, has acquired a controlling interest in the Davidson Ore Mining Co., Buffalo, which has three mines in the Iron River area of the Menominee range. The Davidson company also owns a minority interest in the Struthers Iron & Steel Co., Struthers, O. Pittsburgh Coke & Iron Co. will have one director on the Struthers board of five members. The Davidson mines are underground and have produced 300,000 to 400,000 tons per season in years of heavy demand. In 1939 output was 50,784 tons.

Evergreen Mines Co., Crosby, Minn., has leased the Greenway mine on the Mesabi range, near Grand Rapids, Minn., owned by the Greenway Mining Co., P. H. Nelson, Duluth, president. Dewatering and further stripping will be done before actual production is started. Initial shipments will be direct but much of the ore will be beneficiated. Available ore in the mine is estimated at 1,679,979 tons.

Contracts Awarded by Navy and War Departments

■ United States navy department, bureau of supplies and accounts, last week awarded the following contracts:

Timken Roller Bearing Co., Steel and Tube division, Canton, O., alloy steel bar, \$40,939.63.

National Tube Co., Washington, alloy steel tubing, \$28,415.73.

United Aircraft Corp., Pratt & Whitney Aircraft division, East Hartford, Conn., aircraft engine parts, \$11,944.

Babcock & Wilcox Co., Barberton, O., bladed alloy cones, \$16,103.

Robins Dry Dock & Repair Co., New York, conversion of U. S. S. LARAMIE, \$656,460.

Vickers Inc., Detroit, hydraulic pumps, \$185,754.80.

Buda Co., Washington, diesel engines, \$261,938.50.

National Supply Co., Holmesburg, Philadelphia, marine diesel engine, \$9125.

Aluminum Co. of America, Washington, pistons, \$5316.98.

Latrobe Electric Steel Co., New York, tool steel, \$56,605.75.

Great Lakes Steel Corp., Ecorse, Detroit, sheet steel, \$5257.74.

American Rolling Mill Co., Middletown, O., sheet steel, \$5467.51.

Inland Steel Co., Chicago, sheet steel, \$39,579.78.

Weirton Steel Co., Weirton, W. Va., sheet steel, \$17,840.51.

Morris, Wheeler & Co. Inc., Philadelphia, sheet steel, \$120,514.31.

Crucible Steel Co. of America, New York, tool steel, \$45,592.03.

Imperial Electric Co., Akron, O., motor-generator sets, \$10,764.

Kollsman Instrument division of Square D Co., Elmhurst, N. Y., horsepower meters, \$6000.

E. I. du Pont de Nemours & Co., Smokeless Powder division Wilmington, Del., nitric acid equipment, \$412,472.

Foundry Equipment Co., Cleveland, core and mold ovens, \$26,400.

Carnegie-Illinois Steel Corp., Washington, steel, \$135,980.87.

Jessop Steel Co., Washington, Pa., steel, \$13,060.21.

Carnegie-Illinois Steel Corp., Washington, steel, \$76,078.52.

Timken Roller Bearing Co., Steel and Tube division Canton, O., steel, \$18,730.60.

American Rolling Mill Co., Middletown, O., steel, \$60,988.39.

Oliver Farm Equipment Sales Co., Chicago, tractors, \$5032.

C-O-Two Fire Equipment Co., Newark, N. J., fire extinguishers, \$8435.18.

Monarch Machine Tool Co., Sidney, O., engines lathes, \$6478.

Aldrich Pump Co., Allentown, Pa., centrifugal pumps, \$6691.

Ajax Mfg. Co., Cleveland, forging, bolt and rivet machines, \$21,768.

Lionel Corp., New York, compensating binnacles, \$15,000.

Atlas Imperial Diesel Engine Co., Chicago, generator unit \$9824.01.

American Laundry Machinery Co., Cincinnati, single geared washers \$28,489.

Following contracts were awarded by bureau of yards and docks, navy department:

Arundel Corp. and Consolidated Engi-

neering Co., Baltimore, aviation facilities at naval air station, San Juan, P. R., and Charlotte Amalie, V. I., \$3,272,000.

Hawallan Dredging Co., Ltd., Raymond Concrete Pile Co. and Turner Construction Co., aviation facilities at naval air station, Midway Island, \$1,337,500.

Siems Spokane Co., Johnson, Drake & Piper, Inc., and Puget Sound Bridge & Dredging Co., aviation facilities at naval air stations, Kodiak, Alaska, and Unalaska, Alaska, \$4,305,000.

Lee T. Turner, Washington, plant addition to Washington navy yard, \$95,676.

Two Air Compressors at navy yard, New York, to Hardie-Tynes Mfg. Co., Birmingham, Ala., \$47,300.

Boiler repairs and piping at naval Hospital, Washington, to Continental Contracting Co., Fort Dodge, Iowa, \$7550.

Navy department also awarded these contracts:

Improvement of power plants at navy yards, Philadelphia, and Charleston, S. C. and Marine Barracks, Parris Island, S. C., to United Engineers and Constructors Inc., Philadelphia, \$1,260,000.

Torpedo shop and storage at naval mine depot, Yorktown, Va., to O. T. Graham & Co. Inc., Richmond, Va., \$68,700.

United States war department last week awarded the following contracts:

Ordnance Department Awards

White Motor Co., Cleveland, O., automotive equipment, \$5,491,188.

Barnard Aviation Equipment Co. Inc., Ashley, Pa., ammunition accessories, \$933,550.

Bendix Aviation Corp., Elmira, N. Y., aircraft weapons, \$2,545,000.

Aetna-Standard Engineering Co., Youngstown, O., gun carriages, \$1,703,050.24.

Doehler Die Casting Co., Pottstown, Pa., ammunition parts, \$141,946.70.

Pollak Mfg. Co., Arlington, N. J., ammunition parts, \$955,350.

Stewart-Warner Corp., Chicago, ammunition parts, \$506,001.60.

Safety Car Heating & Lighting Co., Inc., New York, military equipment, \$129,396.09.

Builders Iron Foundry, Providence, R. I., military equipment, \$29,501.

Parish Pressed Steel Co., Reading, Pa., artillery carriages, \$1,427,296.

American Brass Co., Waterbury, Conn., metal for cartridge cases, \$60,424.40.

Stewart-Warner Corp., Chicago, ammunition parts, \$865,359.44.

Corps of Engineers Awards

General Electric Co., Schenectady, N. Y., anti-aircraft equipment, \$4,671,000.

American Car & Foundry Co., New York, ponton equipment, \$9128.47.

Electric Wheel Co., Quincy, Ill., parts for trailers, \$8427.20.

Flour City Ornamental Iron Co., Minneapolis, parts for footbridges, \$9143.09.

American Bridge Co., Ambridge, Pa., field fortification equipment, \$11,592.

Virginia Bridge Co., Roanoke, Va., parts for loading bridges, \$20,056.

Wood Roadmixer Co., Cheyenne, Wyo., road construction equipment, \$8989.

American Car & Foundry Co., New York, ponton equipment, \$17,158.

Ensign-Bickford Co., Simsbury, Conn., demolition equipment, \$34,780.

Evinrude Motors, Milwaukee, motors, \$29,246.44.

Cincinnati Tool Co., Cincinnati, ponton equipment, \$15,412.07.

Sperry Gyroscope Co. Inc., Brooklyn, N. Y., military equipment, \$7,060,650.

Ingersoll-Rand Co., Washington, circular saws, \$91,938.

La Crosse Trailer & Equipment Co.,

La Crosse, Wis., trailers, \$60,894.

Air Corps Awards

Leece-Naville Co., Cleveland, airplane parts, \$217,420.
 Republic Aviation Corp., Farmingdale, L. I., N. Y., airplane parts, \$114,636.84.
 Hell Co., Milwaukee, trailers, \$235,980.
 Pioneer Instrument division Bendix Aviation Corp., Bendix, N. J., airplane parts, \$24,567.

Signal Corps Awards

Strömberg-Carlson Telephone Mfg. Co., Rochester, N. Y., field telephones, \$198,000.
 Graybar Electric Co., New York, field telephones, \$162,000.
 Circle Wire & Cable Co., Maspeth, L. I., N. Y., wire, \$254,966.
 Phelps Dodge Copper Products Co., New York, wire, \$183,413.31.
 Graybar Electric Co. Inc., New York, wire, \$382,800.

Motor Vehicle Awards

General Motors Corp., Chevrolet division, Detroit, trucks, \$33,910.88.
 Yellow Truck & Coach Mfg. Co., Pontiac, Mich., trucks, \$15,254,786.04.

Quartermaster Corps Awards

J. B. Bertrand, Inc. and Peter Klewit Sons Co., Denver, runway for Lowry Field, Colo., \$32,966.
 A. T. Beckett, Oakland, Calif., radio operations building for McChord Field, Wash., \$9400.
 Industrial Heating & Engineering Co., Milwaukee, air corps oil storage and dispensing system for Chanute Field, Ill., \$9480.
 Pittsburgh-Des Moines Steel Co., New York, elevated steel tank for Westover Field, Mass., \$35,800.
 Moore Electric Co., Los Angeles, street lighting system for Hill Field, Utah, \$118,786.
 Foster & Creighton Co. Inc., Nashville, Tenn., supply building and engine repair shop for Southeast Air Depot, Tampa, Fla., \$1,433,400.
 Watt and Sinclair of Florida Inc., Palm Beach, Fla., temporary buildings at Orlando Airport, Fla., \$155,130.
 Ward Construction Co., Tampa, Fla., barracks and mess buildings at Orlando Airport, Fla., \$137,700.
 Douglas-Loeffler Co., Detroit, gasoline fueling system at Selfridge Field, Mich., \$76,370.
 Vulcanized Rubber Co., New York, safety razors, \$20,760.

Medical Department Awards

Westinghouse X-Ray Co. Inc., Long Island City, N. Y., X-ray machines, \$8570.
 Kelley-Koett Mfg. Co. Inc., Washington, radiographic fluoroscopic machines, \$7400.
 American Sterilizer Co., New York, sterilizing equipment, \$5317.50.
 Royal Typewriter Co. Inc., Washington, typewriters, \$12,481.
 Servel Inc., New York refrigerators, \$7300.80.
 Standard Surgical Instruments Co., New York, surgical instruments, \$7950.
 William Langbein & Bros., Brooklyn, N. Y., operating knives, \$7950.

Chemical Warfare Service Awards

Wickwire Spencer Steel Co., New York, tinsplate, \$26,828.
 N. Y. Thread Grinding Corp., New York, gages, \$7746.
 Ingersoll Rand Co., Philadelphia, air compressors, \$2953.75.
 Philip E. Lenderking, Baltimore, ventilating systems, \$1640.
 Chas. Fisher Spring Co., Brooklyn, N. Y., wire clamps, \$1100.
 Aluminum Co. of America, Washington, supplies, \$1057.50.
 Beckley Perforating Co., Garwood, N. J., perforated tinsplate, \$3750.

Purchases Under Walsh-Healey Act

(In week ended July 27)

Iron and Steel Products

	Commodity	Amount
Western Pipe & Steel Co. of Calif., San Francisco	Ruys	\$109,742.50
Carnegie-Illinois Steel Corp., Washington	Bar steel	76,091.32
Doehler Die Casting Co., Pottstown, Pa.	Angletubes	82,660.00
H. H. Robertson Co., Pittsburgh	Skylight material	10,649.00
Parker Appliance Co., Cleveland	Fittings	19,257.00
Seattle Chain & Mfg. Co., Seattle	Chains, fittings	19,820.22
McKay Co., Pittsburgh	Chains, fittings	123,728.15
Stanley Works, New Britain, Conn.	Valve guards	16,000.00
Welker Mfg. Co., Cromwell, Conn.	Strap buckles	24,750.00
Independent Iron Works Ltd., Oakland, Calif.	Steel	10,469.83
American Cast Iron Pipe Co., Birmingham, Ala.	Cast-iron pipe	18,185.00
Taylor-Davis Inc., Philadelphia	Reinforcing bars	*9,432.36
Leach Co., Oshkosh, Wis.	Reel unit	378,150.00
Pacific Gear & Tool Works Inc., Los Angeles	Gate hoists	98,976.00
Charles Mundt & Sons, Jersey City, N. J.	Tinplate	32,564.00
Parrish Pressed Steel Co., Reading, Pa.	Towing bars	11,772.24
Colson Corp., Elyria, O.	Stand assemblies	33,281.25
Gilbert & Barker Mfg. Co., Springfield, Mass.	Water chests	28,685.84
Otis Elevator Co., Buffalo	Steel castings	*11,247.90
William Seringecour, Washington	Seaplane equipment	25,479.16
Keystone Steel & Wire Co., Peoria, Ill.	Nails, wire	*15,340.00
Truscon Steel Co., Los Angeles	Steel	16,042.50
Carnegie-Illinois Steel Corp., Pittsburgh	Steel	11,530.30
U. S. Steel Export Co., Washington	Steel piling, shapes	*21,004.49
S. Bлекman Inc., Weehawken, N. J.	Coffee urns, tables	135,765.18
Total		\$1,240,624.25

Nonferrous Metals and Alloys

International Nickel Co. Inc., New York	Nickel alloy	\$31,800.00
Bohn Aluminum & Brass Corp., Detroit	Aluminum	116,345.50
Riverside Metal Co., Riverside, N. J.	One cent blanks	21,687.50
Kennecott Sales Corp., New York	Copper	32,250.00
Revere Copper & Brass Inc., Baltimore	Condenser tubes	15,709.98
Phelps Dodge Copper Products Corp., New York	Condenser tubes	11,242.69
American Brass Co., Waterbury, Conn.	Gilding metal bands	33,966.00
American-LaFrance-Foamite Corp., Elmira, N. Y.	Fire extinguishers	Indefinite
Fyr-Fyter Co., Dayton, O.	Fire extinguishers	Indefinite
General Fire Truck Corp., Detroit	Extinguishers	Indefinite
Phister Mfg. Co., New York	Fire extinguishers	Indefinite
Pyrene Mfg. Co., Newark, N. J.	Fire extinguishers	Indefinite
Aluminum Goods Mfg. Co., Mantowoc, Wis.	Aluminum pitchers	21,170.00
Chase Brass & Copper Co. Inc., Waterbury, Conn.	Brass	118,417.80
Seovill Mfg. Co., Waterbury, Conn.	Cartridge cases	115,744.16
American Metal Co. Ltd., New York	Copper	33,150.00
International Silver Co., New York	Silver-plated ware	86,676.16
Bridgeport Brass Co., Bridgeport, Conn.	Cartridge cases	554,900.90
Total		\$1,193,060.69

Machinery and Other Equipment

Fairbanks, Morse & Co., Chicago	Propelling mach.	\$1,435,350.00
Ingersoll-Rand Co., New York	Pneumatic tools	36,877.27
Peter Peff, Superior Air Products Co., Newark, N. J.	Oxygen equipment	12,880.00
Gardner Denver Co., Washington	Compressors	22,061.14
Tobe Deutschmann Corp., Canton, Mass.	Filtering equipment	24,152.00
Allis-Chalmers Mfg. Co., Milwaukee	Tractors	44,381.25
Bay City Shovels Inc., Bay City, Mich.	Machinery parts	Indefinite
Caterpillar Tractor Co., Peoria, Ill.	Machinery parts	Indefinite
Gallon Iron Works & Mfg. Co., Gallon, O.	Machinery parts	Indefinite
Gar Wood Industries Inc., Detroit	Machinery parts	Indefinite
International Harvester Co. Inc., Washington	Tractors	50,021.22
Caterpillar Tractor Co., Peoria, Ill.	Tractors	28,356.10
Worthington Pump & Machinery Corp., Kansas City, Mo.	Air compressors	10,080.00
Kearney & Trecker Corp., Milwaukee	Milling machines	51,160.60
E. C. Brown Co., Rochester, N. Y.	Demustardizing apparatus	63,470.00
EX-Cell-O Corp., Detroit	Shell turning mach.	68,047.56
Swind Machinery Co., Philadelphia	Planer	19,962.00
Winds-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn.	Drills, lathes	162,550.00
Heald Machine Co., Worcester, Mass.	Cylinder grinders	59,280.00
Cincinnati Milling Machine & Cincinnati Grinders Inc. Cincinnati	Milling machines	128,056.00
Kingsbury Machine Tool Corp., Keene, N. H.	Machines	20,799.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Milling machines	107,325.03
E. C. Fuller Co., New York	Sewing machines	67,357.50
Leland-Gifford Co., Worcester, Mass.	Drilling machines	25,951.00
Austin-Hastings Co. Inc., Cambridge, Mass.	Planer-shapers	22,862.80
Browning Crane & Shovel Co., Cleveland	Cranes	199,200.00
Jones & Lamson Machine Co., Springfield, Va.	Shell turning mach.	41,461.30
Fairbanks, Morse & Co., Chicago	Propelling machinery	2,850,461.00
Austin-Hastings Co. Inc., Cambridge, Mass.	Planers	51,837.00
Total		\$5,603,939.77
Grand Total		\$8,037,624.72

*Estimated. †Purchases to be made when and if needed.

Canada To Add \$40,000,000 to War Plant Construction Work

TORONTO

■ EXPENDITURES made or authorized for new plants or plant extensions for manufacture of war materials in Canada now total \$130,000,000, according to C. D. Howe, minister of munitions and supplies. His department is planning additional construction work to cost \$40,000,000. It estimates that when the \$170,000,000 construction program is completed facilities will have been created for an annual production of more than \$300,000,000 worth of war materials.

At end of March, capital cost of plant construction in Canada had been assumed by 30 companies. By end of June some 50 new Canadian plants or extensions were being built on behalf of the two governments. In July, work was started on several more plants.

Canada's aluminum production, now 100,000 net tons annually, will be raised to 180,000 tons by plant additions under way.

Brass output is to be increased by a \$12,000,000 plant expansion at Montreal. To fabricate aluminum into sheets and shapes, \$20,000,000 is being spent.

A government sponsored company which provides machine tools purchased \$1,300,000 worth of such equipment on its own account and \$15,000,000 for government contractors last month.

Orders for 3200 planes costing \$110,000,000 have been placed with eight Canadian companies. Output of airplanes in Canada early next year is expected to be at the rate of 360 per month.

Orders for ammunition of all types, including parts, total \$70,000,000.

Nova Scotia Steel & Coal Co., New Glasgow, N. S., has received an order from the British purchasing commission for 100,000 shells. Four to six months will be required to install machinery and make alterations for their production.

Department of munitions and supply, Ottawa, last week placed 1295 orders totaling \$14,941,292. Most important contract awarded during the week was to Jacobs Aircraft Engine Co., Pottstown, Pa., totaling \$7,941,120. Contracts awarded to Canadian companies were as follows:

Mechanical transport: George W. Reed & Co. Ltd., Montreal, \$183,000; Eastern Steel Products Ltd., Montreal, \$65,120; Laurentide Equipment Co. Ltd., Montreal, \$18,154; Walter Klidde & Co. of Canada Ltd., Montreal, \$14,793; Dominion Rubber Co. Ltd., Ottawa, \$38,442; W. D. Beath & Son Ltd., Toronto, \$82,632; Dunlop Tire & Rubber Goods Co. Ltd., Toronto, \$337,045;

Goodyear Tire & Rubber Co. of Canada Ltd., Toronto, \$799,772; Massey-Harris Co. Ltd., Toronto, \$122,590; Firestone Tire & Rubber Co. of Canada Ltd., Hamilton, \$812,500; Cockshutt Plow Co. Ltd., Brantford, Ont., \$16,500; Gar Wood Industries of Canada Ltd., Windsor, Ont., \$39,111; Godfredson Ltd., Windsor, \$58,125; Kelsey Wheel Co. Ltd., Windsor, \$312,233.

Aircraft supplies: Jacobs Aircraft Engine Co., Pottstown, Pa., \$7,941,120; Irvin Air Chute Ltd., Fort Erie, Ont., \$184,287; Fleet Aircraft Ltd., Fort Erie, \$23,222; National Steel Car Corp. Ltd., Malton, Ont., \$20,871; Coulter Copper & Brass Co. Ltd., Toronto, \$27,966; De Havilland Aircraft of Canada Ltd., Toronto, \$41,940; G. H. Wood & Co. Ltd., Toronto, \$7250; MacDonald Bros. Aircraft Ltd., Ottawa, \$21,465.

Electrical equipment: Canada Wire & Cable Co. Ltd., Montreal, \$67,746; Canadian National Telegraph Co. Ltd., Montreal, \$7159; Canadian General Electric Co. Ltd., Ottawa, \$31,860; Northern Electric Co. Ltd., Ottawa, \$29,220; A. Shepard, Ottawa, \$42,336; Federal Wire & Cable Co. Ltd., Guelph, Ont., \$7128.

Miscellaneous: Ottawa Car & Aircraft Ltd., Ottawa, \$6712; J. F. Williamson Ltd., Saint John, N. B., \$15,056; Canada Car & Foundry Co. Ltd., Montreal, \$8570; Dominion Rubber Co. Ltd., Ottawa, \$48,250; General Steel Wares Ltd., Ottawa, \$7523; RCA Victor Co. Ltd., Ottawa \$22,680; Milner Rubber Co. Ltd., Granby, Que., \$48,250; Beatty Bros. Ltd., Fergus, Ont., \$22,680; Canadian Buffalo Sled Co. Ltd., Preston, Ont., \$7560; St. John Dry Dock & Shipbuilding Co., Saint John, N. B., \$10,356; Clarke Steamship Co. Ltd., Montreal, \$19,412; W. D. Beath & Son Ltd., Toronto, \$6014.

Munitions: Aluminum Co. of Canada Ltd., Montreal, \$111,300; Consolidated Mining & Smelting Co. of Canada Ltd., Montreal, \$276,768.

Brazilian Steelworks Commission Arrives

■ A commission from Brazil seeking financial and technical assistance to establish a steelworks in that country, arrived in New York last week. United States' Export-Import bank, as reported in STEEL, Aug. 5, p. 32, authorized a \$10,000,000 loan to be used for purchase of equipment in America for the plant.

The plant is to have an annual ingot capacity of approximately 300,000 tons. Finished steel output is to be devoted mainly to certain basic products, particularly structural shapes.

Heading the commission's technical corps is Col. Edmundo de Macedo Soares e Silva, who expects to spend about three months studying American engineering and production methods. He plans to return with a corps of technical experts to

aid in establishing the plant. President of the commission is Dr. Guilherme Guinle, a leading industrialist and financier. Another member is Dr. Ary F. Torres, an industrial engineer.

Commission members point out that Brazil possesses natural resources essential to a steel industry, including iron ore, coal, limestone and manganese. The iron ore, they say, is hematite containing upwards of 62 per cent iron. Communication with sources of coal is possible through rail and water transportation and manganese deposits are located close to the iron ore bodies, several of which are 350 miles or less from the coast.

Recommends Specific Job Training Program

■ Industry, needing more trained workers to expedite the national defense program, must teach many thousands how to perform one task on one machine, according to George T. Trundle Jr., president, Trundle Engineering Co., Cleveland. There is no time, he pointed out in an article published by the Association of Consulting Management Engineers Inc., New York, to make highly skilled mechanics of all new workers.

With proper instruction, Mr. Trundle continued, four to six weeks' training is sufficient. Declaring men can't be trained in classrooms, he advocated direct learning, on the job, from men skilled in machine operation and capable of teaching others.

Mr. Trundle declared false the general assumption we cannot even start a broad defense production program without vast quantities of new machines. There are, he asserted, thousands of machines now idle. Many are old, but may be adapted to single-purpose production required by national defense. Others, he said, could be easily rebuilt or repaired.

Rebuilding of Follansbee Plant Nears Completion

■ Construction work on the \$1,270,000 modernization program of Follansbee Steel Corp., Pittsburgh, preparatory to installation of equipment is nearing completion, according to John Follansbee, chairman.

"Revamping of the company's old open hearth building at Follansbee, W. Va., into a modern 63 x 168-foot brick, glass, and steel structure for housing two new cold-reducing mills has been completed. Foundations for one new mill are already installed, and those for the second mill will be completed this week," Mr. Follansbee said.

Iron and Steel Exports in First Half Increase 200 Per Cent

■ IRON and steel exports, scrap excluded, reached new heights in June with shipments of 617,678 gross tons, valued at \$38,794,157, according to the metals and minerals division, department of commerce. They were more than 30 per cent larger than the May total, 471,481 tons, valued at \$31,217,379, and three times as great as those of June, 1939—189,968 tons, valued at \$13,789,887.

For the first half, 1940 exports were 2,770,614 tons, valued at \$197,970,212, compared with 923,275 tons, valued at \$70,254,297 in same period last year, tonnage up 200 per cent.

Exports to Europe, North and Central America, the West Indies and the Far East were larger in June than in May but slight losses were shown in trade with South America and Africa. Shipments to Europe, reflecting a marked rise in exports to the United Kingdom, rose from 192,744 tons in May to 262,007 tons in June; trade with North and Central America increased to 119,420 tons from 80,812 tons and exports to the Far East totaled 112,609 tons, compared with 69,338 tons in May. Decrease of 2100 tons in shipments to South America, 100,580 tons in June against 102,683 tons in May, and the 2900 tons reduction in exports to Africa, 23,062 tons in June, 25,904 tons in May, were too small to indicate a trend.

United Kingdom Leads

Non-alloy steel ingots were the largest item in point of tonnage, 206,403 tons, of which 178,641 tons went to the United Kingdom, 12,781 tons to Canada and 10,291 tons to Japan. Second in volume was the 48,852-ton trade in non-alloy black sheets, Canada taking 20,619 tons, France 8246 tons and China 3023 tons. Tin plate exports totaled 33,386 tons, Argentina taking 4894 tons, Brazil 3585 tons, China 3174 tons and Japan 3120 tons.

The United Kingdom was the largest market in June, its purchases totaling 231,094 tons, with Canada second, 90,421 tons, Argentina third with 38,540 tons, China fourth with 27,129 tons and Japan fifth with 26,668 tons. Each of these markets took more tonnage in June than in May.

Scrap exports, 318,369 tons, valued at \$5,261,321, were slightly larger than the 312,483 tons, valued at \$5,199,424, exported in May but were far below the June, 1939, total of 398,888 tons, valued at \$5,692,273. Cumulative scrap exports for six months, 1,481,105 tons, valued at

\$25,128,578, were substantially less than in the comparable period in 1939, 1,788,752 tons, valued at \$26,262,850. Of the June, 1940, iron and steel scrap exports, 317,202 tons, the United Kingdom received 155,364 tons, Japan 56,766 tons and Canada 55,317 tons.

First half scrap exports include 459,449 tons to the United Kingdom, compared with 154,401 tons in the like 1939 period. Japan, second largest market, took 415,016 tons, compared with 1,039,257 in first half, 1939. Italy received 320,923 tons in the first six months this year, compared with 274,843 in the like period in 1939.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Articles	Gross Tons		Jan. through June 1940
	June 1940	May 1940	
Pig iron	30,915	23,606	130,936
Ferromanganese and spiegeleisen	777	3,431	10,097
Other ferroalloys	3,087	759	5,857
Ingot, blooms, etc.:			
Not containing alloy	206,403	129,304	620,120
Alloy, incl. stainless	9,525	3,980	18,208
Steel bars, cold fin.	2,815	3,210	21,567
Bars, iron	1,362	471	8,360
Bars, concrete	10,257	8,421	79,902
Other steel bars:			
Not containing alloy	29,434	36,901	181,421
Stainless steel	33	156	529
Alloy, not stainless	3,006	2,805	14,105
Wire rods	28,036	16,796	103,184
Boiler plate	754	802	5,512
Other plates, not fab.:			
Not containing alloy	48,551	35,716	213,655
Stainless steel	107	25	236
Alloy, not stainless	125	301	1,349
Skelp, iron or steel	11,290	4,799	31,421
Sheets, galv. iron	1,702	847	4,844
Sheets, galv. steel	13,200	10,931	83,828
Sheets, "black" steel:			
Not containing alloy	48,852	31,989	226,507
Stainless steel	151	62	982
Alloy, not stainless	509	308	3,568
Sheets, black iron	2,239	1,839	16,852
Strip steel, cold-rolled:			
Not containing alloy	4,317	3,645	24,574
Stainless steel	49	44	321
Alloy, not stainless	35	29	203
Strip steel, hot-rolled:			
Not containing alloy	10,028	8,560	63,468
Stainless steel	1	1	43
Alloy, not stainless	58	45	297
Tin plate, taggers' tin	33,386	29,537	264,549
Terne plate (including long ternes)	688	727	3,128
Tanks, except lined	2,546	1,477	14,194
Shapes, not fabricated	26,777	15,766	106,695
Shapes, fabricated	9,123	6,650	38,721
Plates, fabricated	1,560	1,063	8,862
Metal lath	31	228	751
Frames and sashes	59	373	909
Sheet piling	3,105	1,009	6,870
Rails, 60 lbs.	2,227	11,589	40,248
Rails, under 60 lbs.	2,635	4,100	11,926
Rails, relaying	180	1,182	6,078
Rail fastenings	429	1,333	4,852
Switches, frogs, crsgs.	139	169	1,979
Railroad spikes	239	523	2,563
Railroad bolts, nuts, etc.	187	297	1,255
Boiler tubes, seamless	1,378	1,446	10,331
Boiler tubes, welded	269	158	1,143
Pipe:			
Seamless casing and oil line	7,081	11,198	64,357
Do., welded	1,040	1,472	19,703
Seamless black	3,455	2,051	15,978
Pipe fittings:			
Mall. iron screwed	306	291	2,439
Cast-iron screwed	369	239	1,520
Pipe and fittings for:			
Cast-iron pressure	5,727	9,781	27,247
Cast-iron soil	1,513	1,752	7,886

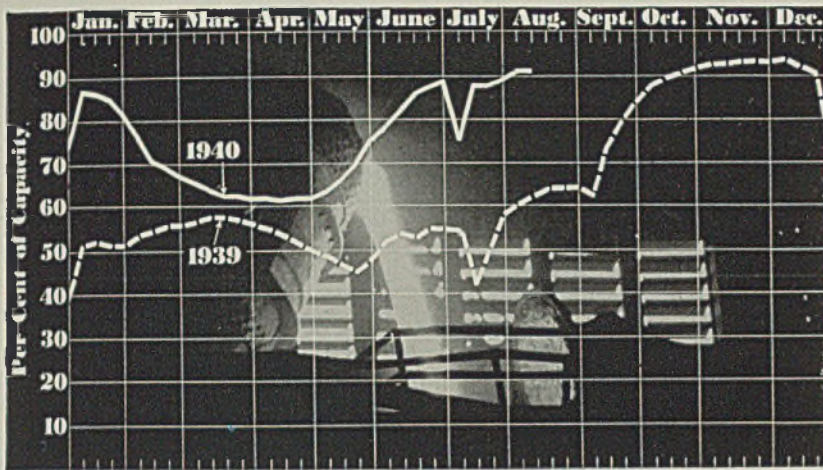
U. S. FOREIGN TRADE IN IRON AND STEEL, INCLUDING SCRAP

	Gross Tons			
	1940		1939	
	Exports	Imports	Exports	Imports
Jan.	583,521	8,274	362,672	27,664
Feb.	671,301	6,740	359,690	19,149
Mar.	663,980	5,096	474,360	25,369
April	612,906	6,674	394,008	44,083
May	783,964	7,759	532,641	28,142
June	936,047	5,505	588,856	32,587
July			513,664	30,851
Aug.			477,078	28,328
Sept.			575,613	29,874
Oct.			591,856	19,189
Nov.			605,555	15,216
Dec.			600,437	14,709
Total			6,076,429	315,161

Articles	June 1940		May 1940		Jan. through June 1940
	June 1940	May 1940	June 1940	May 1940	
Pipe, welded:					
Black steel	4,938	2,401	19,825	2,954	
Galv. wrought-iron	616	347	2,954	26,715	
Galv. wrought-iron	4,432	4,422	4,167	7,644	
All other pipe, fittings	1,217	294	4,167	7,644	
Wire:					
Plain iron or steel	7,655	5,991	43,667	27,417	
Galvanized	5,953	5,596	15,569	2,290	
Barbed	3,658	3,552	2,290	3,24	
Woven-wire fencing	308	486	3,24	1,145	
Woven-wire screen			1,145	5,027	
Insect cloth:					
Other	57	67	603	1,731	
Wire rope and cable	171	195	1,731	8	
Wire strand	683	1,065	8,749	27,842	
Electric welding rods	38	78	484	381	
Tacks	344	251	2,519	2,440	
Card clothing	2	1	2,440	6,593	
Other wire	1,034	1,104	1,208	812	
Wire nails	5,707	3,834	207	2,008	
Horseshoe nails	86	26	207	2,008	
Tacks	45	57	2,008	2,440	
Other nails, staples	605	554	2,440	2,440	
Ordinary bolts, machine screws	1,675	1,496	2,440	2,440	
Castings:					
Gray iron (incl. semisteel)	394	415	2,305	1,032	
Malleable-iron	225	221	1,032	985	
Steel, not alloy	70	165	985	763	
Alloy, incl. stainless	65	57	763	6,593	
Car wheels, tires, and axles:					
Wheels and tires	1,350	1,068	2,440	2,008	
Axles, no wheels	245	248	2,008	812	
Axles with wheels	31	2	207	2,008	
Horseshoes and calks	25	34	2,008	2,440	
Forgings, n.e.s.:					
Not containing alloy	2,898	1,730	11,673	2,440	
Alloy, incl. stainless	568	675	2,440	2,440	
Total	617,678	471,481	2,770,614	1,469,543	
Scrap, iron and steel	317,202	310,069	1,469,543	2,691	
Scrap, tin plate	158	165	2,691	2,691	
Tin plate circles, strips, cobbles, etc.	457	290	2,691	4,906	
Waste-waste tin plate	319	1,849	4,906	1,375	
Terne plate clippings and scrap	233	110	1,375	1,481,105	
Total scrap	318,369	312,483	1,481,105	4,251,719	
GRAND TOTAL	936,047	783,964	4,251,719	368,437	
Iron ore	278,689	86,075	368,437		

■ June farm equipment exports were valued at \$7,179,482, compared with \$9,555,833 in May, a decrease of approximately 25 per cent, due mainly to seasonal influences. In June, 1939, the exports were \$7,334,077. According to the machinery division, department of commerce, tillage implements were exported to the value of \$788,038, compared with \$958,004 in May and \$550,760 in June, 1939.

Tractor exports in June were valued at \$4,414,809, in May \$7,139,935 and in June, last year, \$4,387,011.



PRODUCTION... Steady

■ STEELWORKS operations last week held unchanged at 90½ per cent of capacity. Three districts advanced, six had fractional losses and three held the preceding week's rate. A year ago the rate was 62 per cent; two years ago, 40 per cent.

Detroit—Repair work on two open hearths caused a decline of 6 points to 93 per cent.

St. Louis—Unchanged at 62½ per cent. An additional open hearth this week will raise the rate to 65 per cent.

Cleveland—Rose 4½ points to 85 per cent on small gains by all producers.

Cincinnati—Declined 3 points to 78 per cent, with an upturn indicated shortly.

Birmingham, Ala.—Steady at 88

per cent, 21 open hearths active.

Youngstown, O.—Down 3 points to 82 per cent as two open hearths were taken off for repairs, 65 remaining in operation, with three bessemerers. This week an advance of 2 points is scheduled.

Pittsburgh—Loss of ½-point to 86 per cent is result of vacations at some works. Another slight drop this week is expected.

Chicago—Off ½-point to 96½ per cent due to furnace changes and repairs. One small interest in-

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Aug. 10	Change	Same week 1939	1938
Pittsburgh	86	- 0.5	52	30
Chicago	96.5	- 0.5	56	33.5
Eastern Pa.	89	+ 1	43	30
Youngstown	82	- 3	55	43
Wheeling	99	+ 1	79	54
Cleveland	85	+ 4.5	80	38
Buffalo	88.5	- 2	60.5	42
Birmingham	88	None	70	50
New England	80	None	70	40
Cincinnati	78	- 3	57	65
St. Louis	62.5	None	54.5	30
Detroit	93	- 6	64	52
Average	90.5	None	62	40

creased output substantially but small curtailments by other producers more than offset this. Three plants are above theoretical capacity.

Central eastern seaboard—With one large interest operating at 101 per cent of theoretical capacity the district rate is up 1 point to 89 per cent, which is expected to continue this week.

Wheeling—Moved up 1 point to 99 per cent, with no change indicated for this week.

Buffalo—Off 2 points to 88½ per cent. Open hearths under repair will resume this week. Hanna Furnace Corp. has blown in its last blast furnace, giving National Steel Corp., its parent organization, 100 per cent operation. The Buffalo furnace produces merchant iron.

New England—Steady at 80 per cent, with the same rate expected this week.

Steel Ingot Statistics

Period	Calculated Monthly Production—All Companies		Calculated Weekly production, all weeks of companies in month		Number of			
	Net tons	Per cent capacity	Net tons	Per cent capacity				
1940	Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.							
Jan.	5,369,601	86.40	285,714	56.10	5,655,315	84.11	1,276,595	4.43
Feb.	4,203,508	72.37	205,527	43.19	4,409,035	70.16	1,064,984	4.14
March	4,073,196	65.54	191,559	37.62	4,264,755	63.42	962,699	4.43
April	3,798,371	63.11	176,335	35.76	3,974,706	61.04	926,505	4.29
May	4,582,694	73.74	258,709	50.80	4,841,403	72.00	1,092,867	4.43
June	5,228,529	86.88	304,381	61.72	5,532,910	84.97	1,289,723	4.29
July	5,272,708	85.03	322,362	63.44	5,595,070	83.40	1,265,853	4.42
7 mos.	32,528,607		1,744,587		34,273,194		1,126,296	30.43
1939	Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.							
Jan.	3,413,783	55.35	165,080	27.22	3,578,863	52.83	807,870	4.43
Feb.	3,149,294	56.55	219,621	40.10	3,368,915	55.07	842,229	4.00
March	3,621,177	58.71	217,950	35.93	3,839,127	56.67	866,620	4.43
April	3,122,418	52.27	230,356	39.22	3,352,774	51.11	781,532	4.29
May	3,104,697	50.34	190,467	31.40	3,295,164	48.64	743,829	4.43
June	3,314,012	55.48	209,868	35.73	3,523,880	53.71	821,417	4.29
July	3,308,029	53.75	256,798	42.43	3,564,827	52.74	806,522	4.42
7 mos.	23,033,410		1,490,140		24,523,550		809,624	30.29
Aug.	3,965,515	64.29	276,479	45.58	4,241,994	62.62	957,561	4.43
Sept.	4,436,792	74.45	332,676	56.77	4,769,468	72.87	1,114,362	4.28
Oct.	5,626,685	91.22	453,492	74.77	6,080,177	89.75	1,372,500	4.43
Nov.	5,694,788	95.34	452,995	77.12	6,147,783	93.71	1,433,050	4.29
Dec.	5,468,880	88.87	353,134	58.35	5,822,014	86.13	1,317,198	4.42
Total	48,226,070	66.43	3,358,916	47.05	51,584,986	64.70	989,355	52.14

The percentages of capacity for 1939 are calculated on weekly capacities of 1,392,331 net tons open hearth ingots and 136,918 net tons Bessemer ingots, total 1,529,249 net tons; based on annual capacities as of Dec. 31, 1938, as follows: Open hearth ingots, 72,596,153 net tons; Bessemer ingots, 7,138,880 net tons.

The percentages of capacity operated for 1940 are calculated on weekly capacities of 1,402,899 net tons open hearth ingots and 114,956 net tons Bessemer ingots, total 1,517,855 net tons; based on annual capacities as of Dec. 31, 1939 as follows: Open hearth ingots, 73,343,547 net tons; Bessemer ingots, 6,009,920 net tons.

July Ingot Output Up Despite Holiday Break

■ July open-hearth and bessemer steel ingot production totaled 5,595,070 net tons, according to the American Iron and Steel institute. This was slightly greater than the June output of 5,532,910 tons, despite holiday and vacation shut-downs in July, and 57 per cent above the 3,564,827 tons made in July, 1939.

Calculated weekly ingot output in July was 1,265,853 tons, slightly less than the June weekly average of 1,289,723 tons. In July, 1939, the weekly average was 806,522 tons.

In July production was at an average rate of 83.40 per cent of capacity, compared with 84.97 per cent in June and with 52.74 per cent in July, 1939.

Total output for seven months this year is 34,273,194 tons, compared with 24,523,550 tons in the like period last year, an increase of approximately 40 per cent.

MEN of INDUSTRY

CHARLES R. MILLER JR. has been appointed director of purchases, United States Steel Corp. of Delaware, with headquarters at Pittsburgh. He takes over the duties, with respect to purchases, of Charles H. Rhodes, vice president, who as noted in STEEL, Aug. 5, p. 30, has been transferred to Chicago.

Frank J. Rief, purchasing agent, Chicago district, Carnegie-Illinois Steel Corp., will assume responsibilities of all purchases for Carnegie-Illinois, effective Aug. 15. He will continue to have his office in Chicago, and will be assisted in Pittsburgh by R. L. Van Cleve, and in Chicago by H. G. Elder.

Mr. Rief has been with the corporation 28 years, first at the South Chicago works and since 1916 in Chicago in the purchasing department. Mr. Van Cleve has been assistant purchasing agent, Pittsburgh district, under Mr. Miller, while Mr. Elder has been assistant purchasing agent, Chicago district.

Craig Hampton is now superintendent of maintenance, Copperweld Steel Co., Warren, O. He previously was identified with the steel and tube division of Timken Roller Bearing Co., Canton, O.

Charles L. McCuen, general manager, Oldsmobile division, General Motors Corp., Lansing, Mich., has been named vice president of the corporation and has been transferred to the central office in charge of engineering activities. In his new post he succeeds O. E. Hunt, who has been made a member of the policy committee with specially assigned duties. Announcement of these and other changes was made by Alfred P. Sloan Jr., chairman,



Charles R. Miller Jr.

following a recent board of directors meeting. Both Mr. McCuen and Mr. Hunt are former members of the engineering staff of Packard Motor Car Co.

Sherrod E. Skinner, general manager, Ternstedt division of General Motors, has been appointed general manager of Oldsmobile, succeeding Mr. McCuen. He has been active with Ternstedt since 1930. He is succeeded there by Joseph W. Jackson, works manager.

Frederick C. Kroeger, general manager, Delco-Remy division of General Motors, Anderson, Ind., and lately directing activities of the Allison Engineering division in Indianapolis, has been named general manager of Allison. Mr. Kroeger succeeded C. E. Wilson, now acting president of General Motors, as head of Delco-Remy.

Ollie V. Badgley, factory manager at Delco-Remy, becomes general manager there. H. H. Curtice, vice president of the corporation and

general manager of Buick Motor division, has been elected a director to succeed Seward Prosser, resigned.

R. G. Justus has been named manager of industrial sales, Westinghouse Air Brake Co., with headquarters at Wilmerding, Pa. He joined the air brake company in 1911 as clerk at its St. Louis office and later was promoted to industrial representative. Since 1932 he has been representative in the southwestern district.

M. J. Tennes Jr., the past several years vice president and sales manager, Shafer Bearing Corp., Chicago, has been elected president. A H. Williams, heretofore chief engineer, has been made vice president, and Ray P. Tennes, assistant secretary and treasurer, has become secretary and treasurer.

S. C. Merrill has been named assistant general sales manager, automotive division, Timken Roller Bearing Co., with headquarters in Detroit. Mr. Merrill joined the New York office of Timken in 1922 and was in charge of sales there. In 1936 he was transferred to the automotive division at Detroit as district manager of sales.

Col. L. B. Lent, engineer, inventor, and trade association executive, has been appointed executive secretary, American Engineering Council, Washington, and will assume his new duties immediately. He succeeds Frederick M. Feiker, who as noted in STEEL, July 22, p. 31, has become dean of engineering at George Washington university.

Colonel Lent is a native of Brew-



Charles L. McCuen



Frederick C. Kroeger

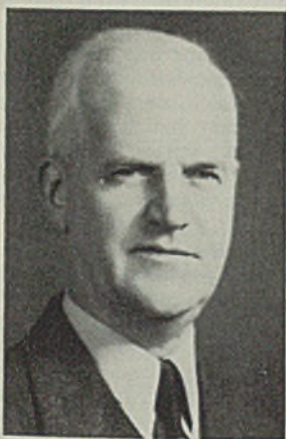


Sherrod E. Skinner

ster, N. Y., and a graduate of Stevens Institute of Technology, Hoboken, N. J. After five years as associate editor of the magazine *Power*, he became associated with the Riverside Engine Co., Oil City, Pa. The installation by this firm of several large engines for the Ford Motor Co. resulted in his employment by Mr. Ford as assistant chief engineer of construction and maintenance.

American Steel & Wire Co., Cleveland, announces the following changes in operating personnel, to be effective Sept. 1:

Harry H. Lumley, manager of operations in the Duluth district, is being transferred to Chicago where he will be assistant manager of operations. B. E. Pheneger, heretofore general superintendent, Cleveland coke works and Central furnaces and docks, will succeed



B. E. Pheneger

Mr. Lumley as Duluth district manager, while H. A. Byrns, superintendent of blast furnaces at Duluth, will become general superintendent of Cleveland coke works and Central furnaces and docks. James A. Gates, general foreman at Central furnaces and docks, has been appointed superintendent.

J. C. Witherspoon, assistant general superintendent at Donora Steel and Wire works, is being transferred to the steel division at Duluth, where he will be general superintendent. Harold Cope, superintendent of blast furnaces at Donora, is being appointed assistant general superintendent of Donora Steel and Wire works, succeeding Mr. Witherspoon. H. O. Johnson will succeed Mr. Cope, as superintendent of blast furnaces at Donora, while H. B. Burke, turn foreman at Donora blast furnaces, will replace Mr. Johnson as general foreman of that department.

J. V. McCartney has joined the New York office of H. A. Brassert



H. A. Byrns

& Co. Inc., with headquarters at 60 East Forty-second street. Mr. McCartney recently returned to this country from the London office of the company where he was engaged as chief engineer in charge of the iron and steelworks development recently completed at Karabuk, Turkey. This development required about three years to construct and comprises a complete plant for production of approximately 150,000 tons of rolled steel annually.

Ralph F. Hess has been elected vice president in charge of operations, North American Refractories Co., Cleveland. He has been production manager since formation of the company in 1929. Howard H. Hopwood, sales manager since 1936, has been promoted to vice president and general sales manager, while Stephen M. Swain has been appointed director of research. Mr. Swain has been chief ceramic engineer since 1934.

William P. Laseter, heretofore assistant manager, export division, Oil Well Supply Co., Dallas, Tex., and president of Cia. Consolidada "Oilwell," S. A., Mexican subsidiary of



William P. Laseter

Oil Well Supply, has become associated with John A. Roebbling's Sons Co., Trenton, N. J., as manager of its newly created export division, with headquarters at 19 Rector street, New York. Since 1919 Mr. Laseter has been identified with Latin-American trade, the greater portion of his 21 years in the export business having been spent in Cuba and Mexico.

Carl L. Westin has been named southwestern district service manager for Westinghouse Electric & Mfg. Co., with headquarters in St. Louis. He will be in charge of service plants in St. Louis, Houston, Tex., Denver, and Kansas City, Mo. Since 1938 he has been assistant northwestern district service manager at Chicago.

W. J. Koehring has resigned as president, Koehring Co., Milwaukee. He has been succeeded by George E. Long, secretary and treasurer, who also will continue as general manager. Mr. Koehring becomes chairman of the board. Peter P. Graser is the new secretary-treasurer, while C. A. Koehring will continue as vice president in charge of sales.

O. W. Baldwin has been appointed assistant chief chemist, Gary works, Carnegie-Illinois Steel Corp. He formerly was turn foreman. Other changes at the Gary works: J. N. Quinlan, heretofore assistant division superintendent, has been made division superintendent, west mills; H. H. Bushong has been transferred from the McDonald mills, Youngstown, O., where he had been superintendent since 1935, to Gary as first assistant division superintendent of the west mills; and S. R. Stanier, heretofore superintendent, merchant mill strip mills, has become second assistant division superintendent, west mills.

Charles J. Marks has been appointed chief tool engineer, United Aircraft Corp., East Hartford, Conn. He will assist the vice president in charge of operations in co-ordinating the planning of facilities and tooling by the several divisions. Mr. Marks has been production engineer for Pratt & Whitney Aircraft division since 1925.

Arthur A. Merry and Frederick L. Woodcock have been appointed to the positions of chief tool engineer of Pratt & Whitney Aircraft division and Hamilton Standard Propellers division, respectively. Since June, 1940, Mr. Merry has been assistant production engineer of Pratt & Whitney, while Mr. Woodcock formerly was in charge of tool designing with Hamilton Standard Propellers division.

Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

Bill Extending Bank's Lending Authority Approved.

Committee To Hold Labor Board Amendment Hearings.

Navy Department Collaborates on Labor Supply.

Manufacturers' Orders Increased 11 Per Cent in June.

WASHINGTON

■ SENATE committee on banking and currency last week ordered a favorable report on S.4204 which provides for increasing lending authority of the Export-Import Bank of Washington by \$500,000,000. Introduced by Senator Wagner, New York, the bill is in accordance with a request recently made by the President.

Assistance in development of resources, stabilization of economies and "orderly marketing of products of the countries of the Western Hemisphere" is specified. Provision is made that through written request by the federal loan administrator, with President's approval, the Export-Import bank be allowed to make loans to any government and its central banks of the Western Hemisphere. Such loans, according to the bill, may be made and administered as the bank may determine.

Jesse Jones, federal administrator, also appeared before the house banking and currency committee last week in favor of a similar bill pending in the lower house.

Mr. Jones declared "the increased lending capacity will place the bank in a position to assist in the good neighbor policy and at the same time aid American manufacturers and exporters who will meet ever increasing competition from other parts of the world, particularly when the war is over."

Mr. Jones told the committee

further that "the legislation will place the bank in a position to continue financing exports from the United States on a somewhat broader scale, particularly to the Latin American countries, and, where possible, to assist these countries to develop their natural resources, to produce more of the things we import from them and which are not competitive with our own products."

Ask Early Action on Amendments

Hearings before the senate labor committee on amendments to the national labor relations board act which have already passed the house will begin Aug. 13. Senate may take action during the present session of congress.

In line with its decision to hold hearings, Senator Thomas, chairman, said the committee will hold a series of closed sessions to review the legislation with William Green, president, American Federation of Labor; John L. Lewis, president, Congress of Industrial Organizations; a National Association of Manufacturers' representative and others.

National Association of Manufacturers asked for early action on the amendments in view of increased powers which the labor board would obtain under the pending national guard and conscription bills.

H. W. Prentis Jr., president of the association, telegraphed committee-men that the proposal to make it

an unfair labor practice not to re-employ men called for military service made immediate amendment of the Wagner act "even more necessary."

House amendments would abolish the present labor board and set up a new three-member agency to exercise only judicial functions. Administrative duties would be turned over to an administrator appointed by the President.

Senator Taft, Ohio, forecast controversy over a provision which would let a craft union obtain recognition as a bargaining unit within any plant. This provision was objectionable to the CIO, he said, which in most cases represents workers without regard to craft lines.

War department has announced that to increase employment and facilitate production, the six ordnance manufacturing arsenals will be put on a three shift basis Aug. 10.

Arrangement is authorized temporarily to obtain maximum production of needed war supplies. During the continuance of the program laborers and mechanics will be paid time and a half for time over 40 hours per week. Result will be three shifts of 8-hours per day, six days a week.

STEEL MANUFACTURERS' JUNE INVENTORIES INDEX 116.6

Index value of iron and steel manufacturers' inventories, based on Dec. 31, 1938, as 100, was 116.6 for June, compared with 113.6 in May and 99.3 in June last year, according to commerce department's monthly industry survey.

Taking January, 1939, as 100, index value of new orders received by such manufacturers in June was 162.9 compared with 144.6 in May and 101.3 in June last year.

June index of iron and steel shipments was 151.5 against 132.7 in



On Landing Gear Strut Cylinders you can write a new production schedule with Fay Automatics

THESE Airplane Landing Gear Strut Cylinders are machined from Chrome Nickel Molybdenum Steel Forgings. Until recently, the outside diameters were turned by tools on a turret lathe slide, while the inside bores were being roughed out with heavy drills on the turret.

Dissatisfied with production, this manufacturer turned for help to Jones & Lamson Engineers.

Long familiarity with turret lathe work suggested that, on this job, the only operations that could be done to advantage on a turret lathe were the finish cuts on the inside diameter, and that a new production plan should be written for the piece.

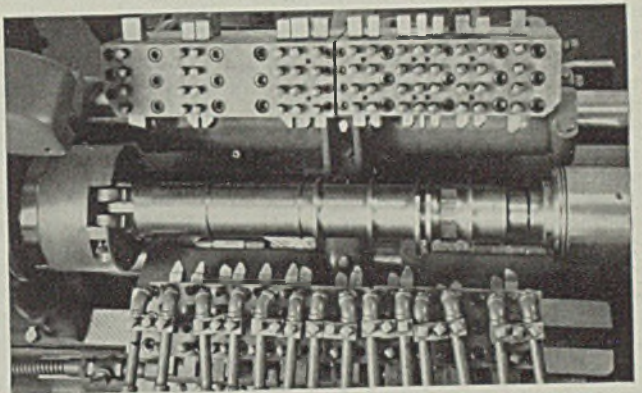
Today the outside diameters are roughed on one 12" Fay Automatic and finished with much the same tooling on another. One man runs both machines, completing a piece every 17 minutes with high speed steel tools.

Between operations on the Fay the pieces are heat treated.

Inside diameters are rough bored on special heavy duty boring equipment and finished on a turret lathe.

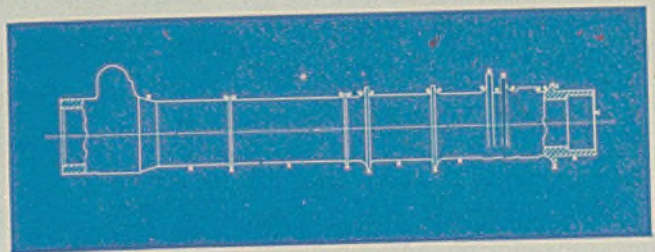
With this new combination of Fay Automatic and Turret Lathe a former day's production is now little more than an hour's work.

Write today to Jones & Lamson and see what such intelligent combinations can do to earn unexpected dividends for you.



ABOVE:—12" Fay Automatic Lathe Multiple Tooling for finishing cut.

BELOW:—Airplane Landing Gear Strut Cylinder, Exterior Surfaces.



JONES & LAMSON MACHINE CO.

SPRINGFIELD, VERMONT, U. S. A.



MANUFACTURERS OF: SADDLE & RAM TYPE UNIVERSAL TURRET LATHES . . . FAY AUTOMATIC LATHES . . . AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES . . . AUTOMATIC THREAD GRINDING MACHINES . . . COMPARATORS . . . TANGENT AND RADIAL, STATIONARY AND REVOLVING DIES AND CHASERS
"Profit Producing Machine Tools"

May and 109.4 in June last year, with January, 1939, as 100.

Value of iron and steel manufacturers' unfilled orders increased 10.9 per cent over May and 63.9 per cent over June, 1939.

For the entire group of manufacturers, tabulations for June reveal a gain in new orders of more than 11 per cent over the May volume, increases spread over both durable and nondurable goods industries.

Advance in new business carried the department's new order index from 121.3 in May to 134.9 in June.

Incoming business exceeded shipments even more than in May, with a further rise in order backlogs. Unfilled orders increased about 7 per cent in durable goods, comparing with an increase of 3½ per cent in May, when the first appreciable rise of the year was noted.

Manufacturers' shipments in June were 3 per cent above the previous month, approximately the same increase as in May. Increases in shipments were general in nondurable goods from May to June, amounting to 4½ per cent, while gains in durable goods were more limited, the average being a little more than 1 per cent. Advance in durable goods shipments was centered principally in iron and steel, with a rise of 14 per cent. Machinery industries also showed a moderate rise, while most other durable goods declined without adjustment for seasonal influences.

Rise in manufacturing production and shipments extending over May and June occurred without general inventory accumulation.

KNOX CAUTIONS AGAINST "PIRATING" OF LABOR

Navy department has recently entered into contracts for large amounts of shipbuilding, shore construction and other work on the national defense program, according to Secretary of the Navy Knox. He said that "additional contracts will be made from time to time to conform to the progressive requirements of national defense, and as appropriations therefore are made to the navy department by congress.

"It is already evident that in certain localities and in certain specialized trades and occupations a shortage of skilled labor exists. The navy department is collaborating with other federal agencies and with organized labor to meet this situation. The secretary of the navy takes this opportunity to urge all naval contractors to foresee their labor requirements and to inform, as far in advance as possible, state and federal employment services and others concerned of such needs in order that there may be as little delay as possible in supplying the re-

quired personnel and to avoid unnecessary migration of labor.

"It is also urged that recognition be given to the importance of diminishing the ranks of the unemployed and to prevent by all practicable means the 'pirating' or 'scamping' of labor, that is, enticing men from one employer to work for another, both of whom may be engaged on work of equal importance to the nation as a whole. Such pirating of labor always leads eventually to uneconomical and disastrous results.

"The present shortage in certain skilled mechanical trades is due in no small degree to the failure to maintain apprentice training in private establishments during the lean years following 1929. Since about 1936 the navy department has been building up its apprentice training in its navy yards and its own industrial establishments. In 1939 it had about 2000 apprentices under training and expects to reach nearly 4000 before the end of 1940. I urge private industry to start apprentice courses, where none now exist, and to increase the number of apprentices where such courses are now being maintained."

KNUDSEN APPOINTS ADDITIONS TO STAFF

William S. Knudsen, head of the defense commission's production division, has announced the following additions to his staff:

Mason Britton, vice president, McGraw-Hill Publishing Co., to be supervisor of machine tools in the machine tool section.

A. B. Einig, general manager, Motch & Merryweather Machinery Co., Cleveland, and Donald M. Lafflin, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., to be machine tool technicians.

W. V. Kohler, chief engineer, Illinois Bell Telephone Co., Chicago, and Stephen F. Voorhees, senior partner of Voorhees, Walker, Foley and Smith, architects in design and construction, New York, as consultants to W. H. Harrison, head of the construction section.

JOINT CIO, AFL COMMITTEE PLEGGED TO DEFENSE WORK

Sidney Hillman, national defense advisory commission member in charge of labor supply, last week announced the labor policy advisory committee, representing American Federation of Labor, Congress of Industrial Organizations and Railway Brotherhoods, has adopted the following resolution:

"In view of the necessity in maintaining the continuation of production of all goods and services required for national defense, and, inasmuch as the welfare of labor may best be forwarded by

amicable adjustment of such internal problems, which if not adjusted may affect national defense, therefore:

"Be it resolved: That a committee of four, consisting of two representatives of the A. F. of L. and two of the CIO, be appointed to endeavor to adjust any difficulties which may arise between organizations affiliated with the A. F. of L. and CIO which may in any way affect the continuation of operations on any project or in any plant engaged in work affecting the national defense program."

Members designated by Mr. Hillman to serve on this committee:

Van A. Bittner, United Mine Workers of America; Emil Rieve, president, Textile Workers Union of America; H. W. Brown, international president, International Association of Machinists; and George Q. Lynch, general president, Pattern Makers League of North America.

AUTOMOBILE BUILDERS ASKED TO OPERATE CANNON PLANT

Government is negotiating with General Motors and Chrysler Corp. for operation of two aircraft cannon factories which it will erect, according to information here.

Negotiations became known when executive hearings before the house appropriations committee, in connection with the pending \$5,000,000,000 appropriations for the defense program, were made public.

Maj. Gen. C. M. Wesson, chief of ordnance, reported contracts will be let about Sept. 1 for aircraft cannon plants costing \$14,000,000.

Meanwhile, he said, the army is "getting an order started" with Bendix Corp., Bendix, N. J. Rather than build a new plant there, near the Atlantic coast, it will construct two in the Middle West. Bendix facilities may be expanded, however.

For immediate requirements, Gen. Wesson said, the army also is seeking to place an order with Chrysler, prior to construction of new factories. Chrysler and General Motors would operate the new plants, under present plans.

Gen. Wesson said it would require two and a half to three years to complete enough guns to outfit planes being purchased for army-navy aircraft expansion.

Some 37-mm. cannon are now being manufactured by the Colt Arms Co., which received an order for \$2,000,000 or more last week, but its facilities are limited, Gen. Wesson pointed out. New plants are necessary, he added.

"Information coming from abroad," he said, "indicates that we have got to have guns of higher power on airplanes than we have had in the past, which were .30 and .50 caliber."

Activities of Steel Users, Makers

■ CHAIN BELT CO., Milwaukee, has completed moving manufacturing operations of its screw conveyor and light steel bucket divisions from its Chicago plant to the West Milwaukee works. Personnel has also been transferred to West Milwaukee and the Chicago plant has been discontinued.

Lewis B. Lindemuth has moved his offices from 134 East Forty-seventh street, New York, to 140 Cedar street.

Offices of Bakelite Corp. and Halowax Corp. have been moved from 247 Park avenue, New York, to the Carbide & Carbon building, 30 East Forty-second street.

Cowles Detergent Co., Cleveland, will move its executive and general offices Aug. 31 from 10525 Carnegie avenue to larger quarters at 7016 Euclid avenue.

Koppers Co., Pittsburgh, has developed a wholly automatic domestic coke stoker. Bryant Heater Co., Cleveland, has been selected to manufacture the device.

American Asphalt Paint Co., Chicago, and its subsidiary, Marietta Paint & Color Co., Marietta, O., have been consolidated and are now operating as the American-Marietta Co., with headquarters at 43 East Ohio street, Chicago.

Bastian-Blessing Co., Chicago, has appointed National Cylinder Gas Co., Chicago, distributor in Michigan, Ohio and Indiana, for its line of welding and cutting equipment under the name Reg-O.

Evidence of increased construction activity is cited in an announcement by Pettibone Mulliken Corp., Chicago, that during the first five months of 1940 its sales of welded dippers for power shovels exceeded those in the entire year 1939.

Hartley Wire Die Co. has moved from Waterbury, Conn., to larger quarters at Thomaston, Conn., increasing its floor space by approximately 15,000 square feet. The company recently celebrated its ninetieth anniversary.

In the patent infringement suit instituted by Ajax Mfg. Co., Cleveland, against National Machinery Co., Tiffin, O., which has been pending in the United States district court for the western district of

Ohio for some time, the parties have concluded a settlement and the suit has accordingly been dismissed without prejudice.

Jones & Laughlin Steel Corp. has awarded contract to Peabody Engineering Corp., New York, for modernization of two blast furnace gas washers, located at the Eliza furnaces, Pittsburgh works. The new equipment is scheduled for installation late in September.

Ferro Enamel Corp., Cleveland, has entered the synthetic-finish field, and through Liquid Plastic Corp., Cleveland, a wholly owned subsidiary, will offer a line of "Vedoc" finishes for use on sheet metal products of all types.

Weldon Tool Co., Cleveland, is now the exclusive manufacturer and distributor of the Tu-Lip counterbore formerly made by Gopher Machine & Tool Works Co., Minneapolis. It will henceforth be sold under the name Weldon Tu-Lip counterbore.

Died:

■ MICHAEL F. TIGHE, 82, for 17 years president of the Amalgamated Association of Iron, Steel and Tin Workers until his retirement several years ago, in Pittsburgh, Aug. 5. At the age of 10 he went to work for a cut nail factory in Wheeling. He learned to puddle iron and was employed by the Wheeling Steel & Iron Co. Later he became a subordinate officer in the Pittsburgh offices of the Amalgamated association, and was elected its president in 1919. When the Amalgamated affiliated with the Steel Workers Organizing committee of the CIO Tighe refused to stand for re-election.

Simpson C. Leonard, 73, in Detroit, Aug. 2. He was for many years secretary-treasurer, Western Bar Iron association. Previous to going to Detroit from Youngstown in 1896, he had puddled iron in Mahoning valley mills where he had reached the position of puddle boss. He took a metallurgical course in Ohio State university, then went to the Buffalo Iron & Steel Co. as assistant chemist. In 1896 he joined American Car & Foundry Co., becoming general manager of the company's wrought iron bar mills in Detroit and St. Louis. He

retired from American Car & Foundry in 1925, and founded Michigan Leather Packing Co., of which he was president until his illness some months ago. Meanwhile, he had been manager of Rich Tool Co., now a division of Eaton Mfg. Co., Cleveland.

Karl W. Johnson, 79, president, Commonwealth Screw Co., Worcester, Mass., in that city, July 31.

William Horton Woodhall, 47, for 18 years metallurgist with Harrison Steel Castings Co., Attica, Ind., July 19, in Indianapolis.

William A. Buettner, 61, president, Buettner & Shelburne Machine Co., Terre Haute, Ind., at his home in that city recently.

Douglas F. Fesler, 65, formerly general manager and owner of Alemite Die Casting & Mfg. Co., recently in Beverly Hills, Calif. He retired in 1938.

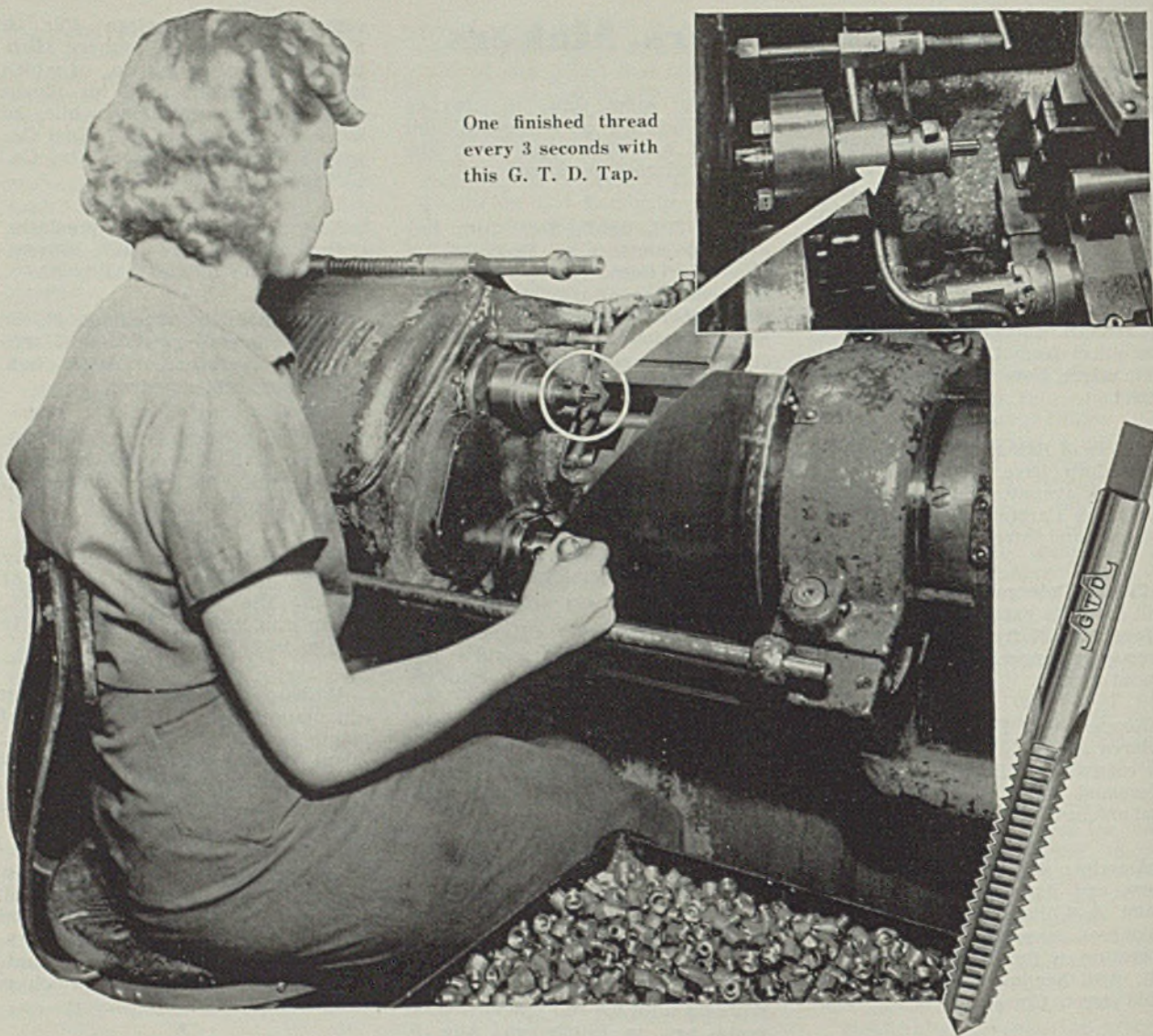
William A. James, 69, Aug. 2 at Chautauqua, N. Y. He was chief engineer of the Lackawanna, N. Y., plant of Bethlehem Steel Co., having been with that plant since 1901, when it was known as Lackawanna Steel Co.

T. W. Lux, 60, assistant secretary-treasurer, Acme Steel Co., Chicago, July 25 in that city. He had been with Acme about 27 years. Mr. Lux introduced a cost accounting system, the basis of which is still employed.

W. C. Martin, president, Vulcan Rivet & Bolt Corp., Tarrant, Ala., recently at his home in Birmingham. At one time he was chief engineer, Woodward Iron Co. and helped organize the Superior Pipe Co., Bessemer, Ala.

Claiborne Morrison James, 68, construction engineer, July 30 in Cumberland, Md. He was president, Tri-State Engineering Co., Cumberland, which he helped organize, and previously had spent a number of years as construction engineer with the Baltimore & Ohio railroad and the Atlantic Coast line.

Christian Rasmussen, 54, plant engineer, International Harvester Co., Milwaukee, in Milwaukee, recently. Born in Denmark, Mr. Rasmussen was engaged in engineering work in Russia when he joined International Harvester in 1912, staying in Moscow for six years and then going to Milwaukee in 1918. He had been superintendent in charge of plant operations many years.



One finished thread every 3 seconds with this G. T. D. Tap.

MORE PRODUCTION

WITH G. T. D. HIGH SPEED TAPS

Do you want faster production? This company did — on these heavy duty cast brass elbows. They got it, too, when they adopted G. T. D. Greenfield High Speed Ground Thread $\frac{7}{16}$ -24 Taps. Average production was stepped up from 1050 to 1220 per hour, a 16% increase. And production per tap went from 9,000 to 12,000, up 33 $\frac{1}{3}$ %. These increases represented clear savings

because they used the same machine, and even the same cutting lubricant.

G. T. D. Greenfield solicits the opportunity to make equally good in your plant. Our standard and special threading tools are backed by the accumulated experience of over 75 years, all of which is at your disposal. Get in touch with your local distributor or with a G. T. D. Engineer.

GREENFIELD TAP & DIE CORPORATION, Greenfield, Mass.

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



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

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Buick Capacity Increased to 1500 Cars Daily.

Dual Carburetion Features 1941 Engine.

McCuen, Olds Manager, To Head GM Engineering.

Chrysler, Dodge Prepare Plants for Arms Orders.

Revolutionary Shell Lathe Reported in Planning Stage.

DETROIT

■ WHEN Harlow H. "Red" Curtice lifts the drapes from his 1941 Buick models in Flint this Tuesday he will be opening officially what it is hoped will be an even greater year than the past model year. Extensions, changes and improvements in plant and equipment have boosted Buick daily capacity from 1300 to 1500, and output of 1941's is being aimed at 350,000, compared with 285,000 during the year just concluded.

At that, it is reported, Buick dealers could have sold another 20,000 cars this summer had they been available, so intense was the last-minute rush among buyers. This shortage of new models was not peculiar to Buick, however, for others found a similar situation. Even Cadillac was reported to have been about 2000 short, and Pontiac an estimated 15,000.

Just how these shortages are figured is not known, but the fact that there were any deficiencies of new models at all is the unusual thing. Ordinarily at this time of the year dealers have to resort to various types of "pressuring" of buyers to clean up stocks.

Mr. Curtice discloses that Buick plants operated consistently throughout the 1940 model season two full shifts and a skeleton third shift every day with the exception of Saturdays, Sundays and legal holidays. More than 15,800 employes worked an average of 2050 hours each during the past year, with virtually no fluctuation in employment and at an average wage of better than \$1 per hour. He adds that inventory periods have

been reduced to a minimum this year, with a staggered schedule for closing various manufacturing departments and a minimum period of shutdown. As a result, during the changeover period employment has held consistently above 9000 and resumption of normal operations now is nearly complete.

Buick's expansion and retooling program includes new tools and equipment in every manufacturing department, incident to design change and capacity increase. Among major construction projects which have been completed to handle 1941 output were expansion in the sheet metal department, involving construction of a large addition and extensive rearrangement of machinery; a new axle plant; removal of gear manufacturing to a new building and a new manufacturing layout for the production of auto engine connecting rods.

Additional equipment installations were made in the foundry, forge, transmission and final assembly line. All these changes have been mentioned briefly in previous issues of STEEL.

Among engine innovations for 1941 is the dual carburetion system developed for Buick power plants. Manifold design is reported to have been completely reworked and two separate carburetors used to proportion fuel to engine. Proving ground tests are said to have shown improved gaso-

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line economy ranging from 3 to 5 miles to the gallon.

Buick engineers have been working closely with army technicians, reports Mr. Curtice, on armament projects intended to adapt the Buick valve-in-head engine to military uses. He indicated that any arms production would be collateral to passenger car output.

Over at the Oldsmobile plant in Lansing, the big news is the departure of general manager C. L. McCuen, who has been at the helm of this division for seven years and now leaves to head up engineering activities of the General Motors Corp. in Detroit. The change is recognition of the high regard in which Mr. McCuen is held by GM chief executives, and behind the scenes he is being touted as eventual timber for the top ranks.

In the past model year Olds turned out close to 200,000 cars, the best sales year in its history. Current stocks of new cars in dealers hands amount to about 20,000 cars. Some 15 per cent of Olds buyers have taken cars equipped with the Hydra-Matic drive, indicating production of 30,000 of these units. This was far below demand for the unit, and plans for 1941 are being based on 50 per cent of all Oldsmobiles being equipped with the automatic transmission.

Eyes of the industry are being focused on the new Olds press shop which is now being outfitted for production of forgings. Originally it was understood all forgings in this new plant were going to be made by the press method, but modifications have been made to include a number of forging hammers of the lighter variety. Indications still point the likelihood that crankshafts will be attempted by the press forging method.

Olds also has installed a number of new broaching machines for finishing engine block surfaces.

Buick likewise has made installation of an appreciable number of broaching machines to handle connecting rod machining. Four

builders participated in this order, some of the machines ranging up to 10 tons in size.

Departure of Mr. McCuen from Olds brings in a new general manager, Sherrod E. Skinner, hitherto in charge of the Ternstedt division of General Motors. Mr. Skinner served in the submarine service during the World war, came to Ternstedt in 1930.

In his new post as vice president in charge of engineering for GM, Mr. McCuen can give full rein to his flair for pioneering new developments in motor car building. He succeeds Ormond E. Hunt, who has been transferred to the corporation's policy committee with specially assigned duties. Both Hunt and McCuen at one time were associated with the engineering staff of Packard, Hunt leaving in 1918 to become chief engineer in charge of Liberty aircraft engine design and production and later chief engineer for Chevrolet. McCuen left Packard in 1922 to become experimental engineer for Rickenbacker Motor Co., four years later going to Olds.

■ CONSIDERABLY more activity among motor plants in lining up their position in armament production is going on than is apparent superficially. Actual orders, of course, are few, but figuring on various types of equipment is furious, to say the least. Chrysler's special ordnance manufacturing division personnel have practically vacated their Highland Park offices, moving to No. 4 Dodge plant on Conant road and the former Dodge truck plant on Lynch road. The latter has been equipped to handle some special shell orders of relatively small size, but soon may be the scene of some important manufacturing operations on cartridge cases.

One of the most important phases of armament production now under consideration is that being lined up for Dodge involving manufacture of recoil mechanisms and gun carriages. No actual orders for this equipment have been placed, it is understood, but the extent of current planning indicates they may mature shortly. There have even been discussions of an entire new plant to be erected by the Dodge division to handle this production and to be in operation within eight months. Location and size have not been revealed.

As an alternative to building a new plant, the suggestion has been made that De Soto production be transferred from the present plant on Wyoming avenue to the Chrysler Jefferson avenue plant, releasing the assembly plant on Wyoming for armament production. The latter plant is an old one, pre-

vious occupants having been Buick and La Salle.

Bulk of operations in the new plant would be of a machining nature and steps are reported to have been taken to clear the way for supplying the necessary large volume of machinery, particularly milling machines, the plant would require.

Detroit city council has been informed by Packard that the company proposes to use property adjoining its plant at Harper and Mount Elliott avenues for construction of a test house for Rolls-Royce engines to be made under contract now pending with the government. In the effort to forestall the possibility of later complaints developing from residents in the area over

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.	226,952	356,692	449,492
Feb.	202,597	317,520	422,225
March....	238,447	389,495	440,232
April....	237,929	354,266	452,433
May....	210,174	313,248	412,492
June....	189,402	324,253	362,568
6 mos....	1,305,501	2,055,744	2,539,440
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†
July 13.....	62,176	61,610
July 20.....	53,020	47,420
July 27.....	34,822	40,595
Aug. 3.....	17,373	28,250
Aug. 10.....	12,635	24,875

†Comparable week.

noise and vibration, the council has been asked to have one of its members visit the Allison Engineering division plant in Indianapolis to inspect similar test houses.

Modern methods of construction, involving double walls, reinforced concrete, insulation and spring suspension of the engine under test, are said to have eliminated, for all practical consideration, the noise and vibration problems such plants might propose.

Reports of consideration being given to plans for building a revolutionary type of shell-turning lathe in quantities running up into the thousands are heard in this territory. Utmost secrecy is claimed to surround the plan which is about as follows: Lathes would be built up with base, headstock and tail-

stock a single casting, cored out for gears and shafts and requiring no finishing. Bushings to receive gears and shafts would be located and anchored in place with expanding alloy. No hardened and ground ways would be necessary and a complete lathe could be assembled in a couple of weeks. Assembly would be handled by some plant not affiliated with the machine tool industry. The first lot would include several thousand. Cost would be low, productive life might be short.

One-man strike at City Auto Stamping Co., Toledo, O., was the peculiar outgrowth of a fairly even division of the working force between the A. F. of L. and the CIO, although the former had been awarded the bargaining rights. Jules Gusse, metal polisher, was laid off under seniority provisions of the union contract. Being a CIO member, he charged discrimination and started a one-man picket line. Then fellow CIO men joined him and refused to enter the plant. A. F. of L. men continued to work and were given protection against pickets by A. F. of L. workmen from a nearby water system construction job who took a "holiday" from their jobs to join in the fun. Finally, after court orders, injunctions and other legal procedures, a truce was brought about and the case submitted to the NLRB for judgment.

Cast Steel Crankshafts

Proponents of the cast steel crankshaft for motor cars use as one of their chief arguments for this type of shaft over the forged steel shaft the reduction in number and cost of machining operations necessary on the steel shaft. For example, on the Chrysler crankshaft better than 50 operations are required to turn the rough forging into a finished shaft, and 26 gages, costing in excess of \$250,000, are used to check these operations for accuracy. Rough forging weighs 110 pounds, finished shaft 90 pounds. Statically and dynamically balanced, the shaft has nine integrally-forged counterweights and a Lancaster vibration dampener.

Continuous casting of plate glass will be carried out in a plant now being erected by Libbey-Owens-Ford Glass Co., Toledo, O., on the site of one of the original Edward Ford Plate Glass Co., dismantled a decade ago. The new plant will include furnaces, batching house and equipment for continuous casting. Present facilities including pot furnaces and the Bicheroux method of casting will be retained for special types of plate glass—heat tempered (used in automobile rear windows) and vitrolite. Construction work on the new unit will require about a year.

MONARCH'S
8-POINT
PLATFORM
for
Forward Looking
AMERICA



POINT 2 OF MONARCH'S PLATFORM

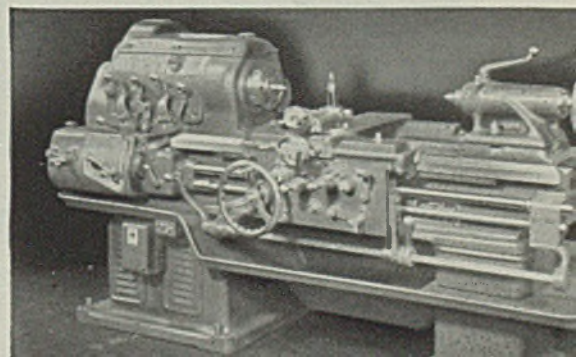
★ ★ ★ INDUSTRY SHOULD TRAIN YOUNG MEN

NO employment without experience . . . no experience without employment. That has been the sad state of American youth in many fields since the Great Depression. Whirling in a vicious circle . . . thrown bewildered into a struggle for security—easy prey for any "ism" that comes along.

Industry owes an obligation to itself and to society, to assume its share of the responsibility for guiding these young Americans along the way to a more useful life. Training must be provided in order that skilled hands can be developed for tomorrow's production requirements . . . so that a second generation of leaders will be ready to assume responsibility when the time comes.

Monarch provides for the development of its skilled workers by conducting specialized, voluntary training groups—which, over a period of time, mold another generation of master craftsmen. The Monarch Machine Tool Company, Sidney, Ohio.

Monarch's New 14" x 30" "AA" Lathe



MONARCH LATHES

Finished Steel Exports 15.8% of June Output

Finished steel made for sale in June amounted to 3,802,485 net tons, compared with 3,576,860 tons in May and 3,065,218 tons in April, according to the American Iron and Steel Institute. In June 252,141 tons was shipped to members of the industry for conversion into further finished products. In May, the corresponding figure was 289,653 tons.

Finished steel exported in June totaled 601,688 tons, compared with 476,761 tons in May and 371,532 tons

in April. June exports constituted 15.8 per cent of total production, while for entire first half exports were 13.3 per cent, indicating the increasing proportion of finished steel going abroad.

Practically every classification showed an increase over May, output of standard steel rails being an exception, dropping from 136,705 tons in May to 120,235 tons in June. Bars increased from 544,258 tons to 625,242 tons; plates from 281,806 to 317,981; heavy structurals from 209,604 to 234,451 tons; sheets from 740,642 to 773,993 tons; hot-rolled strip from 110,597 to

116,737 tons; cold-rolled strip from 45,229 to 56,463 tons.

Production for six months this year totaled 20,657,771 tons, compared with 14,273,988 tons in first half, 1939. After deducting shipments to other members of the industry for further conversion the net total was 19,556,180 tons, this representing 73.2 per cent of finishing capacity, against 12,958,629 tons, at 53.4 per cent of capacity in the 1939 period. Finished steel exports in first half this year were 2,752,775 tons, 13.3 per cent of production, and for the first six months, 1939, 777,768 tons, 5.45 per cent.

AMERICAN IRON AND STEEL INSTITUTE Capacity and Production for Sale of Iron and Steel Products

June - 1940

	Number of Companies	Items	Annual Capacity Net tons	Production for Sale—Net Tons								
				Current Month			To Date (6 Months 1940)					
				Total	Per cent of capacity	Shipments Export	To members of the industry for conversion into further finished products	Total	Per cent of capacity	Shipments Export	To members of the industry for conversion into further finished products	
Ingot, blooms, billets, slabs, sheet bars, etc.	33	1	xxxxxxx	454,232	xxx	211,236	128,125	2,020,968	xxx	720,553	518,516	xxxxxxx
Heavy structural shapes	8	2	5,205,300	234,451	54.9	21,287	xxxxxxx	1,154,775	44.6	98,366	xxxxxxx	
Steel piling	4	3	320,000	16,306	60.6	912	xxxxxxx	79,002	48.4	7,897	xxxxxxx	
Plates—Sheared and Universal	19	4	5,855,450	317,981	66.2	47,594	613	1,721,337	59.1	225,912	10,386	xxxxxxx
Skelp	7	5	xxxxxxx	83,214	xxx	14,215	32,780	292,114	xxx	40,632	117,984	xxxxxxx
Rails—Standard (over 60 lbs.)	4	6	3,647,600	120,235	40.2	383	xxxxxxx	906,577	50.0	41,873	xxxxxxx	
Light (60 lbs. and under)	6	7	306,800	10,215	40.6	2,188	xxxxxxx	50,783	33.3	15,789	xxxxxxx	
All other (Incl. girder, guard, etc.)	2	8	118,000	398	4.1	76	xxxxxxx	16,500	28.1	2,382	xxxxxxx	
Splice bar and tie plates	15	9	1,300,200	41,150	38.6	221	xxxxxxx	314,059	48.6	4,545	xxxxxxx	
Bars—Merchant	35	10	xxxxxxx	352,242	xxx	57,604	26,504	1,939,675	xxx	211,454	150,332	xxxxxxx
Concrete reinforcing—New billet	15	11	xxxxxxx	126,031	xxx	22,326	xxxxxxx	560,615	xxx	144,396	xxxxxxx	
Retrolling	18	12	xxxxxxx	14,453	xxx	392	xxxxxxx	68,621	xxx	4,258	xxxxxxx	
Cold finished—Carbon	18	13	xxxxxxx	47,815	xxx	1,429	xxxxxxx	303,303	xxx	6,971	xxxxxxx	
Alloy—Hot rolled	15	14	xxxxxxx	69,590	xxx	7,868	4,070	409,656	xxx	27,530	27,381	xxxxxxx
Cold finished	14	15	xxxxxxx	5,884	xxx	261	xxxxxxx	42,633	xxx	1,360	xxxxxxx	
Hoops and balling bands	5	16	xxxxxxx	9,227	xxx	1,369	xxxxxxx	45,637	xxx	4,334	xxxxxxx	
TOTAL BARS	53	17	12,372,465	625,242	61.6	91,249	30,574	3,370,140	54.8	400,303	177,713	xxxxxxx
Tool steel bars (rolled and forged)	15	18	110,220	5,864	64.8	462	xxxxxxx	32,882	60.0	2,389	xxxxxxx	
Pipe and tube—B. W.	13	19	1,815,860	92,795	62.3	6,905	xxxxxxx	435,995	48.3	40,217	xxxxxxx	
L. W.	10	20	1,246,340	33,004	32.3	2,442	xxxxxxx	158,227	25.5	17,786	xxxxxxx	
Electric weld	5	21	731,520	26,655	44.4	2,349	xxxxxxx	119,206	32.8	12,551	xxxxxxx	
Seamless	15	22	3,159,840	147,073	56.7	13,918	xxxxxxx	850,703	54.1	87,636	xxxxxxx	
Conduit	6	23	151,145	5,771	46.5	54	xxxxxxx	33,777	42.3	810	xxxxxxx	
Mechanical Tubing	13	24	554,825	19,276	42.3	2,125	xxxxxxx	128,217	46.4	7,559	xxxxxxx	
Wire rods	19	25	xxxxxxx	95,997	xxx	28,360	16,531	487,556	xxx	127,690	79,695	xxxxxxx
Wire—Drawn	37	26	2,255,210	110,870	59.9	13,392	594	653,068	58.2	82,327	5,260	xxxxxxx
Nails and staples	19	27	1,091,690	53,698	59.9	6,332	xxxxxxx	279,565	51.2	33,352	xxxxxxx	
Barbed and twisted	16	28	438,270	22,785	63.4	6,938	xxxxxxx	101,423	46.5	20,159	xxxxxxx	
Woven wire fences	15	29	772,790	22,404	40.1	232	xxxxxxx	129,323	33.6	1,210	xxxxxxx	
Bale ties	11	30	119,050	7,354	75.3	30	xxxxxxx	30,167	50.9	143	xxxxxxx	
All other wire products	6	31	27,030	1,056	47.6	-	xxxxxxx	6,225	46.3	-	xxxxxxx	
Fence posts	13	32	147,485	6,009	49.7	79	xxxxxxx	28,207	38.4	443	xxxxxxx	
Black plate	12	33	653,295	31,666	59.1	11,307	7,221	188,498	58.0	19,175	55,293	xxxxxxx
Tin plate—Hot rolled	9	34	1,201,960	38,029	38.6	3,631	xxxxxxx	257,728	43.1	62,560	xxxxxxx	
Cold reduced	10	35	2,930,860	206,134	85.7	35,501	xxxxxxx	1,168,001	80.1	226,569	xxxxxxx	
Sheets—Hot rolled	26	36	xxxxxxx	454,157	xxx	47,955	25,439	2,484,383	xxx	255,772	69,914	xxxxxxx
Galvanized	16	37	xxxxxxx	118,155	xxx	11,575	xxxxxxx	618,410	xxx	84,633	xxxxxxx	
Cold rolled	18	38	xxxxxxx	159,680	xxx	8,078	xxxxxxx	1,068,450	xxx	45,341	xxxxxxx	
All other	15	39	xxxxxxx	42,001	xxx	2,020	xxxxxxx	274,593	xxx	12,602	xxxxxxx	
TOTAL SHEETS	27	40	13,255,610	773,993	71.2	69,628	25,439	4,445,836	67.4	398,348	69,914	xxxxxxx
Strip—Hot rolled	24	41	3,525,110	116,737	40.4	6,753	12,264	664,320	37.9	38,498	67,531	xxxxxxx
Cold rolled	35	42	1,313,360	56,463	52.4	1,583	xxxxxxx	330,632	50.6	8,693	xxxxxxx	
Wheels (car, rolled steel)	5	43	419,035	8,593	25.0	70	xxxxxxx	94,292	45.2	2,332	xxxxxxx	
Axles	5	44	472,280	5,277	13.6	91	xxxxxxx	41,219	17.6	1,718	xxxxxxx	
Track spikes	11	45	327,275	8,284	30.8	125	xxxxxxx	57,476	35.3	2,318	xxxxxxx	
All other	3	46	9,100	284	38.0	-	xxxxxxx	4,813	106.3	-	xxxxxxx	
TOTAL STEEL PRODUCTS	152	47	xxxxxxx	3,802,485	xxx	601,688	252,141	20,657,771	xxx	2,752,775	1,101,691	xxxxxxx
Estimated total steel finishing capacity based on a yield from ingots of	68.9 %	48	53,714,800	xxxxxxx	80.5	xxxxxxx	xxxxxxx	xxxxxxx	73.2	xxxxxxx	xxxxxxx	xxxxxxx
Pig iron, ferro manganese and spiegel	27	49	xxxxxxx	448,870	xxx	42,200	145,599	2,547,501	xxx	177,423	651,029	xxxxxxx
Ingot moulds	4	50	xxxxxxx	40,966	xxx	359	xxxxxxx	196,562	xxx	1,536	xxxxxxx	
Bars	10	51	160,600	2,224	16.9	8	275	13,713	17.2	94	1,167	xxxxxxx
Pipe and tubes	3	52	109,377	3,373	37.6	81	xxxxxxx	17,613	32.4	541	xxxxxxx	
All other	3	53	71,180	877	15.0	149	267	5,892	16.6	998	1,644	xxxxxxx
TOTAL IRON PRODUCTS (ITEMS 51 to 53)	12	54	276,247	6,474	28.6	238	542	37,218	27.1	1,633	2,811	xxxxxxx

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month 3,550,344 N.T.; 80.5 % of Finishing Capacity.
To date 19,556,080 N.T.; 73.2 % of Finishing Capacity.
The above tonnage represent 68.9 % of the ingots produced by companies whose products are included above.

Total Number of Companies
Included - 153

FINANCIAL

STEEL INDUSTRY'S RATE OF RETURN AMONG LOWEST

■ ANNUAL rate of return on net worth for the first half, 1940, for 400 companies averaged 10.9 per cent, compared with 7 per cent in the first half of 1939, according to the National City Bank of New York. Iron and steel companies were among the lowest earners in the bank's compilations.

Ten automobile builders, other than General Motors Corp., had the highest return for the period of any industrial group, 22.2 per cent. Lowest return on net worth in the manufacturing division, including

334 companies, was earned by the leather and shoe industry. It was 5 per cent, compared with 5.6 per cent a year ago.

Average rate of return for the manufacturing companies was 11.4 per cent, compared with 7.2 per cent in the first half, 1939. Fifty-six non-manufacturing companies' rate of return was 8 per cent, against 6.7 per cent in the period last year. Latter percentages are computed from the bank's statistics and exclude coal mining.

Annual rate of return is based on net profits as reported by the corporations, after depreciation, interest, taxes and other charges and reserves, but before dividends. Net worth includes book value of out-

standing preferred and common stock and surplus account at the beginning of each year.

No.	Industrial Groups	Annual Rate of Return %	
		First Half 1939	1940
6	Baking	8.5	7.9
19	Food products—misc.	11.2	11.6
7	Beverages	11.8	13.6
14	Textiles and apparel	7.5	10.5
4	Shoes and leather	5.6	5.0
7	Wood products	0.4	5.5
14	Paper products	4.5	10.1
26	Chemicals, drugs, etc.	11.0	14.7
12	Petroleum products	2.8	8.5
15	Stone, clay and glass	7.8	10.5
1	Iron and steel—U. S. Steel	0.3	5.5
29	Iron and steel—other	1.8	6.2
12	Building equipment	2.4	7.1
17	Electrical equipment	8.7	13.8
12	Hardware, tools, etc.	7.0	12.0
10	Household equipment	10.4	12.1
31	Machinery	5.0	12.3
10	Office equipment	9.9	12.5
1	Railway equipment	1.8	11.3
1	Automobile—General Motors	19.7	21.6
10	Automobile—other	17.1	22.2
22	Auto equipment	13.6	20.7
28	Metal products—misc.	10.5	20.0
17	Misc. manufacturing	8.4	7.0
334	Total manufacturing	7.2	11.4
10	Coal mining	4.7	7.1
10	Metal mining	6.2	8.7
9	Mining, quarrying—misc.	11.8	14.6
21	Trade (wholesale and retail)	5.9	6.6
16	Service and construction	6.1	6.3
400	Total	7.0	10.9

*Incurred deficit for the period.

Steel Consumers' Earnings Statements

■ FIRST half, 1940, net income reported by 124 iron and steel consumers aggregated \$122,992,478, compared with \$64,492,386 total net income earned by the same companies in corresponding period last year. Only five incurred a loss for the six months, against 25 reporting deficits for first half, 1939. Previous tabulations in STEEL, July 22, p. 20 and July 29, p. 14 listed 69 companies; the following includes 55. All figures are net earnings except where asterisk denotes loss:

	Second 1940 Quarter	Second 1939 Quarter	First 1940 Half	First 1939 Half
Addressograph-Multigraph Corp., Cleveland	\$	\$	\$497,218	\$429,490
Allis-Chalmers Mfg. Co., Milwaukee	1,639,889	990,145	2,609,758	1,700,422
American Steel Foundries, Chicago	405,566†	218,549†	1,666,526	114,342
Atlas Drop Forge Co., Lansing, Mich.			12,280	6,416
Babcock & Wilcox Co., New York	645,340†	123,930*	1,474,905	636,620*
Black & Decker Mfg. Co., Towson, Md.	329,349†	179,063†	523,674†	316,488†
Bower Roller Bearing Co., Detroit	300,791†	208,382†	669,310	428,336
Briggs & Stratton Corp., Milwaukee	271,693†	208,189†	670,586	552,377
Brockway Motor Co. Inc., Cortland, N. Y.			78,012	70,778
Cooper-Bessemer Corp., Mt. Vernon, O.			271,105	13,533†
Crosley Corp., Cincinnati	53,854†	193,141†	96,661	402,057
Detroit Gasket & Mfg. Co., Detroit	140,788†	113,093†	299,788	241,103
Dresser Mfg. Co., Bradford, Pa.	382,063†	102,269†	733,638	81,383
Driver-Harris Co., Harrison, N. J.	88,440	61,020	231,476†	95,669
Easy Washing Machine Corp., Syracuse, N. Y.	81,295†	47,372†	180,346	143,242
Electric Auto-Lite Co., Toledo, O.	1,393,386†	1,210,039†	3,878,666	2,830,936
Electrolux Corp., New York	376,136	374,697	897,560	818,611
Eureka Vacuum Cleaner Co., Detroit	51,641*	43,572*	83,788*	70,656*
Falrhanks Co., New York	5,329	872	14,744†	3,089†
Falrhanks, Morse & Co., Chicago			948,177	718,397
General Fireproofing Co., Youngstown, O.			521,205	266,596
General Railway Signal Co., Rochester, N. Y.	122,037†	35,579†	237,919	36,288*
General Steel Castings Corp., Eddystone, Pa.	4,032*	100,105*	72,958	514,790†
Gillette Safety Razor Co., Boston	637,004	696,447	1,333,451	1,616,907
Greenfield Tap & Die Corp., Greenfield, Mass.	97,628	22,565	231,476†	57,702
Hoe & Co. Inc., R., New York	104,847†	74,377*	110,499†	151,549*
International Business Machines Corp., New York	2,097,978†	2,147,539†	4,535,482	4,392,356
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.	174,687†	5,437*	65,484	129,922*
Kingston Products Corp., Kokomo, Ind.	30,105*†	17,431*	53,836*	46,230
Lunkenheimer Co., Cincinnati			294,839	108,145
Marchant Calculating Machine Co., Emeryville, Calif.	182,766†	192,557†	407,767	361,451
Marlin Co., Glenn L., Baltimore	2,128,820	285,127	4,291,490	967,624
Micromatic Hone Corp., Detroit	45,133†	14,527†	102,120	29,800
Muskegon Motor Specialties Co., Muskegon, Mich.			126,743	111,137
Nash-Kelvinator Corp., Kenosha, Wis.	901,939	108,264	1,284,880†	248,769†
National Acme Co., Cleveland	721,504	55,900	1,247,050	109,736
National Cash Register Co., Baltimore	618,960	704,344	1,099,831	1,188,369
New Idea Inc., Coldwater, O.	291,188†	193,720†	475,522	238,640
Nobiltt-Sparks Industries Inc., Columbus, Ind.	165,017†	159,742†	451,066	332,397
North American Aviation Inc., Inglewood, Calif.	1,846,979	1,425,730	2,367,638	2,781,682
Otis Elevator Co., New York	662,629	620,530	1,783,629	1,587,157
Packard Motor Car Co., Detroit	140,773*	1,270,945*	102,366*	1,040,616*
Pressed Steel Car Co. Inc., Pittsburgh	537,500	177,364*	974,414	415,470*
Richmond Radiator Co., Uniontown, Pa.			56,144	29,583
Simmons Co., New York			1,055,541	708,092
Square D Co., Detroit	504,272†	181,781†	905,130	308,381
Studebaker Corp., South Bend, Ind.	445,806	717,400	957,309	774,314
Sundstrand Machine Tool Co., Rockford, Ill.			707,676	45,192
Taylor-Wharton Iron & Steel Co., High Bridge, N. J.			106,733†	202,549*
United-Carr Fastener Corp., Cambridge, Mass.			261,612	224,286
United States Pipe & Foundry Co., Burlington, N. J.			783,018	1,434,916
Walworth Co., New York	133,737	97,258*	203,415	145,626*
White Motor Co., Cleveland			743,529	469,045*
Wolverine Tube Co., Detroit	141,607†	78,861†	222,713	175,098
Worthington Pump & Machinery Corp., Harrison, N. J.	526,117†	119,326†	1,078,922	95,164*

*Loss; †indicated; ‡before federal income tax.

AMERICAN ROLLING MILL CO. SELLS \$7,500,000 DEBENTURES

American Rolling Mill Co., Middletown, O., has contracted to sell an aggregate of \$7,500,000 principal amount of 10-year, 3 per cent debentures, of which \$5,000,000 were issued early last week. Two insurance companies were purchasers.

The money is to be used for reduction of \$2,000,000 principal amount of 4 per cent first mortgage notes, payment of \$1,500,000 of bank loans and for additional working capital.

CRUCIBLE STEEL CO.

Crucible Steel Co. of America, New York, earned \$2,404,883 net profit in first half, 1940, after depreciation, depletion, interest, amortization and federal income taxes under existing rates. This was equal, after dividend requirements on the company's 7 per cent preferred stock, to \$3.52 per share on common. In first six months last year, net income was \$350,821 or \$1.47 per share on the 7 per cent preferred.

Net profit for the quarter ended June 30 was \$1,211,727, equal to \$1.78 per common share, and compared with \$1,193,156 or \$1.74 a share on common in the preceding period.

Special stockholders' meeting has been called for Oct. 3 to consider a plan for payment of the accumulated arrearages in preferred dividends, \$40.75 per share, and to merge the company's principal subsidiary, Pittsburgh Crucible Steel Co., with the parent concern. Pro-

(Please turn to Page 92)

Steel Has a Real Profits Problem

■ SUFFICIENT time has elapsed to permit careful examination of the returns on industrial investment during the first half of 1940. Now available is the National City bank's comparison of earnings by different industries. This tabulation shows, in the main, that a large portion of industry enjoyed good profits during this period.

As usual, the automobile industry led the profits parade with more than 21 per cent. Manufacturers of "miscellaneous metal products" returned 20 per cent. Those that averaged 10 to 15 per cent included the manufacturers of food products, beverages, textiles, apparel, paper products, chemicals, drugs, stone, clay, glass, electrical equipment, hardware, tools, household equipment, machinery, office equipment, railway equipment.

At the bottom of the list, along with leather, shoes and wood products, stands steel, with 5.5 per cent for the United States Steel Corp. and 6.2 for the rest of the iron and steel industry. This was the showing on a comparatively satisfactory volume of output, for steel production during first half averaged 72.64 per cent of ingot capacity.

Steelmaking Profitable Only When Production Is Near Capacity

Yet this return is a good one for steel—in the light of returns over a period of years. During the decade 1930-1939 steel's net profit, as compiled by STEEL, averaged only 1.899 per cent on invested capital—and even this figure fails to reflect fully the dismal earnings picture because it represents the profit before deducting fixed charges such as preferred stock dividends and bond interest.

Present indications are that steel earnings should be somewhat better in the second half than in the first. This ex-

pectancy is predicated on the likelihood that production will average considerably higher and that less steel will be sold at reductions from published prices. At the same time there are factors of uncertainty. Collapse of England, for example, would reduce tonnage requirements sharply. Then, too, it seems likely that costs may be increased further, due to imposition of higher taxes by the revenue bill now in the formative stage in congress.

What the steel industry has arrived at in recent years is a selling price-cost relationship which permits a profit of approximately 6 per cent only when steel consumption is at peak—that is, when it is able to distribute overhead expense over a large amount of tonnage and when it feels under less compulsion to offer cut prices in order to get business.

Future not Bright Unless Industry Adjusts To Meet Inevitable Lean Years

From an earnings standpoint, the future of the steel industry must be viewed with some apprehension. Lean times will come again—that is inevitable. If the relation of selling prices to cost remains as at present—when even under today's favorable conditions certain important steel products are in the red—profits of the industry as a whole again will be practically nil. This is a chief problem facing management in the steel industry. Difficult as it is, it is to be hoped that it can be solved. If it is not solved it will be only a matter of time when the industry will cease to attract investors and when it will be shunned by ambitious young men eager to launch successful careers.

EC Krentzberg

The BUSINESS TREND



Activity Well Sustained In Durable Industries

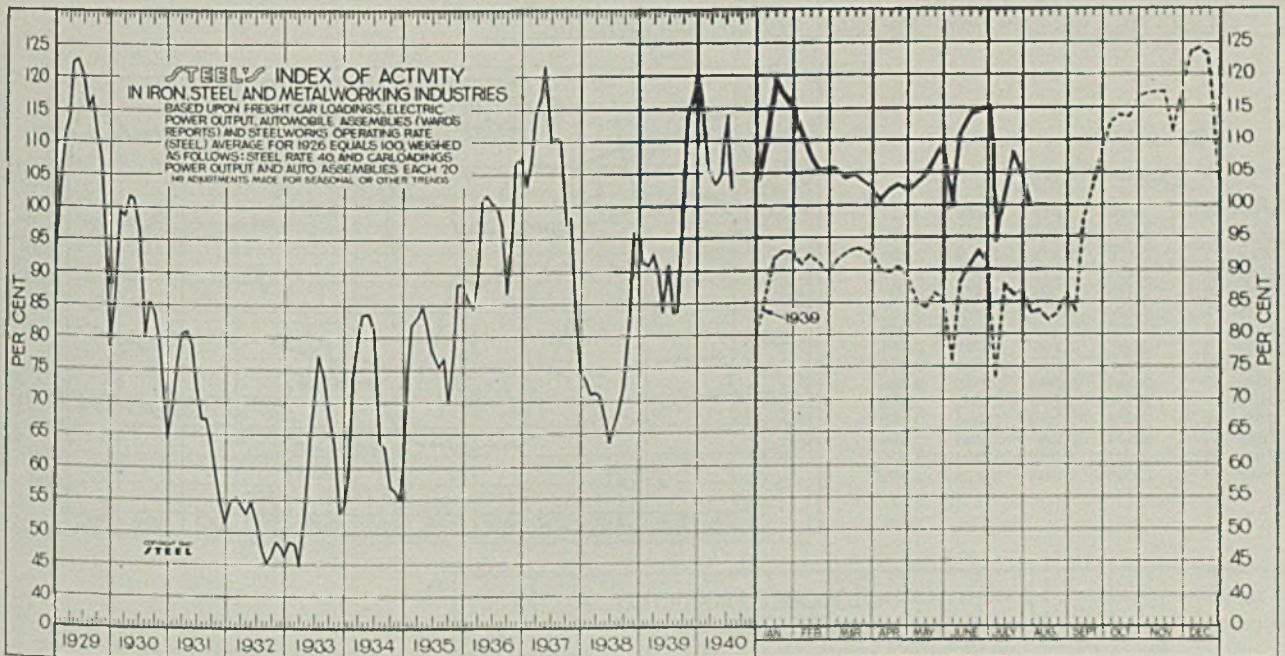
■ THE sharp seasonal decline in automobile production throughout July was the chief factor in forcing STEEL's index to lower levels for the period. Gains in steelmaking operations, electric power consumption and revenue freight carloadings were more than offset by the seasonal recession in motor car assemblies.

During the latest week ended Aug. 3, STEEL's index declined 3.7 points to 99.7, against 103.4 for the week of July 27 and 83.5 in the corresponding 1939 period.

In the week ended Aug. 3 steelmaking operations

and electric power consumption moved into new high levels for this year. Revenue freight carloadings recorded a less than seasonal decline, while automobile production was below half the previous week's total as additional interests closed down preparatory to 1941 model production.

The high level of operations in the durable goods industries is expected to be sustained for some months, reflecting the expansion in order backlogs in most industrial lines and prospects of additional large scale requirements arising from our domestic rearmament program.



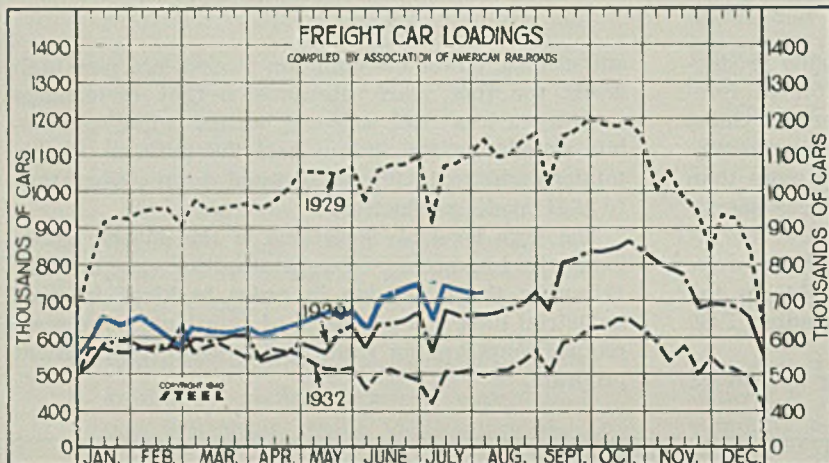
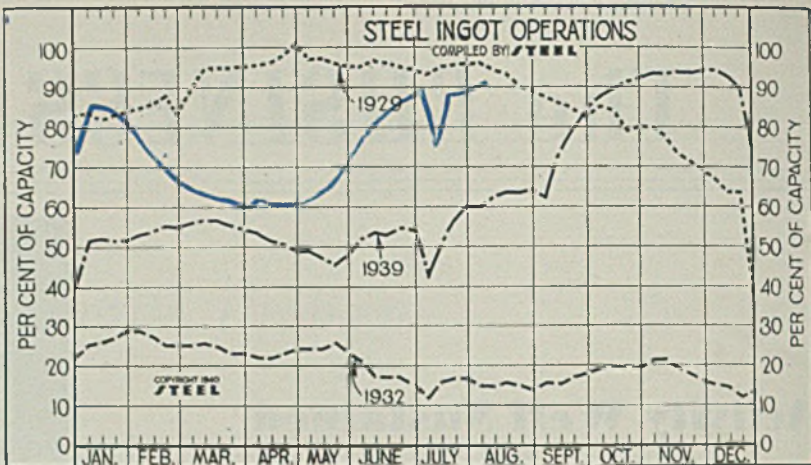
STEEL'S index of activity declined 3.7 points to 99.7 in the week ended Aug. 3:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
May 25	109.1	85.4	Jan.	114.7	91.1	73.3	102.9	83.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
June 1	99.2	75.9	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
June 8	111.9	88.2	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
June 15	114.6	90.9	April	102.7	89.6	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
June 22	114.8	93.0	May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June 29	115.3	91.0	June	114.2	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July 6	94.2	73.4	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
July 13	108.5	87.8	Aug.	.....	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
July 20	106.0	86.0	Sept.	.....	98.0	72.5	96.8	88.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
July 27	103.4	86.8	Oct.	.....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Aug. 3	99.7	83.5	Nov.	.....	116.2	93.9	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
May 4	63.5	49.0	31.0	91.0
May 11	66.5	47.0	30.0	89.0
May 18	70.0	45.5	30.0	91.5
May 25	75.0	48.0	28.5	75.0
June 1	78.5	52.0	25.5	75.0
June 8	81.5	53.5	25.5	74.0
June 15	86.0	52.5	27.0	75.5
June 22	88.0	54.5	28.0	74.0
June 29	89.0	54.0	28.0	77.5
July 6	75.0	42.0	24.0	74.0
July 13	88.0	50.5	32.0	82.0
July 20	88.0	56.5	36.0	81.0
July 27	89.5	60.0	37.0	84.0
Aug. 3	90.5	60.0	40.0	84.5



Freight Car Loadings

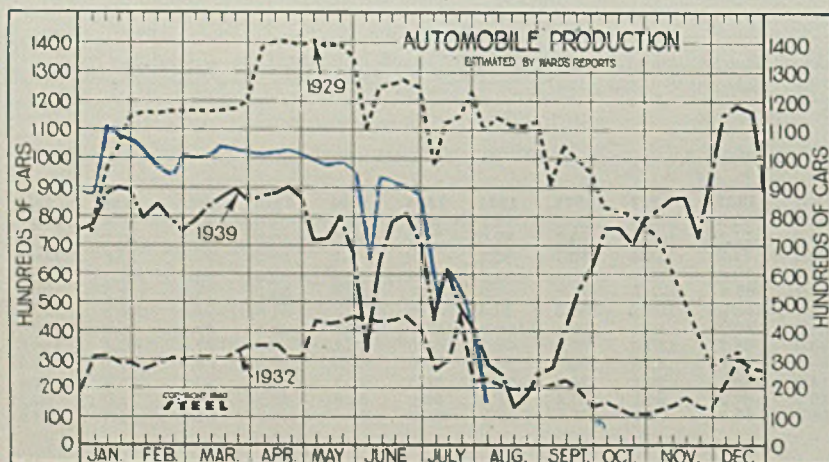
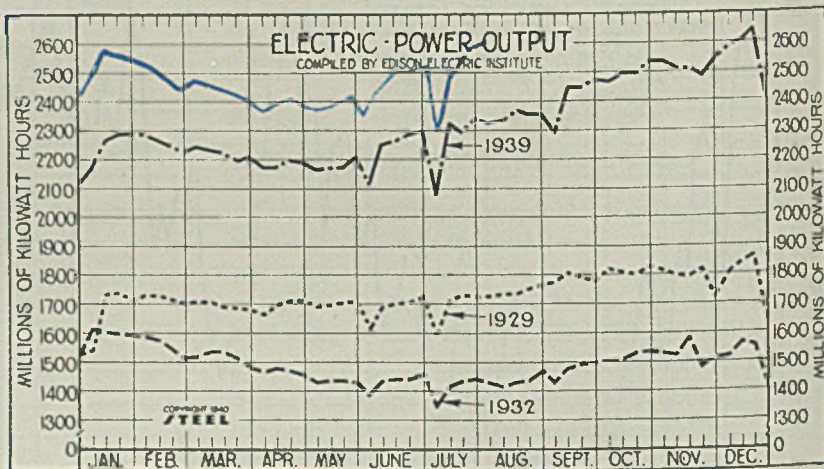
(1000 Cars)

Week ended	1940	1939	1938	1937
May 4	666	573	536	767
May 11	681	555	542	774
May 18	679	616	546	779
May 25	687	628	562	795
June 1	639	568	503	692
June 8	703	635	554	754
June 15	712	638	556	756
June 22	728	643	559	774
June 29	752	666	589	806
July 6	637	559	501	682
July 13	740	674	602	770
July 20	730	656	581	771
July 27	718	660	589	783
Aug. 3	718	661	584	770

Electric Power Output

(Million KWH)

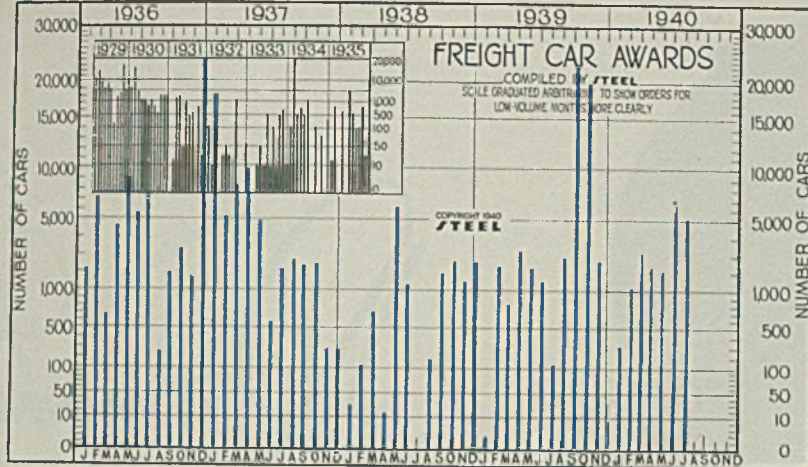
Week ended	1940	1939	1938	1937
May 4	2,386	2,164	1,939	2,176
May 11	2,388	2,171	1,968	2,195
May 18	2,422	2,170	1,968	2,199
May 25	2,449	2,205	1,973	2,207
June 1	2,332	2,114	1,879	2,131
June 8	2,453	2,257	1,992	2,214
June 15	2,516	2,265	1,991	2,214
June 22	2,509	2,285	2,019	2,238
June 29	2,514	2,300	2,015	2,238
July 6	2,265	2,088	1,881	2,096
July 13	2,483	2,324	2,084	2,298
July 20	2,524	2,295	2,085	2,259
July 27	2,601	2,342	2,094	2,256
Aug. 3	2,605	2,325	2,116	2,262



Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
May 4	99.3	71.4	53.4	140.2
May 11	98.4	72.4	47.4	140.4
May 18	99.0	80.1	46.8	131.3
May 25	96.8	67.7	45.1	131.4
June 1	61.3	32.4	27.0	101.7
June 8	95.6	65.3	40.2	118.8
June 15	93.6	78.3	41.8	111.6
June 22	90.1	81.1	40.9	121.0
June 29	87.6	70.7	40.9	122.9
July 6	52.0	42.8	25.4	101.0
July 13	62.2	61.6	42.0	115.4
July 20	53.0	47.4	32.1	88.1
July 27	34.8	40.6	30.4	86.4
Aug. 3	17.4	28.3	14.8	78.7



Freight Car Awards

(Hundreds of Cars)

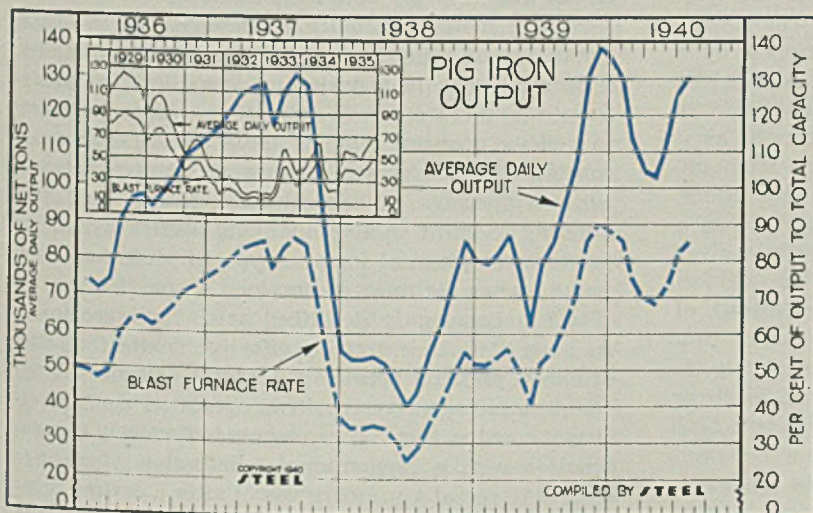
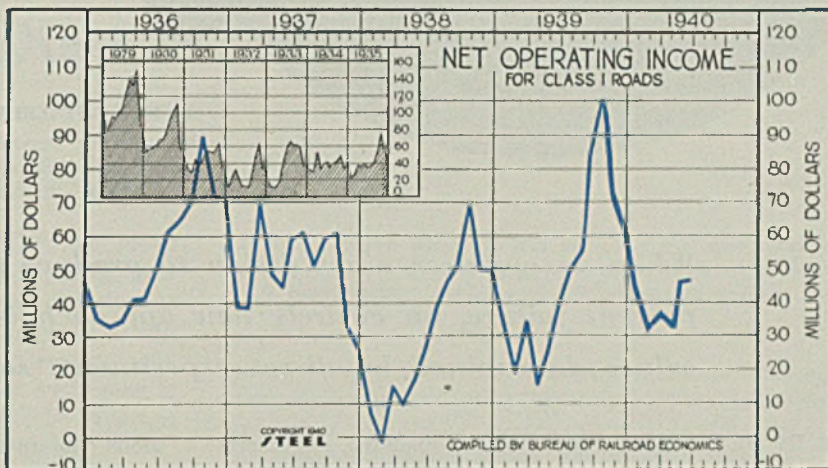
	1940	1939	1938	1937
Jan.	3.60	.03	.25	178.06
Feb.	11.47	22.59	1.09	49.72
Mar.	31.04	8.00	6.80	81.55
April	20.77	30.95	.15	97.72
May	20.10	20.51	60.14	47.32
June	74.75	13.24	11.78	5.48
July	57.36	1.10	.00	10.30
Aug.	...	28.14	1.82	14.75
Sept.	...	230.00	17.50	12.16
Oct.	...	196.34	25.37	13.55
Nov.	...	26.50	12.32	2.75
Dec.	...	.35	25.81	2.75
Total	...	577.75	163.03	516.11

**Class I Railroads
 Net Operating Income**

(Unit: \$1,000,000)

	1940	1939	1938	1937
Jan.	\$45.57	\$32.89	\$7.14	\$38.87
Feb.	32.62	18.59	1.91*	38.78
Mar.	36.73	34.32	14.73	69.88
April	33.82	15.32	9.40	48.36
May	47.08	25.10	16.67	44.24
June	47.42	39.10	25.16	59.35
July	...	49.01	38.43	60.99
Aug.	...	54.59	45.42	50.76
Sept.	...	86.43	50.36	59.62
Oct.	...	101.62	68.57	60.86
Nov.	...	70.35	49.67	32.44
Dec.	...	60.95	49.37	25.99
Average	...	\$49.02	\$31.02	\$49.18

*Indicates deficit.



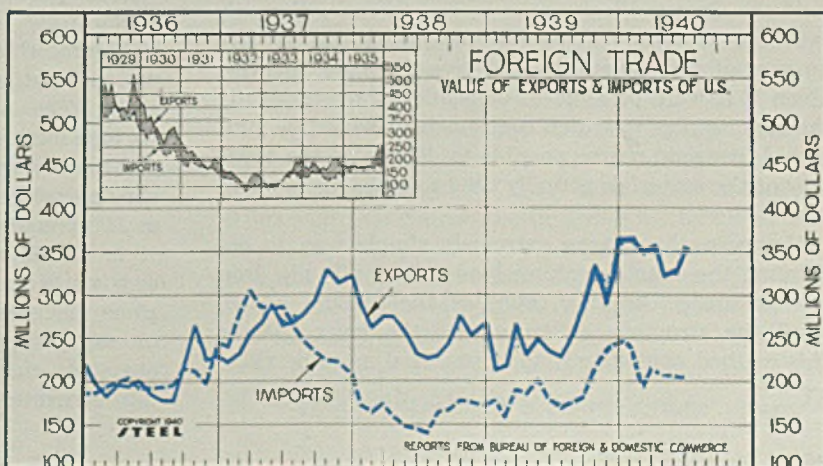
Pig Iron Production

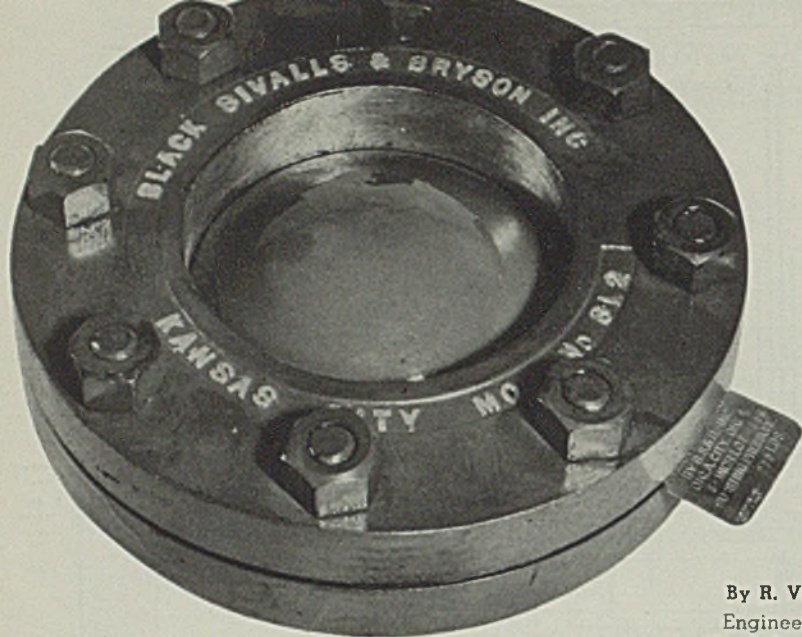
	Daily average Net Tons			Blast furnace Rate (%)		
	1940	1939	1938	1940	1939	1938
Jan.	129,825	78,596	52,201	85.4	51.0	33.6
Feb.	113,943	82,407	52,254	75.0	53.5	33.6
Mar.	105,502	86,465	53,117	69.5	56.1	34.2
Apr.	104,635	76,732	51,819	68.9	49.8	33.4
May	112,811	62,052	45,556	74.2	40.2	29.4
June	127,103	79,125	39,601	83.6	51.4	25.5
July	130,943	85,121	43,827	86.1	55.0	28.2
Aug.	...	96,122	54,031	...	62.4	34.8
Sept.	...	107,298	62,835	...	69.7	40.5
Oct.	...	131,053	74,697	...	85.2	48.0
Nov.	...	138,883	85,369	...	90.3	55.0
Dec.	...	136,119	79,943	...	88.5	51.4
Av.	...	86,375	51,752	...	62.6	37.3

**United States
 Foreign Trade**

(Unit: \$1,000,000)

	Exports		Imports	
	1940	1939	1940	1939
Jan.	\$368.6	\$212.9	\$241.9	\$178.2
Feb.	347.0	218.6	199.8	158.0
Mar.	352.3	267.8	216.7	190.5
April	324.0	231.0	212.2	186.3
May	325.3	249.5	211.4	202.5
June	350.4	236.1	211.4	178.9
July	...	229.6	...	168.9
Aug.	...	250.8	...	175.8
Sept.	...	288.6	...	181.5
Oct.	...	332.1	...	215.3
Nov.	...	292.7	...	235.4
Dec.	...	367.8	...	247.0
Total	...	\$3,177.0	...	\$2,318.3





*D*esigning

By R. V. SUTHERLAND*
Engineering Department
Black-Sivalls & Bryson, Inc.
Kansas City, Mo.

When an engineer must design to produce failure instead of to prevent failure, an entirely new approach is required. Design values determined by direct experiment, so include all factors

■ IN DESIGNING a structure or machine, engineers commonly determine as accurately as possible just what stress will be carried by each component. Then actual loads or stresses are multiplied by a factor of 3, 4 or 5 and the parts made sufficiently strong to withstand these higher values. Use of such a "factor of safety" is a distinct benefit as it affords valuable insurance against failure from unforeseen causes, excessive loads or unusual conditions.

It is possible to say with great certainty that a structure or machine so designed will sustain a given "safe load" indefinitely. However, when an engineer is required to design to *produce failure* instead of *prevent failure*, a new approach is required.

For such work, there is no factor of safety to fall back on for unknown or undetermined loads or conditions. A more accurate knowledge of both stress and material is required.

Suppose, for instance, it is necessary to know exactly the number of pounds of cast iron required to load the George Washington bridge to make it crash into the Hudson. It is extremely doubtful if any amount of mathematics would give the exact answer. Even if it were possible to determine mathematically the exact stress to which each member would be subjected, it would not be possible to determine the capacity of the materials actually used to resist these stresses.

However, there is an extremely simple way to determine the exact breaking load. Just pile pig iron on the bridge, keeping count of the amount added, until the structure collapses into the river. While this method obviously is so impractical as to be ridic-

ulous, the fact remains that the method not only is simple but also an extremely accurate one.

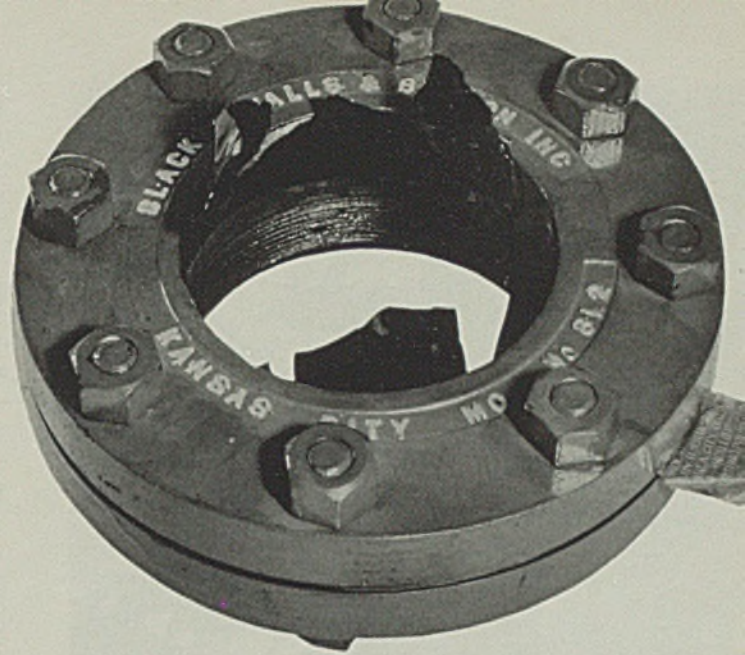
Such a method actually is employed as the basis for design of "bursting disks." As the name implies, a bursting disk is a device made to burst at predetermined pressure. In so doing it provides an opening to relieve pressure. In its most desirable shape it consists of a preformed diaphragm clamped between suitable flanges. A typical disk before and after bursting is shown in accompanying illustrations. The preformed spherical-surface type of disk has been found by far the most successful.

It has been aptly described as a "pressure fuse." As such, it is an extremely effective device for relief of excess pressure because it features extremely large comparative capacity, positive operation and simplicity of construction. It can be used effectively in combination with a conventional relief valve where it is desired to reseal a pressure vessel after a desired pressure drop has been attained through bursting of the disk.

Assume that it is desired to produce a disk which will burst at, say, a pressure of 300 pounds per square inch. The procedure found most practical is the "bridge method." A disk is selected, pressure applied and the bursting point noted. Then it simply is necessary to select a disk whose "identical twin" bursts at 300 pounds. While a somewhat expensive method, it is simple and accurate. In practice, the process consists of making a number of disks from the same piece of material and deliberately bursting one out of, say, every ten made. This is done in a safety chamber, the special air compressor setup embodying accurate indicating and recording gages. The

*Member, American Society of Mechanical Engineers.

For Failure



Typical tests on bursting disks blow the thin disk apart as shown here in these before and after views of a 6-inch disk bursting at a pressure of 220 pounds per square inch

entire lot of disks then is stamped with the mean bursting pressure of those tested. The result is a controlled accuracy guaranteed to be within plus or minus 5 per cent. Actually it will be well within that limit. The thousands of disks already made afford an extensive amount of test data so it now is possible precisely to predict the results to be expected from a certain material of a given thickness.

While mathematical analyses and solution of the stress in bursting disks have been made, there cannot be any mathematical solution taking into account the variations in material. Experience proves that these variables apparently can be determined in no simpler or better way than by fabrication and bursting of a sample disk. However, the production and use of bursting disks is not so simple as one might imagine from this, there being a number of other unusual problems involved both in their manufacture and use.

Safety-Heads, a trade name describing the patented combination of bursting disk and flanges as made by Black-Sivalls & Bryson Inc., are made in sizes from $\frac{1}{2}$ to 24 inches in diameter with bursting pressures from 5 to 20,000 pounds per square inch, and that range is being extended. Apparently there is an almost unending variety of applications for these devices.

In manufacturing these disks, it has been found that most satisfactory results are obtained with ductile materials—that is, metals. It seems to be necessary that the material shall flow under “near-bursting stress” until it attains such a shape as permits the minimum stress for the load. The stress must be a “pure” stress. Use of materials of low ductility appears to result in combined stresses along with “stretch,” resulting in lack of uniformity and unpredictable results.

Almost all metals which can be obtained in sheet form have been employed. These include aluminum, copper, steel, stainless steel, monel, gold, platinum. Laminated combinations of base and the more precious metals are most generally used. Recent produc-

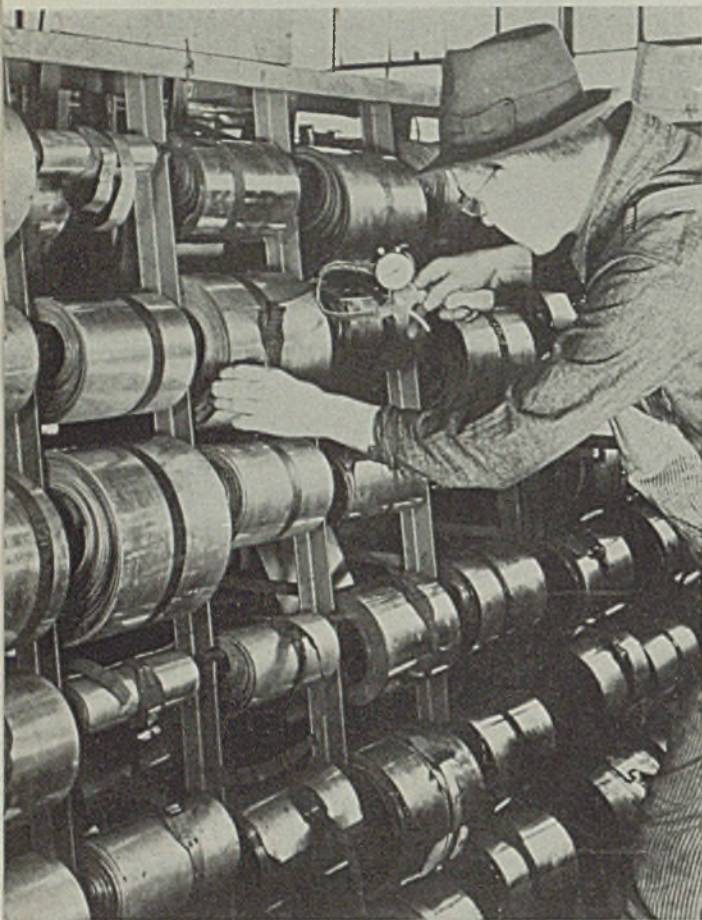
tion in this country of laminated aluminum-and-gold and aluminum-and-silver has provided valuable new materials for disks. Nearly all of these metals can be obtained in many alloys and in many tempers . . . Lead, tin and zinc are notably unsatisfactory.

Aluminum and copper are the most widely used metals for this purpose. They have the very desirable property of low tensile strength. Commercial 2SO aluminum alloy with ultimate tensile strength of 13,000 to 15,000 pounds per square inch has been used to make disks with a bursting pressure of 11 pounds per square inch in 6-inch diameter size and only 160 pounds per square inch in the $\frac{1}{2}$ -inch diameter size.

There is a minimum thickness of any metal which can be used to make disks on a press. Press forming seems superior to pressure forming, probably because it tends to minimize excessive flow of metal from any weak spot and also results in a uniform depth and a uniform amount of cold working. The rate of the drawing operation can be controlled accurately so conditions for the flow of metal can be identical for an entire lot of disks.

To form the disks, the metal must be thick enough to flow into the new shape, semi-spherical, without excessive thinning. After forming, the disks must undergo a certain amount of handling and shipping so must be sturdy enough to withstand this treatment. However, disks have been made as thin as 0.002 inch. Of course, the thickness of the metal must be exactly right. Since metals often are conveniently obtainable only in standard gages, these special thicknesses are produced by cold rolling in a small mill at the fabricating plant.

If required bursting pressure is low, the choice of metal is limited to those which have a low enough



To accommodate the many bursting pressures for which the disks must be designed, strip stock of a wide variety of thicknesses must be available. In addition to standard thicknesses, a rolling mill in the plant is employed to make available many other thicknesses. This view shows only a portion of the stock maintained

strength and can be obtained thin enough to burst at the required pressure. Comparatively high bursting pressures offer a choice of several materials. Corrosion resistance requirements or other special qualifications often will indicate which is the most desirable material for a particular application.

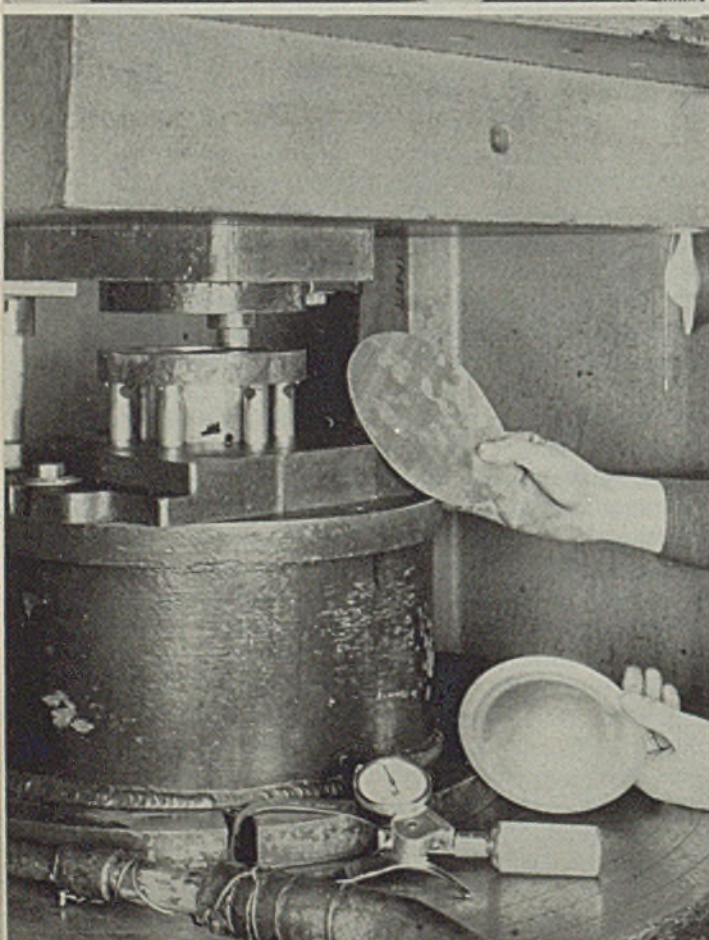
In selecting a bursting disk to safeguard a pressure vessel, it is desirable to consider the pressure vessel itself, including material from which it is made, its working pressure and consequent working stress and the ratio of this working stress to ultimate strength and elastic limit of its material. A safety device must, of course, function before the stress in any part of the vessel itself reaches the elastic limit and distorts permanently. Safe working pressures are almost always established so that working stresses are less than half the elastic limit. In such cases, disks with a bursting pressure of $1\frac{1}{2}$ times the working pressure furnish adequate protection.

"Upper Creep Limit" Determining Factor

This means that a disk will be stressed to $\frac{2}{3}$ its ultimate strength under ordinary working pressures. With many materials, this means they are stressed beyond their elastic limit. This fact is amazing to many engineers who spend nearly all their time designing to *avoid* this very condition. Thus 2SO aluminum with an ultimate tensile strength of 13,000 to 15,000 pounds per square inch is stressed to about 10,000 pounds per square inch under normal working conditions. The nominal elastic limit of this material is about 5000 pounds per square inch.

While these values are for a standard set of conditions and are not correct for the conditions in a disk, the relative values are similar. The determining factor for maximum permissible stress or for ratio of working pressure to bursting pressure is the "upper creep limit" of the material. This is the value beyond which the material flows so rapidly as to fail in a comparatively short time. The fact that the creep limit of metals like lead, tin and zinc is so low as compared with their ultimate strength, accounts for the unsuitability of these metals for disks.

It is difficult to find published data for creep in most metals, in such form as is useful for application to bursting disk design. Most published data available have been determined for engineers who design for ample safety and not for exact failure. Creep stresses, for instance, ordinarily are stated as values resulting in a certain percentage of creep in a certain number of hours. Data such as this are extremely



Most bursting disks are formed in a press operation using a setup similar to that shown here. Note hold-down ring in lower section of die. A micrometer checks amount of reduction in thickness produced by the forming

difficult to apply in the manufacture of disks.

This means that the bursting disk designer must resort to direct experiment and tests to determine the creep limits as well as to help determine other factors such as fatigue, temperature, corrosion, etc.

Where pressure vessels are subject to pulsations, fluctuations or alternate pressure and vacuum the fatigue limit of the material is likely to be the determining factor in figuring the ratio of bursting pressure to working pressure. Here again published data are inadequate. Tests have shown, however, that working pressures must be held considerably below those for more quiescent loads. An aluminum disk, for example, will serve more satisfactorily under severe pulsation if the ratio of bursting pressure to working pressure be 2 rather than $1\frac{1}{2}$.

In process industries, high temperatures often are encountered. In such cases accurate metallurgical characteristics of various metals must be determined by extensive testing at actual working temperatures. For this work, an electrically heated furnace with multiple thermocouples and recording and controlling pyrometers is used. This makes it possible to rate bursting disks not only for room temperature but also for various other temperatures.

Choice of metals and range of bursting pressures narrow sharply for high temperature applications. Aluminum is virtually worthless at temperatures above 300 degrees Fahr. Copper has been used successfully

at somewhat higher temperatures. Stainless steel and monel appear most suitable for extremely high temperatures. Nickel has the seemingly unique and valuable property of preserving an upper creep limit extremely close to its ultimate tensile strength at comparatively high temperatures.

The effect of cold working must be considered in applications where the temperature is above the annealing temperature of the metal in the disk. Copper has the faculty for annealing in time at extremely low temperatures. For that reason, if a copper disk, made from initially fully annealed material, be tested for bursting pressure immediately after it is made, it will show a much higher bursting pressure than it will after having been subjected to comparatively low temperatures for a period of time.

In copper, the cold-working effect of pressing a disk adds approximately 11 per cent to its initial strength. Therefore, allowance must be made for this increase in strength. To insure immediate protection it is desirable fully to anneal copper disks before putting them into use and determining their pressure rating.

The list of similar factors and variables involved in the design, fabrication and use of bursting disks could be extended to great length. In this article I have attempted merely to point out a few of the difficulties and problems involved in a "design for failure" as contrasted with a "design for safety."

Controls Soaking Pit Temperature And Atmosphere Automatically

■ RECENTLY the soaking pit facilities at the Roebbling, N. J., plant of John A. Roebbling's Sons Co. were changed over from producer gas to standard bunker "C" oil as fuel and an exceptionally efficient system installed to provide accurate automatic control of combustion conditions as well as temperature.

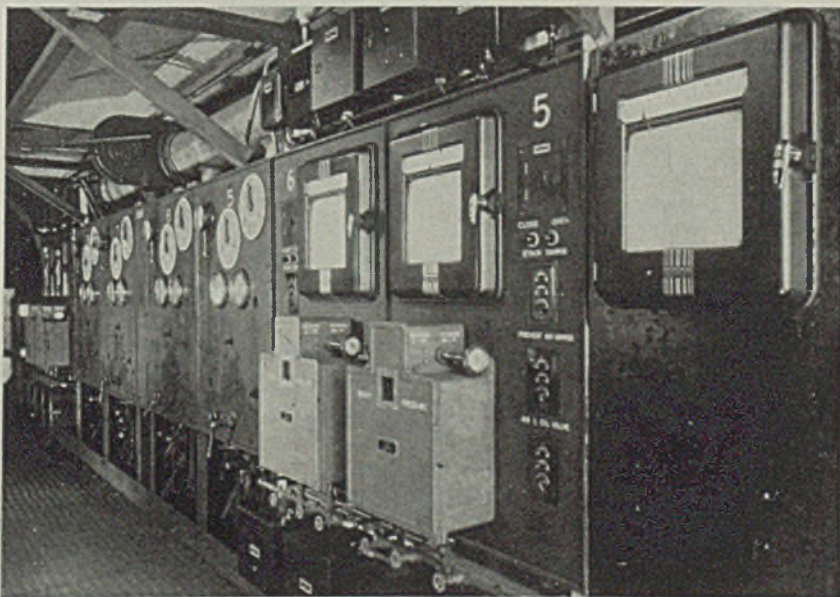
There are eight soaking pits in a double row at this installation. In loading, six hot-top ingots are placed in each pit to give a total capacity of 48 ingots. Rayotubes are mounted to sight 3 or 4 feet below the top edge at the front of each pit. Each Rayotube is connected to a control instrument set-up as shown in the schematic diagram and works with a pyrometer-recorder connected to an electric control valve drive which, through a relay, moves both atomizing air (primary air) and fuel valves. This controller, through another relay, also operates a damper drive to the recuperators to control the intake damper through which secondary air enters, all as shown in the diagram. A dial is provided on

the control panel to permit the fuel-air ratio to be re-proportioned as may be desired.

This arrangement automatically

operates valves for primary and secondary air and also for fuel as furnace (soaking pit) load requirements may dictate. The control operates to make the adjustment gradually, never moving suddenly.

Changes in furnace load do not affect furnace pressure. An entirely separate instrument from the temperature fuel-air system
(Please turn to Page 90)



Deformation Controlled

A unique handling system features a large number of hydraulic jacks on temporary foundations for aligning parts of huge tanks during field erection, permits turning tanks for downhand welding

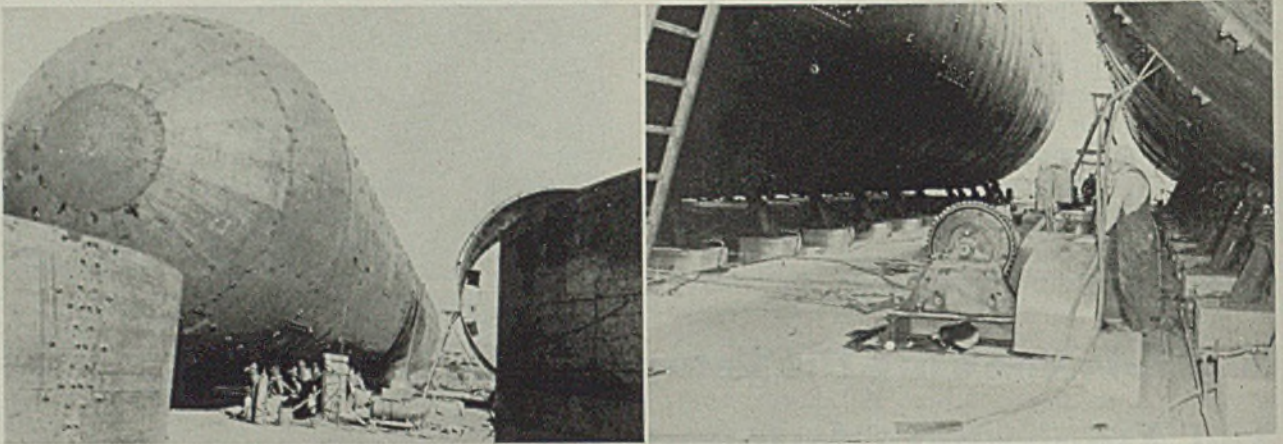


Fig. 1. (Left)—Crawler crane lifting ring section into position. Prefabricated plates stacked at left. Fig. 2. (Right)—Placing section on hydraulic jacks on temporary foundations in assembling huge tanks

■ **FIELD** erection of many large structures involves the necessity of preventing deformation of the members during assembly. In fact, this problem is so severe that the use of certain types of structures has definitely been limited because of the difficulty of developing a satisfactory, simple and efficient erection method.

The system one company has devised to overcome deformation is of particular interest because this same method has possibilities for use in erecting a large variety of structures, especially extremely large horizontal tanks and containers.

For instance, the use of horizontal high-pressure gas holders as against vertical types has several important advantages since the horizontal units have a much smaller overturning moment, both from wind pressure and seismic impact; neither do they loom up above the surrounding objects to monopolize the view, a factor of major impor-

tance in semiresidential and business districts.

Yet difficulties encountered in erection and in supporting the holders on multiple foundations have limited the size of these units greatly. It has been found that by supporting the holders at two points only, using circular girders resting on expansion rollers, all difficulties from the supporting method are eliminated.

Erection troubles were caused mainly by excessive deflections of the circular rings and uneven settlement of the foundations. However, a method was recently de-

veloped by the Lacey Mfg. Co. of Los Angeles and applied successfully to the recent construction of high-pressure storage tanks for the Southern Counties Gas Co. at Santa Monica, Calif.

This type of construction also is very economical for storage of liquified petroleum gases as well as casing head and aviation gasoline.

As will be seen in accompanying illustrations, the extremely large size of these holders called for a new method of handling if they were to be constructed and assembled without serious deformation occurring. These holders, which are of welded construction except for riveted longitudinal joints, each have a capacity of 500,000 cubic feet and were designed for a safe working pressure of 50 pounds per square inch.

The A.P.I.-A.S.M.E. code for unfired pressure vessels was followed in the design except that the clauses limiting the use of plates conforming to A.S.T.M. specification A-7

By **W. A. SANDBERG**

Chief Engineer
 Lacey Mfg. Co.
 Los Angeles

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This ease of machining opens the door to many additional uses for stainless steel. Parts that were previously considered too difficult, and therefore, too expensive, to make of Stainless, are now being turned out *economically* through the savings afforded by Carpenter Free-Machining No. 5.

The Carpenter representative with his specialized knowledge of stainless steels is prepared to help you select the grade best suited to your particular requirements. Get the benefit of his experience by taking up *your* problem with him.

THE CARPENTER STEEL COMPANY
Reading, Pa.



These paint spray nozzles are machined from Carpenter No. 5 (14% Chrome Iron). Drilling and threading are accomplished with ease. The machining speed is 175 feet per minute. Stainless Steel was adopted because it is easily cleaned and keeps the nozzle operating at highest efficiency. There is a Carpenter Stainless Steel to meet every requirement of manufacture.



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

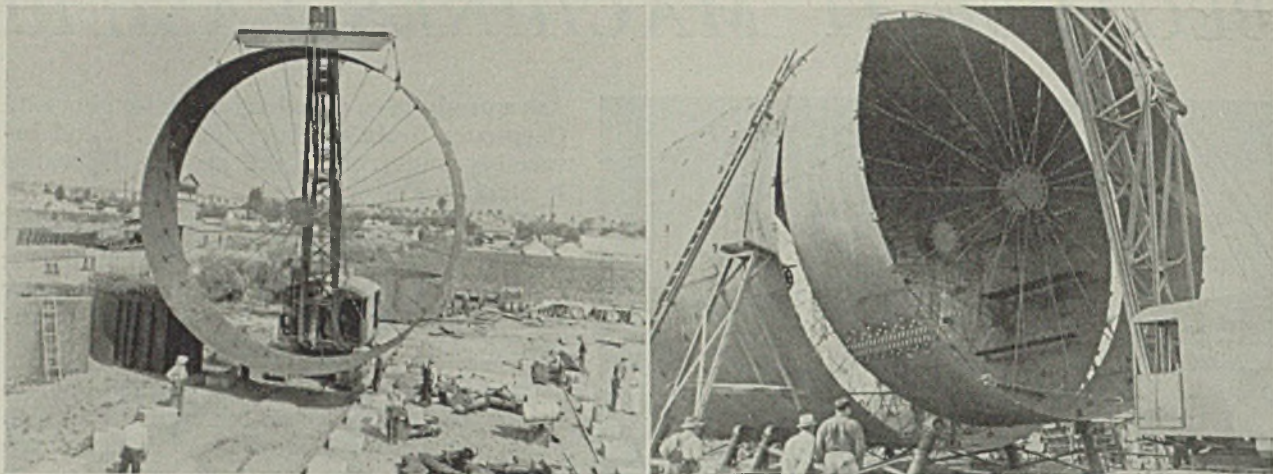


Fig. 3. (Left)—Tank completed. Now clips will be removed, holes plugged, internal tie rods removed, transverse ties attached, permanent supports attached, hydraulic jacks and temporary foundations removed. Fig. 4. (Right)—Here an electric winch pulls cables which revolve tanks for welding in downhand position

to not more than $\frac{1}{8}$ -inch were waived.

The cylindrical shells are 32 feet in outside diameter. Shell thickness is $\frac{3}{8}$ -inch and hemispherical heads are $\frac{1}{2}$ -inch material made with one crown plate and made with two rings of 12 radial segments each. The overall length is approximately 215 feet.

Supported by Two Girders

Each holder is supported by two circular girders located 108 feet 3 inches from center to center. These girders rest on rollers, in turn supported by steel pedestals on concrete foundations. Temperature expansion in this 108-foot 3-inch length is approximately $\frac{3}{4}$ -inch from 30 to 130 degrees Fahr. The expansion rollers adequately handle this movement.

Each tank weighs approximately 750,000 pounds. The supports are designed not only to take care of this weight, but also additional stresses from temperature expansion, expansion from working pressure and from a 20 per cent seismic impact. The longitudinal shell joints are quintuple riveted with $\frac{1}{2}$ -inch outside butt straps and 17 32-inch inside butt straps with $1\frac{1}{4}$ -inch steelp-head rivets. Joint efficiency is 93 per cent. Outside butt straps and outside rivet heads were seal welded for tightness but these welds were not considered when calculating joint efficiency.

From the above figures and from the accompanying illustrations, it is evident these tanks involved a number of erection and fabricating problems. As previously mentioned, the principal trouble anticipated was from deformation. However, this was adequately controlled by the special fabricating method devised as follows:

First step in constructing these tanks was to assemble four prefabricated steel plates together on a horizontal platform to form a section of the shell 32 feet in di-

ameter and 8 feet long. Prior to being shipped to the site for field erection, the plates were rolled to proper curvature, edges were machined for welding and ends punched for rivets. A number of these plates stacked on edge are seen at the lower left in Fig. 1.

First step in the field is to assemble individual shell rings, done on a horizontal platform with the plates on edge, the ring axis vertical. Each ring is about 8 feet long and 32 feet in diameter. With the four plates riveted at their ends to form a circumferential section, radial tie rods are next set in place, bolted into clips tack welded on the interior surface of the shell plates. As will be seen in Figs. 1 and 2, these tie rods are in two sets radiating out from two center rings. They furnish the necessary support to keep the section from being twisted out of shape during erection.

Next step is to move the rings into alignment on the temporary supports, a crawler crane being used to lift and place the rings. As shown in Fig. 2, each ring is placed on a pair of individual hydraulic jacks on the temporary foundations. The tip of each jack carries a roller which contacts the shell section. It is not difficult to manipulate the hydraulic jacks to align the rings accurately. Once aligned, each section is bolted to the preceding section by temporary clips.

Outside parts of the tank heads were assembled on the ground and completely welded before being lifted into place and joined to the tank. The whole shell and inner

portion of the head were completely assembled before the tank was rotated for welding.

Circumferential joints between the rings were welded both inside and out. Inside welding was done on the bottom of the tank from the interior, and the outside seam was applied at the top of the tank. Tank was rotated during welding so most of the work was done in downhand position.

Tank Revolved Readily

Fig. 4 shows the electric winch and cable connecting it to the tank at the left, which is being rotated for welding. It is not difficult to revolve the entire tank on the rollers. It will be noted the rollers are not only bolted to temporary concrete foundations, but are supported laterally by a network of structural steel. The hydraulic connections to the hydraulic jacks are clearly visible in Figs. 2 and 4 and also can be seen alongside the foundations in Fig. 1. Each jack has an individual valve so it can be operated individually when the sections are being lined up.

Before any welding was done on these large gas holders, the complete procedure was established on test plates in the field and operators were tested in accordance with these procedures. Test plates were prepared approximately 3 feet long with a standard U-groove adopted for the circumferential seams on the $\frac{3}{8}$ -inch shell. Using $3/16$ -inch electrodes, a continuous tacking pass was made on the back side of the test plates to correspond to the outside of the shell plates. Next two passes of $3/16$ -inch rod were deposited in the bottom of the groove followed by a sufficient number of passes so that one finishing pass would give a convex outer surface.

In making test plates, each succeeding pass was begun 6 inches (Please turn to Page 90)



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The steel in seamless tubing must be good — you just can't make seamless tubing successfully out of poor steel. But the best tubing for your purpose can only be made of the steel that is exactly right for that particular job.

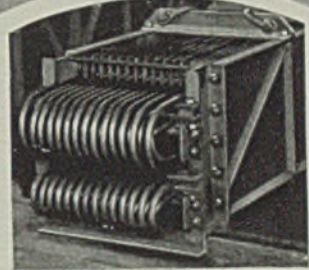
Our independent position gives us the advantage of being able to pick our sources of supply. Through long experience and close cooperation with the various producers of steel, our metallurgists know the kinds of steel each mill makes best. Every pound of steel in our large stock was made to our specifications by mills best able to produce that particular steel.

Every heat of steel that reaches our plant is carefully checked in our own laboratory. Steel of questionable quality is not accepted or used. The identification of all heats is carefully kept in our mill so that detailed records are always available showing the history of the melt.

These facts give us **complete** control over our raw material which is very essential in selecting the right steel for your particular production problem.

We **KNOW** the steel is right for your purpose before we start making your tubing.

Why not talk things over with an Ohio Seamless sales engineer and see what suggestions he has to offer.



Tubing used in pressure applications that call for bends and other severe forming operations must be right from every angle. Strength and easy working qualities of Ohio Seamless Tubing rest on the solid foundation of carefully selected steel. Craftsmanship and material combine to produce OHIO QUALITY.

OHIO
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32
YEARS
CONTINUOUS
OPERATION

SHELBY, OHIO
BIRTHPLACE OF
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STEEL TUBE INDUSTRY
IN AMERICA



The **OHIO**
SEAMLESS TUBE CO.
OHIO SPECIAL QUALITY
Shelby, OHIO

New Porcelain-Enameling Plant

Exceptionally well-planned plant prevents dust on work by using cover-coat booths and drier supplied with filtered air under pressure. Recuperator supplies 3600 c.f.h. of air at 400° Fahr.

■ POSSIBLY one of the most comprehensive and best equipped porcelain enameling shops in existence is the recently completed enameling plant of Tappan Stove Co., Mansfield, O.

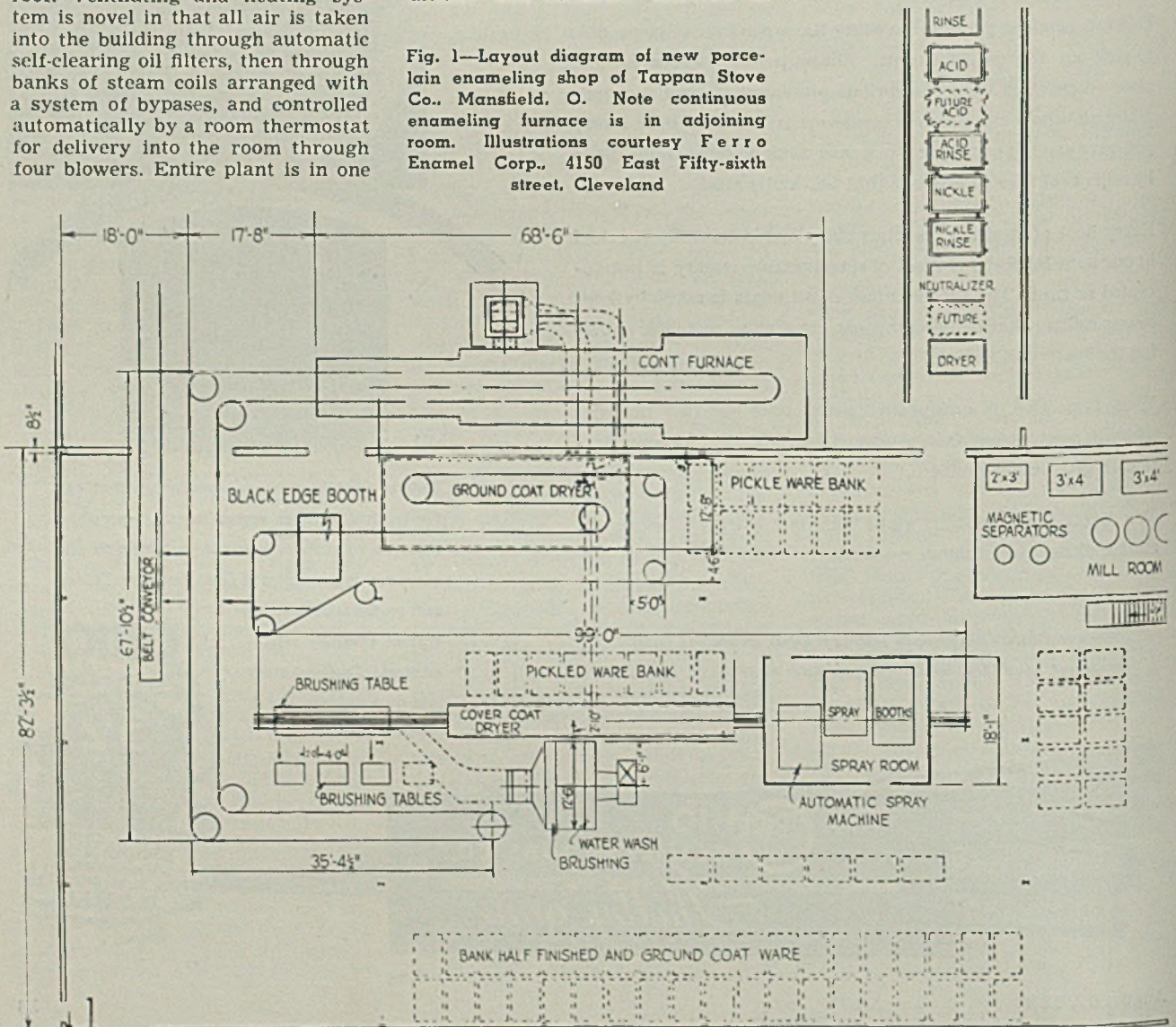
It is housed in a new fireproof building especially designed for enameling purposes. There are no overhead trusses to collect dust. The building is of steel and brick construction with insulated steel deck roof. Ventilating and heating system is novel in that all air is taken into the building through automatic self-clearing oil filters, then through banks of steam coils arranged with a system of bypasses, and controlled automatically by a room thermostat for delivery into the room through four blowers. Entire plant is in one

room and is kept under pressure to prevent dirty air from entering except through the filter system. Building and equipment layout were designed and engineered by Tappan engineers with the continuous furnace and enameling equipment furnished and installed by Ferro Enamel Corp., Cleveland, O.

Pickling room is exceptionally well lighted and air conditioned to assure more pleasant working conditions and resultant increase in

efficiency. An unusual ventilation system here was designed to keep the room under suction so no air leaves the room except through the ventilating system. Air is drawn from the outside through three sets of steam coils set into the wall and then directed by a baffle to pass over the pickling tanks and up through three powerful high-velocity exhaust fans. Air is changed

Fig. 1—Layout diagram of new porcelain enameling shop of Tappan Stove Co., Mansfield, O. Note continuous enameling furnace is in adjoining room. Illustrations courtesy Ferro Enamel Corp., 4150 East Fifty-sixth street, Cleveland



Precision HOLE LAPPING
 NOW ECONOMICAL... with

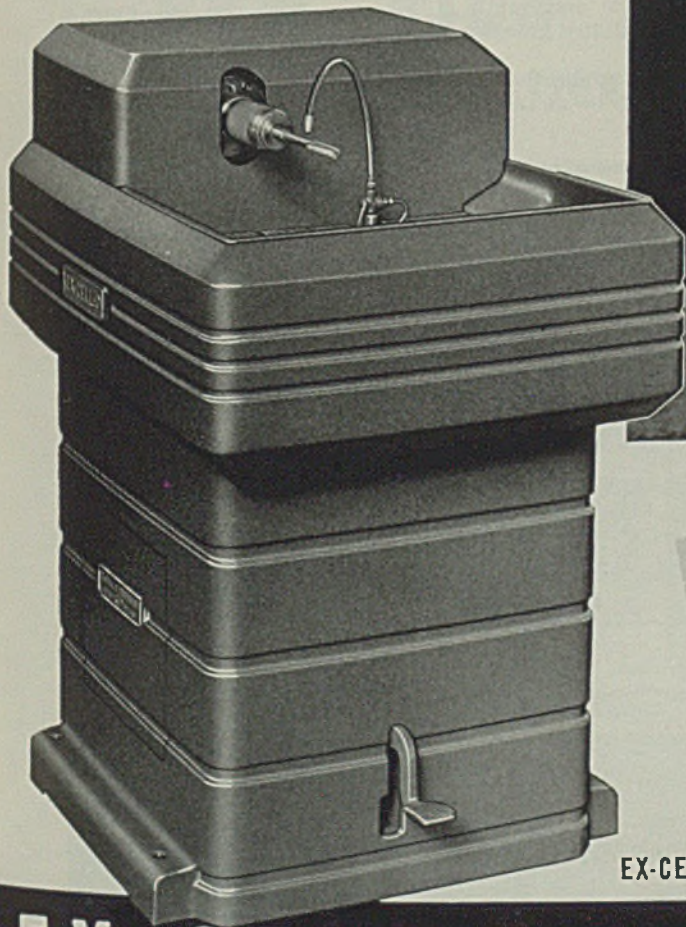
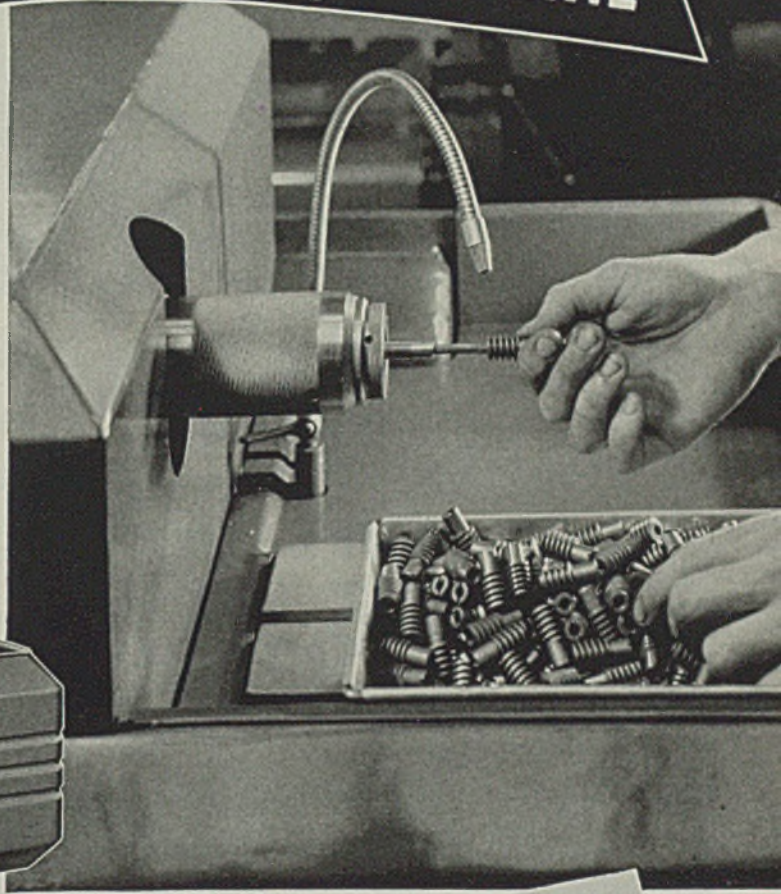
*E*xclusive

advanced design of stones and mandrels, plus extreme ease of operation and control, makes it possible to finish holes to very close limits on the Ex-Cell-O Internal Lapping Machine at a new low cost... on a high production basis.

Due to far greater stone contact area, ordinarily difficult and expensive grinding and finishing operations, such as holes interrupted with keyways, slots, etc., are precision lapped on this Ex-Cell-O machine just as easily as plain holes... stone wear is greatly minimized... the necessity for frequent checking and resetting is reduced.

Send for complete information on this money-saving machine. Initial cost is surprisingly low.

EX-CELL-O *Internal Lapping* MACHINE



BETTER JOB . . . GREATER PRODUCTION
 Worm shown lapped on Ex-Cell-O Internal Lapping Machine by Gear Specialties, Chicago. Former bellmouth conditions eliminated and production increased 50%.

PART—Worm blank • MATERIAL—4615 SAE steel, carburized and hardened • STOCK REMOVED—.0005" • SIZE OF HOLE—.21875" • TOLERANCE—.0003" • PRODUCTION—from 90 to 100 parts per hour.



EX-CELL-O CORPORATION • 1228 OAKMAN BLVD. • DETROIT, MICH.

EX-CELL-O *Precision* **MACHINES AND TOOLS**

Ex-Cell-O Corporation
 1228 Oakman Blvd., Detroit, Mich.
 Please send Bulletin 41102 on the Ex-Cell-O Internal Lapping Machine.

Name _____

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every three minutes, and there is no condensation at any time. It is possible to stand anywhere in this pickle room without noticing fumes.

Pickling room tanks include two cleaner, cleaner-rinse, acid, acid-rinse, nickel-dip, nickel-rinse and alkali solutions and a tank-type drier. Space is provided for future installation of additional tanks when required for increased production. All tanks are approximately 4½ feet wide, 7½ feet long and 4½ feet deep. Steam coils in the tanks maintain solutions at proper temperature.

Tank-type drier is heated by two cross-fired atmospheric-type gas burners, and an ingenious tripper device automatically turns the burners on when the basket is lowered and leaves only the pilots on when the basket is removed. A 1-ton capacity hoist, electrically propelled, conveys the monel metal baskets through the various operations. See layout diagram, Fig. 1.

Like the pickling room, the mill room also is unusually well planned and lighted. Two mills are 4 x 5 feet of 1000-pound capacity, while the other two are 3 x 4 feet of 500-pound capacity—all mills being individually motor driven and equipped with inching drives. Sliding gate guards are provided in front of each mill. Changing the loading heads is accomplished from a catwalk in back of the mills, this walk making the mill doors readily accessible.

Mills are loaded from the mezzanine floor where the frit, clay, oxides and other materials are stored and proportioned. A fully equipped laboratory maintains close watch over milled and sprayed

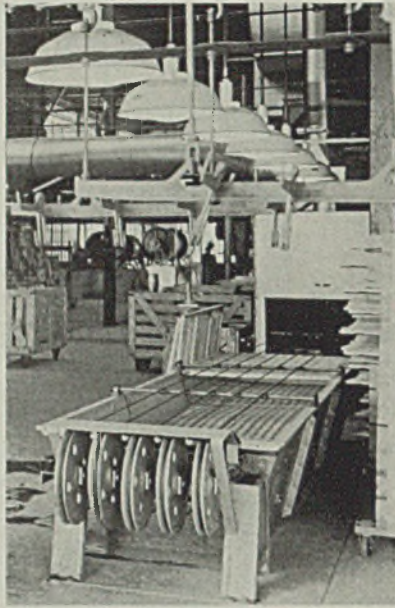


Fig. 2—Unloading end of cable conveyor or serving cover coat drier. Note closely spaced high-intensity lighting fixtures to aid inspection at this point

enamels to insure uniformity. Milled enamel is stored on the mezzanine in a battery of 200 and 300-gallon storage containers which are porcelain enameled both inside and out. An enameled cover has slotted holes to permit stirring.

Booths for cover coat application, see Fig. 3, are enclosed in an air

Fig. 3—Cover coat spray room at extreme left, air supply chamber at upper center, cover-coat drier extends off into distance below air chamber. At right is entrance end of ground-coat drier chamber with chain conveyor

conditioned plenum chamber 23 feet long by 18 feet wide and 12 feet high constructed of sheet metal and containing steel sash windows on two sides.

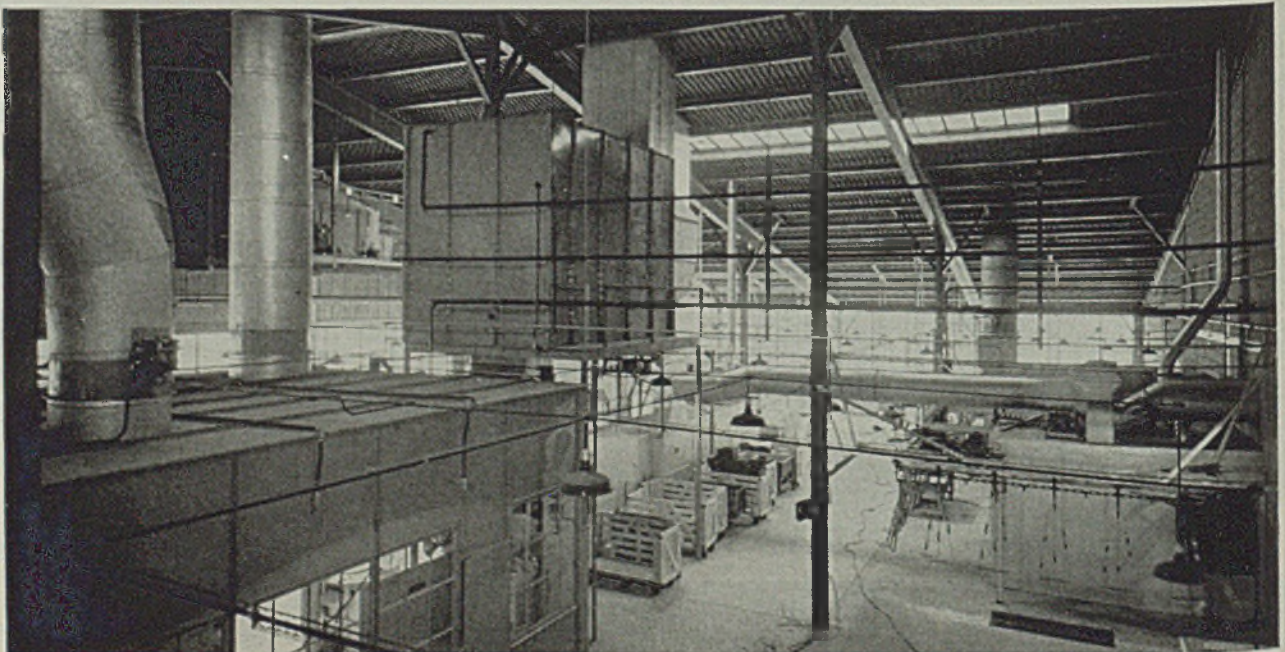
Adjoining the plenum chamber is the air supply or "makeup" air chamber, Fig. 3, containing a bank of steam coils and a large blower. The air from outside the enamel building is drawn into this chamber, where it is heated by the steam coils to control temperatures definitely. A blower discharges this air under pressure into the plenum chamber through a large number of dry air filters. This design enables the air to be equally distributed over the entire area of the spray booths.

The plenum chamber, being under pressure, prevents any shop dirt from being drawn in. This materially reduces one of the hazards of producing dirt-free cover coat ware.

Housed in by the plenum chamber are two 6-foot wide manually operated spray booths and one 6-foot automatic spraying machine, each being equipped with an individual water curtain extending the full width of the booth, making the unit self-cleaning. See Fig. 5.

The automatic spraying machine assembly consists of a moving sprayer head which has four spray nozzles of the type used on ordinary hand spray guns, adjusted to give a flat fan-shaped spray. In operation, the entire spraying assembly moves back and forth at a regulated rate of speed across the conveyor carrying the ware to be sprayed.

The overhead conveyor-type gas-fired ground-coat drier is a special design 34 feet long, 12 feet wide and constructed of 4-inch insulated panels. It can be seen at extreme right,





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Speed is the keynote of the government's ten billion dollar emergency program—a big factor in determining which plants will receive a share of the mammoth defense orders to be placed this fall. For this reason, new aids to production are vitally necessary to the thousands of industrial plants which are competing for this business.

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sell is through an exhibit in the National Metal Exposition at Cleveland, Oct. 21-25.

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Over 275 leading manufacturers have already reserved space in this biggest annual Aid to Production Exposition . . . a few choice spaces are still available. Write or wire collect today for floor plan and full details. Address: W. H. Eisenman, Managing Director, National Metal Exposition, 7301 Euclid Avenue, Cleveland, Ohio.

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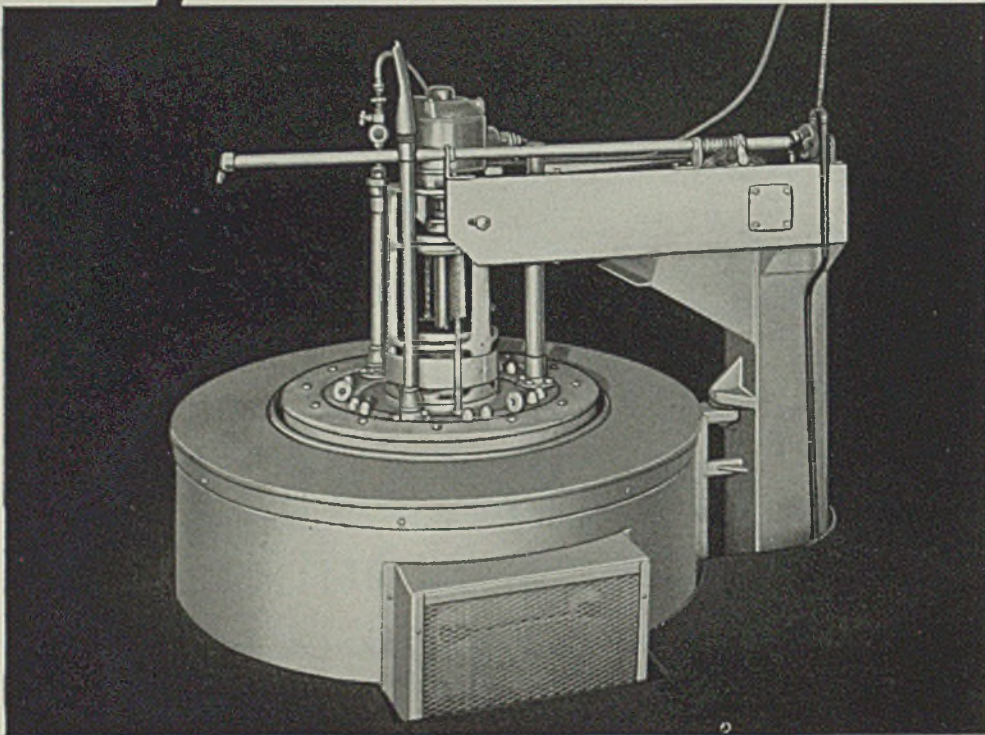


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OCTOBER 21-25, 1940 *Cleveland, Ohio*

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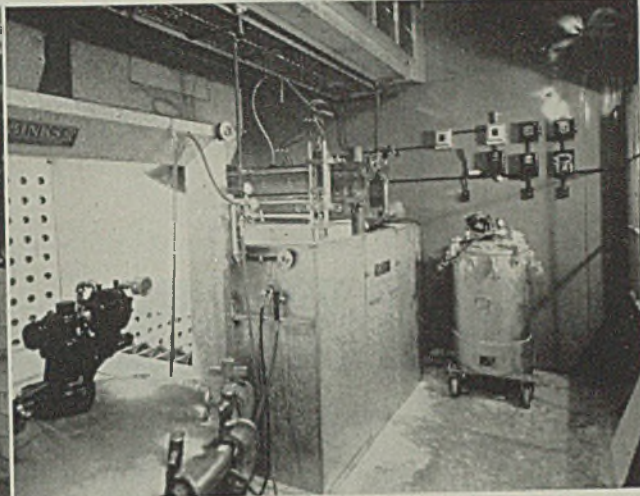
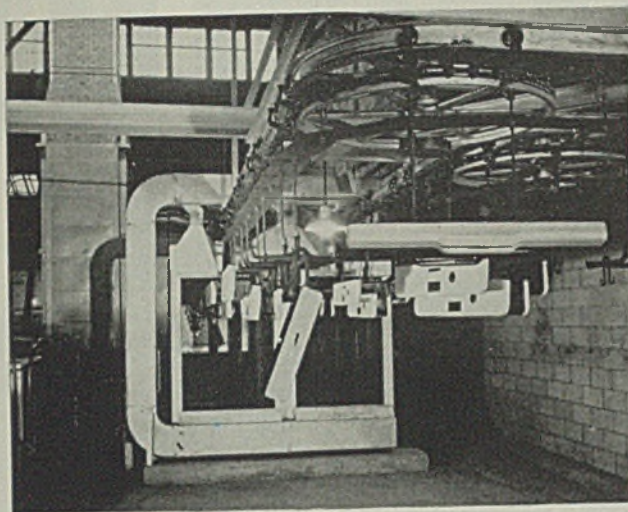


Fig. 4—(Left)—Front view of gas-fired U-type continuous porcelain enamel firing furnace. At extreme left is exhaust stack with recuperators. Duct at entrance of furnace seen here provides forced-air curtain to minimize heat losses. Fig. 5—(Right)—Interior view of spray room

Fig. 3. Heat in addition to that from the furnace recuperator is supplied by a vertical direct gas-fired heater. Heat supply fan discharges the heated air into ducts in the bottom of the oven and recirculates about 75 per cent of all heat supplied. The air heater is of the automatic ignition type with safety and control equipment.

An exhaust fan at the entrance end and a forced-air curtain at the discharge end minimize heat losses from these openings. The conveyor chain is equipped with a corner sprocket drive variable from 10 to 30 feet per minute. Easels to support the ware are on 32-inch centers and contain many movable points and supports. These permit efficient hanging of a great variety of ware.

Ware Passes Through Slots

The black-edge booth located near the discharge end of the drier has a slot through which the ware on the easels passes. It is an 8-foot wide water-wash booth with an individual precipitator unit for reclaiming overspray.

A recirculating ground-coat dip tank with magnetic separator attached insures clean well-set enamel during the entire dipping operation.

The cover-coat conveyor and drier used in conjunction with the spray booth previously mentioned consists of a cable-type conveyor enclosed in an insulated drier housing 40 feet long, 4 feet wide, 6 feet high and constructed of 4-inch insulated panels. Longitudinal doors located along the side permit easy access to the interior for cleaning and inspection. Heat for this drier is furnished by the furnace recuperator. This heated air also is filtered before entering the cover-coat drier.

This conveyor consists essentially of two sets of five endless parallel cables driven by a common driving sheave with working height 30

inches from shop floor level. Cable support and guide sheaves are mounted on a shaft supported on the outside of the drier as shown in Fig. 2. These sheaves are held in place by ball-bearing self-aligning pillow blocks.

A common fault of cable conveyors, especially on cover-coat ware, has been eliminated by the use of two sets of cables. The first set, about 30 feet long, runs from the loading end of the conveyor through the plenum chamber containing the water-wash spray booth and ends on a double-groove driving sheave located between the spray room and the drier entrance. From this point the ware is automatically transferred to another set of cables approximately 70 feet long which conveys the ware through the drier and brushing operations and then to the unloading point. See layout, Fig. 1.

By this arrangement the cables on which the ware has been sprayed do not enter the drier. This prevents enamel dust from collecting in the drier. At the loading and unloading ends of this conveyor, each cable has an automatic spring take-up to maintain even tension on the cables at all times. The conveyor driving mechanism is a totally enclosed, variable speed unit which permits operation at from 8 to 32 feet per minute.

Much of the dried cover-coat ware is brushed on the cables directly over a special-design 16-foot table located on the discharge side of the drier. Top of this table is fitted with $\frac{1}{2}$ -inch mesh galvanized screen

with a perforated plate below for equalizing the flow of air. In addition to this unit, three 3 x 4-foot brushing tables are installed parallel to the conveyor where the most difficult pieces are brushed. All tables are the suction-type, all brushed off enamel being collected and discharged into a reclaiming unit similar to that used with the spray booths.

A new Ferro U-type continuous furnace is housed in a separate building adjoining the enamel shop. Only the furnace conveyor chain enters the enamel shop proper, this allowing more working space and permitting substantial cooling of the ware after it leaves the furnace and before it enters the enamel shop for further processing or inspection.

Trolleys Are Dirtproof

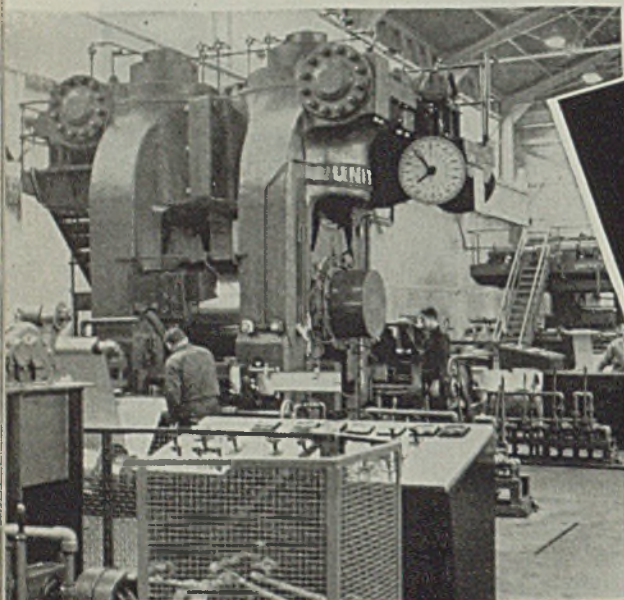
The furnace conveyor chain as shown in layout, Fig. 1, makes a 90-degree turn into the new enamel building to make a total extension from the mouth of the furnace of approximately 235 lineal feet. The conveyor is a drop-forged heat-treated chain with dirtproof trolleys equipped with special attachments that permit alloy hook rods on which the burning tools are carried to be turned at any desired angle. Traction wheel turns are used on all inside and outside turns to eliminate bumpy travel. A spring-type takeup and caterpillar drive unit completes the furnace conveyor.

Furnace itself has a hot zone 16 feet 2 inches long equivalent to about 30 lineal feet of travel in the burning zone. A 50-foot preheat is provided. Furnace is equipped with alundum muffles with new patented corrugated V-bottom. Height of the sidewall is 4 $\frac{1}{2}$ feet while inside width is ample to burn unit ranges.

Two forced air curtains, one at the front of the furnace, see Fig. 4,

(Please turn to Page 89)

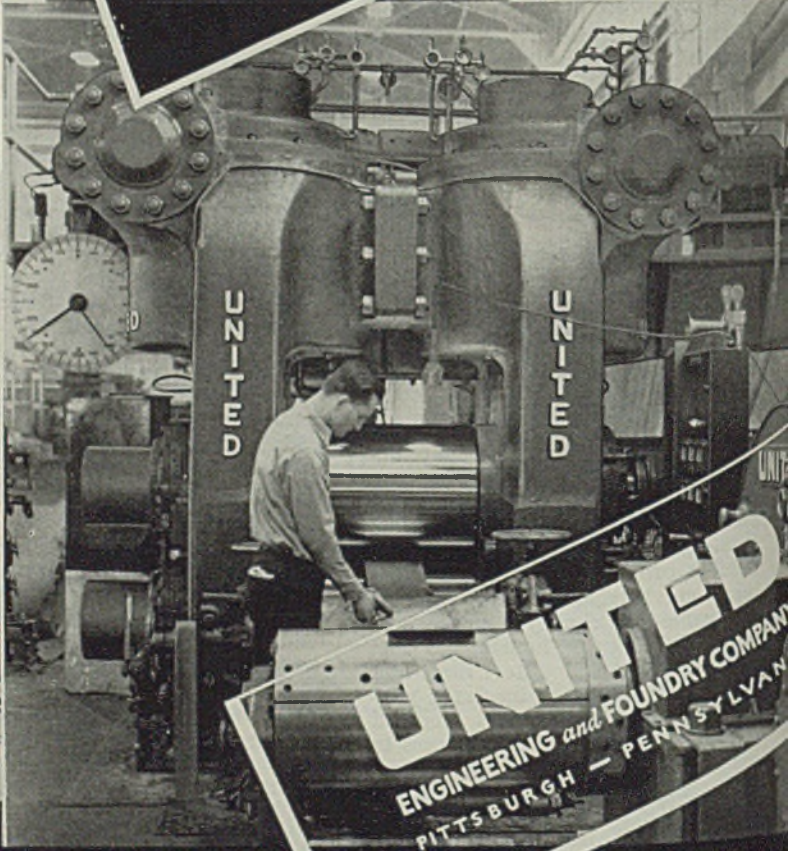
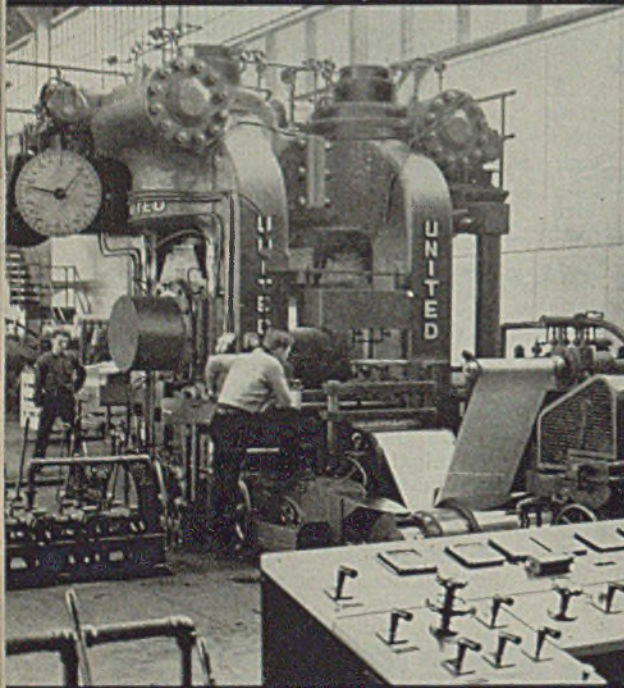
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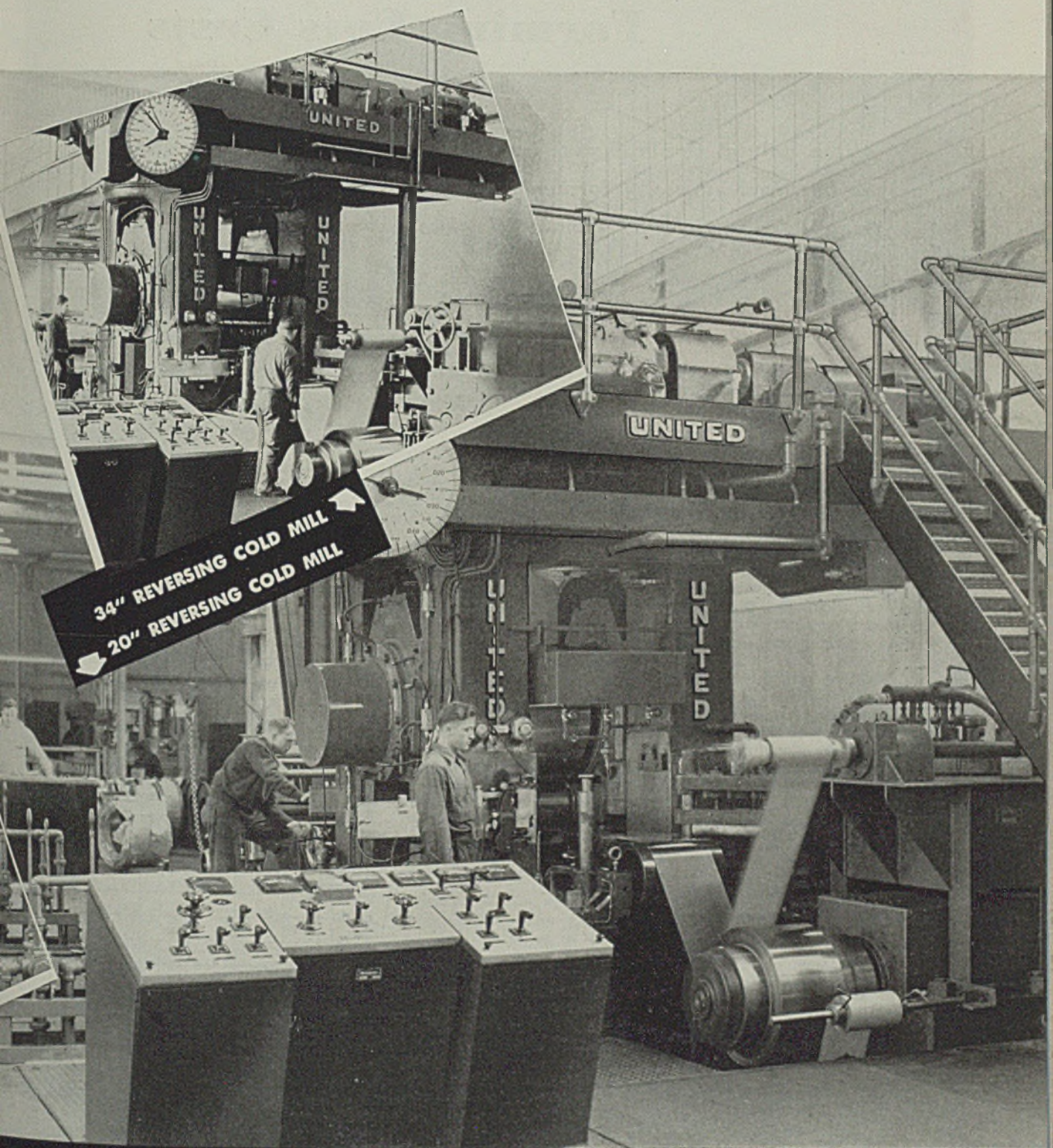


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34" REVERSING COLD MILL
20" REVERSING COLD MILL



Forming Cuts Costs

Often only a simple change in design will permit much welding to be saved by use of formed parts. This generally cuts cost of completed article as forming is less expensive than welding

■ WELDING and forming may be combined in fabrication of welded designs to reduce greatly the cost of a part. The container below might be made in four parts as shown in method 1, resulting in a weld on each corner. The scrap loss is low and the cuts are simple but the welding is considerable. If, however, the parts are cut as shown in method 2 and bent along the edges, the welding footage is materially reduced. The cutting cost and the scrap loss are increased. The resultant product would be made of two pieces, bent along the edges.

A modification of this design might be made as shown in method 3. Factors such as the type of equipment available in the plant will determine which combination of parts is most economical.

A direct comparison of costs is enlightening. Suppose the gross weight of the part is 30 pounds and

By E. W. P. SMITH
Consulting Engineer
Lincoln Electric Co.
Cleveland

the cost of the welding is 18 cents per foot. With 2 feet on a corner, or a total of 8 feet, the cost of welding is \$1.44 for method 1.

Compare this to the part in method 2 where the total footage is 2½. The cost then is 45 cents. As a matter of fact, the cost would really be less than this because in method 2 the joint is a flat butt joint (square groove) and so could be welded in a fixture on a backing-up strip. It is therefore easier to make than the

corner joint illustrated in method 1. Increase in scrap loss—say 25 per cent—would make the gross weight 37½ pounds.

Resultant costs are:

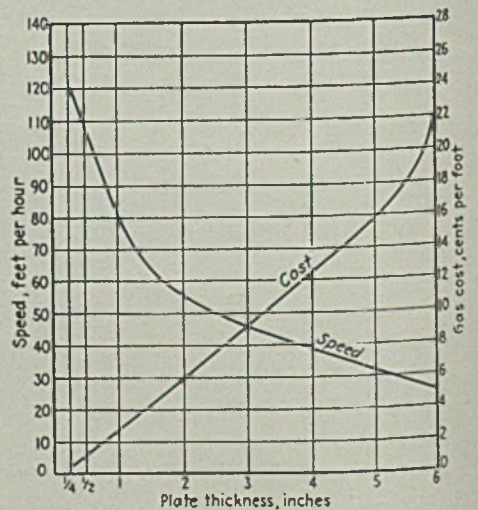
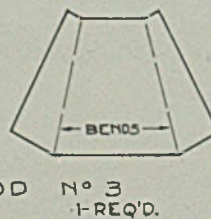
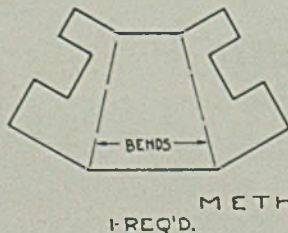
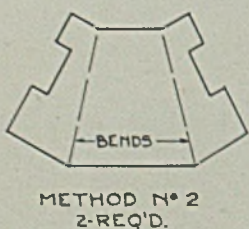
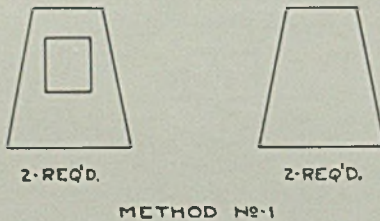
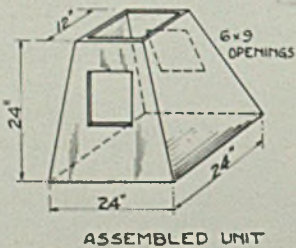
Material (30 × 3c)	.....\$ .90
Welding	..... 1.44
Total	.....\$2.34

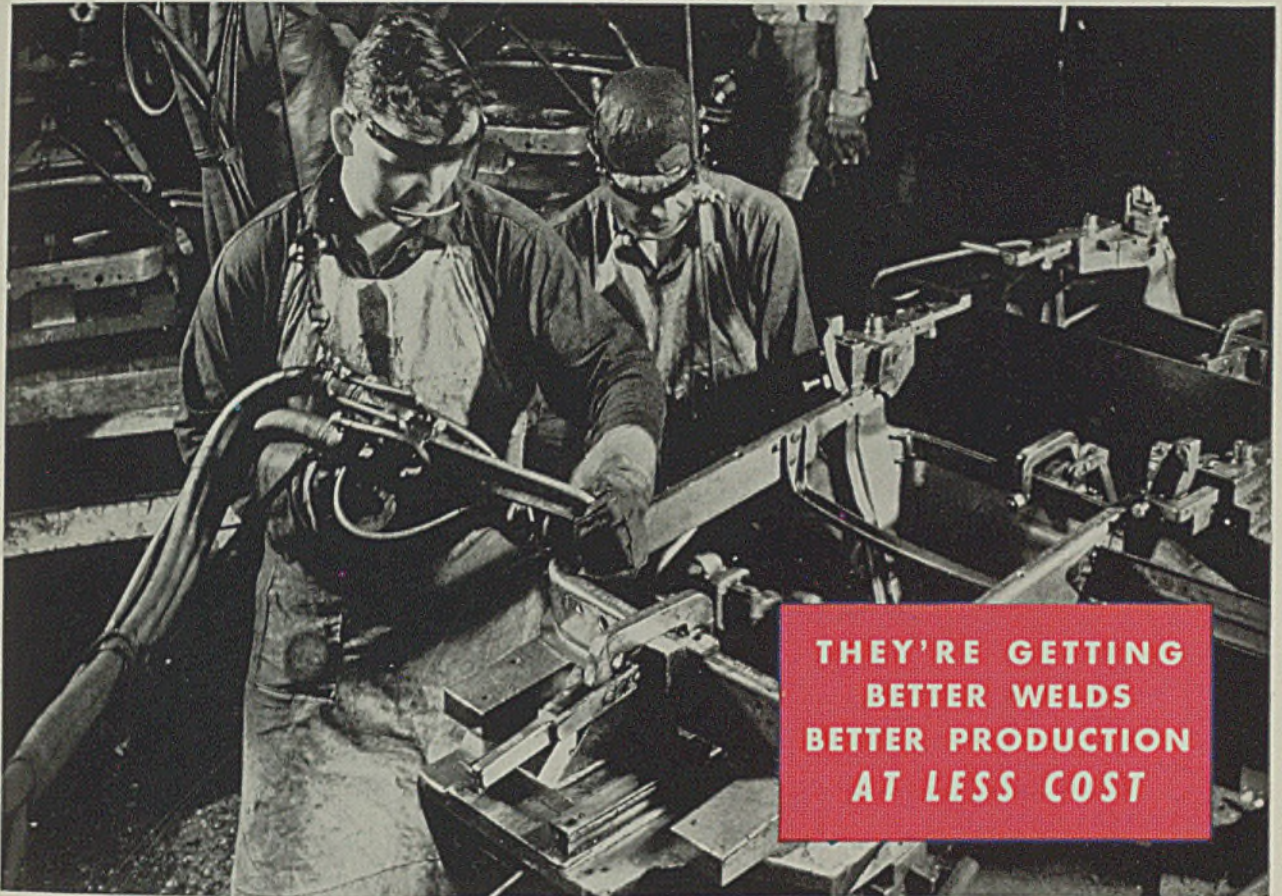
Material (37½ × 3c)	.....\$1.13
Welding	..... .45
Total	.....\$1.58

Saving due to bending\$.76

This saving does not include the cost of bending, yet this would be only a fraction of 76 cents. Hence, in general, when proper equipment is available, it is more economical
(Please turn to Page 89)

Diagrams at left show a container and three methods of fabricating it. Chart at right shows relation between speeds and costs of gas cutting plate of various thicknesses





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Burned resistance welds and poor bond between metal were constant sources of trouble on body assemblies at this well-known automotive plant. Shutdowns were frequent and maintenance was heavy due to the type of welding control in use.

But today the picture is entirely changed. Seventeen gun-welders, each equipped with Weld-O-Trol, have completely eliminated burned welds. A stronger bond is now obtained with half as many welds as used formerly. Rejected assemblies


have reached a new low. And during the six months the Weld-O-Trols have been on the job, they haven't cost a penny for maintenance.

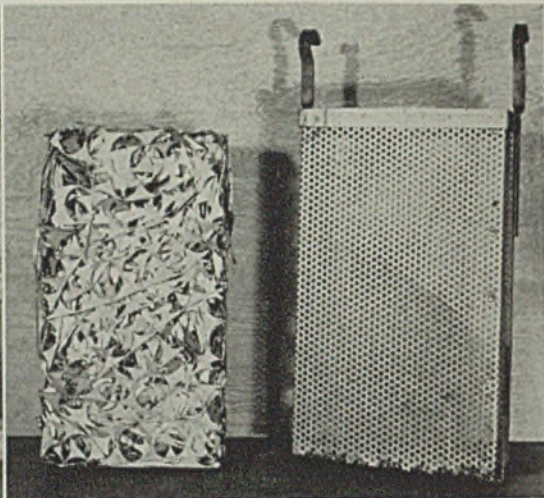
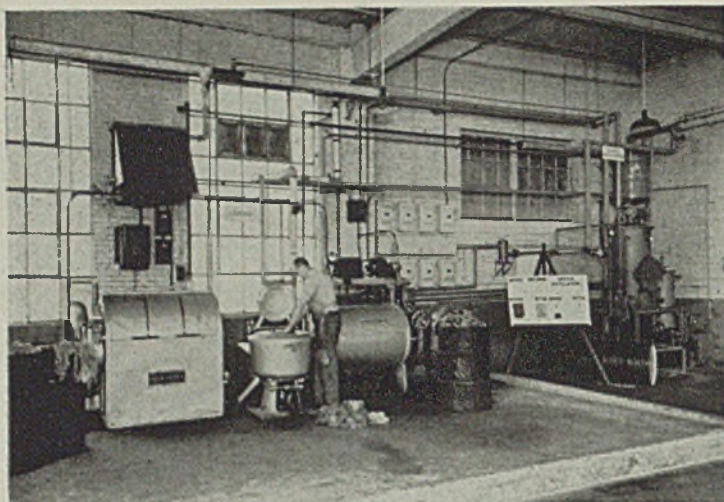
Weld-O-Trol's complete ABSENCE OF MOVING PARTS is the feature largely responsible for this remarkable improvement. It does away entirely with time delay—giving you the full accuracy of the welding timer and a closer control of current.

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Westinghouse Weld-O-Trol 



Profits from Waste

High return possible: 30,000 gallons solvent reclaimed yearly at saving of 90 per cent; 75,000 board feet of lumber reclaimed at 70 per cent profit; copper scrap for anodes saves 40 per cent

AMERICAN industry is rapidly following the lead of automobile manufacturers in organizing salvage departments to reclaim waste materials. By concentrating on "what are we going to do with our waste material," even plants producing a variety of products can net substantial savings by proper recovery methods.

At East Springfield, Mass., Westinghouse Electric & Mfg. Co. spends approximately \$2,500,000 annually for materials in the making of vacuum cleaners, fans, air conditioning equipment, commercial and domestic refrigerators, and saves thousands of dollars annually by being waste conscious. The salvage department was reorganized in 1937 and the floor space expanded from 1000 to 9000 square feet. All scrap and waste material clear through this one department.

Here the value, quality and best method of placing the material back into production are carefully checked. Salvaging apparatus includes stills, centrifuges, filters, machine tools and special equipment adapted to process particular kinds of waste material. The success of these operations depends upon all departments clearing their salvage material through this section.

Economical salvaging runs can be made where a good volume of material is to be reclaimed. Material heretofore thrown down sewers,

Left above, laundry washes 45,000 pounds of wipers yearly. Solvent still at right reclaims 30,000 gallons yearly at 90 per cent saving. Right above, scrap copper is baled, saves 40 per cent when used as plating anode material

By F. A. BULDRA

Supervisor

Salvage Operations

Westinghouse Elec. & Mfg. Co.

East Springfield, Mass.

burned in the incinerator or sold at a very low price is now turned back into the plant output or sold at higher prices.

Salvage problems at the Westinghouse plant include steel, copper, brass, bronze, solder, silver, paper, wood sawdust, various chemicals, paint, thinners, solvents, cleaning materials and laundry work

A punch press has been placed at the baler where steel is baled in the punch shop so wherever it is economical to punch extra parts from skeleton steel or nonferrous sheets, an operator immediately sets up a die and runs material until that order is finished. With this system, parts are punched from scrap at once and stored until the production department places an order for them. A calculation is made within 20 per cent of the year's

activity (volume anticipated) of this part and punching is done up to this limit. There is always the gamble of activity falling off due to canceled orders or changes in design. However, this method more than compensates for the otherwise necessary rehandling of material and pays tremendous dividends in the final analysis.

All solvents and waste oils are stored outside and records kept of the approximate activity per year. These records determine the advisability of buying universal stills, centrifuges and clarifying equipment to rework these materials for use somewhere in the plant. At the present time 30,000 gallons of Var-sol are being distilled at a saving of 90 per cent of the original value. This material is centrifuged on the job to eliminate foreign matter. However, it picks up oil. But when the deposit becomes objectionable, it is collected and placed in an underground tank for later distillation. A 100-gallon-per-hour vacuum still reclaims this material. It is then piped out of the building into a battery of drums set on an elevated runway. The pipe is so designed that the drums fill consecutively. By backing a trailer to the platform, drums can readily be rolled on the trailer, thus eliminating considerable handling.

An interesting example of the elimination of waste came from



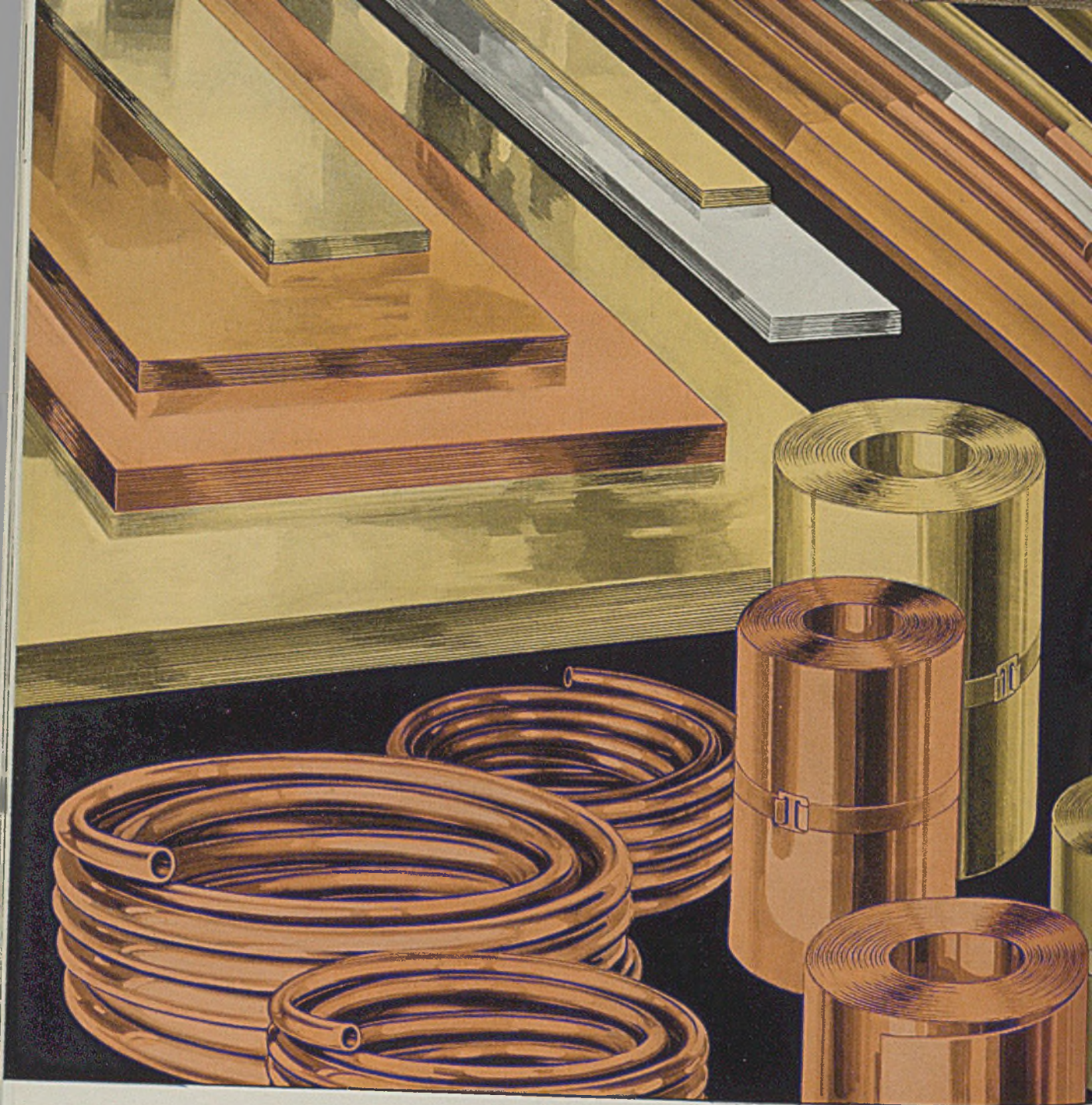
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and in all commercial forms. Manufacturing plants and warehouses are maintained in strategic industrial areas. Distributors, in a nation-wide network, are adequately stocked to supply your needs with these Anaconda Metals. • Throughout the years, many manufacturers have come to regard The American Brass Company as dependable headquarters for everything in Copper, Brass and Bronze. Make it your source of supply for these metals — and for the suggestions of a Technical Department possessing a wealth of metallurgical experience.



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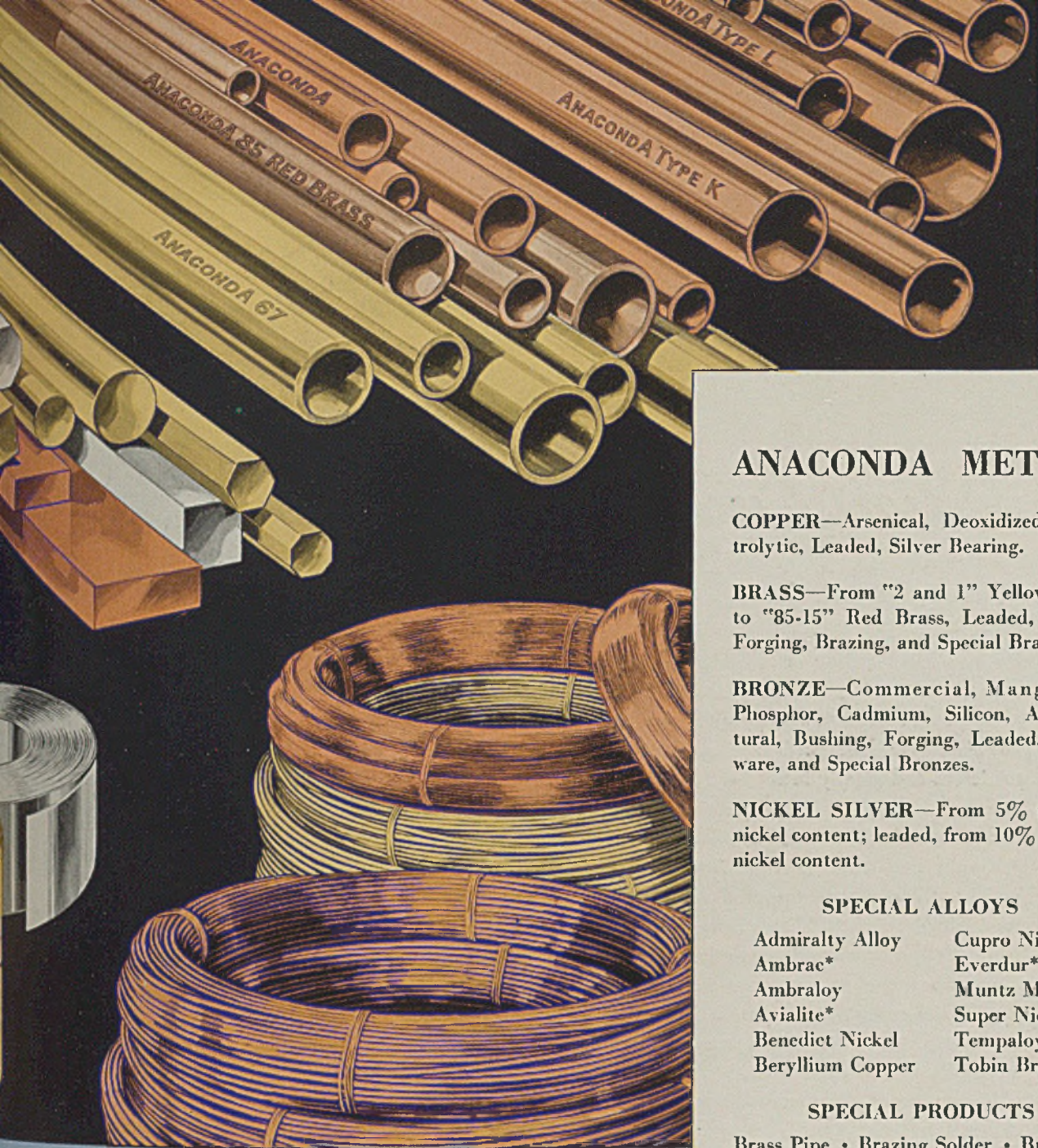
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Beryllium Copper	Tobin Bronze*

SPECIAL PRODUCTS

Brass Pipe • Brazing Solder • Bus Bars, Tubes and Shapes • "Electro-Sheet" Copper • Condenser and Heater Tubes • Copper Tubes and Fittings • Everdur and Copper Electrical Conduit • Eyelets, Grommets, etc. • Flexible Metal Hose • Roofing Copper • Tobin Bronze and Tempaloy Shafting • Welding Rods.

Technical publications on these products are available without cost. Write also for Anaconda Publication B-28, a comprehensive booklet on Anaconda Copper and Copper Alloys.

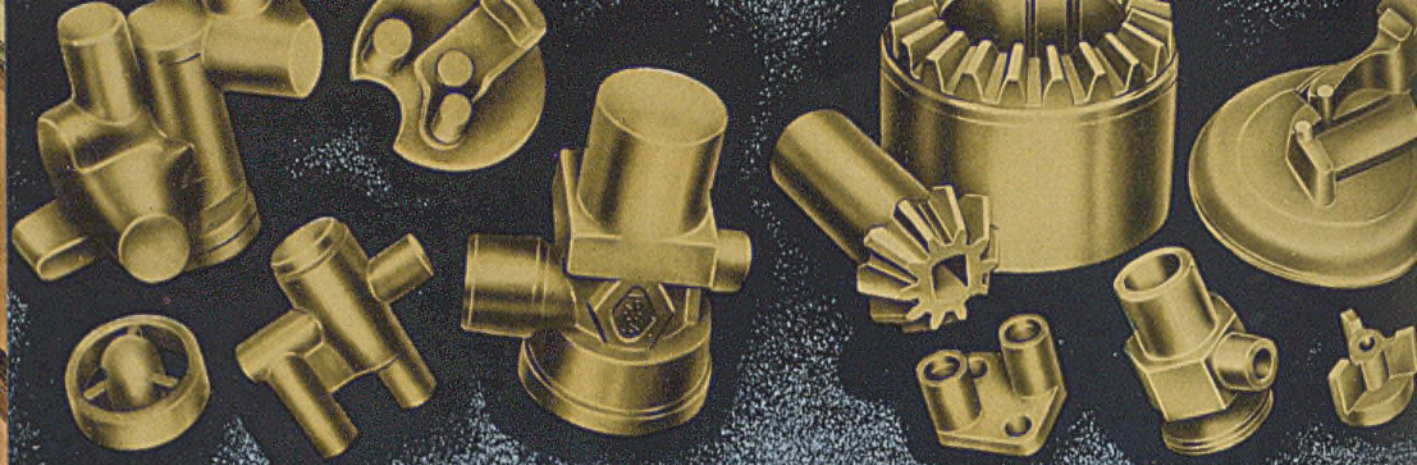
*Trade Marks Registered in U. S. Patent Office.

SEAMLESS PIPE AND TUBES—Manufactured by the cast shell, Mannesmann, and the "extruded, rolled and drawn" processes. Round tubes in sizes from .020" O.D. to 26" O.D. in various wall thicknesses. Square, hexagon, octagon and irregular shaped tubes in a variety of sizes and alloys.

METAL FINISHING—Special finishing equipment is employed and every effort is made to supply Anaconda Copper, Brass, Bronze, Nickel Silver and Special Alloys that exactly meet your particular fabricating requirements in composition, temper, gauge, size, finish and working qualities.

ANACONDA METAL PRODUCTS





HOT PRESSED PARTS • PRESSURE DIE CASTINGS

Short Cuts to a Finished Product

To manufacturers whose products include parts of complicated, irregular design, Anaconda Hot Pressed Parts and Anaconda Pressure Die Castings offer marked advantages: Both products are consistently accurate in dimension and are available in a range of alloys that machine and thread freely. Consequently, they can be finished at higher speeds than sand castings, reducing scrap to a minimum and greatly increasing tool life. Characteristic of both these products is a smooth, fine-texture finish, a uniform grain structure, and the greatest possible freedom from internal defects. Write for Publication B-9. • Anaconda Special Shapes in long mill lengths eliminate the need of expensive milling and other machining operations. Shapes such as pinions, cams, and irregular sections of practically all descriptions are produced by either cold drawing or extruding, depending on the alloy. The finished form is commercially constant in cross section and possesses a higher tensile strength and denser grain structure than sand castings. They are available in copper, brass, bronze and some nickel silver and phosphor bronze alloys in rod form suitable for use in screw machines, turret lathes and in other types of equipment.

EXTRUDED AND
DRAWN SHAPES



THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut • Subsidiary of Anaconda Copper Mining Company

MANUFACTURING PLANTS—Ansonia, Conn. • Buffalo, N. Y. • Detroit, Mich. • Kenosha, Wis. • Torrington, Conn. Waterbury, Conn.

OFFICES AND AGENCIES—Atlanta, Ga. • Boston, Mass. • Buffalo, N. Y. • Chicago, Ill. • Cincinnati, Ohio • Cleveland, Ohio • Denver, Colo. • Detroit, Mich. • Houston, Texas • Kenosha, Wis. • Los Angeles, Calif. • Milwaukee, Wis. • Minneapolis, Minn. • Newark, N. J. • New York, N. Y. • Philadelphia, Pa. • Pittsburgh, Pa. • Providence, R. I. • Rochester, N. Y. • St. Louis, Mo. • San Francisco, Calif. • Seattle, Wash. • Syracuse, N. Y. • Washington, D. C. • Waterbury, Conn.

WAREHOUSES: Chicago, Ill. • Cleveland, Ohio • Milwaukee, Wis. • Philadelphia, Pa. • Providence, R. I. • The American Brass Company of Texas, Houston, Texas

IN CANADA: Anaconda American Brass Limited, Manufacturing Plant and General Office, New Toronto, Ontario
Montreal Office: 939 Dominion Square Building

DM 1024

Anaconda Copper & Copper Alloys

this project. Approximately \$5000 to \$8000 a year was spent for a chemical to mix with Varsol to eliminate a possible fire hazard. When the project was approached from an elimination of waste standpoint by the salvage department, laboratory tests showed that this agent when mixed with Varsol and distilled would set up hydrochloric acid and destroy the still. Therefore, an investigation was made in an effort to eliminate the agent. The fire insurance underwriters were called in to investigate the condition and found that with the addition of safety containers to eliminate the fire hazard, this agent was unnecessary. Therefore, an extra saving was realized.

We are equipped to salvage 7000 gallons of oil per year. The oil is reclaimed by washing to eliminate impurities and then is clarified with clay and centrifuged. This reclaimed oil will not be used again for its initial purpose but as a cutting oil for screw machines.

Salvage Crew Overlooks Nothing

The laundry, consisting of a washer, extractor and drier, washes 45,000 pounds of wipers per year. These wipers are soiled by men wiping their hands and machines. Also gloves, aprons, unionalls and other various fabric are

Some 75,000 board feet of wood is reclaimed per year at a profit of 70 per cent of its original cost. This material is used by the carpenter shop, production department and shipping department. There are two sizes and grades, $\frac{3}{8}$ -inch hard pine and $\frac{1}{2}$ -inch soft pine. The soft pine is readily used. However, approximately 30 per cent of the total volume is hard pine which previously was not used. But the salvage department got busy and found that the hard pine could be employed successfully in the construction of certain boxes. As a result, the demand for hard pine has increased to where the present supply is insufficient to meet the possible applications.

For plating purposes, scrap copper is melted into anodes and used in place of new anodes. It is most economical to place baled copper skeleton scrap in a basket thus eliminating the cost of melting, pouring, drilling and tapping for hooks. A saving of 40 per cent of the original cost of material can be realized in this manner.

Due to various copper tubing applications throughout the plant, there is always a quantity of short ends with a scrap value of one-third the original cost. The reoperating cost of making shorter tubes is 10 per cent which leaves a considerable profit. We have delivered back into the shop over 40,000 pieces copper tubing to be used for various tubing applications.

The company spends a small for-

tune in silver for silver solder to make joints. A careful segregation of the material clearing through the salvage department has saved one man's salary per year.

Due to keen competition in business today, reclaiming and utilization of waste in industry is paramount. Management is realizing this and establishing salvage departments. Where such departments already exist, they are being expanded so the greatest possible return from initial expenditures for materials can be obtained.

New Gear and Bearing Lubricant Introduced

■ A lubricant for highly loaded gears and antifriction bearings of the roller and ball type for use under extremely severe operating conditions is announced by Sterling Motor Truck Co. Inc., 2021 South Fifty-fourth street, Milwaukee. It consists basically of colloidal graphite suspended in a straight mineral oil. Ability of the lubricant to resist heavy loads is attributed primarily to the colloidal graphite which, under pressure, forms a graphoid coating on the gear teeth, etc., the coating becoming integral with the surface of the part. This coating prevents metal to metal contact through a form of "dry" lubrication when the strength of the petroleum lubri-

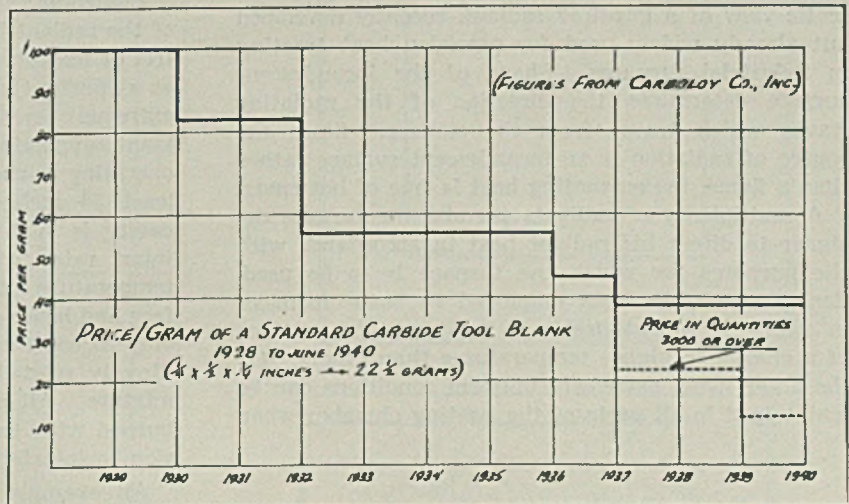
cants is inadequate to maintain continuous lubrication.

Builds Locomotive To Fit the Mine

■ A new 15-ton mine-haulage locomotive announced by General Electric Co., Schenectady, N. Y., has an over-all height of only 26 inches. This enables it to operate in a 40-inch vein without brushing top or taking up bottom. Its overall height has been held down by using high-speed, body-mounted, self-ventilated motors and double-reduction gear drives. The motors are connected to the gears through drive shafts with double universal and slip joints. Equalized spring suspension minimizes derailments, and overload devices protect the equipment.

Two motors, each with a one-hour rating of 90 horsepower and a continuous rating of 84 horsepower, supply the motive power. A 10-step controller provides smooth and fast acceleration with ordinary loads, and application of maximum tractive effort for starting heavy trains. With a special type of trolley support on one side of the locomotive, the trolley base can be raised to a height which permits the pole to be swung across the top of the locomotive by merely operating an air valve.

Greater Production Reduces Costs



■ An example of the effect on costs of increased production due to growing demand is revealed by the above chart showing prices of cemented carbides for cutting tools over the past ten years, during which period their use has increased—particularly for steel cutting.

Since 1930, the price of a typical standard blank of the material has

dropped 60 per cent, from \$1 to 38.3 cents per gram, while minimum prices, based on large quantities have declined to almost one-tenth of the 1930 schedule. Large increases are anticipated in connection with the current armament program. Illustration courtesy of Carbide Co. Inc., P. O. Box 239, Detroit.

Control

By JAMES KNIVETON
Engineer
The Selas Co.
Philadelphia

FOR GAS RADIANTS

Incandescent surface acts as constant pilot, maintains combustion both at extremely low turndown and at high input. Heat output is directly related to air-gas input, permits exact automatic control

■ IMPORTANT advances in gas-heating methods in recent years can be attributed to the ability to produce heat which is largely radiant in character. Radiant heat penetrates rapidly and deeply. It offers a means of achieving efficient furnace operation and uniform heating at high rates.

But radiant heat, with all its ability to penetrate, should be so produced that other favorable characteristics are present also. It is necessary to provide for exact control of heat distribution and temperature. At the same time, it is essential that temperature changes be brought about without disturbance of atmosphere. And it is highly desirable to have a radiant combustion system which simplifies furnace design and operation.

Control of Heat Distribution: Fig. 1 is a diagrammatic view of a gas-fired radiant, recently developed but already widely used for precision heat treating in industrial furnaces. Shape of the incandescent surface determines the direction of the radiating waves which travel from the surface. Since the source of radiation is an incandescent surface rather than a flame, the emanating heat is free of hot spots.

A multiplicity of radiants permits the furnace designer to direct his radiant heat in accordance with the purposes for which the furnace is to be used. Zone control has been employed in some furnaces in which it was desirable to heat certain portions of a charge to higher temperatures than others. On the other hand, extremely uniform conditions can be maintained in all parts of the heating chamber when

uniformity is the requirement. Such control of distribution is the result of burner location and of the absence of hot spots in the radiation.

For applications in which uniformity of distribution is required, the temperature chart in Fig. 2 and the companion diagram in Fig. 3 should be of interest as they show the heating uniformity that is obtained. In this case, four radiants were located in the roof of a furnace along with six recording thermocouples located at the various positions indicated in Fig. 3. Note that the locations include positions near the hearth, near the roof, near side walls and at various intermediate points, yet the band of recorded temperatures for a holding temperature of 1600 degrees Fahr. is narrow.

Controlling Temperature: Design characteristics of the radiant burner make possible the accurate control of temperature. The incandescent surface serves as a constant pilot to maintain combustion both with extremely low turndown and at high input. This constant supporting of combustion is the basis of a wide operating burner pressure range from $\frac{1}{8}$ -inch to at least 54 inches water column. The shape of the cavity is such that incandescence is present at all input rates within this entire range. To control temperature of the radiation from the burner surface and hence in the heating chamber, it is necessary only to control the degree of incandescence which is directly related to rate of input of a given air-gas mixture. All products of combustion are completely burned with the result that there is no flame emission to interfere with the temperature control.

An example of radiant application in which the minimum and maximum operating characteristics of the burner are of paramount importance, is the removable round or rectangular hood furnace in which heavy charges are heated to a predetermined control temperature in the shortest possible time and then held at temperature. The ability of the burners

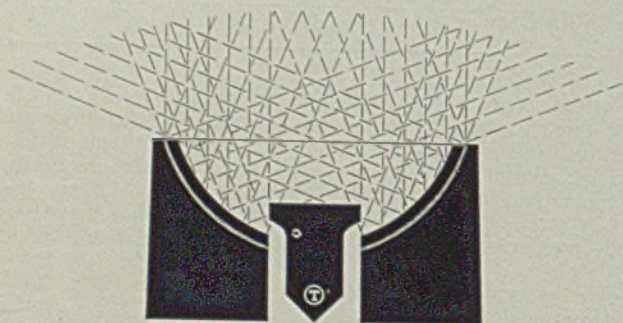


Fig. 1—Diagram shows how radiant heat energy is distributed evenly from incandescent burner cavity

to operate efficiently at high burner pressures permits high heat input for the heating-up cycle. In effect, the charge can be given heat at the highest rate it is capable of absorbing. The high input shortens the heating-up period.

As previously stated, the burners can be operated at burner pressures of 54 inches water column or higher. At this pressure, about 80 cubic feet of manufactured gas per hour is liberated in a combustion space of 3½ cubic inches. At this rate and with the air-gas mixture completely burned, the tremendous heating value of radiants is apparent.

Input for the holding cycle, can be adjusted to any rate within the burner-pressure range from 54 to ½-inch water column. This is a turndown ratio of 53 to 1 in gas burning capacity. In this range, minimum operating burner pressure is equivalent to 1.5 cubic feet of manufactured gas per hour. Hand in hand with the wide input range is the advantage that the incandescent surfaces in the radiants are immediately responsive to control adjustments originating in temperature-control apparatus. This responsiveness permits holding cycles to be carried out exactly.

In another type of furnace where rapid heat transfer to the charge is of more importance than wide variation of input, gas radiants are valuable. In such furnaces, with the cycle depending solely on the absorption rate of the charge, the designer is able to direct the radiants for rapid transfer to the charge, thus shortening the heating cycle and in-

creasing production. Tests conducted on a cylindrical furnace 3 feet by 10 inches in diameter by 17 feet high, fired with radiants located in the walls, showed heat penetration into the charge was more uniform and rapid. Because of the faster heat penetration into the charge, 50 per cent more production is obtained in the same furnace area.

Continuous furnaces, such as those for wire strand and strip annealing, are excellent application for radiant burners distributed over the entire surface of the roof. Not only is even heat distribution from side to side of the furnace obtained but the extremely wide capacity range of the burners permits those near the entrance end to be operated at a higher rate to quickly heat the incoming material. Since combustion is completed in the radiant cavity and since a large portion of the heat produced is radiant in character, burners can be mounted close to the wire or strip resulting in more production per square foot of furnace area and therefore greater economy.

Maintenance of Atmosphere: So complete is combustion within the radiant cavity that the products of combustion are utilized as protective atmosphere

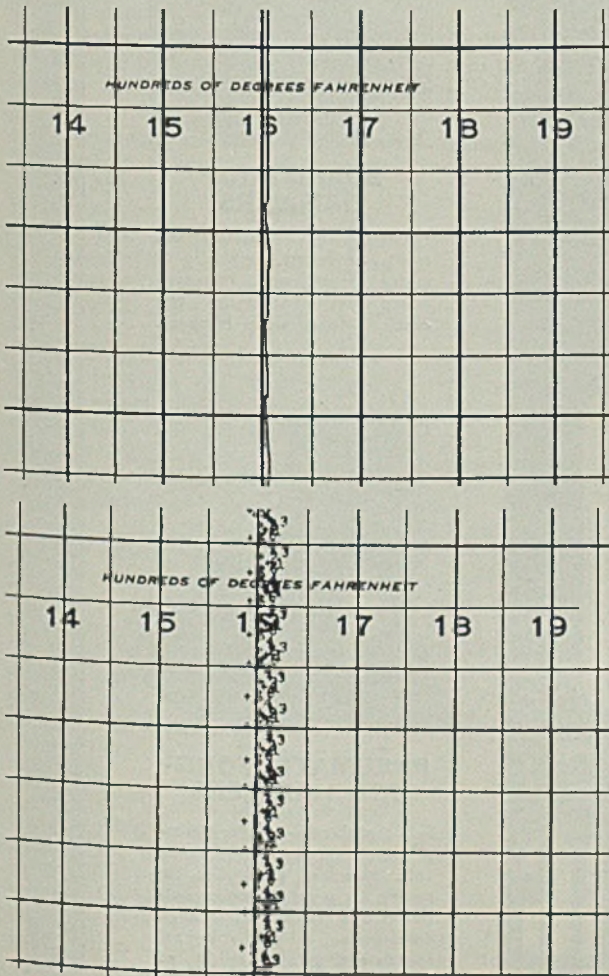
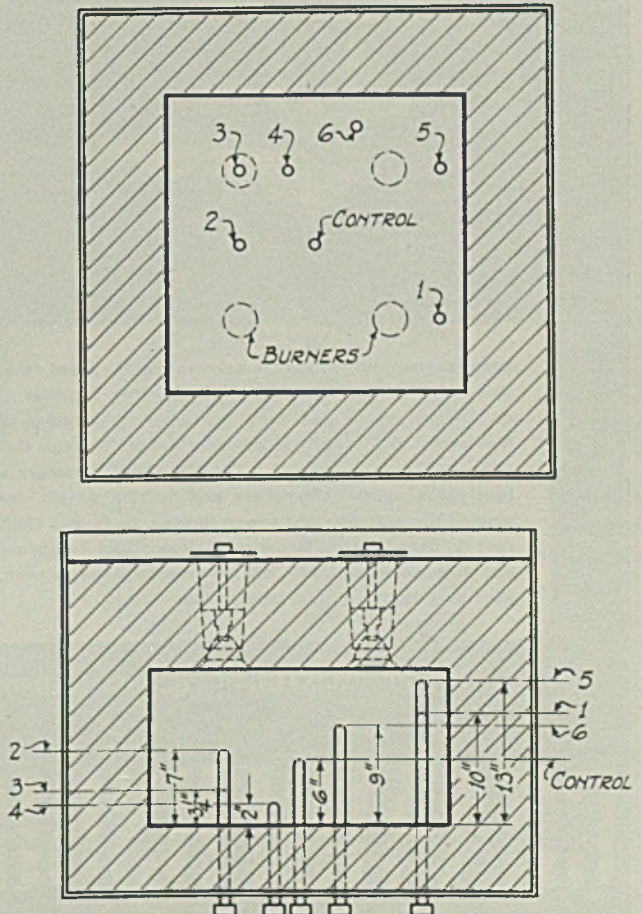


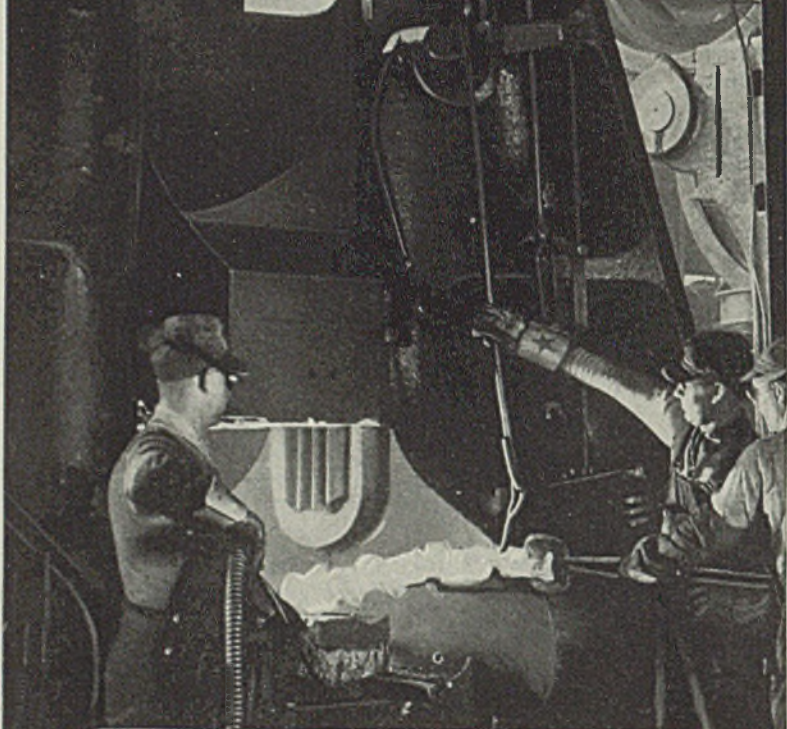
Fig. 2. (Left)—Upper portion shows chart record of a controlling potentiometer while lower section is corresponding record of six thermocouples located in various parts of the furnace chamber as shown in Fig. 3 at right. Note how closely all six records are grouped even though each imprint is quite wide

Fig. 3. (Below)—Upper section shows plan view and lower is sectional view of test setup showing how evenly radiant roof burners heat a furnace chamber



Drop Forgings

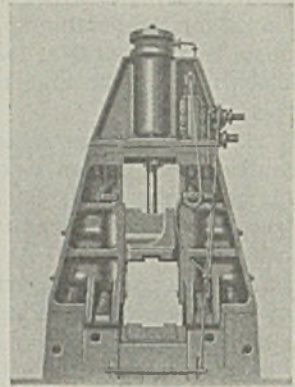
for
STRENGTH
and
SAFETY



Drop forgings are known to everyone as the ideal combination of strength and safety. MODERN drop forgings, made on Chambersburg Hammers, are accurate forgings, using less metal and requiring less machining. Through the precision and speed with which Chambersburg Hammers work, forgings of greater accuracy and lighter weight can be produced — and often at lower forging costs. But FINISHED cost is always lower because of less metal being needed, and less machining. The use of drop forgings in your product may increase your profits, too.

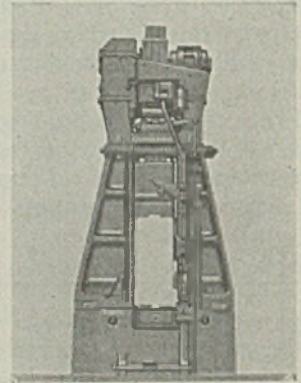
CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG



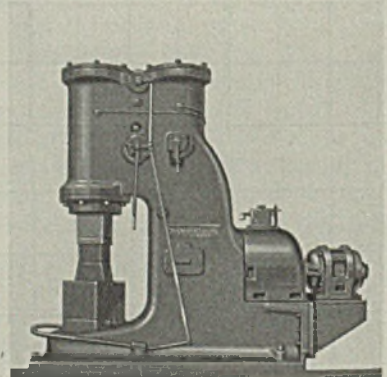
STEAM DROP HAMMERS

Standard of the industry. Greater production, greater steam or air economy, and greater accuracy. The Chambersburg patented Slide Valve is featured.



BOARD DROP HAMMERS

Frame-to-anvil construction, front rod design, simplicity of motor drive, and increased board life characterize this efficient Board Drop Hammer.



PNEUMATIC FORGING HAMMERS

Self-contained — motor, compressor, and hammer in one unit. Has high productive capacity. Its greater forging output is due to its heavier anvil construction, higher impact speeds and greater rapidity of blows.

for the charge. Inlet pressure and turbulence set up within the cavity cause the completely burned gases to be delivered to the furnace chamber in an agitated condition and so to circulate without fans to all portions of the chamber and around the charge. In the air-tight furnaces, required for controlled atmosphere work, positive pressure is maintained within the chamber and there is no diluting of the inner atmosphere.

To produce protective atmospheres for furnace charges, as in the case of clean annealing of stainless steel and wire or bright annealing of copper, it is essential that correct air-gas ratios be maintained. To take advantage of wide burner operating ratio of 53 to 1, combustion systems must be capable of maintaining exact air-gas proportions at all rates of heat input.

The radiants with which the examples cited here are concerned are used with air-gas controllers which provide the desired mixture over the entire operating range.

Simplifying Furnace Design: It is evident that radiants permit furnace design to be simplified and furnace chambers to be reduced in size. Since the radiants will operate efficiently in any position, the heat can be distributed as desired without depending on location of vents, baffles or fans.

In design of furnaces utilizing conventional burners, location of vents and baffles or the use of fans is usually given primary consideration so the burned gases may give the desired heating results. With radiants, the designer can direct the heat as needed for either a thoroughly uniform distribution or a zoned distribution.

ductility at room temperature it readily permits stamping and forming.

New Coating Widens Usage of Valves

■ A new valve application has been developed by Merco Nordstrom Valve Co., 400 Lexington avenue, Pittsburgh, in connection with a new process known as Merchrome coating. Thus a lubricating plug cock valve is now enabled to handle successfully services where the temperatures run as high as 1000 degrees Fahr. and where operating conditions make the ordinary valve inadequate. It is a development in which a welded coating is applied to the rotating surfaces of the plugs and bodies and in some cases other parts of the valves. The coating is a complex metal alloy of extreme hardness and corrosion-resistance. The hardness of the treated surfaces is approximately 54 Rockwell C.

The corrosion resistance of the coating is about equal to that of stainless steels. Forming an inseparable bond, it may be applied in any thickness.

While the use of coated valves is principally for refineries on hot oil and vapor lines, such as cracking, coking and topping units, and for mud lines to combat abrasion and erosion, the application of the coating is expected to prove useful in chemical plants and other industries.

Three Ways of Obtaining Louvres Shown, Production Cost Reduced

■ CARE at the drawing board stage on the part of users of die castings often results in saving many production dollars. For example, the illustrated automobile heater housing shows three ways of obtaining louvres in a casting without extra cores or slides.

By curving the bottom of the housing and extending the louvres slightly onto the front face, Fig. 1, it was possible to core these openings with the rear half of the die. This portion of the die also forms the exterior faces of the front and side louvres. The openings in the side louvres appear where shown in Fig. 2 but are not seen in the position in which the heater is normally viewed; special care in removing flash left at the openings, therefore, is necessary.

In Fig. 3 the louvres at the top of the housing are directed toward the rear, and to core them in this direction would require a special slide in the die, operating at an angle.

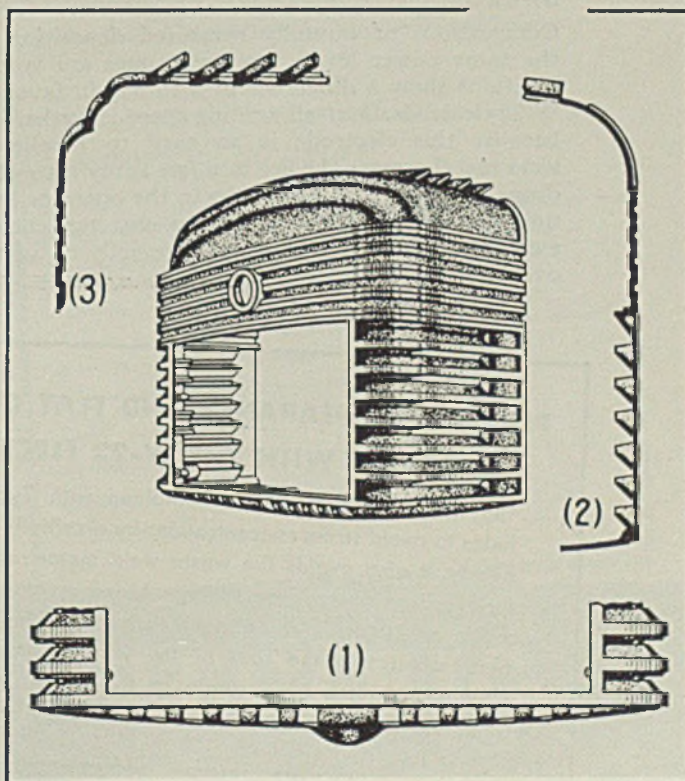
This has been avoided by use of a combination punching and bending die in a punch press subsequent to casting. The punches shear the metal along the rear and at the two sides of the openings, bending them outwardly.

The shearing does not leave perfectly smooth edges but, as these louvres face to the rear, the rough edges are not important. Although the die for performing this extra operation involves some expense it is less than would be involved by coring the casting. Moreover, if these

openings were cored, metal flash left in them would require a trimming die almost equaling the cost of the die required for stamping the louvres.

The heater housing is about 0.045-inch thick where the top louvres are formed. As the zinc alloy used is high in impact strength and in

Illustration shows three ways of obtaining louvres in a casting without extra cores or slides in the die. Photo courtesy New Jersey Zinc Co., 100 Front street, New York



WHY G-E ELECTRODE W-22 GIVES YOU

INCREASED SPEEDS

... 8 per cent
Faster Deposition

HERE is a fully approved, reverse-polarity, all-position electrode for shielded-arc welding of mild steel in any position including vertical and overhead. Type W-22 provides the extra penetration needed for heavy work in order to get thorough fusion into the root of the joint.

Your operators will find the "wetting characteristics" of the W-22 molten deposit make it especially easy to use in making strong fillets of flat contour.

Welding operators agree, when they use this rod, that it is especially

fast and easy to "handle," producing welds of excellent contour and appearance.

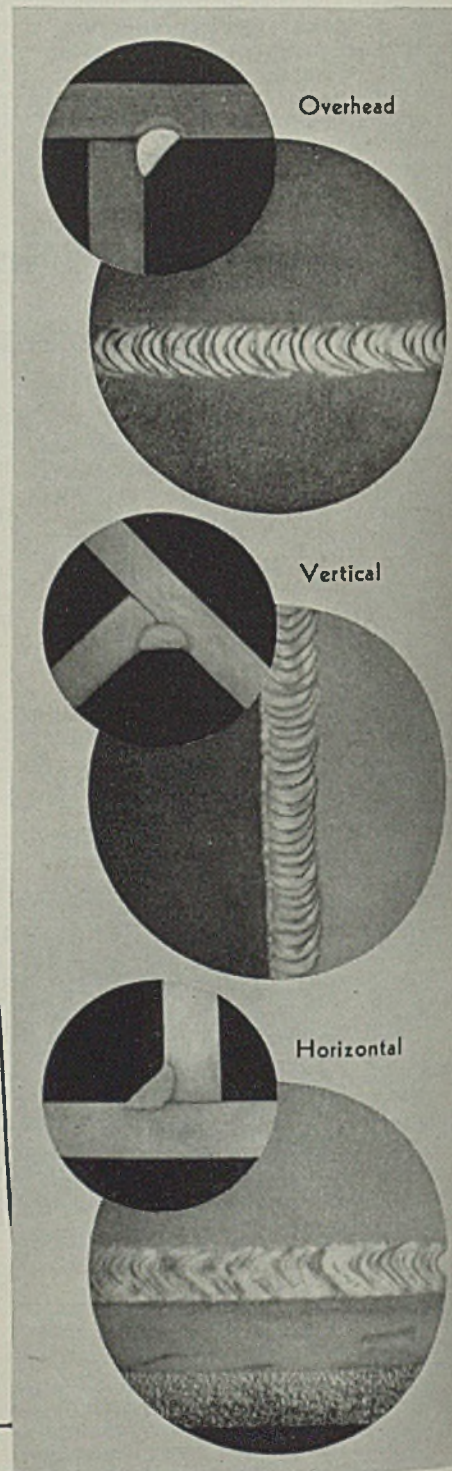
SPEED

Comparisons of carefully measured deposition rates at the same power levels (amperes times arc volts) in all positions show a difference of 5 to 8% in favor of Type W-22 electrode. Over-all welding speed is further increased because this electrode is so easy to handle. Molten weld metal crosses the arc in a fine spray instead of large drops—a feature of great help to the operator in making uniform welds and in avoiding any tendency of the electrode to stick to the work, especially on vertical and overhead joints.

PLEASING APPEARANCE AND FLAT CONTOUR OBTAINED WITH THE W-22 ELECTRODE

The flat contour of deposit obtained with Type W-22 helps to avoid stress concentrations by distributing stresses evenly. It also avoids the waste weld metal represented by a convex contour—a saving which may amount to as much as 20 or 30% on overhead joints. The thorough penetration into the root of the joint develops 100% strength, and the even ripple of the head produces a finish of which any operator can be proud.

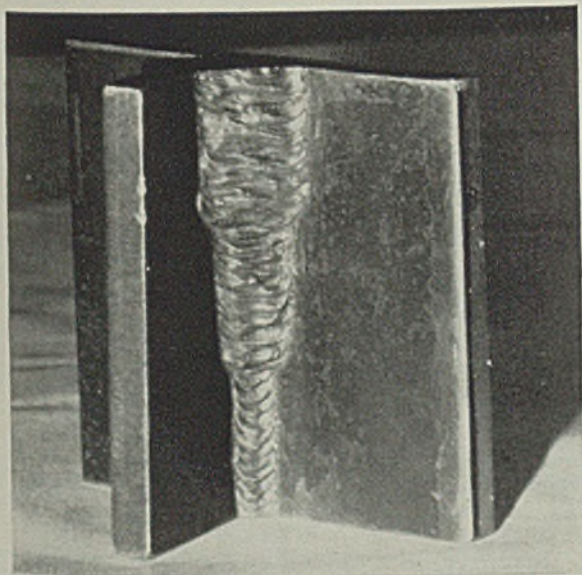
Photographs of W-22 Welds



ON QUALITY WELDS

Approvals: This electrode is approved by:
Bureau of Marine Inspection and Navigation
American Bureau of Shipping, Groups H1G and B1G

Lloyds' Register of Shipping, Section 4, Par. 1-9.
Complete engineering data and test results of welding speeds, physical qualities, etc. are available through your local G-E arc welding distributor or G-E Sales Office. Call or write them today for a free demonstration of this electrode applied to your own work.



Here is an example of the excellent finished appearance obtained on multi-pass joints with the General Electric shielded-arc electrode, Type W-22.

Qualifications, It will meet:

A.W.S. Filler Metal Specification E-6010
A.S.M.E. Boiler Code, Paragraphs U-68.

It will meet the requirements of U. S. Navy Specifications 22-W-7, Class 1, and is permitted on work requiring approval of Hartford Steam Boiler Inspection and Insurance Company.

Type W-22 is today's best answer to the profit formula for electrodes: **MAXIMUM DEPOSITION RATE × MAXIMUM USABILITY = MAXIMUM WELDING SPEED**

Immediate delivery of Type W-22 electrode, as well as any other in the full line of G-E electrodes, can be made from local stocks held by G-E arc welding distributors right in your own territory.

Local deliveries are further backed by direct-from-factory shipments. **NO DELAY!**

General Electric Co., Sect. B 673-14
Schenectady, N. Y.

Gentlemen:

Please send me, free of charge, the items I have checked below:
Speed Welding With The W-22 Electrode. GES-2510 ()
G-E's New Electrode Bulletin—GEA-1546F ()

Name

Address

Company

Title

673-14

GENERAL ELECTRIC

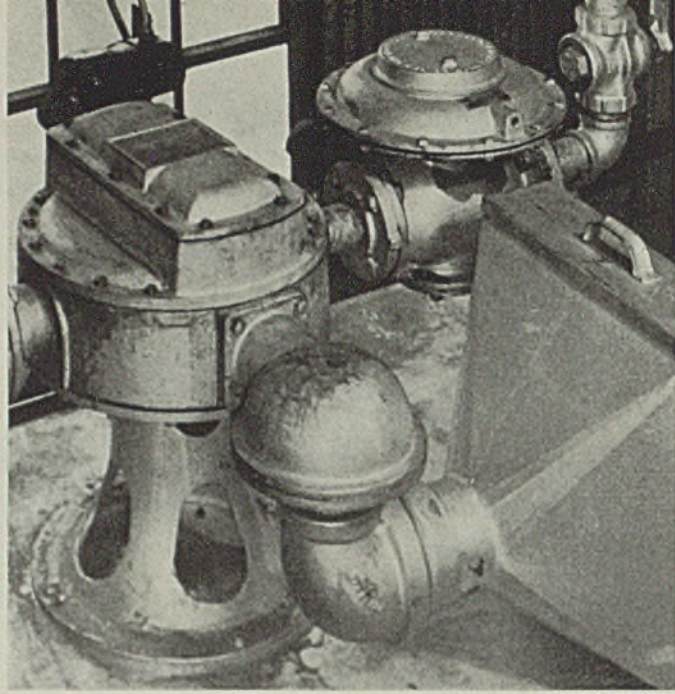


Fig. 5—Industrial carburetor of the Kemp type which supplies premixed fuel

Bright Annealing

Deoxidizing gas from the producer is sampled continuously and is maintained at the desired analysis by a reversing motor on the carburetor which alters the ratio of air to gas as required

■ A CONTROLLED system that fulfills the established need for the automatic correction of variables now is available for protective atmosphere generators used in the bright annealing process. This new device not only is sensitive, accurate and continuous in operation, but makes absolute for the first time the control of atmosphere gas characteristics. A constant indication of current gas analysis and a continuous graphic record are provided.

The new device assures the desired analysis constantly by com-

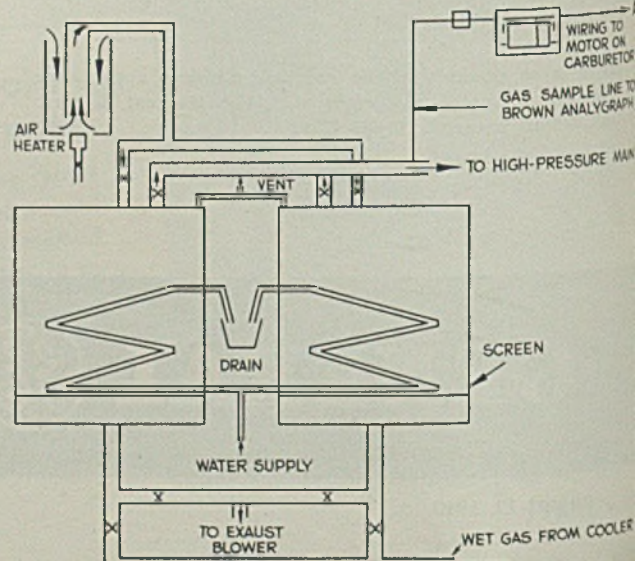
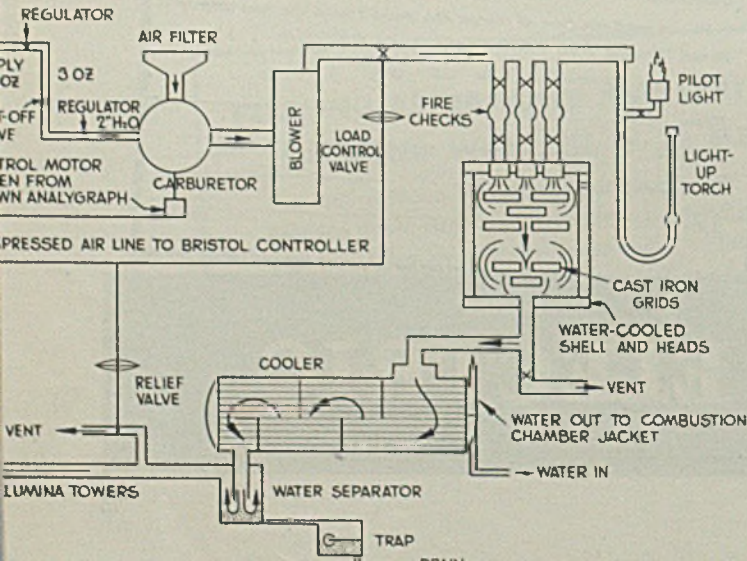
pensating for changes in the specific gravity of the fuel gas, the thermal value of the fuel gas, and the variation in the combustion air supply.

The bright annealing gas as generated is sampled continuously, the sample passing through a thermal conductivity analysis cell. This cell develops a potential which is a measure of the composition of the

gas as produced. A controlling potentiometer indicates and records the potential.

When an atmosphere gas producer is placed in operation, the desired analysis of the gas is set by a manual adjustment of the hand wheel on an industrial carburetor. This analysis is maintained automatically from that point on by a motor of special characteristics

Fig. 1 (Left)—Schematic diagram of a 15,000-cubic foot per hour atmos-gas producer. Fig. 2 (Right)—Diagram of drying tower which serves the atmos-gas generating units

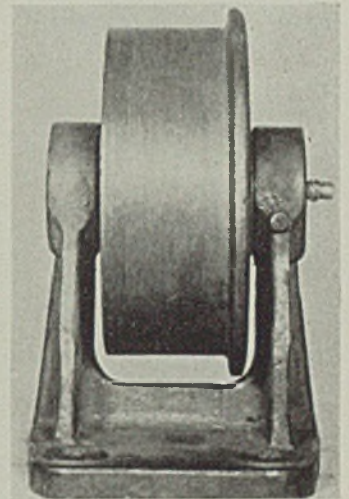
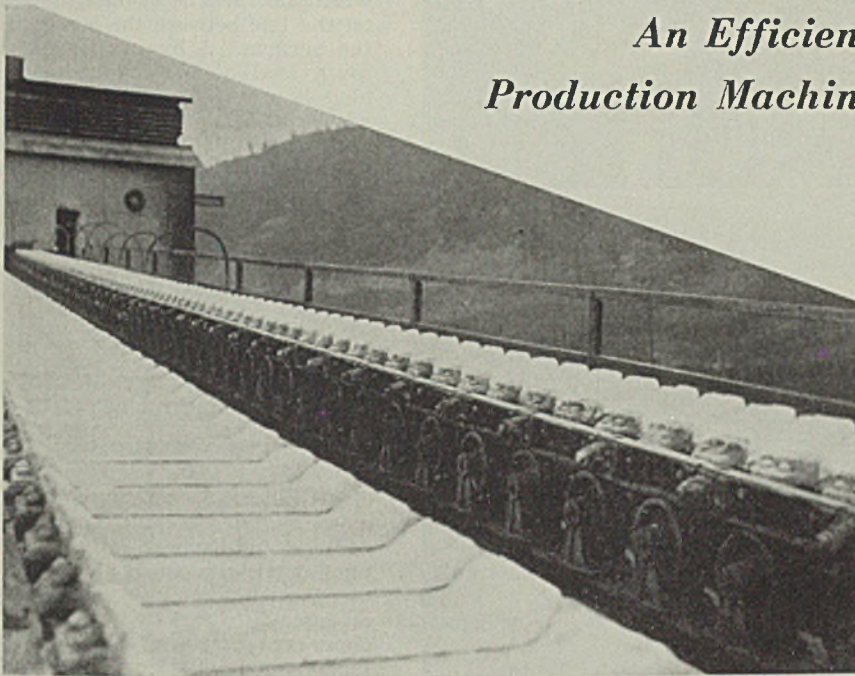


THE STATIONARY WHEEL PIG CASTING MACHINE

*An Efficient
Production Machine*

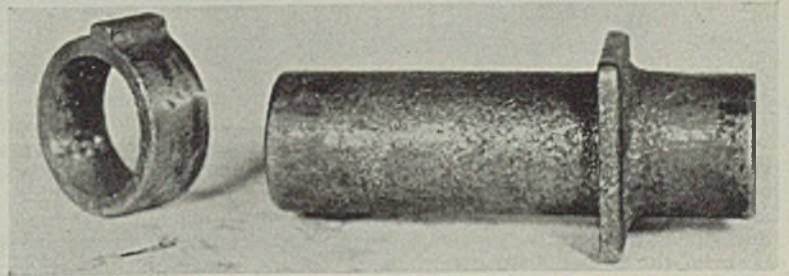
(FERREE DESIGN) Patents Pending

Low Power Consumption.
Smooth, Quiet Running.
Broad Speed Range.
Precision Speed Control.
No Breakdown Delays.
Dependable Operation.
100% Greater Capacity.



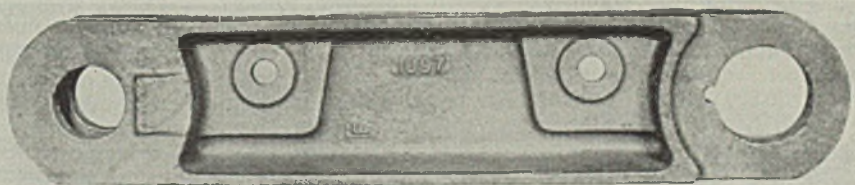
The Stationary
Mounted Wheel

It is an exceedingly rugged and heavy machine. All parts are of best material for respective duty. Less than one-fourth the moving and wearing parts in standard pig casting machines. The only pig casting machine where roller bearings and forced feed lubrication is practicable. Maintenance and repair costs are practically eliminated. All sizes of pigs can be cast by changing the moulds only. No vibration in machine—resulting in better grain structure in pigs.



The Manganese Steel Pin and Bushing

The Steel
Casting Link



We can show you this machine in operation in the Pittsburgh District.

WILLIAM M. BAILEY COMPANY
PITTSBURGH ENGINEERS PENNA., U. S. A.

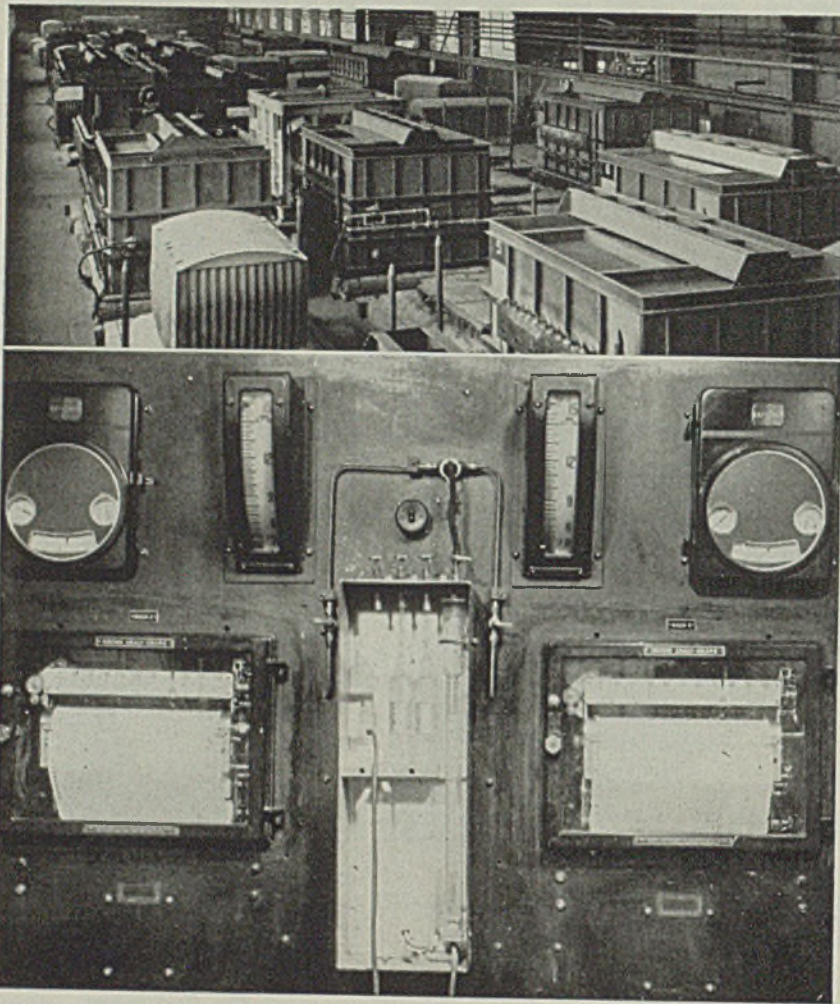


Fig. 3.—General view of annealing department which is served by constant-analysis gas units for bright annealing. Fig. 4—Analygraph of the Brown type which records the amount of combustible in the gas

which is geared to the micrometer adjusting screw on the carburetor. This motor responds when energized through the potentiometer in response to deviations in the gas composition. The controlled circuit for this application has been especially developed co-operatively by engineers of the Brown Instrument Co., 4508 Wayne street, Philadelphia, and the C. M. Kemp Mfg. Co., 407 East Oliver street, Baltimore.

Five gas generating units of the Kemp type and one of the Surface Combustion type, each having a capacity of 15,000 cubic feet per hour, or a total capacity of 90,000 cubic feet per hour, serve the annealing department of the American Rolling Mill Co., Middletown, O. A view on this department is shown in Fig. 3. Various indicating, recording and/or controlling instruments operate in conjunction with the generating equipment. The gas temperature in and out of the refrigerating unit and the per cent of carbon dioxide in the gas as well as the rate of gas flow are under instrumentation on the Surface

Combustion machine. The gas temperature to the alumina towers, the per cent of carbon dioxide controlled and recorded on the analygraph as well as the rate of gas flow are recorded on the Kemp machines. Common to all machines are instruments which record the pressure of the cooling water and bright annealing gas.

A typical analysis of the gas is as follows: Carbon dioxide, 5.6; oxygen, 0.0; carbon monoxide, 9.6; hydrogen, 12.0; methane, 1.0; and nitrogen, 71.8 per cent.

The gas sample is taken to the Brown analygraph where it is analyzed and recorded. The control functions so that if the analysis does not conform to specifications, predetermined limits on impulse are sent to the reversing motor on the carburetor. The motor either increases or decreases the ratio of air to gas port size as required. The operation of the motor, which is through a worm drive at slow speed, is intermittent or continuous depending upon the variation of the gas analysis from the desired point. The

lag between sampling and controlling is approximately 1½ minutes. The analygraph records the amount of combustible in the gas.

The load on the machine is controlled by a Bristol free controller which operates a diaphragm valve on the line between the blower and the burners. A by-pass for a minimum load of 7000 cubic feet per hour is provided. In the event that all the load is shut off on the main header the minimum load is passed to the atmosphere through the relief valve provided.

A schematic diagram of a 15,000 cubic foot per hour atmosphere-gas producer as well as the drying towers are shown in Figs. 1 and 2.

Safety Device Prevents Damage to Vehicles

■ An automatic safety control for motor-operated rolling doors is announced by Kinnear Mfg. Co., Columbus, O. Its application reduces the possibility of injury to persons or damage to cars or trucks in case doors are carelessly closed by attendants who fail to note whether or not the opening is completely cleared when they push the control button.

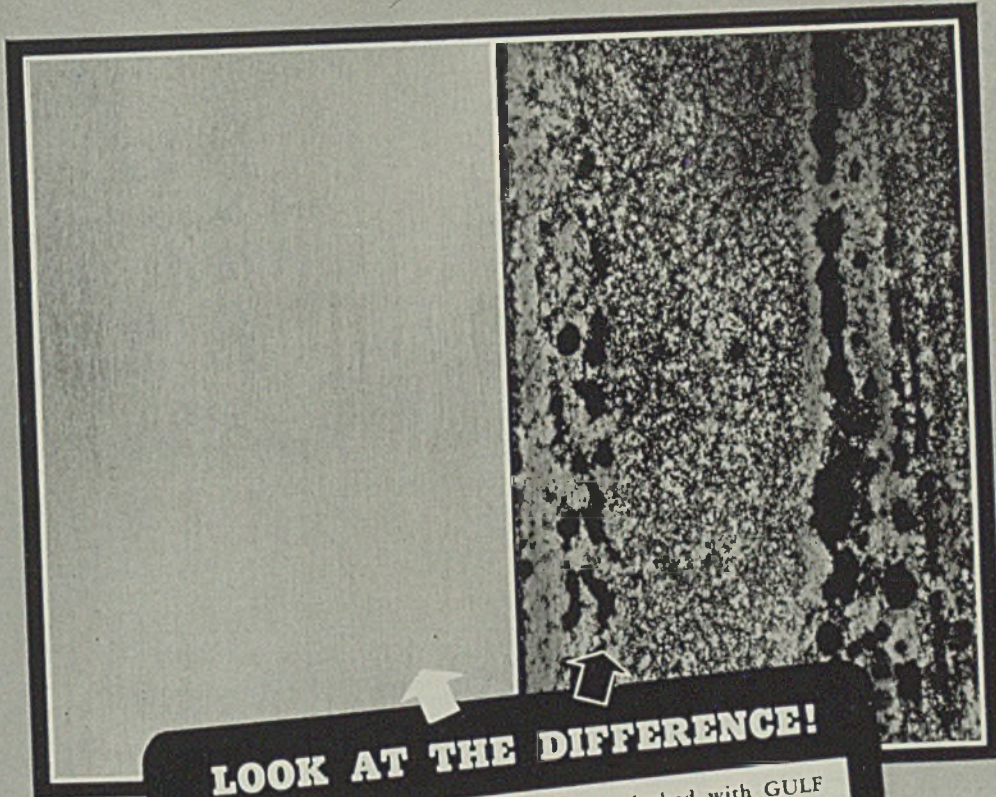
The device works through a compressible, air containing weather strip installed along the bottom edge of the door. When the door contacts an obstruction upon closing, it compresses the weather strip which forces air through an impulse switch, causing the door to either stop its closing travel, or immediately revert to its fully open position.

Aluminum Cleaner Also Retards Corrosion

■ A new aluminum cleaner, Cowles AE, for general cleaning of aluminum parts of all kinds is announced by Cowles Detergent Co., 7016 Euclid avenue, Cleveland. It also contains properties to prevent corrosion of nonferrous metals.

The cleaner has been compounded to produce in solution the high colloidal activity and proper balance of detergent anions necessary for cleaning accumulations of shop dirt, drawing and cutting oils. It is customarily used in concentrations of 3 to 6 ounces per gallon of hot water. The time of immersion and temperature of the solutions are dependent upon the individual cleaning demand. All parts cleaned rinse freely and after drying are ready for further finishing or shipment.

Use this improved
SLUSHING COMPOUND
 to protect highly finished metal surfaces



LOOK AT THE DIFFERENCE!

These two similar pieces of metal, one slushed with GULF OILCOAT No. 1 and the other with a conventional slushing compound, were exposed to highly corrosive influences for the same length of time. The superior value of GULF OILCOAT No. 1 is clearly demonstrated by the perfect condition of the metal plate on the left.

GULF OILCOAT NO. 1 is easily applied, long lasting and economical to use.

YOU can now secure an improved material to protect highly finished surfaces of steel and non-ferrous metal products against corrosion — GULF OILCOAT NO. 1. This product is an entirely new type of slushing compound, developed by Gulf technologists after many years of research and field tests.

While GULF OILCOAT NO. 1 provides a thin film which is not easily rubbed off by handling, it may be readily removed by conventional solvents. Accelerated laboratory corrosion tests, as well as field tests with all types of metals have established the superiority of this new type of slushing material over products formerly used for this purpose.

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Better Finishing Methods Produce Improved Cutter Efficiency

■ ALTHOUGH some operators believe the increased expense of producing a higher surface finish on cutters offsets the benefits to be derived, such actually is not the case, this erroneous impression no doubt resulting from use of long, costly procedures now obsolete in the light of modern practice.

When John Lindegren, assistant superintendent at the Crompton & Knowles Loom Works, Worcester, Mass., began work on improved surface finishes as applied to cutting edges, he discovered that tool costs were increasing from year to year even though they were using the best tools the market afforded. The machines were of modern design and the speeds and feeds were not excessive. What was causing this condition?

For sharpening various milling cutters, for instance, they were using wheels $3\frac{3}{4}$ to $2\frac{1}{8}$ x $1\frac{1}{4}$ x $\frac{1}{2}$ -inch, ME 21561, 3846-K. To improve on this a "BE" bonded wheel in a finer grit, 3860-K5BE, was recommended. This was satisfactory, producing a much keener edge with much less wheel wear mainly because this wheel re-

By V. H. ERICSON
Norton Co.
Worcester, Mass.

quired less dressing. Examination of the cutting edges produced by these two wheels under a magnifying glass revealed to a far greater extent the improvement that had been made.

At this stage of the work the following questions developed:

What is a cutting tool? Very simple—it is an instrument that has one or more sharp edges used for removing surplus material.

Why does it wear out? Because the cutting edges break down, become dull and fail to cut off the surplus material to renew its original effectiveness.

Why does it become dull? Because for some reason the cutting edge becomes defective and cannot do the work demanded of it. It is no longer a good edge.

What is a good cutting edge? A good edge should be an unbroken line at the junction of two planes, usually forming an acute angle.

Why must the line be *unbroken*? To equalize the load placed upon the edge.

With the foregoing theories in mind, the microscope was employed. Accompanying illustrations and photomicrographs, at magnification of 100 diameters demonstrate clearly the results of this study.

The sketches, Figs. 1 and 2, help explain the cutting theory. Note the hills and valleys run into each other not hill to hill and valley to valley but haphazardly, causing a ragged broken line of peaks and

valleys. Obviously when the cutter is put in use, the unsupported peaks are unequal to the heavy load imposed upon them and quickly break off, leaving flat spots that rub instead of cut. This places a greater load on the remaining edge which in turn fails quicker than it would if the edge were straight and the load equally distributed. In the meantime these flat spots continue to abrade, tearing the stock off instead of giving a smooth clean cut and at the same time generating heat, through this friction, that eventually affects the entire cutting edge and naturally the hardness of the cutter. Net result—a dull tool.

The next step was to devise an economical method of removing the hills and valleys, approaching as near as possible a straight unbroken line. To perform this operation a Norton fine grit Crystolon shellac wheel (37320-J8L) was used with good success on the tool and cutter grinders, surface grinders, etc. This work and change of wheels is accomplished easily on the usual tool and cutter machines. The same method is used

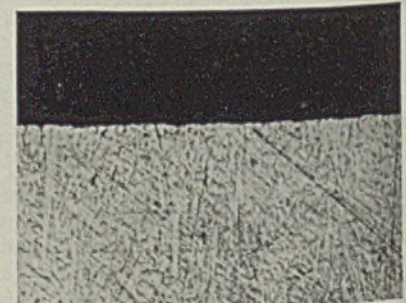
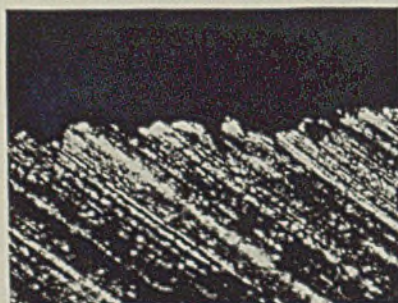
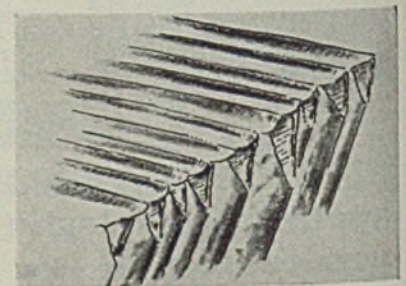
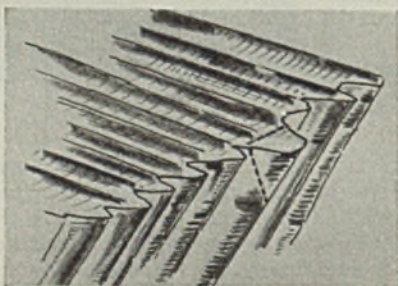


Fig. 1. (Upper left)—Sketch shows conception of rough ground cutting edge with hills and valleys created by coarse abrasive grains. Note how the peaks or points break off quickly in Fig. 2, upper right, due to the heavy load imposed on them. Edge dulls quickly. Fig. 3. (Lower left)—Cutting edge of tooth of 6-inch face mill as commonly reground, at 100 diameters. Contrast this with the highly finished edge of the same cutter shown in Fig. 4, lower right, same magnification

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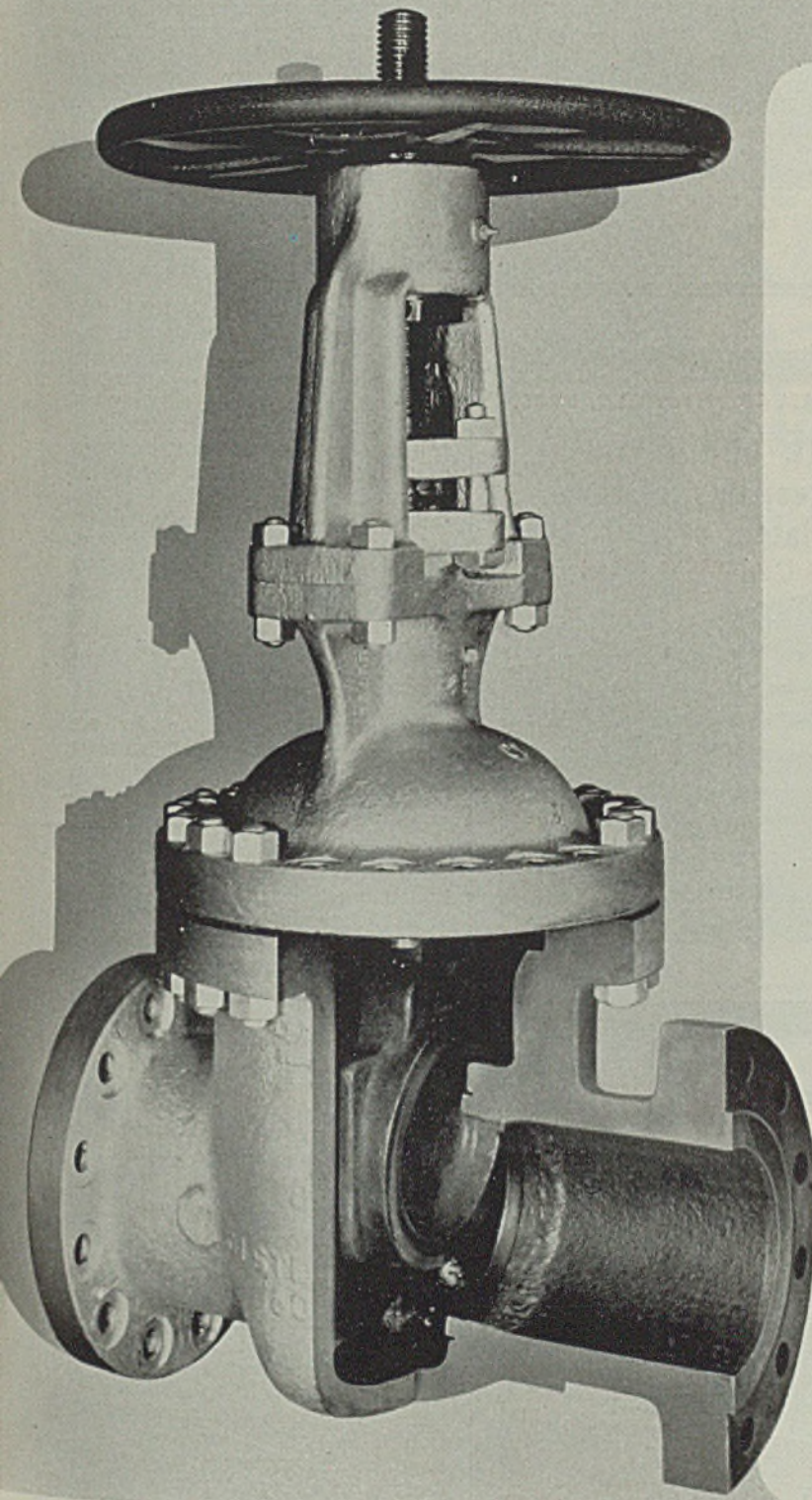
Your own foundryman will gladly show you how your products may be similarly improved by a wider use of steel castings. Or you may consult, without obligation, Steel Founders' Society, 920 Midland Building, Cleveland, Ohio.

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1. Uniform structure, for greater strength, shock and stress resistance.
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MODERNIZE YOUR PRODUCT WITH

STEEL CASTINGS



for all milling cutters. Gear cutters are ground first in lots—then the wheel is changed and the lot given the high surface finish. Dies, punches and broaches are ground and given a high surface finish in position by changing the wheels.

The most interesting part of the work now follows and it substantiates the theory relative to a good cutting edge—an unbroken line at the junction of two planes. Bear in mind when reviewing these pictures that only one plane of the cutter has been given a high surface finish so a few hills and valleys from the other plane are quite

visible to the eye in some cases.

It is not hard to imagine that the cutter illustrated in Fig. 3 would cut much cleaner and last much longer than that illustrated in Fig. 4. To prove it, actual records were kept of work produced with ground tools and those ground and highly finished. Some substantial increases were obtained.

The usual procedure is to remove 0.003 to 0.005-inch with the 3860-K5BE wheel leaving about 0.001-inch for the finishing wheel (37320-J8L Crystolon shellac). To remove any more than 0.001-inch with this latter wheel might result

in slight burning which can be overcome by thinning the rim with an abrasive stick. One of the gear-shaper cutters finished by this method gave a surface roughness reading of 1.3 micro inches. Other plants may use different methods and grains and grades but the final result is a better cutting edge.

The benefits derived from this work are many and perhaps are forerunners of further economies. The following advantages were effected in this case: Longer life of cutting tools because resharpenings are fewer, fewer grinding wheels used, increase in work between regrinds, better quality of work produced, less power consumption.

Percentage increase in work produced with the high surface finished tools on a few of the operations as compared to production obtained from an ordinarily ground tool shows some surprising contrasts. On gear cutting, increases of 232, 263 and 350 per cent were recorded. In milling work, the finer finished cutters showed increases from 100 to 400 per cent. Punch and die work revealed 33 and 66 per cent increases.

Rotary Union Solves Friction Problem

■ A new rotary union for use wherever a gas or liquid line must be connected to a revolving shaft, roll or drum is announced by Perfecting Service Corp., 2622 South Parkway, Chicago. It features low-friction performance and is especially designed for web-driven rollers. It is particularly adapted to the needs of fabricators of steel, aluminum and other metal products.

Recent improvements have made it possible to offer two types of unions—the standard type for use on pressures over 50 pounds, and the heavy-duty unit for use on pressures over 50 pounds. The unions also are available for special requirements in connection with brine and other types of liquids.

Window Ventilator Keeps Out Rain

■ A new kind of window ventilator for homes, institutions and public buildings is announced by Wind-Guards Inc., Dearborn, Mich. Besides advantages of natural ventilation it assures privacy, control of sunlight and protection against sudden rains. Being adjustable to practically all windows, the ventilators are available in three sizes to fit window openings 14 to 22, 22 to 34 and 34 to 54 inches. The frame and louvers are of Armco Zincgrip sheets. The unit is finished to harmonize with surroundings.

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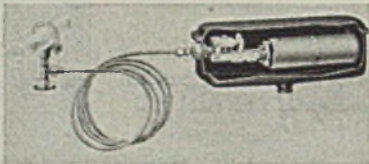
Division of Simonds Saw and Steel Co.

Tacony and Fraley Sts., Phila., 127 S. Green St., Chicago



Humidifying Valve

■ McDonnell & Miller, Wrigley building, Chicago, have developed a snap action humidifying valve to eliminate the possibility of the valve sticking or clogging due to presence of scale or other foreign matter. A cam-and-roller action causes it to snap from tight clos-

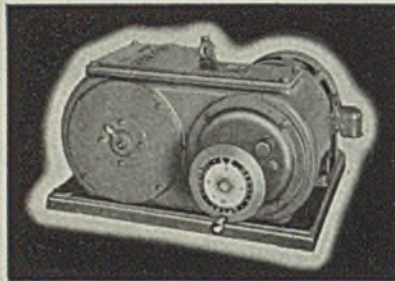


ure to wide open whenever the water level drops a quarter of an inch. When the water level rises to the proper level the valve snaps to the closed position, seating tightly against water pressure up to 150 pounds. This "wide opening" feature assures flushing out the orifice and cleaning the seat. The humidifier control is made in three different styles—the No. 17 which consists of the valve and float only is 10 9/16 inches in length; No. 117 which includes the valve and float in a covered float chamber measures 11 inches long, 3 inches wide and 4 1/4 inches deep; and No. 217 which incorporates copper tubing and a simple means of tapping into city water supply line.

Speed Indicator

■ Reeves Pulley Co., Columbus, Ind., announces a new handwheel-speed indicator for use in connection with variable speed transmissions, vari-speed motor pulleys and motodrives. Known as the Speedial, it indicates speed settings of the different units. The actual indication is a definite number of turns of the speed shifting screw of the unit. For each full turn of the shifting screw the Speedial registers one point or degree on the circular scale as shown in the illustration. It is available for use on both new units and on units already in service.

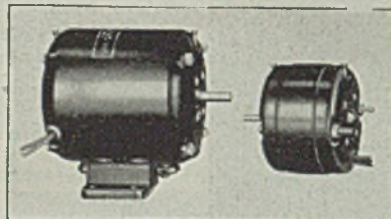
Feature of the unit is the space available on the dial for the user to write his own calibrations in whatever corresponding units he prefers. Blank dials can be calibrated to individual requirements and provided to read either clockwise or counterclockwise. Gear ratios of 20:1, 30:1 and 60:1 are available. The dial is calibrated in ac-



cordance with these ratios in from 0 to 20, 0 to 30 and 0 to 60 turns of the shifting screw.

Shaded Pole Motors

■ Emerson Electric Mfg. Co., 1824 Washington avenue, St. Louis, announces a new line of shaded pole motors, in pressed steel frames, for unit heaters, blowers and other fan applications that do not impose a heavy starting load and that come up to full speed quickly. These are



available in two frame sizes, with capacities ranging from approximately 1/400 to 1/25 horsepower. The small frame is furnished with detachable strap base and the large frame can be furnished with rigid saddle base or resilient hub mounting. All ratings can be furnished without base, with extended-through-bolts for stud mounting. Frames are all equipped with self-aligning wool-packed, oil impregnated bearings, and surrounding oil retaining washer. The motor design includes a covered bearing in the back cover, which has a fiber thrust plug to absorb the thrust action of the shaft. These motors also are suitable for vertical operation, with shaft end up.

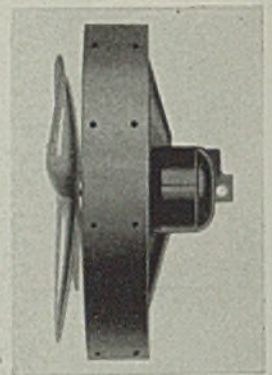
Air Heaters

■ Heating division, Westinghouse Electric & Mfg. Co., Mansfield, O.,

announces a new line of wall and floor mounted air heaters. Ease of installation and clean, steady, odorless heat make these units desirable for use in crane cabs, truck houses, valve houses, locomotive cabs, scale rooms and garages. They are designed for use with either a 3-heat hand switch or type AA thermostat. Wall mounted air heaters range from 25 1/4 to 31 3/4 inches in length and are 10 1/2 to 16 1/2 inches high. They have a rating of 1000 to 4500 watts and operate on 115, 230 or 440 volts. Floor mounted units have approximately the same heating surface in inches and the same wattage rating as the wall mounted units.

Ventilating Fans

■ Truflor Fan Co., Harmony, Pa., announces a new line of roof ventilating fans for increasing the re-



moval of air in gravity-type ventilators. The fans are available in 48, 42, 36, 30, 24 and 18-inch sizes with air exhaust capacities ranging from 40,000 to 2000 cubic feet per minute.

Clamp Vise

■ Knu-Vise Inc., 16841 Hamilton street, Detroit, has developed a Knu-Kam-Klump which has an adjustment range of between 3/4 and 1 inch, depending on the portion of the toggle bar used for clamping. It is made in two sizes, both interchangeable with the standard type Nos. 110 and 250 toggle clamps. Its action is similar to a toggle clamp in that they both have a clamping bar hinged at one end, the operating handle, and base member for attaching it to the fixture. The link connecting handle to toggle bar is slotted to permit this bar to be withdrawn rapidly from the work. The upper portion of the toggle or clamping bar is machined to a cam surface against which two rollers are in contact at all times. When the handle is in the vertical position, these rollers are contacting the low part of the cam surface and the toggle bar is



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From an original drawing by Orison MacPherson

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"And just as steel wire serves everyone so fully, its manufacture is one of the most diversified operations in our works. Here in this J&L wire mill are hundreds of highly specialized units operated by skilled workmen under supervision of experienced mill management. Each unit is integrated with the whole J&L chain of Controlled Quality steel production, that follows through the smelting of selected iron ores, conversion of the iron into steel ingots, rolling of ingots into blooms, billets, and wire rods. We saw the rods run their fiery course through the loud, speeding rolls, faster than half a mile a minute. We saw them pass their tests for tensile strength and accuracy of size.

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pulled through a series of tungsten-carbide dies, each reducing the rod's diameter until the desired size or gage of wire is produced. Then, by different combinations of finishing and heat treating operations, the wire is processed into wire of infinite varieties and qualities for unlimited channels of service — strong, accurate wire for J&L wire rope; bright and galvanized wire for J&L nails, staples, barbed wire and woven fencing; highly tempered J&L Mastercraft spring wire, which manufacturers like yourself use in making springs for soft, durable mattresses and fine furniture; Electromatic oil tempered spring wire for special mechanical springs; special wire for cold forming into bolts and machinery parts; tin-coated wire for communication lines; soft wire for the thousands of manufacturers who make coat hangers, wood screws, paper clips — 160,000 other articles of daily service.

"When you think of all these uses of steel wire — stemming from the mighty ingot, the common denominator of this great industry, you realize afresh that steel is our most useful metal, our first line of defense, our greatest servant, in the design of modern life."

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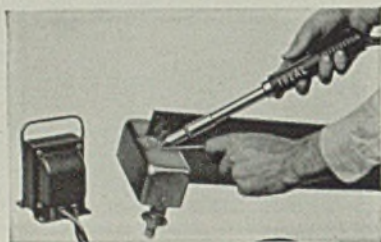
August 12, 1940

in the maximum position to take the thickest part being held in the fixture. Continued swinging of the handle forces these cam rollers against the rise of the cam so that the toggle bar is eventually in the minimum clamping position.

Soldering Iron

■ Ideal Commutator Dresser Co., Sycamore, Ill., has introduced a Quick Heat soldering iron which attains soldering heat in less than a minute.

Through the use of a special carbon electrode heating element, its



tip is quickly brought up to soldering temperature. Carbon electrode makes contact at point of tip so that heat is concentrated where it is most effective. Heating is controlled by a thumb-operated button on the handle. Although the iron is recommended for all ordinary soldering purposes, it is not recommended for continuous duty.

Gas Mask

■ Mine Safety Appliance Co., Brad-dock, Thomas and Meade streets, Pittsburgh, announces the addition of an all-vision facepiece to the all-service gas mask which features non-fogging, large-area lenses of



laminated shatterproof glass. It permits vision at all seeing angles, as lenses are contoured at sides. Dry

incoming air is conducted over the lenses, preventing accumulation of moisture or fog. The unit readily fits any face with the gas-tight seal eliminating pressure points. The minimum dead air space inside the facepiece also cuts down re-breathing of exhaled air. The facepiece, made of specially compounded, molded rubber can be sterilized without harm. An all-rubber head harness holds the facepiece in such a position that no metal touches the face.

Spray Nozzle

■ Spraying Systems Co., 4021 West Lake street, Chicago, has introduced a Fulljet spray nozzle for various industrial and chemical processes, gas washers and evaporative condensers. It is available in brass or other materials. Its pipe connection is 1/2-inch male, and capacity is 2.5 or 2.9 gallons per minute at 10 pounds pressure. The nozzle produces a full-cone square spray with uniform distribution. This same nozzle can be furnished with a round spray pattern. Sturdily constructed, it has large passages to prevent clogging.

Tapgun

■ Black & Decker Mfg. Co., Towson, Md., has introduced a new Tapgun to its line of production tools. It weighs only 3 3/4 pounds, measures 9 1/4 inches overall and taps up to 5/16-inch in cast iron, 3/16-inch



in steel, 3/8-inch in brass or aluminum. It taps at 400 revolutions per minute and backs out at 525 revolutions per minute.

Remote Control

■ U. S. Electrical Motors Inc., 200 East Slausson avenue, Los Angeles, Calif., announces a new system of electric remote control adapted to its Varidrive motor. It makes possible the automatic control of the take-off shaft speed by means of a thermostat, float switch or other control. It consists of a small worm gear reducer mounted on the motor control case and connected to the motor control shaft which changes the speed. The pilot motor is operated by thermostat, float switch or similar control through

a cyclic relay or process timer. The thermostat or float switch controls the direction of speed change while the cyclic relay governs the rate of change of the speeds.

Swing Grinder

■ Hammond Machinery Builders, Kalamazoo, Mich., announces type W wide swing grinder for use on bulky work or any application where extra working space around the wheels can be used to advan-



tage. It is a 3-horsepower machine with totally enclosed motor. It also is equipped with 14-inch boiler plate guards spaced 36 inches between wheels.

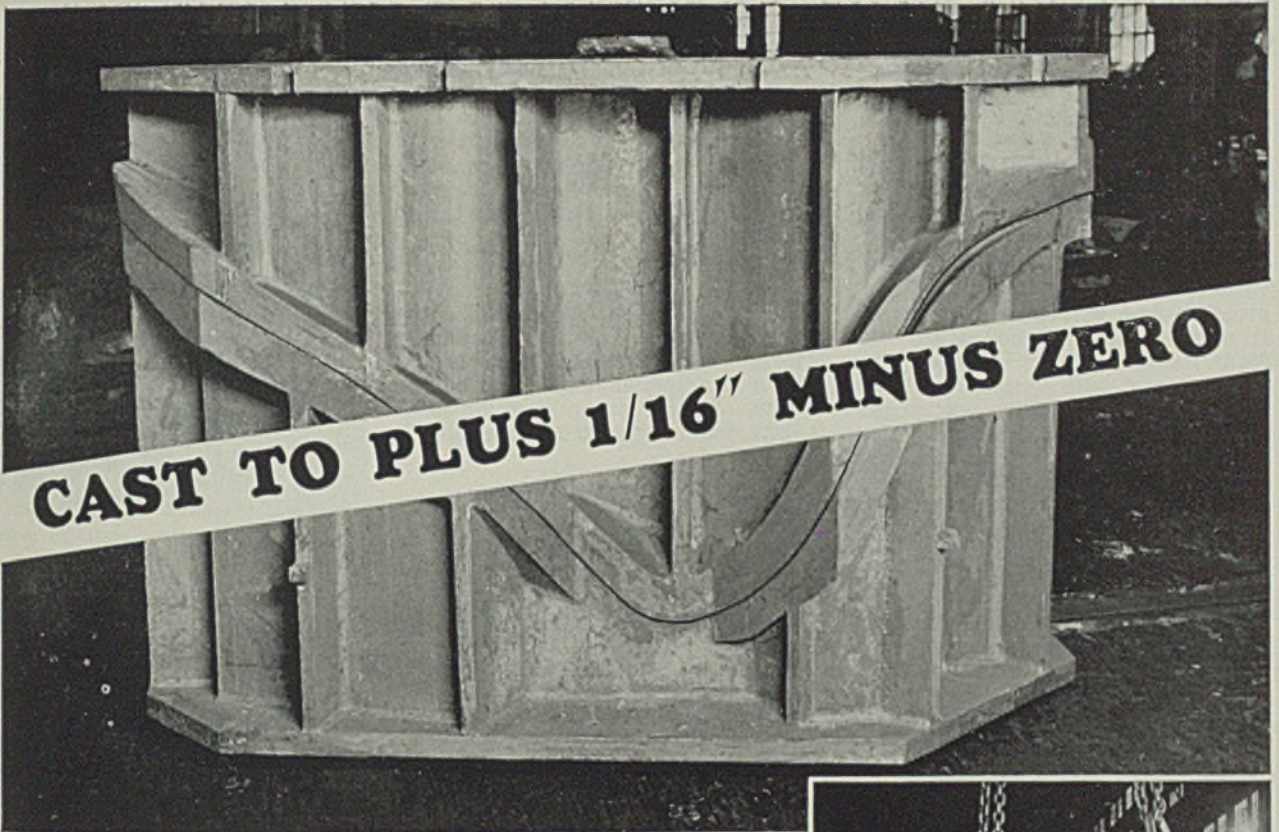
Disk Sanders

■ Skilsaw Inc., 3313 Elston avenue, Chicago, announces three new additions to its line of disk sanders—models SP, H2 and SL. The first is a 2-speed heavy duty sander and polisher for steady use in metal fabricating plants where there is need for a variety of sanding, polishing and buffing operations. When operating at a speed of 4200 revolutions per minute with a 7-inch disk, it provides a maximum of sanding efficiency. When changed to 1300 revolutions per minute, the tool can be used with felt rubbing pads or lamb's wool polishing bonnets for rubbing down lacquered surfaces



and other polishing operations. A gear shift enables it to change from one speed to the other. The tool is 18 1/2 inches long and weighs 14 1/4 pounds.

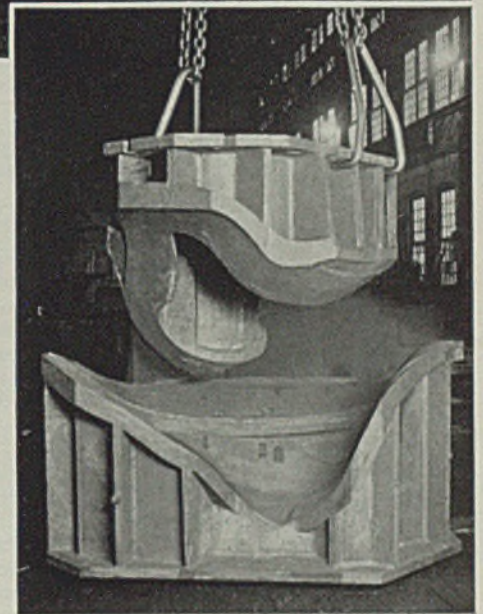
Model H2 also is a 2-speed heavy duty sander. It utilizes a 9-inch disk which is used at a speed of 2700 revolutions per minute. When



THINK how much machining is saved when two pieces totalling 16,340 pounds can be cast to tolerances as close as this. This fender blank holder, for example, is ready *as cast* for final hand finishing. A minimum of filing exposes clean, hard, sound metal. Hours of profiling, hours of checking saved.

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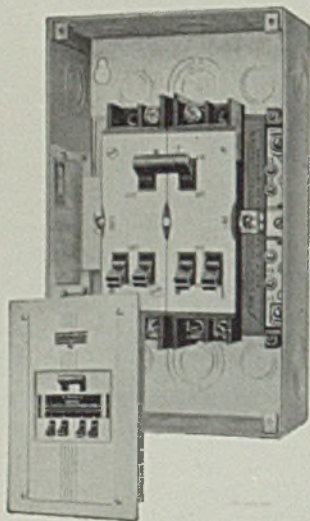
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the outer edge of the disk becomes worn, it is re-sized to a 7-inch diameter using a special trimmer which is provided with the sander. The smaller disk can be mounted on the alternate 7-inch pad and used at a speed of 4200 revolutions per minute. The sander is 19½ inches long and weighs 16 pounds.

Model SL is an extra heavy power unit that can handle a wide variety of heavy duty sanding, grinding and surfacing operations. It operates at a no-load speed of 5000 revolutions per minute. It may be used with various sanding pads, grinding wheels, wire cup brushes and other accessories. It is 18 inches long and weighs 15 pounds.

Multibreaker Assemblies

■ Cutler-Hammer Inc., 315 North Twelfth street, Milwaukee, announces a change in the case construction as used with its type MB multibreaker assemblies. The device now has an insulated groundable neutral. These assemblies are available with 1 to 16 breakers which can be arranged for 2 or 3-pole solid neutral circuits for alternating cur-



rent service. Type MB is furnished in either flush or surface mounting styles.

Tube Bender

■ Greenlee Tool Co., division of Greenlee Bros. & Co., Rockford, Ill., has developed a hand tube bender for bending steel, copper, brass and other tubing, as used in the machine-tool, aviation, air-conditioning, refrigeration and plumbing fields.

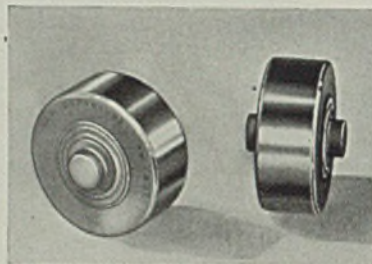
Because of its design, the bender can bend tubing without kinking or flattening. The bending is accomplished by a rolling action which

eliminates friction and leaves the finish of the tube unmarred.

The tool is available in six sizes for bending tubing with outside diameters of ¼, 5/16, ¾, ½, ¾ and ¾-inch. Although it is ordinarily held in a vise, a tapped hole in the head permits the use of an auxiliary handle for bending small sizes or soft tubing without a vise.

Treadle Roll Bearing

■ New Departure, division General Motors Corp., Bristol, Conn., has developed a special treadle roll bearing of high carbon steel which is completely protected from dirt



or lint and fully lubricated for long life. It is easy rolling and designed so it cannot rub at the sides of the treadle arm.

Explosion-Proof Switch

■ Micro Switch Corp., Freeport, Ill., has developed a small explosion proof switch for use in hazardous locations such as atmospheres containing vapors of ethyl ether, gasoline, alcohol, acetone, lacquer solvents, etc., and for grain dusts. Measuring 3¾ x 2½ x 2 inches, it is available with roller arm with the axis of the roller either parallel to or at right angles to the arm, and as a bullet nose push rod type. Its mounting space is kept to a minimum by omitting feet or lugs. However, where a foot or lug-type mounting is desirable, a universal mounting strap is available. A removable cover plate provides easy access to the terminals, which are supported on the switch element itself and accept No. 14 solid wire. The switching unit enclosed within the cast iron housing is the standard Micro Switch with a separate Underwriters' listing of 1200 watts up to 600 volts alternating current. Single pole, double throw contact arrangements also are available.

Gasket Marker

■ Crane Packing Co., 1800 Cuyler avenue, Chicago, announces an improved gasket marker for marking and outlining gasket sizes on sheet packing. It is about 4 inches longer

than previous markers and is made of rust-proof spring brass. It elimi-



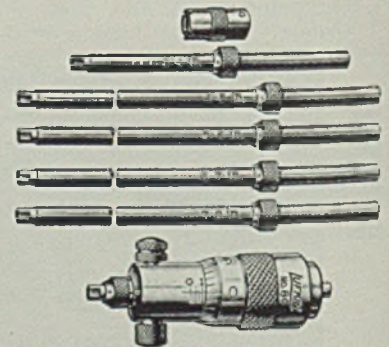
nates the use of a compass as all necessary information for marking gasket sizes is etched in raised characters on the device.

Angle Iron

■ George Scherr Co., 128 Lafayette street, New York, has developed a new universal Magne-Blox angle iron for holding diversified work of all types. It consists of a series of steps measuring in width 3/16, ¼, ½, 1 5/16 and 1¾ inches upon which may be placed special pieces for surface grinding without the use of complicated clamps and attachments. Its overall dimensions are 3 x 3 x 7½ inches. When placed on the plane surface of the magnetic chuck, the angle iron will form a magnetic right angle giving the same holding power per square inch as the chuck itself.

Inside Micrometers

■ Lufkin Rule Co., Saginaw, Mich., has placed on the market No. 80 series inside micrometers. Range in these micrometers is obtained by use of extension rods and collars.



Provision also is made for adjusting tension and taking up wear on the screw. Contact points of rods are adjustable for maintaining their individual length.

Forming Cuts Costs

(Concluded from Page 62)

to form or to bend than to weld. Shapes are not only bent, formed and machined for welded designs, but they are also cut by gas. It is interesting to note that for plate up to 5 inches thick inclusive, the cost for gas only for a cut of 100 square inches (cross section) is approximately 25 cents at the average price of oxygen and acetylene. The speed of cutting increases rapidly as thickness of plate is reduced so that the labor charge varies. See chart.

Note that as the thickness of the plate increases, production in square inches cut also goes up. For example, 1/4-inch plate cut at a rate of 120 feet per hour means 360 square inches in cross section is cut. Plate of 1/2-inch thickness, cut at a rate of 108 feet per hour means 648 square inches in cross section is cut. Plate of 1 inch cut at 80 feet per hour amounts to 1080 square inches. Economy through the use of large plate is obvious insofar as this factor of preparation is concerned.

The data as given include no fatigue and no setup allowances.

burners of the furnace. Full automatic modulating control with all necessary safety devices is provided. Normal operating fuel consumption varies between 2500 and 3000 cubic feet per hour of natural gas at 1050 B.t.u. Chain speed on ground-coat work is 7 feet per minute and 9 feet per minute for cover-coat operations.

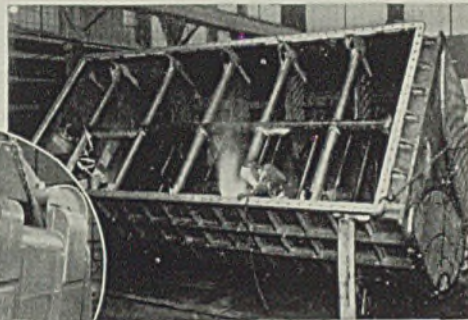
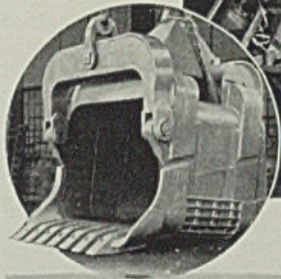
Furnace exhaust stack, at extreme left in Fig. 4, contains a 2-pass recuperator with 70 tubes and core busters so hot exhaust gases from the furnace enter at the base of the stack and give up a great portion of their heat to the recuperator tubes.

Filtered air at room temperature

is introduced through an upper duct and gets its initial heating while passing through 35 tubes around which the cooler exhaust gases are guided. After entering an insulated plenum chamber, the filtered air passes through another set of 35 tubes in contact with the hotter exhaust gases for final heating before being exhausted through the lower duct by means of a fan. Removable insulated plugs permit inspection of the recuperator tubes.

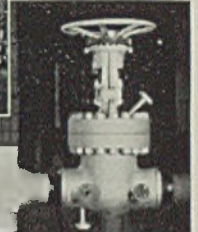
Recuperator is designed to provide 3600 cubic feet per hour of hot air at 400 degrees Fahr. This recuperated heat is used primarily in the cover-coat drier.

35 cu. yd. Man-Ten steel dipper welded with Murex Carbon-Moly by Marion Steam Shovel Co. Marion, O.



Murex-welded shell and turbine connector built by Ross Heater & Mfg. Co Buffalo.

High pressure piping welded with Murex Carbon-Moly by Geo. C. Limbert & Co., Chicago.



Plan to Revise Practice On Coated Abrasives

The standing committee in charge of simplified practice recommendation R89-36, "Coated Abrasive Products," recently approved a revision of the recommendation, and the division of simplified practice, national bureau of standards, Washington, has mailed copies to all interests for consideration and approval.

Simplification of these products was first undertaken in 1928, when a survey of the industry disclosed the existence of more than 8000 varieties. Early in 1928 a general conference of manufacturers, distributors and users drafted the original recommendation R89-28, which reduced the number of stock varieties to 1923. Subsequent revisions in 1931 and 1935 listed 1863 and 1868 stock varieties, respectively.

The proposed revision now would further reduce the number of stock varieties to 1739. Mimeographed copies of the proposed revision are available.

Enameling Plant

(Concluded from Page 59)

and one about 20 feet in from the front provide an effective means of preventing heat loss and minimizing cold air flow into the furnace.

A twin-nozzle burner supplies proper amount of natural gas and air for combustion to the two rear

SPEED UP YOUR WELDING OF HIGH STRENGTH—LOW ALLOYS WITH

MUREX ELECTRODES

SPECIALLY DESIGNED FOR CARBON-MOLY, COR-TEN, MAYARI, CROMANSIL, 2%-3% NICKEL AND OTHER STEELS

- The Murex line includes a group of specially developed rods designed to produce welds with tensile strengths ranging from 70,000 to 100,000 lbs. per sq. in.; ductilities of 20% to 30% and corrosion and heat resisting qualities matching closely any of the more widely used new steels. Because of their excellent deposition rates at high amperages, their ease of handling by skilled welders, and the assurance they provide of cleaner, smoother deposits they step up welding speeds and help hold down costs.

Ask to have Murex Electrodes demonstrated on your high strength—low alloy applications. A note to the nearest M & T office will bring a representative promptly.

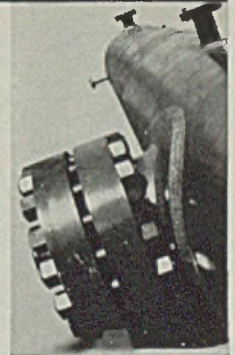
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"Murex Electrodes—Thermit Welding—Thermit Metal & Alloys"

Investigate Thermit Welding, too—in use since 1902 for heavy repair work; crankshafts, housings, frames, etc.



Accumulator built of A. S. T. M. A-203, Grade B steel by Black, Sivalls & Bryson, Oklahoma City. Welded with Murex Nickel Steel.

Deformation Controlled

(Concluded from Page 52)

from the starting point of the pass ahead to show the contour of each pass.

As the welding of the test plates progressed, the best possible amperage and voltage were determined for each pass and size of electrode. This then was included as part of the procedure, allowing a 10 per cent variation above or below the values to take care of varying field conditions.

In the actual welding of the shells, the continuous outside tacking pass was applied in position, after which the two inside passes of 3/16-inch rod were applied as far as practical without rotating the shell or erecting staging. The succeeding passes were deposited in sections approximately 5 feet long with 1-foot backstepping. This meant rolling the holders in 5-foot steps with all the operators working in the bottom of the holders, keeping time with each other as well as possible. In welding the outside pass and in all the seal welding of rivets and backstraps, the operators were moved out on top of the tank and the holders were rolled in approximately 8-foot steps.

Heads were welded in downhand position as far as possible. Each bead was thoroughly cleaned and peened to relieve stresses set up during welding. The circular girders were welded in position throughout.

After the shell has been completed, Fig. 3, the clips and bolts which held the sections in place during welding and which still appear in

Fig. 3 are removed. Then the bolt holes are plugged. After this the shell is tested with compressed air at 110 per cent of working pressure (55 pounds per square inch), subsequently reduced to 35 pounds. Next the circular girders were assembled and welded to the tank. The two circular girders for each tank are spaced 108 feet 3 inches center to center on the 215-foot tanks.

After a tank was located at the proper elevation, centered between supports and carefully leveled, supporting brackets were bolted to the roller cradles and welded to the girders. The roller cradles and rollers for the permanent supports at the two circular girders were first assembled as a unit and bolted to the pedestals of the permanent supports before the brackets were welded to the girders.

Many Jacks Employed

After the brackets and longitudinal braces were welded in place, the hydraulic jacks were let down and removed from the temporary foundations. Then the tank pressure was blown down. Finally the interior tie rods forming the bracing system were removed and transverse ties welded in place.

Features of this erection method thus seem to include the use of temporary tie rods to hold sections in position during erection, also use of a large number of hydraulic jacks on temporary foundation for aligning the parts. In addition, use of cable wrapped around the tank and pulled by electric winch provided means of positioning both for interior and exterior welds so all could

be made in a downhand position, making for maximum efficiency in welding.

Also important were properly designed slings and lifts for moving the section about on a crawler-type crane. One of these cranes is shown assembling the sections in Figs. 1 and 2.

No doubt many of these innovations in erection procedure could be applied with equal advantage to the field erection of other large structures.

Controls Soaking Pit

(Concluded from Page 49)

automatically holds furnace pressure at any desired point by moving the stack damper as may be necessary.

This type of setup, however, is especially recommended where air infiltration is a large variable. All instruments are standard type.

Use of this system has been quite satisfactory, due to the extreme sensitiveness of the control equipment. After an ingot has come to the soaking heat, its temperature is easily maintained within plus or minus 5 degrees Fahr. of the de-

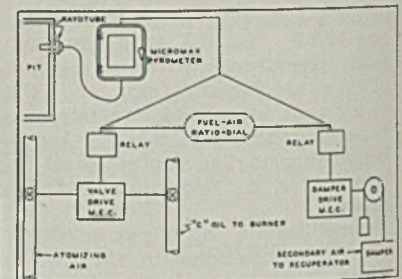


Diagram of Rayotube setup

sired point which may be set anywhere from 2100 to 2450 degrees Fahr. Ingots are heated with great uniformity to a thoroughly plastic condition.

In addition, the atmosphere is controlled exactly as desired to maintain the correct oxidizing condition required to form hard scale that will break off cleanly in the roughing rolls. These results are obtained with an economical outlay for equipment and at low fuel cost. With old pits which may have a large variable air leakage, such a control setup may be of extreme value in aiding the heaters to send out properly heated ingots.

The steel handled in these pits is usually special analysis material, including practically all of the high alloys as well as the usual carbon-manganese steels.



You Can Depend On "Hercules" (Red Strand) Wire Rope

Highlights of Quality

1. Acid Open-Hearth Steel Wire
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3. Correct Manufacturing Methods
4. Furnished in both the Round and Flattened Strand constructions, in either Standard or Preformed Type.

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MEETINGS

GRAY IRON FOUNDERS WILL DISCUSS NATIONAL DEFENSE

■ ANNUAL meeting of Gray Iron Founders' society will be held at Hotel Cleveland, Cleveland, Sept. 12. While the meeting will be devoted largely to reports of activities during the past year, plans to meet the problems of rearmament and co-operation in that connection with the government will be discussed. All gray iron foundry executives are invited.

CHICAGO IS MEETING PLACE FOR HOT DIP GALVANIZERS

American Hot Dip Galvanizers association will conduct its semiannual meeting at the Palmer House, Chicago, Aug. 22. Morning will be devoted to a technical session at which papers relating to zinc coatings by the hot dip galvanizing process will be presented by members and by the association's technical director of research, Wallace G. Imhoff; afternoon is reserved for the regular business session. Only members may attend the latter, but guests by invitation may participate in the technical meeting. Other features of the program are a luncheon and banquet.

NEW SHOW WILL PROMOTE ELECTRICAL ENGINEERING

An Electrical Engineering exposition will be held in Convention Hall, Philadelphia, Jan. 27-31, during the midwinter meeting of the American Institute of Electrical Engineers. First of its kind, the exposition is designed to serve the electrical industry by promoting a more rapid dissemination of information on new developments.

Exhibits will include new and improved electrical products for the generation, transmission and utilization of electrical energy—of interest to engineers in the utility, railroad, industrial and consulting fields. Charles F. Roth, Grand Central Palace, New York, is exposition manager.

FOREMEN HOLDING ANNUAL MEETING IN CINCINNATI

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., A. C. Cosgrove, vice president and general manager, Crosley Corp., Cincinnati, and Donald R. Richberg, New York, will be featured speakers at the seventeenth annual convention of the National Association of Foremen at Hotel Gibson, Cincinnati, Sept. 26-29.

In addition to discussing organization technique in foremen's clubs, the convention will examine problems confronting the foreman as

the result of current defense activities, the responsibility of foreman to management and vice versa, legal problems, job simplification, and personnel problems. An exposition of industrial equipment will be held concurrent with the convention.

REFRACTORIES SYMPOSIUM IS SCHEDULED IN CHICAGO

A symposium on acid, basic and neutral refractories is to be held in Chicago on the evening of Sept. 20, under joint auspices of the Chicago section, American Ceramic society, and department of ceramic engi-

neering, University of Illinois. Meeting will be in the auditorium of the Chicago Lighting institute, Civic Opera building.

Speakers will include Dr. Robert B. Sosman, research laboratory, United States Steel Corp., Kearny, N. J., who will present a paper on "Temperature versus Refractories;" W. F. Rochow, Harbison-Walker Refractories Co., Pittsburgh, with a paper on "Service Application of Acid Refractories;" and Dr. R. P. Heuer, General Refractories Co., Philadelphia, who will discuss service applications of basic refractories.



- Great flexibility for handling ore cargoes from ship to dock is provided in this bridge built by Dravo for Great Lakes Steel Corporation. 350 feet overall, it has a central span of 187 feet, carries a 10-ton bucket. Apron hoist provides clearance for steamer masts.

- Whether the problem is one of modernizing old equipment, replacing obsolete handling machines or designing special facilities to meet new problems, consultation with Dravo Corporation may prove to be of great value to you.

- Added to its ability to fabricate and erect structures such as the one shown here, Dravo Corporation has had years of experience building docks, retaining walls, plant foundations—everything that enters into the problem of terminal facilities. Inquiries relative to specific problems may be addressed to

DRAVO CORPORATION

ENGINEERING WORKS DIVISION

SHIPYARDS: PITTSBURGH, PA.—WILMINGTON, DEL.
GENERAL OFFICES AND SHOPS: NEVILLE ISLAND—PITTSBURGH, PA.

Financial News

(Concluded from Page 41)

posed plan would also eliminate the company's earned surplus deficit resulting from adjustment of property account, and would create in its place an earned surplus clearing the way for dividend payments.

The plan contemplates exchanging each present share of 7 per cent preferred with accrued unpaid dividends into 1.4 shares of new 5 per cent preferred. Each share of the new stock will be convertible into two shares of common.

Company's directors announced, last week, their intention of declar-

ing a dividend on the new preferred stock for the quarter beginning July 1.

SUPERIOR STEEL CORP.

Second quarter net profit of Superior Steel Corp., Pittsburgh, steel finisher, was \$31,661. This was equal, after interest, depreciation and federal income taxes, to 28 cents per share on capital stock, and compared with \$54,043 net deficit incurred in the period last year. Net profit for the quarter ended March 31 was \$84,010 or 74 cents per share.

Total net profit for six months ended June 30, was \$115,671, equal

to \$1.02 a share, against \$60,776 net loss for the first half, 1939.

EASTERN ROLLING MILL CO.

Eastern Rolling Mill Co., Baltimore, reports it incurred an \$84,823 net deficit in the quarter ended June 30, compared with a net loss of \$37,377 in the period last year. First quarter, 1940, net profit was \$5568.

Net loss for the first half this year, computed from quarterly reports, was \$79,255, against a net deficit totaling \$65,394 in the period last year. For 12 months ended June 30 reported net loss was \$91,285.

WESTINGHOUSE ELECTRIC NET PROFIT 59 PER CENT HIGHER

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., reports net income for 12 months ended June 30 was \$17,352,590. This was 59 per cent greater than \$10,890,598 net profit earned in the previous period.

Net income for first six months this year was \$9,837,012, equal to \$3.68 per share, compared with \$6,338,787 or \$2.37 per share in first half, 1939.

Dividends of \$1 per share on both common and preferred stock were recently declared by the company's directors and will be payable Aug. 30 to record of Aug. 13.

A. W. Robertson, chairman, reported orders booked by Westinghouse in the 12 months were highest for any such period, totaling \$245,256,874 against \$177,487,833 a year ago.

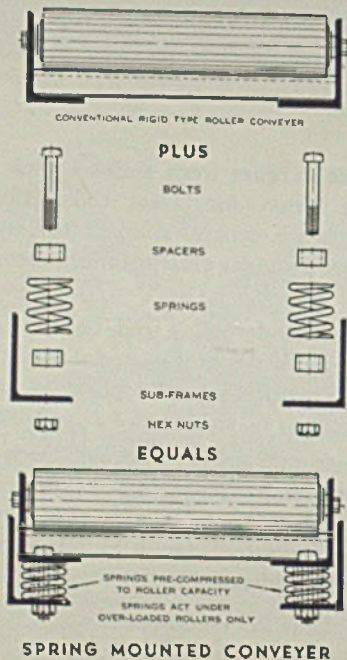
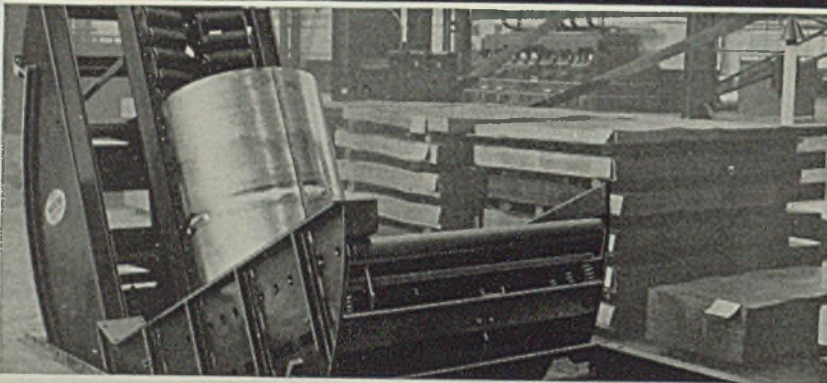
Pig Iron Production Figures Modified Slightly

Actual July coke pig iron production in United States totaled 4,060,513 net tons, according to complete reports from operators of the country's 231 potential blast furnaces. Average daily rate was 130,984 tons, compared with 127,103 in June. These figures are essentially as reported in STEEL, Aug. 5, p. 24, in a compilation including some estimates.

Furnaces in blast July 31 totaled 187 as stated last week, although there were two changes not previously reported. Ensley No. 6 stack of Tennessee Coal, Iron & Railroad Co., in Alabama, was blown in July 9, after having been down for relining since May 31. Reusens furnace of E. J. Lavino Co., in Virginia, was blown out July 31.

National Steel Corp., Pittsburgh, reported blowing in an additional furnace at the Buffalo plant of its subsidiary, Hanna Furnace Corp., on Aug. 3. Placing the stack in blast brought National's iron and steel works operating rate up to the 100 per cent level, according to the corporation's report.

MATHEWS SPRING MOUNTED CONVEYERS



CUT MAINTENANCE COSTS

THE principle is simple; the roller axes are rigidly locked in the frame as in the conventional "rigid type" construction, but the conveyor 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 conveyor 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 conveyor construction for the job.

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

Ask for Illustrated Folder

MATHEWS CONVEYER COMPANY
114 TENTH STREET, ELLWOOD CITY, PENNA.

CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS

< < HELPFUL LITERATURE > > >

1. Annealing Furnaces

Lee Wilson Engineering Co.—8-page illustrated bulletin, "Annealing Furnaces for Wire and Strip," describes these units and shows typical installations. These furnaces are fired with vertical radiant tubes and are said to attain uniformity of structure and tensile strength in short cycles at low fuel rates.

2. Cements and Coatings

Atlas Mineral Products Co.—16-page illustrated bulletin, "Materials of Chemical Construction," presents complete information on materials including acid-proof cements, plastic linings, jointing materials, and protective coatings for acid and alkali proof construction, tanks, towers, floors, ducts, trenches and sewers.

3. Vises and Tools

Hollands Manufacturing Co.—24-page illustrated loose-leaf catalog No. 36 describes machinists' and fliers' solid and swivel jaw vises with stationary and solid bases, as well as combination bench, pipe, anvil and woodworkers' vises. Pipe cutters, dies, and stocks and ladders are also described. Complete specifications and prices are given.

4. Continuous Filing

Continental Machines, Inc.—4-page illustrated folder D-357 gives specifications on bench and floor model continuous band filing machines. Each model handles ¼, ⅜, and ½-inch widths of files in types designed for material being machined.

5. Welded Tip Tools

Fansteel Metallurgical Corp.—8-page illustrated folder G-401 contains explicit instructions for making tools of "Tantung" welding rod which is applied to steel shanks by acetylene torch, and lists prices of welding rod and standard welded tip tools.

6. Development in Rubber

B. F. Goodrich Co.—32-page illustrated bulletin, "Typical Examples of Goodrich Development in Rubber," is a reprint of a series of 28 recent advertisements illustrating and describing improvements and applications of rubber to many types of products and industries.

7. Electroplating Baskets

Hanson-Van Winkle-Munning Co.—Illustrated bulletin No. D-104 describes complete line of wire baskets in various meshes and gauges, made of steel, brass, aluminum, Monel, and nickel-chromium. In addition to welded metal baskets, glazed earthenware baskets are shown.

8. Automatic Lathe

Gisholt Machine Co.—6-page illustrated bulletin No. 1080 presents full details of No. 12 hydraulic automatic lathe for between center and chucking work. Machine finds application on production turning jobs such as gear blanks, cylinder liners and pistons, small impellers, and flywheels.

9. Fluorescent Lamps

Westinghouse Electric & Manufacturing Co.—24-page illustrated bulletin No. A-3618, entitled "Fluorescent Lighting," is a practical guide to the application of Mazda F lamps and equipment. It explains how lamps work and purpose of auxiliaries. Direct current operation, temperature effect, color, stroboscopic effect, radio interference and lighting costs are some of the subjects covered.

10. Air Shut-Off Valves

Homestead Valve Manufacturing Co.—6-page illustrated folder No. 83975 describes "Homestead-Ross" valves for use as quick acting shut-off valves on air lines to air guns, chipping hammers, and air operated tools. Valves are adaptable also on gas and cold water service for pressures up to 150 pounds.

11. Floor Dye

Flexrock Co.—4-page illustrated bulletin describes "Colorflex," a resin base floor dye that preserves wood floors and protects concrete. This product which provides a clean gloss surface is available in grey, red, green, and brown.

12. Split Phase Motors

Century Electric Co.—4-page illustrated bulletin No. BCA 120.0 shows construction features and operating characteristics of split phase fractional horsepower motors ranging in size from 1/20 to ¼ horsepower.

13. Control Instruments

Bristol Co.—Illustrated bulletin No. 548 describes line of thermometer and pyrometer controllers for gas, electric, and oil fired industrial furnaces, kilns and ovens. Included is information regarding air and electrically operated controllers, automatic control valves, thermometer bulbs and thermocouples.

14. Plating Salt

E. I. du Pont de Nemours & Co.—Illustrated service manual gives full data for operation and maintenance of plating solutions including cost and time tables on commercial deposits. Features of "Cadalyte" salt for cadmium plating presented. Tests for deposit thickness are suggested.

15. Abrasive Cleaning

American Foundry Equipment Co.—4-page illustrated circular No. 4 describes the new continuous "Wheelabrator Tumb-Blast," airless blast cleaning equipment for high production shops. Work to be cleaned is carried through blast barrel on an endless apron type conveyor which cascades and tumbles work, completely exposing it to full effect of abrasive blast.

16. Micrometers

George Scherr Co.—4-page illustrated bulletin, "Reed Micrometers," describes and gives specifications and list prices of all types of micrometers for inside and outside measurement. These instruments feature tool steel spindles, frictional adjustment and fixed anvils.

17. Metering Orifice

York Oil Burner Co.—4-page illustrated bulletin, "Iris Shutter," describes a variable iris shutter metering valve or orifice for metering or regulating the flow of steam, air, gas and liquids. These units are applicable to metering service in all types of industries.

18. Laboratory Furnaces

Ajax Electrothermic Corp.—4-page illustrated bulletin No. 12 gives complete information on small electric furnaces for laboratory purposes. The 3-kilowatt converter for temperatures up to 2500 degrees Cent. is described as are furnaces for use with this converter.

19. Electric Arc Welder

Harnischfeger Corp.—Illustrated bulletin No. W-28 describes the new WD-150 square frame arc welder which measures less than 33 inches in length and one foot in height and delivers welding current ranging from 200 down to 15 amperes. Details of design and service available from parallel hook-up of two or more machines are also included.

20. Wire Rope Connectors

Electroline Co.—8-page illustrated bulletin No. F-2 gives details of the improved "Electroline-Flege" wire rope connectors with built-in vibration damping design. Installation methods, several corrosion resistant finishes and types, and available sizes are presented.

21. Dust Control

Fangborn Corp.—4-page illustrated bulletin No. 2056 shows dust control equipment in use in various types of plants. Explanation is given of how maintenance costs are reduced, valuable materials are salvaged, depreciation rates are lowered with use of dust control machinery.

STEEL

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22. Bronze Bearings

Moraine Products Div., General Motors Corp.—72-page illustrated tool list of "Durex" bronze bearings describes bearing material, gives installation data including press fits and clearances and complete dimensions of types of bearings. Includes plain cylindrical, flange, thrust washer, seal ring, self-aligning, cylindrical splined O.D., half, and step flange bearings.

23. Direct Current Motors

Allis-Chalmers Manufacturing Co.—40-page illustrated bulletin No. B-6002 gives data on and shows applications of large direct current motors and controls for heavy duty drives. In addition to showing installation views of these motors in steel and mining industries, many pages are devoted to design features of the machines.

24. Grinding Wheels

Sterling Grinding Wheel Co.—80-page illustrated catalog No. 40 presents specifications, descriptions, list prices, and application and operating data on grinding wheels for all types of products in industry. One section is devoted to wheel specifications for grinding machines.

25. Steel Valves

Hancock Valve Div., Manning, Maxwell & Moore, Inc.—4-page illustrated bulletin 5-7000 reproduces A.S.M.E. service rating tables. Information on "Dura-valve" and bar stock valves includes cut-away views of construction. Prices and dimensions are listed. Tells how to select proper valve for various purposes.

26. Temperature Recorder

Leeds & Northrup Co.—12-page illustrated bulletin N-33B-685 describes Speedomax pyrometer for high-speed recording. Uses for temperature, pressure and humidity measurements, speed, radio field strength and microphotometer measurements are explained. Completed chart resulting from instrument operation is shown.

27. Electric Tools

The Porter-Cable Machine Co.—12-page illustrated folder gives brief descriptions of portable electric sanders, "Speedmatic" hand saws, floor sanders, and belt, disc and spindle sanders. Applications are discussed and shown. Specifications of various models are listed.

28. Flexible Couplings

Link-Belt Co.—12-page illustrated catalog 1845 contains price and dimensional data on types A, B, and RC couplings and information on revolving and stationary casings for RC type. Simple selection tables and instructions for installation and lubrication are included.

«« HELPFUL LITERATURE

(Continued)

29. Combustion Furnace

Harry W. Dietert Co.—Illustrated leaflet describes the No. 3400 "Varitemp" combustion furnace for carbon and sulphur determinations of all metals by combustion method. Unit is adaptable for combustion of coal, coke and oils for determination of sulphur with a special determinator.

30. Nickel Alloys

International Nickel Co.—32-page illustrated bulletin No. T-13 shows the use of nickel and nickel-base alloys in the design of corrosion resistant machinery and equipment. Engineering data in chart and tabular form amplifies text regarding physical properties of these alloys.

31. Diesel-Electric Switcher

General Electric Co.—24-page illustrated bulletin No. GED-803 describes advantages and savings possible with diesel-electric locomotives for all types of switching by railroads and in industrial plants. Typical installations of various types of machines are shown.

32. Wires and Cables

The Okonite Co.—32-page illustrated booklet No. OK-1005 gives pictorial trip through laboratory showing step-by-step procedures of developing new insulation or protective sheath. How it is put into production, checked and tested in laboratory and proving ground is explained briefly.

33. Magnetic Drums

Magnetic Engineering & Manufacturing Co.—4-page illustrated catalog No. 340 describes high power magnetic drums for protection, purification, concentration and separations. Practical applications for all kinds of separations are explained. Data on dimensions and capacities are included.

34. Steam Cleaning

Homestead Valve Manufacturing Co.—4-page illustrated bulletin No. J-24025 shows savings possible through the use of "Hyppressure Jenny" steam cleaning equipment on maintenance and production jobs. Typical applications of this equipment for all types of cleaning are shown.

35. Bar Stock Valves

Reading-Pratt & Cady Div., American Chain & Cable Co.—16-page illustrated bulletin No. 1186 contains complete information, dimensions, and application recommendations for bronze, carbon steel, and stainless steel bar stock valves which are precision machined from bar stock metals and fulfill need for close controlled valves, capable of withstanding wide range of temperatures and pressures.

36. Small Switches

Micro Switch Corp.—Illustrated data sheet No. 12 discusses features, construction, and application details of panel mounting and roller-leaf "Micro" switches. Blueprints show dimensions and outlines. Charts give operating characteristics of each.

37. Surface Condenser

Ingersoll-Rand Co.—Illustrated bulletin No. 2622 describes the cross flow type R surface condenser, designed for high vacuums and high efficiency in small capacities. Sizes range from 200 to 1500 kilowatt units. Typical installations, cross sectional views and constructional details are given.

38. Electric Solderer

Ideal Commutator Dresser Co.—Illustrated bulletin, "Instant Heat," gives details and applications of the new electric soldering tool which employs a transformer and bi-carbon element which heats instantly upon touching wire or terminal to be soldered.

39. Machine Tools

Jefferson Machine Tool Co.—4-page illustrated bulletin, "Speed Up Production," contains complete description and specifications on swing frame grinding and polishing machine, lathe tail stock turret head, lathe tool post turret, lathe adjustable pull feed, and endless belt sander.

40. Traveling Cranes

Northern Engineering Works—8-page illustrated bulletin No. S-107 describes "Super-Cranes" for heavy duty service. Constructional details as well as views of typical installations of these traveling cranes are included.

41. Grinding Wheel Stand

Cincinnati Milling Machine & Cincinnati Grinders, Inc.—Illustrated bulletin No. G-454 describes wheel balancing stand with 20 and 40 inch swing, and wheel balancing arbor for maintenance of correct wheel mount balance. Four arbors available are illustrated.

42. Diesel Engines

Caterpillar Tractor Co.—32-page illustrated bulletin No. 6056 shows more than a hundred typical applications of "Caterpillar" diesel engines in all types of industries. Performance records for each application are given briefly.

STEEL

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Steel Demand Supports Near-Capacity Output

*Shipments make little impression on
backlogs. Deliveries seen extended
further by fall. Scrap is stronger*

■ OPERATING problems occupy the principal attention of most steel producers as demand holds in a volume matching or exceeding near-capacity output.

Shutdowns for repairs have interrupted the recent steady upturn in steelmaking by some districts, but the national average held last week at 90½ per cent. Increased schedules are indicated for several areas this week.

Heavy shipments lately have been without effect on mill backlogs of many products, and deliveries on some items have become further delayed. Buyers generally are protected on current needs, either by previous commitments now being filled or by stocks on hand, consequently the supply situation so far has been without serious inconveniences.

Possibility is seen of more extended delays in deliveries by fall. Exports recently have accounted for 15 to 20 per cent of steel output, and war developments will determine how long this proportion will continue. Even without the share of such business coming from Great Britain and Canada future demand appears likely to engage most steelmaking facilities, since a marked upturn in automotive needs is in prospect the remainder of the year and requirements of the defense program are becoming increasingly prominent.

Automobile production is at or near the season's ebb, declining last week to 12,635 units. A year ago the bottom was reached one week later at approximately this same level. Assemblies of new models are expected to be increased as rapidly as possible, in order not only to take advantage of the active retail market but also to avoid insofar as possible any interruption to operations later in the year because of shortages of material.

Scrap prices have advanced for the second successive week, moving the composite up 21 cents to \$18.50. Quotations have edged upward in several districts, with mills showing more interest in the market. Government licensing does not appear to be restricting exports of No. 1 heavy melting steel, but certain independent steel producers plan to make a formal protest to Washington, seeking extension of licensing to cover foreign shipments of all scrap grades.

While last week's awards of structural shapes and concrete reinforcing bars were off from the heavy

volume of the preceding three weeks, large tonnages are involved in pending and prospective construction.

Several large orders for line pipe have swelled recent business in tubular products. Outstanding in proposed pipe line laying is application of the Reserve Gas Pipe Line Co. to the federal power commission to build a 1500-mile line of 24-inch pipe between the Gulf coastal region and New York city.

Railroad equipment orders continue fairly active and are supplemented by heavier steel purchases for freight car repairs. Recent awards include 2350 freight cars by the Southern Pacific, 1000 box cars to be built by the Chicago, Burlington & Quincy, 21 coaches and 18 diesel-electric locomotives by the Atlantic Coast Line and two streamlined passenger trains placed jointly by the Chicago & North Western, Southern Pacific and Union Pacific.

June exports of 617,678 gross tons of iron and steel, including pig iron but excluding scrap, compare with a monthly average of 525,000 tons in 1917, when foreign shipments set an all-time yearly peak. England and Canada accounted for more than one-half the June tonnage, taking 231,094 and 90,491 tons, respectively. Continuation of the June pace through remainder of the year will bring 1940 exports slightly above the 1917 total.

Tin plate production was unchanged last week at 71 per cent, but with consumers' stocks being reduced an increase in specifications is looked for soon.

Pig iron shipments are steady or slightly heavier compared with a month ago. Foundry operations are being stimulated by heavier production of automotive, railroad and farm equipment castings. Better activity at implement and tractor plants also is reflected in expanding steel needs.

Most changes in district steelmaking rates last week were small. Pittsburgh eased ½-point to 86 per cent, with Chicago down a similar amount to 96½. Youngstown, off 3 points, to 82, is scheduled to move higher this week. Other reductions include 6 points to 93 at Detroit, 3 points to 78 at Cincinnati and 2 points to 88½ at Buffalo. Increases were 4½ points to 85 at Cleveland, 1 point to 99 at Wheeling and 1 point to 89 in eastern Pennsylvania. Birmingham at 88, New England at 80 and St. Louis at 62½ were unchanged.

MARKET IN TABLOID ★

Demand

Active for practically all products.

Prices

Generally firm; scrap up further.

Production

Unchanged at 90½ per cent.

COMPOSITE MARKET AVERAGES

	Aug. 10	Aug. 3	July 27	One Month Ago July, 1940	Three Months Ago May, 1940	One Year Ago Aug., 1939	Five Years Ago Aug., 1935
Iron and Steel	\$37.66	\$37.60	\$37.53	\$37.63	\$37.33	\$35.95	\$32.68
Finished Steel	56.60	56.60	56.60	56.60	56.60	55.60	54.02
Steelworks Scrap..	18.50	18.29	18.17	18.56	17.18	15.30	12.05

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	Aug. 10,	July	May	Aug.	Pig Iron	Aug. 10,	July	May	Aug.
	1940	1940	1940	1939		1940	1940	1940	1939
Steel bars, Pittsburgh.....	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh.....	\$24.34	\$24.34	\$24.34	\$22.34
Steel bars, Chicago.....	2.15	2.15	2.15	2.15	Basic, Valley.....	22.50	22.50	22.50	20.50
Steel bars, Philadelphia.....	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia	24.34	24.34	24.34	22.34
Iron bars, Chicago.....	2.25	2.25	2.25	2.05	No. 2 foundry, Pittsburgh.....	24.21	24.21	24.21	22.21
Shapes, Pittsburgh.....	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago.....	23.00	23.00	23.00	21.00
Shapes, Philadelphia.....	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham.....	19.38	19.38	19.38	17.38
Shapes, Chicago.....	2.10	2.10	2.10	2.10	Southern No. 2, del. Cincinnati..	22.89	22.89	22.89	20.89
Plates, Pittsburgh.....	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ av.)...	25.215	25.215	25.215	23.215
Plates, Philadelphia.....	2.15	2.15	2.15	2.15	Malleable, Valley.....	23.00	23.00	23.00	21.00
Plates, Chicago.....	2.10	2.10	2.10	2.10	Malleable, Chicago.....	23.00	23.00	23.00	21.00
Sheets, hot-rolled, Pittsburgh...	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	28.34
Sheets, cold-rolled, Pittsburgh...	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh.....	23.17	23.17	23.17	21.17
Sheets, No. 24 galv., Pittsburgh...	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	125.33	125.33	105.33	85.33
Sheets, hot-rolled, Gary.....	2.10	2.10	2.10	2.00					
Sheets, cold-rolled, Gary.....	3.05	3.05	3.05	3.05					
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	2.40					

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 3/8-inch, Pitts.	2.00	2.00	2.00	1.92

Scrap

Heavy melt, steel, Pitts.....	\$18.75	\$19.55	\$18.00	\$16.15
Heavy melt, steel No. 2, E. Pa....	18.00	17.50	16.00	14.40
Heavy melting steel, Chicago....	17.50	17.25	16.65	13.75
Rails for rolling, Chicago.....	21.25	21.25	20.45	17.75
Railroad steel specialties, Chicago	20.25	20.25	19.75	15.50

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		Black Plate, No. 29 and Lighter	
Pittsburgh.....	2.10c	Pittsburgh.....	3.05c
Chicago, Gary.....	2.10c	Chicago, Gary.....	3.05c
Cleveland.....	2.10c	Granite City, Ill.....	3.15c
Detroit, del.....	2.20c		
Buffalo.....	2.10c	Long Terns No. 24 Unassorted	
Sparrows Point, Md.....	2.10c	Pittsburgh, Gary.....	3.80c
New York, del.....	2.34c	Pacific Coast.....	4.55c
Philadelphia, del.....	2.27c	Enamelling Sheets	
Granite City, Ill.....	2.20c	No. 10	No. 20
Middletown, O.....	2.10c	Pittsburgh.....	2.75c
Youngstown, O.....	2.10c	Chicago, Gary.....	2.75c
Birmingham.....	2.10c	Granite City, Ill.....	2.85c
Pacific Coast ports.....	2.65c	Youngstown, O.....	2.75c
		Cleveland.....	2.75c
		Middletown, O.....	2.75c
		Pacific Coast.....	3.40c
			4.00c

Cold Rolled

Pittsburgh.....	3.05c
Chicago, Gary.....	3.05c
Buffalo.....	3.05c
Cleveland.....	3.05c
Detroit, delivered.....	3.15c
Philadelphia, del.....	3.37c
New York, del.....	3.39c
Granite City, Ill.....	3.15c
Middletown, O.....	3.05c
Youngstown, O.....	3.05c
Pacific Coast ports.....	3.70c

Galvanized No. 24

Pittsburgh.....	3.50c
Chicago, Gary.....	3.50c
Buffalo.....	3.50c
Sparrows Point, Md.....	3.50c
Philadelphia, del.....	3.67c
New York, delivered.....	3.74c
Birmingham.....	3.50c

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.	No.	No.
Bars.....	410	430	442
	18.50	19.00	22.50
		27.50	

Plates.....	21.50	22.00	25.50	30.50	Gulf ports.....	2.45c
Sheets.....	26.50	29.00	32.50	36.50	Birmingham.....	2.10c
Hot strip.....	17.00	17.50	24.00	35.00	St. Louis, del.....	2.34c
Cold stp.....	22.00	22.50	32.00	52.00	Pacific Coast ports.....	2.75c

Steel Plate

Pittsburgh.....	2.10c
New York, del.....	2.29c
Philadelphia, del.....	2.15c
Boston, delivered.....	2.46c
Buffalo, delivered.....	2.33c
Chicago or Gary.....	2.10c
Cleveland.....	2.10c
Birmingham.....	2.10c
Coatesville, Pa.....	2.10c
Sparrows Point, Md.....	2.10c
Claymont, Del.....	2.10c
Youngstown.....	2.10c
Gulf ports.....	2.45c
Pacific Coast ports.....	2.65c

Steel Floor Plates

Pittsburgh.....	3.35c
Chicago.....	3.35c
Gulf ports.....	3.70c
Pacific Coast ports.....	4.00c

Structural Shapes

Pittsburgh.....	2.10c
Philadelphia, del.....	2.21 1/2 c
New York, del.....	2.27c
Boston, delivered.....	2.41c
Bethlehem.....	2.10c
Chicago.....	2.10c
Cleveland, del.....	2.30c
Buffalo.....	2.10c

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.....	2.38c
Philadelphia, del.....	2.47c
Boston, delivered.....	2.52c
New York, del.....	2.49c
Gulf ports.....	2.50c
Pacific Coast ports.....	2.80c

Rail Steel

(Base, 5 tons or over)	
Pittsburgh.....	2.05c
Chicago or Gary.....	2.05c
Detroit, delivered.....	2.15c
Cleveland.....	2.05c

—The Market Week—

Buffalo	2.05c
Birmingham	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.70c

Iron

Chicago	2.25c
Philadelphia, del.	2.37c
Pittsburgh, refined	3.50-8.00c
Terre Haute, Ind.	2.15c

Reinforcing

New Billet Bars, Base	
Chicago, Gary, Buffalo, Cleve., Birm., Young, Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

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	3.40c
Woven wire fencing (base C. L. column)	
Single loop bale ties, (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
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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, Chl. cago, Massillon, Canton, Bethlehem, Detroit, delivered	2.70c	2.80c	
Alloy			
S.A.E. Diff.	S.A.E.	Diff.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
Stove Bolts			
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	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c
Cooperage hoop, Young, Pitts.; Chicago, Birm.	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	
Chicago	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c
Carbon Cleve., Pitts.	2.80c
0.26-0.50	2.80c
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	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c
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. 1 ½ and larger	64 off
Tire bolts	52.3 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.	Sizes	Gage
½-inch and less.	67	70	1 ½ "O.D.
¾-1-inch	64	65	1 ¾ "O.D.
1 ½-1 ¾-inch	62	62	2" O.D.
1 ¾ and larger	60		2 ¼ "O.D.

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	2.95c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.	
Structural	3.40c

¾-inch and under	65-10 off
Wrought washers, Pitts., Chl., 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 2 ½ and 1 ½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel			
In.	Blk.	Galv.	
½	63 ½	54	
¾	66 ½	58	
1-3	68 ½	60 ½	
Iron			
¾	30	13	
1-1 ¼	34	19	
1 ½	38	21 ½	
2	37 ½	21	
Lap Weld Steel			
2	61	52 ½	
2 ½-3	64	55 ½	
3 ½-6	66	57 ½	
7 and 8	65	55 ½	
9 and 10	64 ½	55	
11 and 12	63 ½	54	
Iron			
2	30 ½	15	
2 ½-3 ½	31 ½	17 ½	
4	33 ½	21	
4 ½-8	32 ½	20	
9-12	28 ½	15	

Line Pipe Steel			
1 to 3, butt weld	67 ½		
2, lap weld	60		
2 ½ to 3, lap weld	63		
3 ½ to 6, lap weld	65		
7 and 8, lap weld	64		
10-inch lap weld	63 ½		
12-inch, lap weld	62 ½		
Iron			
¾ butt weld	25	7	
1 and 1 ½ butt weld	29	13	
1 ½ butt weld	33	15 ½	
2 butt weld	32 ½	15	
1 ½ lap weld	23 ½	7	
2 lap weld	25 ½	9	
2 ½ to 3 ½ lap weld	26 ½	11 ½	
4 lap weld	28 ½	15	
4 ½ to 8 lap weld	27 ½	14	
9 to 12 lap weld	23 ½	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			
	Charcoal	Iron	
Sizes	Gage	Steel	
1 ½ "O.D.	13	\$ 9.72	\$23.71
1 ¾ "O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2 ¼ "O.D.	13	13.79	21.68
2 ½ "O.D.	12	15.16	
2 ¾ "O.D.	12	16.58	26.57
3" O.D.	12	17.54	29.00
3 ½ "O.D.	12	18.35	31.36
4" O.D.	11	23.15	39.81
4 ½ "O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
5 ¾ "O.D.	7	68.14	

Seamless			
	Hot	Cold	
Sizes	Gage	Rolled	Drawn
1" O.D.	13	\$ 7.82	\$ 9.01
1 ¼ "O.D.	13	9.26	10.67
1 ½ "O.D.	13	10.23	11.79
1 ¾ "O.D.	13	11.64	13.42

2" O.D.	13	13.04	15.03
2 ¼ "O.D.	13	14.54	16.76
2 ½ "O.D.	12	16.01	18.45
2 ¾ "O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 ¼ "O.D.	12	19.50	22.48
3 ½ "O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 ½ "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—Pet 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	
Std. flgs., Birm., base	\$100.00.

Semifinished Steel

Rerolling Billets, Slabs (Gross Tons)	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs, Birm., Sparrows Point	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets	
Pitts., Chl., 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 ¾-inch incl. (per 100 lbs.)	\$2.00
Do., over ¾ to 1 ¼-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.50.	

Skelp	
Pitts., Chl., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton Beehive Ovens	
Connellsville, fur.	\$4.35- 4.60
Connellsville, fdry.	5.25- 5.50
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	15.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylo	26.00c
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	7.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	\$28.00

—The Market Week—

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.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	\$24.00	\$24.50	\$23.50	\$25.00
Birmingham, Ala.	19.38		18.38	24.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
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	22.00			
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
St. Louis, northern	23.50	23.50	23.00	

	No. 2 Fdry.	Malle-able	Basic	Besse-mer
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

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	Ladle Brick (Pa., O., W. Va., Mo.)
Fire Clay Brick	Dry press..... \$28.00
Super Quality	Wire cut..... 26.00
Pa., Mo., Ky..... \$60.80	Magnesite
First Quality	Domestic dead-burned
Pa., Ill., Md., Mo., Ky... 47.50	grain, net ton f.o.b.
Alabama, Georgia..... 47.50	Chewelah, Wash., net
New Jersey..... 52.50	ton, bulk..... 22.00
Second Quality	net ton, bags..... 26.00
Pa., Ill., Ky., Md., Mo... 42.75	Basic Brick
Georgia, Alabama..... 34.20	Net ton, f.o.b. Baltimore, Ply-
New Jersey..... 49.00	mouth Meeting, Chester, Pa.
Ohio	Chrome brick..... \$50.00
First quality..... 39.90	Chem. bonded chrome... 50.00
Intermediate..... 36.10	Magnesite brick..... 72.00
Second quality..... 31.35	Chem. bonded magnesite 61.00
Malleable Bung Brick	Fluorspar
All bases..... \$56.05	Washed gravel, duty
Silica Brick	pd., tide, net ton. \$25.00-\$26.00
Pennsylvania..... \$47.50	Washed gravel, f.o.b.
Joliet, E. Chicago..... 55.10	Ill., Ky., net ton,
Birmingham, Ala..... 47.50	carloads, all rail..... 21.00
	Do. barge..... 50.00
	No. 2 lump..... 22.00

Ferroalloy Prices

Ferromanganese, 78-82%	Do., ton lots..... 11.75c	Do., spot..... 145.00	Silicon Metal, 1% iron,
carlots, duty pd..... \$120.00	Do., less-ton lots..... 12.00c	Do., contract, ton lots 145.00	contract, carlots, 2 x
Ton lots..... 130.00	67-72% low carbon:	Do., spot, ton lots..... 150.00	¼-in., lb..... 14.00c
Less ton lots..... 133.50	Car- Ton Less	15-18% tl, 3-5% carbon,	Do., 2%..... 12.50c
Less 200 lb. lots..... 138.00	loads tons ton	carlots, contr, net ton 157.50	Spot ¼c higher
Do., carlots del. Pitts. 125.33	2% carb... 17.50c 18.25c 18.75c	Do., spot..... 160.00	Silicon Briquets, contract
Spiegel Eisen, 19-21% dom.	1% carb... 18.50c 19.25c 19.75c	Do., contract, ton lots. 160.00	carloads, bulk, freight
Palmerton, Pa., spot... 36.00	0.10% carb. 20.50c 21.25c 21.75c	Do., spot, ton lots..... 165.00	allowed, ton..... \$69.50
Do., 26-28%..... 49.50	0.20% carb. 19.50c 20.25c 20.75c	Alsilfer, contract carlots,	Ton lots..... 79.50
Ferrosilicon, 50% freight	Spot ¼c higher	f.o.b. Niagara Falls, lb. 7.50c	Less-ton lots, lb..... 3.75c
allowed, c.l..... 74.50	Ferromolybdenum, 55-	Do., ton lots..... 8.00c	Less 200 lb. lots, lb. 4.00c
Do., ton lot..... 87.00	65% molyb. cont., f.o.b.	Do., less-ton lots..... 8.50c	Spot ¼-cent higher.
Do., 75 per cent..... 135.00	mill, lb..... 0.95	Chromium Briquets, con-	Manganese Briquets,
Do., ton lots..... 151.00	Calcium molybdate, lb.	tract, freight allowed,	contract carloads,
Spot, \$5 a ton higher.	molyb. cont., f.o.b. mill 0.80	lb. spot carlots, bulk	bulk freight allowed,
Silicomanganese, c.l., 2%	Ferrotitanium, 40-45%	Do., ton lots..... 7.00c	lb..... 5.00c
per cent carbon..... 118.00	lb., con. tl., f.o.b. Niag-	Do., less-ton lots..... 7.50c	Ton lots..... 5.50c
2% carbon, 108.00; 1%, 133.00	ara Falls, ton lots... \$1.23	Do., less 200 lbs..... 8.00c	Less-ton lots..... 5.76c
Contract ton price	Do., less-ton lots..... 1.25	Spot, ¼c higher.	Spot ¼c higher
\$12.50 higher; spot \$5	20-25% carbon, 0.10	Tungsten Metal Powder,	Zirconium Alloy, 12-15%
over contract.	max., ton lots, lb..... 1.35	according to grade,	contract, carloads,
Ferrotungsten, stand., lb.	Do., less-ton lots..... 1.40	spot shipment, 200-lb.	bulk, gross ton..... 102.50
con. del. cars..... 1.90-2.00	Spot 5c higher	drum lots, lb..... \$2.50	Do., spot..... 107.50
Ferrovanadium, 35 to	Ferrocolumbium, 50-60%	Do., smaller lots..... 2.60	34-40%, contract, car-
40%, lb., cont... 2.70-2.80-2.90	contract, lb. con. col.	Vanadium Pentoxide,	loads, lb., alloy..... 14.90c
Ferrophosphorus, gr. ton,	f.o.b. Niagara Falls... \$2.25	contract, lb. contained	Do., ton lots..... 15.00c
c.l., 17-18% Rockdale,	Do., less-ton lots..... 2.30	Do., spot..... 1.15	Do., less-ton lots..... 16.00c
Tenn., basis, 18%, \$3	Spot is 10c higher	Chromium Metal, 98%	Spot ¼c higher
unitage, 58.50; electric	Technical molybdenum	cr., 0.50 carbon max.,	Molybdenum Powder,
furn., per ton, c. l., 23-	trioxide, 53 to 60% mo-	contract, lb. con.	99%, f.o.b. York, Pa.
26% f.o.b. Mt. Pleasant,	lybdenum, lb. molyb.	chrome	200-lb. kegs, lb..... \$2.60
Tenn., 24% \$3 unitage	cont., f.o.b. mill..... 0.80	Do., spot..... 89.00c	Do., 100-200 lb. lots... 2.75
75.00	Ferro-carbon-titanium, 15-	88% chrome, contract... 83.00c	Do., under 100-lb. lots 3.00
Ferrochrome, 66-70 chro-	18% carbon, 6-8% carb,	Do., spot..... 88.00c	Molybdenum Oxide
mium, 4-6 carbon, cts.	carlots, contr., net ton. \$142.50		Briquets, 48-52% mo-
lb., contained cr., del.			lybdenum, per pound
carlots..... 11.00c			contained, f.o.b. pro-
			ducers' plant..... 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates 1/4-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
							Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.05	3.31	4.09	8.59	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.00	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.00	3.22	3.75	8.15	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.45	....	3.65	8.15	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.42	3.20	3.75	8.15	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.25	4.30	4.64	3.20	3.80	8.45	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	....	5.00	....	4.42	....	....
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.50	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.15	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	....	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	4.06	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.60	4.45	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

	S.A.E. 1035-1050		Hot-rolled Bars (Unannealed)		
	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	4.45	....	....	....	....
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; 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, 1500-3499 pounds, New York; 150-1499 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, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia.

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 Official Rates of Exchange

Export Prices f.o.b. Port of Dispatch—

Domestic Prices at Works or Furnace—

By Cable or Radio

Last Reported

	Continental Channel of North Sea ports, gross tons:		Quoted in gold pounds sterling	£ s d	Fry. pig iron, St. 2.5	£24.24 6 0 0 (a)	£17.18	French		Belgian		Rhein			
	British gross tons U. K. ports	Quoted in dollars at current value						£ s d		::Francs		::Francs		::Mar	
								£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
Foundry, 2.50-3.00 St.	....	....	338 23	3 18 0	....	....	....	788	331 44	950	\$25 33	63	63		
Basic bessemer	....	....	....	....	....	....	....	....	29 79	900	27 94	(b) 69 50	19		
Hematite, Phos. .03-.05	....	....	....	....	....	....	....	....	10 92	320	7 64	19	19		
Billets	....	....	331 95	3 15 0	....	....	....	26 62	1 221	42 20	1 275	38 79	96		
Wire rods, No. 5 gage	....	....	60 71	7 2 6	....	....	....	1 69c	1 692	2 06c	1 375	2 38c	132		
Standard rails	....	....	548 99	5 15 0	....	....	....	1 63c	1 530	2 06c	1 375	1 98c	110		
Merchant bars	2 66c	14 15 0	2 77c	7 6 0	....	....	....	1 49c	1 487	2 06c	1 375	1 93c	107		
Structural shapes	2 48c	13 15 0	2 83c	7 9 0	....	....	....	2 55c	14 3 0††	1 95c	1 951	2 42c	1 610	2 29c	127
Plates, 1 1/4 in. or 5 mm.	2 68c	14 17 6	3 53c	9 6 0	....	....	....	2 30c	2 295†	2 85c	1 900†	2 59c	1 44†	144†	144†
Plates, 1 1/2 in. or 5 mm.	3 40c	18 17 6	2 98c	7 17 0*	....	....	....	4 07c	22 12 6	3 59c	3 589	4 80c	3 200	6 66c	370
Sheets, gal., 24 ga., corr.	3 98c	22 2 6	3 94c	10 7 6	....	....	....	3 83c	21 5 0	2 34c	2 340	3 00c	2 000	3 11c	173
Bands and strips	2 76c	7 5 0	2 76c	7 5 0	....	....	....	2 91c	16 3 6††	1 71c	1 713	2 48c	1 650	2 29c	127
Plain wire, base	3 15c	8 6 3	3 15c	8 6 3	....	....	....	†British ship-plates. Continental, bridge plates, 24 ga. \$1 to 3 mm. basic price.	....	....	....	....	....	....	....
Galvanized wire, base	3 75c	9 17 6	3 75c	9 17 6	....	....	....	British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel.	....	....	....	....	....	....	....
Wire nails, base	3 56c	9 7 6	3 56c	9 7 6	....	....	....	(a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. *Close annealed.	....	....	....	....	....	....	....
Tim plate, box 108 lbs.	\$ 5 61	1 7 9	....	....	....	....	....	††Rebate of 15s on certain conditions.	....	....	....	....	....	....	....

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

**Gold pound sterling not quoted. ::No 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		Buffalo	12.00-12.50	Buffalo	21.00-21.50	Eastern Pa.	25.00-25.50
Birmingham, No. 1.	15.00	Chicago	12.00-12.50	Chicago	17.50-18.00	St. Louis, 1 1/4-3 3/4"	18.00-18.50
Bos. dock No. 1 exp.	16.00-16.25	Cincinnati, dealers.	7.00- 7.50	Cleveland	23.00-23.50		
New Eng. del. No. 1	15.50-16.00	Cleveland, no alloy.	11.50-12.00	Pittsburgh	20.50-21.00		
Buffalo, No. 1.	18.00-18.50	Detroit	†9.50-10.00	St. Louis	17.00-17.50		
Buffalo, No. 2.	16.00-16.50	Eastern Pa.	13.00-13.50	Seattle	18.00-18.50		
Chicago, No. 1.	17.50-17.75	Los Angeles	4.00- 5.00				
Chicago, auto, no alloy	16.50-16.75	New York	†8.50				
Cincinnati, dealers.	14.50-15.00	Pittsburgh	13.50-14.00	PIPE AND FLUES			
Cleveland, No. 1.	17.50-18.00	St. Louis	8.50- 9.00	Chicago, net.	12.50-13.00		
Cleveland, No. 2.	16.50-17.00	San Francisco	5.00	Cincinnati, dealers.	11.00-11.50		
Detroit, No. 1	†15.00-15.50	Toronto, dealers.	7.00- 7.25				
Detroit, No. 2	†14.00-14.50	Valleys	11.50-12.00	RAILROAD GRATE BARS			
Eastern Pa., No. 1.	19.50			Buffalo	13.00-13.50		
Eastern Pa., No. 2.	18.00	SHOVELING TURNINGS		Chicago, net	13.50-14.00		
Federal, Ill., No. 2.	14.25-14.75	Buffalo	13.00-13.50	Cincinnati, dealers.	10.00-10.50		
Granite City, R. R. No. 1	14.75-15.25	Chicago	12.00-12.50	Eastern Pa.	15.50-16.00		
Granite City, No. 2.	13.75-14.25	Chicago, spl. anal.	14.50-15.00	New York	†11.50-12.00		
Los Ang., No. 1, net	13.00-13.50	Detroit	†11.00-11.50	St. Louis	12.00-12.50		
Los Ang., No. 2, net	12.00-12.50	Pitts., alloy-free.	15.50-16.00				
N.Y. dock No. 1 exp.	15.00-15.50			RAILROAD WROUGHT			
Pitts., No. 1 (R.R.)	19.50-20.00	BORINGS AND TURNINGS		Birmingham	14.00		
Pittsburgh, No. 1.	18.50-19.00	<i>For Blast Furnace Use</i>		Boston district	†9.50-10.00		
Pittsburgh, No. 2.	17.50-18.00	Boston district.	†6.00- 6.25	Eastern Pa., No. 1.	19.50-20.00		
St. Louis, No. 1.	14.75-15.25	Buffalo	11.50-12.00	St. Louis, No. 1.	12.00-12.50		
St. Louis, No. 2.	13.75-14.25	Cincinnati, dealers.	5.50- 6.00	St. Louis, No. 2.	13.50-14.00		
San Fran., No. 1, net	13.00-13.50	Cleveland	12.00-12.50				
San Fran., No. 2, net	12.00-12.50	Eastern Pa.	11.00-11.50	FORGE FLASHINGS			
Seattle, No. 1.	15.00	Detroit	†11.00-11.50	Boston district.	†11.00-11.50		
Toronto, dtrs., No. 1	11.00	New York	†8.00	Buffalo	16.00-16.50		
Valleys, No. 1.	18.00-18.50	Pittsburgh	12.50-13.00	Cleveland	16.50-17.00		
		Toronto, dealers.	6.75	Detroit	†14.75-15.25		
				Pittsburgh	16.50-17.00		
		AXLE TURNINGS					
		Buffalo	16.00-16.50	FORGE SCRAP			
		Boston district.	†9.50-10.00	Boston district	†7.00		
		Chicago, elec. fur.	17.50-18.00	Chicago, heavy.	21.50-22.00		
		East. Pa. elec. fur.	17.50-18.00				
		St. Louis.	11.25-11.75	LOW PHOSPHORUS			
		Toronto	6.00- 6.50	Cleveland, crops.	23.00-23.50		
				Eastern Pa., crops.	25.00-25.50		
		CAST IRON BORINGS		Pitts., billet, bloom, slab crops	25.00-25.50		
		Birmingham	8.00				
		Boston dist. chem.	†8.50- 8.75	LOW PHOS. PUNCHINGS			
		Buffalo	11.50-12.00	Buffalo	21.00-21.50		
		Chicago	11.25-11.50	Chicago	21.00-21.50		
		Cincinnati, dealers.	5.50- 6.00	Cleveland	20.00-20.50		
		Cleveland	12.00-12.50	Eastern Pa.	23.00-23.50		
		Detroit	†11.25-11.75	Pittsburgh	24.00-24.50		
		E. Pa., chemical	14.50-15.00	Seattle	15.00		
		New York	†8.00- 8.50	Detroit	†17.50-18.00		
		St. Louis.	8.00- 8.50				
		Toronto, dealers.	6.75	RAILS FOR ROLLING			
				<i>5 feet and over</i>			
		RAILROAD SPECIALTIES		Birmingham	16.50		
		Chicago	20.00-20.50	Boston	†15.75-16.00		
		ANGLE BARS—STEEL		Chicago	21.00-21.50		
		Chicago	20.00-20.50	New York	†17.50-18.00		
		St. Louis.	17.25-17.75	Eastern Pa.	23.00-23.50		
		SPRINGS		St. Louis.	19.00-19.50		
		Buffalo	22.00-22.50	STEEL CAR AXLES			
		Chicago, coll.	22.00-22.50	Birmingham	18.00		
		Chicago, leaf.	20.50-21.00	Boston district	†18.00-18.50		
		Eastern Pa.	24.50-25.00	Chicago, net	21.50-22.00		
		Pittsburgh	24.50-25.00	Eastern Pa.	24.50		
		St. Louis	17.25-17.75	St. Louis	21.00-21.50		
		STEEL RAILS, SHORT		LOCOMOTIVE TIRES			
		Birmingham	17.00	Chicago (cut)	21.50-22.00		
		Buffalo	22.50-23.00	St. Louis, No. 1	17.50-18.00		
		Chicago (3 ft.)	20.50-21.00	SHAFTING			
		Chicago (2 ft.)	21.00-21.50	Boston district	†18.50-18.75		
		Cincinnati, dealers.	21.50-22.00	New York	†19.00-19.50		
		Detroit	†21.50-22.00				
		Pitts., 3 ft. and less	24.00-24.50				
		St. L. 2 ft. & less.	20.50-21.00				
		STEEL RAILS, SCRAP					
		Birmingham	15.00				
		Boston district.	†14.50-15.00				

Ores	Eastern Local Ore	Spanish, No. African basic, 50 to 60%	Manganese Ore
Lake Superior Iron Ore	<i>Cents, unit, del. E. Pa.</i>	nom.	<i>Including war risk but not duty, cents per unit cargo, lots</i>
<i>Gross ton, 51 1/4 %</i>	Foundry and basic 56-63%, contract.	Chinese wolframite, net ton, duty pd.	Caucasian, 50-52% 60.00
<i>Lower Lake Ports</i>	10.00	Brazil iron ore, 68-69%, ord.	So. African, 50-52% 58.00-59.00
Old range bessemer	Foreign Ore	Low phos. (.02 max.)	Indian, 49-50% 56.00
Mesabi nonbessemer	<i>Cents per unit, c.i.f. Atlantic ports</i>	F.O.B. Rio Janeiro.	Brazilian, 46% 50.00-53.00
High phosphorus	Manganiferous ore, 43-55% Fe., 6-10%	Scheelite, imp.	Cuban, 50-51%, duty free 71.00-73.00
Mesabi bessemer	Mang.	Chrome ore, Indian, 48% gross ton, c.i.f.	Molybdenum
Old range nonbessemer	N. African low phos	\$28.00-30.00	Sulphide conc., lb., Mo cont., mines \$0.75

Sheets, Strip

Sheet & Strip Prices, Pages 96, 97

Pittsburgh—Sheet orders have begun to filter in from automobile makers, although releases are light and it is not expected much sheet tonnage will actually move during the next 30 days. Miscellaneous sheet buying has been fairly good. Production is estimated at 75 to 80 per cent of capacity; galvanizing operations 73 per cent.

Cleveland — Specifications continue active. While buying is retarded seasonally as well as by previous heavy shipments, mills have shown little if any improvement in deliveries recently. Holdups on shipments are infrequent, since even in cases where material is not required immediately, buyers are interested in avoiding future delays by adding to stocks. Relatively little tonnage currently is moving to automotive interests.

Boston—Sheet buying is light, consumers and distributors having heavy stocks. Several mills, insisting on specifications on remaining low-priced tonnage, took cancellations on the remainder. Some new business has been booked at the full list price but buying is only in small, scattered lots for specialties. Cold-rolled strip buying is heavy, fully supporting near-capacity operations. Orders for shipment beyond this quarter at open prices and some covering on this basis is being done.

New York—Sheet buying is perhaps at the lowest level this summer, both in orders and specifications. Practically all shipments against low-priced contracts on galvanized sheets were cleaned up Aug. 1, which leaves a gap in that product. Some consumers are still building up stocks of commercial products in anticipation of government work in expectation of a delivery delay this fall, especially after the automobile industry covers on 1941 models.

Philadelphia — Sheet buying is comparatively slow, due to recent heavy coverage but consumption is well maintained and more active buying next month is indicated.

Buffalo—Although some seasonal recession was noted in buying of sheets and strip, rolling schedules of mills have not been affected. Indications of a possible slackening in operations developing in the near future are more than offset by the first of what is expected to be large tonnage for the new 1941 automobiles. Mills also report big backlogs as a sustaining factor.

Cincinnati—Although comparatively light so far, the trend in demand for automotive sheets is up,

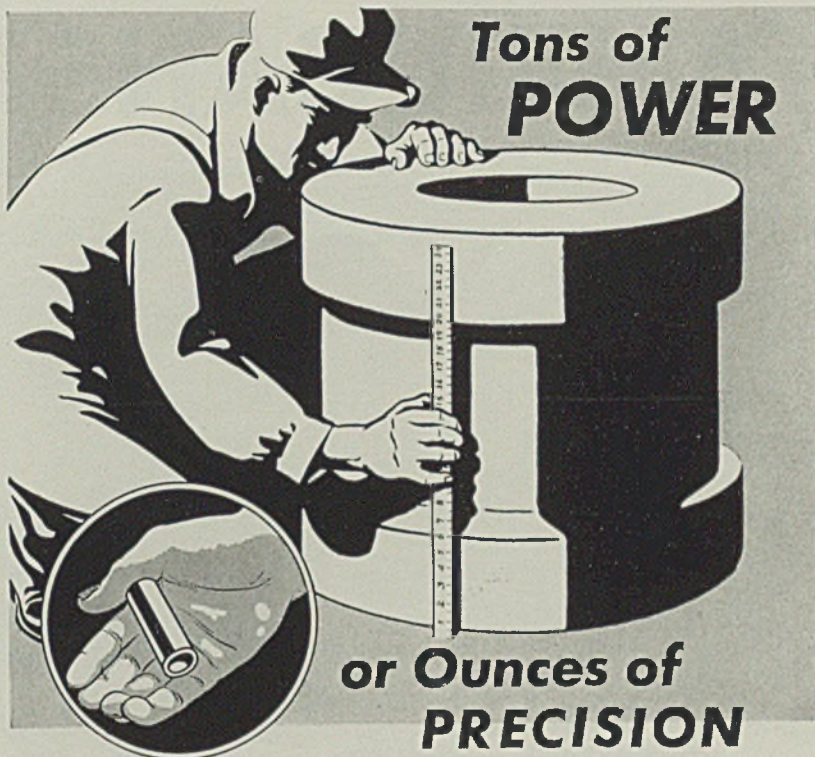
holding rolling schedules at 75 per cent. Little present tonnage is for British account, or for direct national defense needs. Buying by miscellaneous consumers shows a slackening, needs for this quarter having been previously covered adequately. Electrical sheets are active. Releases from household appliance makers are sustained.

St. Louis—Aside from cold strip, purchasing of which is reported as showing some improvement, sheet and strip business is noticeably reacting to seasonal influences. Production is being maintained, but at

the cost of backlogs. Galvanized sheets, particularly heavier gages, continue relatively slow.

Birmingham, Ala.—Sheet production remains close to capacity or better than 85 per cent. Demand is fairly evenly divided between manufacturers' and roofing sheets. A moderate quantity of cotton tie strip is being produced.

Toronto, Ont.—Orders for sheets and strip are in good volume as a result of continued placing of large war contracts. The automotive industry has issued specifications for 1941 car models and heavy buying



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The screw-down nut in a blooming mill weighs about 3500 lbs. It stands the continuous, smashing impact of reducing massive steel ingots in modern high-speed rolling mills. The small bushing, used in a precision lathe, must maintain accuracy within .0005 of an inch, through years of service. These extremes suggest the wide application of AMPCO METAL in industry.

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on this account is expected soon, but in the meantime substantial tonnages are being taken for motorized vehicles for the army. Some mills report booking into November, while practically all production has been covered to the end of September.

Plates

Plate Prices, Page 96

Pittsburgh — Plate bookings the past week have been slightly less

than shipments, but backlogs remain high. Operations are at capacity. Demand is good from both industrial construction and maritime operations.

Cleveland — Orders have been boosted materially by shipbuilding and railroad needs. American Shipbuilding Co. has placed about 4500 tons, mostly plates, for 12 submarine-net tenders, and several thousand tons of plates have been booked for freight car repairs. Miscellaneous demand continues fairly active. Plate shipments still are extended,

averaging about four to six weeks. On thick sections eight weeks may be required.

Chicago—Steel plates continue among the most active products, both at mills and warehouses. Government needs, direct and indirect, play a large part in the current market. Mill deliveries, especially on heavier and wider gages, continue to be quite extended. Railroad freight car and diesel locomotive requirements are increasing. Plate prices, once traditionally weak, are firm.

Boston — Plate demand is steady, with most inquiry for less-than-carloads for prompt delivery. Delivery of wider plates is more extended. Shipyard specifications are steady with one eastern Pennsylvania mill supplying most tonnage for private builders. Floor plate and navy yard requirements are more widely distributed.

New York—Following a brief lull plate demand has improved and miscellaneous buying is fairly active. While some Pittsburgh and mid-western mills offer delivery in four to five weeks, most eastern producers can do better, about three weeks on most wider and heavier gages and a week to ten days on lighter.

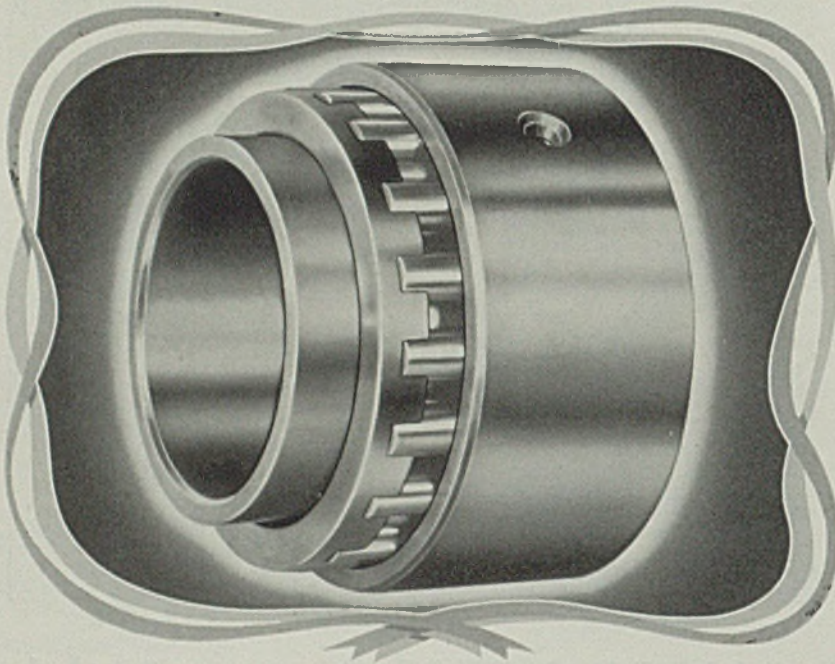
Philadelphia — Ingalls Shipbuilding Corp., Birmingham, Ala., is low on one to six C-3 cargo boats, requiring 18,350 tons of plates and 6550 tons of shapes. Sun Shipbuilding Co. has released a further large tonnage of plates and it is understood some specifications now entered by shipbuilders run into 1943. Railroad business continues active, new business including 3500 tons of plates placed by the Reading Co. with several mills for hopper car repairs. Miscellaneous business is improving slowly. Deliveries on light plates now average two to three weeks and on heavy plates three to four weeks.

Birmingham, Ala.—Plate production is steady and mills are heavily booked, due to persistent demand from manufacturers of tanks, shipbuilders and the car plant at Bessemer.

Seattle—Local shops are having a normal run of seasonal jobs in lots of less than 100 tons each. Prospects are improved with additional ship construction expected to be placed with western yards. Puget Sound Sheet Metal Works, Seattle, has a contract to furnish tanks and vessels for the Consolidated Mining Co.'s plant at Trail, B. C., requiring more than 100 tons of stainless steel plates.

Toronto, Ont.—Plate demand has come into more prominence as a result of large orders for tanks of the Mark III type for the British

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and Canadian governments. However, it is stated that most of Canada's plate demand will be filled by United States producers, as Canadian producers are booked to the end of the year.

Plate Contracts Placed

100 tons or more, stainless steel, tanks and vessels for smelter, Trall, B. C., to Puget Sound Sheet Metal Works, Seattle.

Plate Contracts Pending

205 tons, 500,000-gallon elevated steel tank for constructing quartermaster, MacDill field, Tampa, Fla., Chicago Bridge & Iron Co., Chicago, low.

205 tons, 500,000-gallon elevated steel tank, Westover air field, Chicopee, Mass., Pittsburgh-Des Moines Steel Steel Co., Pittsburgh, low.

Unstated, 2915 feet 4 to 36-inch welded steel pipe for Winthrop, Wash., fish hatchery; bids to reclamation bureau, Coulee City, Wash., Aug. 23.

Bars

Bar Prices, Page 96

Pittsburgh — Automotive orders are beginning to reach mill books. Inquiries arising from the national defense program also are being received. Merchant bar backlogs are fair and deliveries are being made on schedule. Cold-finished divisions report slight increase in business, particularly from automotive parts-makers, and inquiries indicate substantial increases this fall from agricultural implement manufacturers.

Cleveland — Bar deliveries are lengthening despite absence of active automotive buying. Shipments are most extended on larger sizes, rollings of which are infrequent. Deliveries on smaller sections vary somewhat with different mills but generally are not less than four weeks. Producers are being pressed for shipment not only to accommodate current needs but also because some buyers wish to avoid a more stringent supply situation in coming months.

Chicago — Steel bar orders, which were somewhat quiet in the past two weeks, are beginning to pick up. Carbon bar orders in many quarters show an upward tendency, but more notable betterment has been attained in alloy steel bars.

Boston — Hot-rolled carbon and alloy bar demand is brisk and consumption heavier. Textile equipment builders are releasing carbon bars more liberally and machine shop consumption is steady. Shops producing alloy forgings are releasing substantial tonnages and a

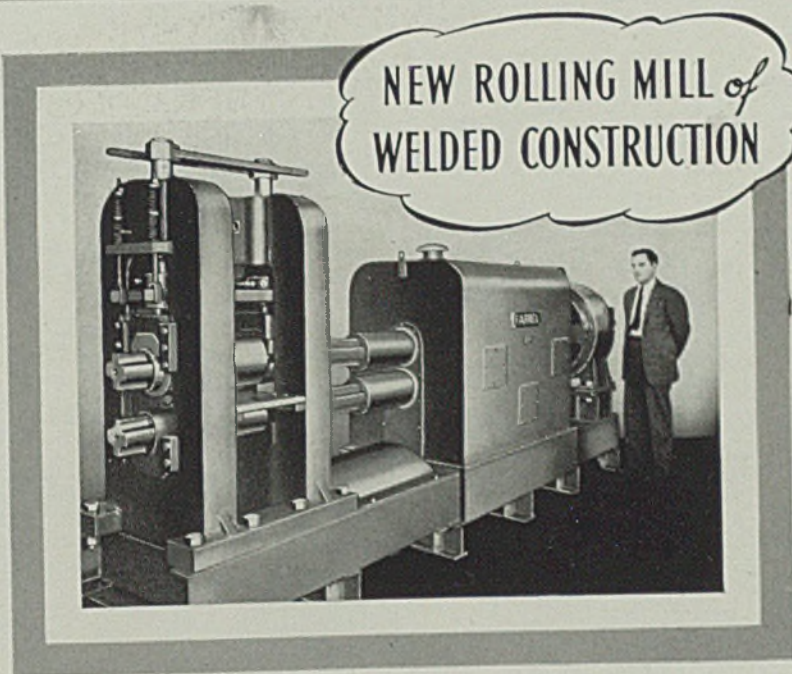
Worcester forger with aircraft orders is farming out tonnage. Government buying is gaining. Watertown arsenal having awarded 1600 tons for induction furnace melting, with deliveries spread to April. Shipyard specifications are heavy. Deliveries on heat-treated alloy stock range to ten weeks or more.

New York — Commercial bar demand lags, although a good volume of tonnage is still moving and heavy additional requirements are in prospect. The lag is noted particularly in plain carbon bars, with railroads and bolt and nut manu-

facturers specifying less actively. The principal movement has been in bars for machine tool and aviation equipment manufacturers and government arsenals.

Birmingham, Ala. — Bar output is well sustained, considerable tonnage being for concrete reinforcing while merchant bar demand has held up consistently.

Toronto, Ont. — Booking of merchant bars has been more active recently and mills now report most of their output contracted to the end of September. However, on some lines delivery can be obtained with-



Built by FARREL for Purdue University

This rolling mill recently built for experimental work at Purdue University embodies some interesting features. It is of welded construction and is designed to perform either hot or cold rolling of metals.

It is an 8" x 12" two-high mill with the mill, reduction drive, pinion stand and motor mounted on a common bedplate to form an integral unit. The mill housings, drive case and bedplate are all fabricated from rolled steel plate and welded. Two pairs of interchangeable forged steel rolls are furnished, one pair of suitable composition and hardness for cold rolling and the other pair for hot rolling. The housings are of the arch-top type, welded together into a single structure.

On each housing, mounted between the top roll rider and adjusting screw, is a hydraulic cylinder or pressure block with a ram. The total separ-

ating force on each screw is recorded in pounds on a chart, and adding the separate readings gives the total separating force on the mill.

The mill is driven by a direct current, variable speed motor through an enclosed double reduction drive with integral pinion stand. The drive is the vertical type with all gear centers in the same plane. Gears and mill pinions are accurately generated Sykes continuous tooth herringbone and are mounted in anti-friction roller bearings. An oil pump with filter provides force-feed lubrication to all gears and bearings.

When you have a problem involving the rolling of metals take advantage of the experienced counsel and expert assistance Farrel engineers can give you. We are prepared to build mills of any size for rolling all kinds of non-ferrous metals and cold rolled strip steel.



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Pipe

Pipe Prices, Page 97

in two or three weeks. Especially heavy purchases are reported from toolmakers and mining companies.

Buffalo—Following slightly less demand around the end of July sellers report releases against heavy third quarter bookings for steel bars are again in volume equal to the best movement this year.

Philadelphia—Bar backlogs continue to grow, with most interests unable to promise delivery on carbon grades much before September and alloy grades before November.

The situation may be relieved somewhat when larger production facilities are completed. Ingalls Shipbuilding Corp., Birmingham, Ala., is low on one to six C-3 cargo boats requiring 1300 tons of bars, 600 tons of rivets and bolts. Frankford arsenal took bids Aug. 5 on 250 tons of tungsten bullet core steel and Remington Arms Co. is in the market for 400 tons of the same material. Standard Pressed Steel Co., Jenkintown, Pa., is booked well into 1941 on bullet core machining contracts for Frankford arsenal.

Pittsburgh—Little change has been indicated, with standard pipe active, oil country steady, mechanical goods unchanged and miscellaneous buying fair. Backlogs in tubular specialties have not receded, although bookings have been somewhat lighter over the last two weeks. Line pipe orders are heavier.

Boston—Resale prices for merchant steel pipe are irregular and generally weak at most distributing points in New England. Cast pipe buying is slow and competition with asbestos-cement pipe is keener. Providence, R. I., has placed 400 tons with the Everett, Mass., foundry.

New York—Utility companies continue substantial buyers of merchant pipe, apparently as protection against a possible shortage of steel this fall. Jobbers also are laying in stocks in expectation of possible extension in mill deliveries. Demand from the building trades for heating and plumbing pipe is expanding somewhat, with the outlook promising for well into the fall.

Birmingham, Ala.—Pacific coast points are taking much cast iron pipe tonnage, mostly in smaller sizes, and government projects, notably naval bases, require considerable pipe.

Seattle—Inquiry has increased and agencies expect improved volume within 30 days. Quartermaster, Fort Lewis, Wash., received bids Aug. 7 for 9920 feet of 4 to 10-inch cast iron pipe, 22 hydrants, 6580 feet galvanized and 11,900 feet of black welded steel pipe and accessories. Specifications for Winthrop, Wash., fish hatchery, bids to reclamation bureau Aug. 23, include 1115 feet 4 to 6-inch galvanized steel pipe.

San Francisco—Little improvement in demand for cast iron pipe is noted. Only one award of size was reported. Awards totaled 637 tons and brought the year's aggregate to 31,060 tons, compared with 21,576 tons for the same period a year ago.

St. Louis—American Rolling Mill Co., Middletown, O., has been awarded 120,000 feet of electric welded steel pipe for a power plant at Venice, Ill., through Western Foundation Co., Chicago.

Washington—Reserve Gas Pipe Line Co., a Texas corporation, has filed application with federal power commission for a pipe line to carry natural gas from the Gulf coastal region to New York and adjacent industrial areas. The line will be 2500 miles long, of 24-inch

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This Erie Steam Drop Hammer is one of a battery for small forgings.

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pipe to withstand 1000 pounds per square inch pressure and will cost about \$80,000,000.

Steel Pipe Placed

26,000 tons, 20-inch line for Natural Gas Pipe Line Co. of America from Geneseo, Ill., to Milwaukee, to A. O. Smith Corp., Milwaukee.
 13,500 tons, 8-inch, gasoline line for Socony-Vacuum Oil Co. from Buffalo to Syracuse, N. Y., to Jones & Laughlin Steel Corp. and National Tube Co., Pittsburgh.

Cast Pipe Placed

637 tons, 24-inch, San Diego, Calif., to United States Pipe & Foundry Co., Burlington, N. J.
 400 tons, 12-inch and under, Providence, R. I., to Warren Pipe Co., Everett, Mass.

Cast Pipe Pending

255 tons, 4 to 8-inch, Sacramento, Calif.; bids opened.
 125 tons, McChord Field and Fort Lewis, Wash.; bids opened.

Rails, Cars

Track Material Prices, Page 97

Award of 2350 freight cars to several builders by the Southern Pacific and 18 diesel electric locomotives to Electro-Motive Corp., La Grange, Ill., by Atlantic Coast Line were the high lights of last week in the railroad market.

Chicago & North Western, in conjunction with Southern Pacific and Union Pacific, placed two streamlined trains and Atlantic Coast Line two stainless steel streamlined trains. The North Western also awarded 60 covered hoppers.

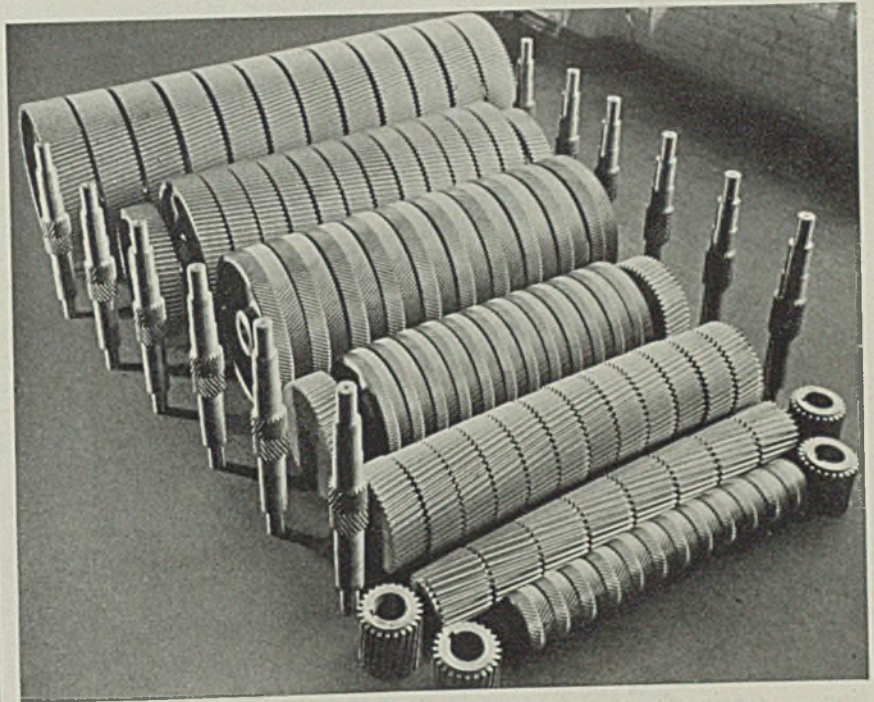
War department is reported considering purchase of 2000 railroad cars especially designed for troop transportation, estimated to cost \$15,000,000 to \$20,000,000. Details as to when bids will be asked are not announced.

Domestic freight car awards in July involved 5864 units, according to final returns. This brings the total for seven months to 22,037, against 9642 in the corresponding period last year, 8021 in the first seven months of 1939 and 47,015 in the same period in 1937. Further comparisons follow:

	1940	1939	1938	1937
Jan.	360	3	25	17,806
Feb.	1,147	2,259	109	4,972
March	3,104	800	680	8,155
April	2,077	3,095	15	9,772
May	2,010	2,051	6,014	4,732
June	7,475	1,324	1,178	548
July	5,864	110	0	1,030
7 mos.	22,037	9,642	8,021	47,015
Aug.		2,814	182	1,475
Sept.		23,000	1,750	1,216
Oct.		19,634	2,537	1,355
Nov.		2,650	1,232	275
Dec.		35	2,581	275
Total	57,775	16,303	51,611	

Car Orders Placed

Atlantic Coast Line, 21 light-weight stainless steel streamlined coaches, to E. G. Budd Mfg. Co., Philadelphia; to be operated in connection with Pennsylvania railroad.
 Chicago, Burlington & Quincy, 1000 box cars, to own shops.
 Chicago & North Western, sixty 70-ton covered hopper cars, to General American Transportation Corp., Chicago.
 Chicago & North Western and Union Pacific railroads, owned jointly, one streamlined train, to Pullman-Standard Car Mfg. Co., Chicago; diesel-electric power plant to be supplied by Electro-Motive Corp., La Grange, Ill.
 Chicago North Western, Southern Pacific and Union Pacific railroads, joint ownership, one streamlined train, to Pullman-Standard Car Mfg. Co., Chicago.
 Southern Pacific, 2350 freight cars; 500 box cars each to General American Transportation Corp., Chicago, Pressed Steel Car Co., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.; 500 automobile cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; 350 hoppers to American Car & Foundry Co., New York.



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Rail Orders Placed

Pere Marquette, 1850 tons, to Carnegie-Illinois Steel Corp., Chicago.

Car Orders Pending

Chicago, Rock Island & Pacific, court permission asked for purchase of 1000 box cars and construction of 200 gondolas in own shops.

Locomotives Placed

Akron, Canton & Youngstown, two steam locomotives, reported placed with Lima Locomotive Works, Lima, O.

Atlantic Coast Line, 18 diesel-electric

locomotives, to Electro-Motive Corp. La Grange, Ill.

Chicago & North Western, Union Pacific and Southern Pacific jointly, motive power for two streamlined trains for service to the Pacific coast, to Electro-Motive Corp., La Grange, Ill.

Buses Booked

A.e.f. Motors Co., New York, 30 coaches for Pittsburgh Motor Coach Co., Pittsburgh.

J. G. Brill Co., Philadelphia, 60 trolley coaches for Honolulu Transit Co., 10 for Denver Tramway Corp., 8 for Des Moines Railway Co., 3 for Shreveport Railway Co.

Wire

Wire Prices, Page 97

Pittsburgh—Slight increases have been noted in the manufacturers' wire market. Initial automobile orders have been received and buying is active by partsmakers. Miscellaneous manufacturing continues steady. In the merchant market jobber buying has gained slightly, particularly in agricultural products. Export demand for merchant products remains fairly steady.

Chicago—First substantial wire orders for automotive uses are expected this week. Releases by auto seat spring makers have been unusually light. Merchant wire demand is good. Production is high but difficulties in deliveries are experienced in many items. Rural demand is good for this time of year. Mesh, for road building, will be in heavy demand till late fall.

Boston—While buying has leveled in a few wire products, bookings are maintained, specialties covering a wide range. Finishing operations are near capacity with overtime schedules effective in some departments. Shipments are heavier but backlogs are being reduced on only a few products. Automotive tonnage is increasing. Rope demand is heavier and backlogs are increasing.

New York—Demand for wire products continues active, with incoming specifications about equal to shipments. Manufacturing wire is moving particularly well and is beginning to reflect heavier automotive buying.

Birmingham, Ala.—Wire products, including all specifications, continue in good demand. Fencing and nails are moving in large quantities, and output of the wire mill is about 80 per cent.

Tin Plate

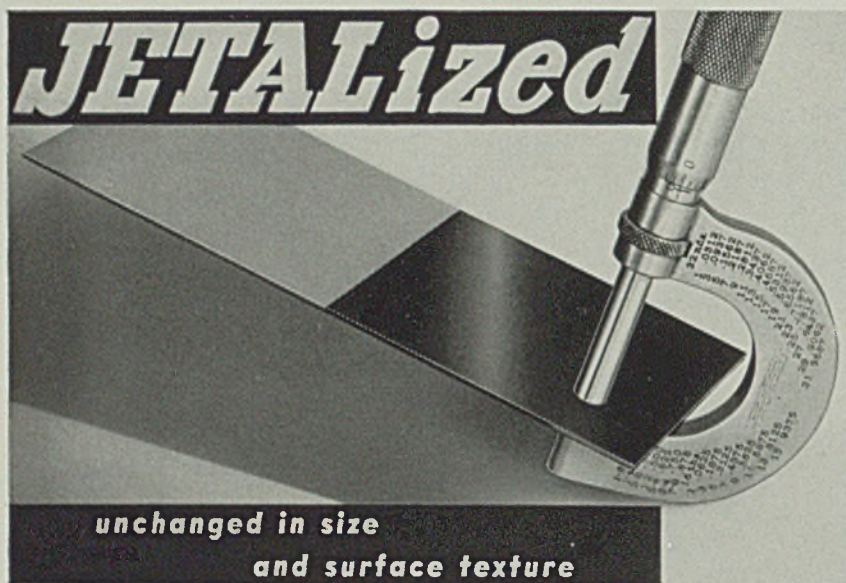
Tin Plate Prices, Page 96

Pittsburgh—Tin mill operations have steadied, with estimated production last week at 71 per cent of capacity. Specifications are slightly better, and shipments over the past week were heavier than the preceding week. Consumers have been reducing inventories and are expected to increase releases substantially over the next few weeks.

Semifinished Steel

Semifinished Prices, Page 97

Pittsburgh—Releases on sheet bars from nonintegrated mills were slightly better last week than during the previous week. Export de-



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mand continues strong, with Britain the principal customer. Demand for skelp and wire rods is steady.

Shapes

Structural Shape Prices, Page 96

Pittsburgh—Both public works projects and industrial construction continue to add to mill backlogs. Inquiries over the past week were somewhat less than the previous week, although shipments are high and awards numerous.

Chicago—Structural bookings are ahead of shipments but fabricators find a continuance of recent quiet. As a result most present structural business is being placed with the mills by a widely-diversified group of miscellaneous users. Structural needs of the defense program have not been significant in this area, though reported substantial in coast districts.

Boston—More structural steel is being bought for government cost-plus contracts. Awards approximating 3000 tons include 1800 tons for crane runways for a Groton, Conn., shipyard and 650 tons for a second addition to a Worcester, Mass., forge shop. Bridge requirements expected out by early fall will take close to 20,000 tons of steel, mostly fabricated shapes.

New York—Structural activity is expanding, with the largest recent inquiry involving approximately 14,000 tons for subway, route 110, section 10, in Brooklyn, on which general contractors' bids will be opened Aug. 27. A substantial tonnage of plain beams may also be purchased for shoring. Action on approximately 12,000 tons for twin dry docks for the Newport News Shipbuilding & Dry Dock Co., with an additional tonnage for piers, is expected to be announced soon.

Philadelphia—Leading structural mills are booked four to five weeks and further gains in backlogs are seen as government cost-plus con-

tracts are coming out in increasing numbers.

Buffalo—Interest in the structural steel market is growing as present projects easily aggregate the best tonnage of the year. A few fair sized projects are scattered among numerous small jobs.

Seattle—Public works and defense projects involving heavy tonnages are being released and fabricating shops in Seattle and Portland, with large backlogs, are anticipating increased activity. Pacific Car & Foundry Co., Seattle, is low

at \$124,935 and has been recommended for award for 1000 tons for a shop building at Puget Sound navy yard. Wisconsin Bridge & Iron Co., Milwaukee, has 260 tons for the Continental Can Co. plant at Walla Walla, Wash.

San Francisco—Shape awards last week totaled 3382 tons and brought the year's aggregate to 152,700 tons, compared with 77,084 tons for the same period last year.

Toronto, Ont.—Fabricators report an even flow of orders, and backlogs are mounting steadily. Most new



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This deep drawn liquid receiver is one of the several special products manufactured by Hackney for the refrigeration industry. It is suitable for 250 lb. per sq. in. working pressure. Note that the vessel is equipped with two bull's-eye fittings which consist of ground glass inserts of approximately 1/2" thickness. They are held in place by special gaskets and with a brass ferrule retainer. With these bull's-eyes, it is a simple job to gauge the amount of liquid refrigerant in the receiver.

In availing themselves of Hackney design and manufacturing facilities, manufacturers get the benefits of Pressed Steel Tank Company's more than 35 years' experience in the manufacture of special shapes and shells from many types of metals. Through positive control of heat treatment, X-ray control of welding and numerous other Hackney procedures, they are assured of better, more dependable products at lower costs. Whatever industry you are in, you may find Hackney's facilities beneficial and profitable. A Hackney engineer will be glad to cooperate with you in developing new shells or shapes or improve on those now being used. There is no obligation—write for details.

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Shape Awards Compared

	Tons
Week ended Aug. 10	24,101
Week ended Aug. 3	49,720
Week ended July 27	45,939
This week, 1939	17,975
Weekly average, year, 1940	21,306
Weekly average, 1939	22,411
Weekly average, July	33,958
Total to date, 1939	712,534
Total to date, 1940	681,795

Includes awards of 100 tons or more.

Behind the Scenes with STEEL

Vacation At Home

■ Back after a week of unrelaxing. We missed our fishing this year but managed to accomplish something we've always wanted to do. We played a full round of golf every day for seven straight days and took off twelve strokes from our previous low score. Another week like that and we'll be getting big ideas.

"Hearty"

■ Most heart-touching discontinuance notice our circulation department has had to accept came last week from an old friend out in Independence, Kansas. He writes: *Having been boosted out of active business life by the all-too-common coronary trouble, the question is whether a "hearty" should keep on with an old friend trade paper and be periodically reminded of what he is missing out on, in the hope of "staying young," or just resign himself gracefully to being a cabbage, or emulating "Elsie," according to the Doctor's, family's and friend's admonitions to "Take it easy." I presume (he sadly concludes) you had better let my address plate die.*

Delirium Tremens

■ Railway Express Agency recently shipped several pythons from Seattle, Wash., to various points about the country. Now, they include the trade price on pythons in their published list and in case you're planning on sending one home to the wife and kiddies figure it at \$50 per linear foot.

The Raw Deal

■ Chicago Editor, Jim Powell, tells of being cornered by a fellow on Michigan Ave. the other day who pointed to Jim's Willkie button and whispered very con-

fidentially, "The Dems got buttons like that too, only they say, with one word on each line, 'Roosevelt And Wallace.'" "So?" says Jim. "Yeah," says the other guy, "but see what those first letters spell? R-A-W, raw! Okay, now spell it backwards." "War," pronounces Jim solemnly, as his friend smiles happily and darts off in quest of more Republicans.

Notes On Defense

■ Speaking of war, the U.S.N. 16-inch shore gun hurls a 2400-lb. projectile 31 miles at the unbelievable rate of 1500 miles an hour. It reaches the mark ahead of its own sound.

Time Loss

■ Medical consultant C. D. Selby of General Motors estimates from a 6-month survey that 10 per cent of the workmen lose an average of 37 days each year because of ordinary sickness or non-occupational injuries. This is a loss of 260,000 calendar days or 712 years!

Hotel Penton

■ Cleveland is running a dangerously high pennant fever these days but we understand that the local hostelries are quaking in their boots for fear the Indians will really come through and win. Unofficially it is reported that every hotel room in town is already reserved for World's Series time because of some convention or other in town that week, and if that's so, our time has come. Here we are with a swell steam-heated nine-story building not over a 100-yard dash from the stadium and a men's and women's wash room on every floor. Let's see, we can get about three cots in every office and at five bucks a crack and with all the offices—why it's a gold mine!

SHRDLU

—The Market Week—

business is in connection with plant additions and new plants for war production. On this account alone it is stated that upwards of 20,000 tons of structural steel contracts are pending. Awards for the past week exceeded 10,000 tons. Building construction in Canada for first half exceeded that of the corresponding period of 1939 by approximately 75 per cent and further expansion predicted with large government projects already announced exceeding \$50,000,000.

Shape Contracts Placed

3500 tons, Union Electric Co. of Illinois power house, Venice, Ill., equally divided between Mississippi Valley Structural Steel Co. and Stupp Brothers Bridge & Iron Co., St. Louis, through Stone & Webster Construction Co., Boston. (Previously reported.)

2506 tons, including 1275 tons sheet piling, 1100 tons tainter gates and 131 tons of structurals, Caddoa or John Martin dam, Arkansas river, Colorado, to unnamed interest.

2200 tons, plant, Carbide & Carbon Chemicals Corp., New York, for erection at Texas City, Tex., to Mosher Steel Co., Houston, Tex.

1800 tons, mainly crane runways, Electric Boat Co., Groton, Conn., to American Bridge Co., Pittsburgh.

1660 tons, three land-plane hangars, Norfolk, Va., to Virginia Bridge Co., Roanoke, Va.

1000 tons, shop building, Puget Sound navy yard, to Pacific Car & Foundry Co., Seattle.

975 tons, 18-story apartment building, Nineteenth street and Central Park West, New York, to American Bridge Co., Pittsburgh.

710 tons, steel piling, Arklabuta dam, Coldwater river, Miss., to Inland Steel Co., Chicago.

680 tons, belt parkway contract E-2, Brooklyn, N. Y., to American Bridge Co., Pittsburgh.

650 tons, second addition, forge shop, Wyman-Gordon Co., Worcester, Mass., to American Bridge Co., Pittsburgh.

600 tons, steel piling, shore protection for Diamond Alkali Co., Fairport, O. to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, factory building No. 98 for Union Carbide & Carbon Corp., Niagara Falls, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

600 tons H and Z-steel sheet piling for Tongue Point, Ore., naval air base, to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, piling, dock extension, Pere Marquette railroad, St. Joseph, Mich., to Bethlehem Steel Co., Bethlehem, Pa.

490 tons, plant addition, American Smelting & Refining Co., Perth Amboy, N. J., to Belmont Iron Works, Eddystone, Pa.

480 tons, 12-story apartment, 42 East Sixty-seventh street, New York, to Drier Iron Works, New York, through Schroeder & Koppel, 369 Lexington avenue, New York.

465 tons, United States postoffice garage, Detroit, to R. C. Mahon Co., Detroit.

425 tons, building Continental Can Co., Passaic, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa.

400 tons, building, Bakelite Co., Bound

—The Market Week—

Brook, N. J., to American Bridge Co., Pittsburgh.

385 tons, state highway bridge, PSC-8758, Broome county, New York, to American Bridge Co., Pittsburgh.

350 tons, telephone building, Quincy, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

310 tons, platforms and supports, Bayway, N. J., to Lackawanna Steel Construction Co., Buffalo.

300 tons, Gould Academy gymnasium, Bethel, Me., to American Bridge Co., Pittsburgh.

265 tons, extension to building No. 80, navy yard, Portsmouth, N. H., to Bethlehem Fabricators Inc., Bethlehem, Pa.

260 tons, Continental Can Co. plant, Walla Walla, Wash., to Wisconsin Bridge & Iron Co., Milwaukee; Austin Co., general contractor.

260 tons, repairs to Sixty-third street line, Chicago Rapid Transit Co., Chicago, to Hansell-Elcock Co., Chicago.

255 tons, subway section 73-SF Cook county, Illinois, to American Bridge Co., Pittsburgh.

240 tons, trestle and bins, for Ohio Valley Coal Co., Elm Grove, W. Va., to Riverside Steel Co., Wheeling, W. Va.

240 tons, extensions to engine houses, Hagerstown, Md., and Maryland Junction, W. Va., for Western Maryland railway, to Phoenix Bridge Co., Phoenixville, Pa.

230 tons, court house and custom house, Spokane, Wash., to Willamette Iron & Steel Corp., Portland, Ore.

225 tons, Coca Cola building, Louisville, Ky., to Louisville Bridge & Iron Co., Louisville, Ky.

220 tons, overhead bridge and viaduct FAGH-119, Milbank, S. Dak., to Bethlehem Steel Co., Bethlehem, Pa.

210 tons, heaters for crude unit, oil refinery, Bayway, N. J., to Pittsburgh Bridge & Iron Works, Rochester, Pa.

200 tons, scrap metal plant, for navy department, Brooklyn, N. Y., to A. J. Fitchy.

195 tons, bridge No. 1996, Vanderburg county, Indiana, to International Steel Co., Evansville, Ind.

190 tons, bridge 36.70, for New York, New Haven & Hartford railroad, Southport, Conn., to Phoenix Bridge Co., Phoenixville, Pa.

190 tons, bridge FAGH-684-E1, Lee county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

190 tons, bridge, Cuyahoga county, Ohio, to American Bridge Co., Pittsburgh.

190 tons, bridge, FAGH-519D-FAGM-117A, Harris county, Texas, to Peden Steel Co., Raleigh, N. C.

185 tons, overpass FAGH-96-B, Dennisville, N. J., to Bethlehem Fabricators, Bethlehem, Pa.

160 tons, submarine battery charging building, navy yard, Philadelphia, to Pittsburgh Bridge & Iron Works, Rochester, Pa.

160 tons, 6-story cold storage building, Rath Packing Co., Waterloo, Ia., to Clinton Bridge Works, Clinton, Ia.; also 69 tons of bars to Dcs Moines Steel Co., Des Moines, Ia.

155 tons, loading plant, ordnance depot, Savanna, Ill., to A. C. Woods & Co., Rockford, Ill.

140 tons, state highway bridge, Miami county, Ohio, to Burger Iron Co., Akron, O.

140 tons, addition to laboratory building, Dayton, O., for United States government, to Indiana Bridge Co., Muncie, Ind.

130 tons, office building, Arthur G. Mc-

Kee & Co., Cleveland, to Fort Pitt Bridge Works, Pittsburgh.

130 tons, state bridge over Willimantic river, Willington, Conn., to American Bridge Co., Pittsburgh.

130 tons, bridge CWR-184-1-1, Coryell county, Texas, to Alamo Iron Works, San Antonio, Tex.

125 tons, state bridge RC-40-58, Seely Creek, N. Y., to American Bridge Co., Pittsburgh.

120 tons, state highway bridge, Phillipsburg, Pa., to American Bridge Co., Pittsburgh.

115 tons, bridge 32.73, for New York, New Haven & Hartford railroad, Bridgeport, Conn., to American Bridge Co., Pittsburgh.

115 tons, Deeds carillon tower, Dayton, O., to Burger Iron Co., Akron, O.

115 tons, school building, for St. Patrick's church, Troy, N. Y., to Utica Structural Steel Co., Utica, N. Y.

115 tons, New York state highway bridge, FAS RC-40-61, Chemung coun-

ty, to Lackawanna Steel Construction Co., Buffalo.

110 tons, extension to S. station, Montaup Electric Co., Somerset, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

110 tons, bridge repairs, C-18377, Chesapeake & Ohio railroad, Richmond, Va., to Phoenix Bridge Co., Phoenixville, Pa.

100 tons, St. Aloysius Catholic church, Checktowaga, N. Y., to Ernst Iron Works Inc., Buffalo.

100 tons, building No. 120, laboratory for E. I. du Pont de Nemours & Co., Niagara Falls, N. Y., to R. S. McMannus Steel Construction Co. Inc., Buffalo, Laur & Mack, Niagara Falls, N. Y., general contractor.

Unstated tonnage, steel superstructure over navigation lock, Kentucky dam, Tennessee Valley authority, to Bethlehem Steel Co., Bethlehem, Pa.

Unstated tonnage, powerhouse unit No. 3, Pickwick dam, Tennessee valley authority, to American Bridge Co., Pittsburgh.

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FOR WELDING
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THE PARSONS CHAIN COMPANY, LTD.

Shape Contracts Pending

- 14,000 tons, subway, route 110, section 10, board of transportation, Brooklyn, N. Y.; general contractors' bids Aug. 27.
- 10,000 tons, H-beam bearing piling, Maryland Dry Dock Co., Baltimore, bids asked.
- 4000 tons, approximately, buildings, naval base, Hawaii; Turner Construction Co., New York, general contractor, receiving figures.
- 2700 tons, Benjamin Franklin high school, New York, to be readvertised shortly.
- 2400 tons, bridge, including small bascule, North Portland, Me.; plans ready soon.
- 1800 tons, Woodrow Wilson high school, New York, to be readvertised shortly.
- 1600 tons, grade separations, East Twelfth street, New York, for Triborough bridge authority.
- 1500 tons, aviation and marine corps facilities, marine barracks, Quantico, Va.; John McShain general contractor.
- 1500 tons, contract E-3, Triborough bridge authority grade crossing elimination work, Brooklyn, N. Y.; bids Aug. 15.
- 1400 tons, apartment house, for Anthony Campagna, New York.
- 1300 tons, assembly shop, Bremerton, Wash., for navy.
- 1000 tons, bridges, Kettle river gorge, Boyds, Wash., for bureau of reclamation.
- 1000 tons, Z-piling, 500 tons shapes, seaplane hangar, naval academy, Annapo-

lis, Md.; McCloskey & Co., Philadelphia, general contractor.

- 1000 tons, including 300 tons of sheet piling, Brooklyn approach shafts of Battery-Brooklyn tunnel; Andrew Catapano, Long Island City, N. Y., low on general contract.
- 950 tons, two bridges, Huntingdon county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Aug. 16.
- 850 tons, factory building, Metal Equipment Co., Jamestown, N. Y.
- 700 tons, building for Chevrolet Motor Co., Saginaw, Mich.
- 500 tons, shop, specification 9906, navy yard, Bremerton, Wash.; Pacific Car & Foundry Co., Seattle, Wash., low.
- 450 tons, office building, for United Carbon Co., Charleston, W. Va.
- 410 tons, state highway bridge, North East, Pa.; C. R. Knowles, Gowanda, N. Y., general contractor.
- 400 tons, warehouse, Owens-Illinois Glass Co., Alton, Ill.; bids Aug. 13.
- 344 tons, sheet piling, United States engineer office, Portland, Ore.; Columbia Steel Co., San Francisco, low.
- 275 tons, state bridge SS-40-10, Walkkill, N. Y.
- 265 tons, steel sheet piling, for flood control projects at Sand Point and St. Maries, Idaho; general contracts awarded.
- 250 tons, addition, Cooper hospital, Camden, N. J.; bids in.
- 200 tons, St. Luke's hospital, Bethlehem, Pa.; bids Aug. 17.
- 180 tons, hangar, Denver, Colo., airport; bids Aug. 12.
- 160 tons, warehouse, Jackson & Perkins,

Newark, N. Y.

- 140 tons, postoffice building, Charleston, W. Va.
- 130 tons, highway bridge, Avon, N. Y., bids August 23.
- 125 tons, bridge, Halifax, Vt.; Lockwood-Greene Corp., Concord, N. H., contractor.
- 115 tons, reconstruction building, for St. Peter's church, Washington.
- 110 tons, men's residence, for New York State college, Albany, N. Y.
- Unstated tonnage, hangar, MacDill field, Tampa, Fla.; Central Contracting Co., Atlanta, Ga., general contractor, low at \$1,003,900.
- Unstated tonnage, supply building and repair shop for construction quartermaster, Southeast air depot, Mobile, Ala.; Foster & Creighton, Nashville, Tenn., general contractors, low at \$1,433,400.
- Unstated tonnage, steel stringer bridge and approaches over Chickley river; bids Aug. 27 to R. W. Coburn, chief engineer, Massachusetts department of public works, Boston.
- Unstated, barracks, hospital and exchange, army base, Fairbanks, Alaska; bids to quartermaster, Fort Mason, Calif., Aug. 10.
- Unstated tonnage, motor test stand building, naval station, Pensacola, Fla.; E. J. Photzer, Twelfth and Lindley avenue, Philadelphia, low on general contract at \$108,335.

Reinforcing

Reinforcing Bar Prices, Page 97

Pittsburgh — New business continues to come in at a substantial rate. Prices are almost entirely at 2.15c. Deliveries are being made on schedule, with mill capacity reported ample in most cases. Export business is fair, and in some cases commands a premium.

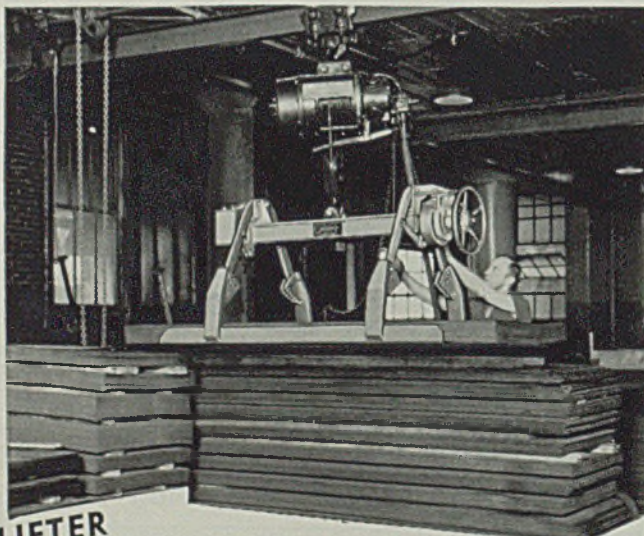
Chicago — Producers and sellers are encouraged by improvement in prices and increase in new demand. Volume of pending projects has tended upward gradually in the past few weeks. Most current tonnage is in small individual projects.

Boston — While a large volume of reinforcing steel is in prospect, current buying is in small lots. More than 11,000 tons is being figured for housing, flood protection and defense

FOR HANDLING SHEET STEEL IN CLOSE QUARTERS

Where headroom is low and where storage area is confined, C-F Sheet Lifters handle tons of stock easily and safely. C-F Lifters need only 5" or 6" between piles, may be lowered vertically over a pack or bundle of sheets and are adjustable for stock from 12" to 72" wide.

C-F Lifters feature safe, one-man end control, in standard manual or powered units of 2 to 20 ton capacity, C-F Lifters accommodate sheets up to 72" wide or may be had in any special size to meet requirements.



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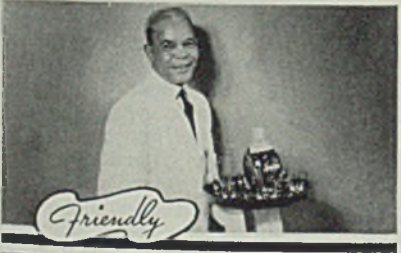
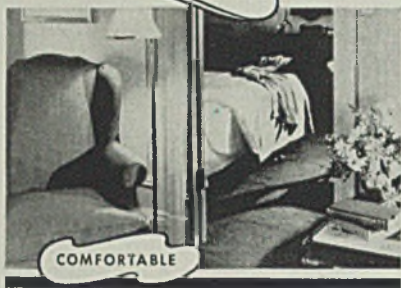
1308 S. Kilbourn Ave. Chicago, U. S. A.

Concrete Bars Compared

	Tons
Week ended Aug. 10	10,935
Week ended Aug. 3	18,521
Week ended July 27	15,420
This week, 1939	10,135
Weekly average, year, 1940	8,813
Weekly average, 1939	9,197
Weekly average, July	8,543
Total to date, 1939	326,512
Total to date, 1940	282,025

Includes awards of 100 tons or more.

This
IS HOTEL
CLEVELAND



ROOMS
from \$3

HOTEL CLEVELAND
Cleveland

August 12, 1940

work, much of it in the Hartford, Conn., district. Reinforcing bar prices are stronger although larger awards bring out moderate concessions.

New York—Action on at least two large reinforcing bar contracts is expected shortly, one involving 2500 tons for the Kingsboro housing project, Brooklyn, on which Caldwell-Wingate Co., general contractor, is low, and 1250 tons for Brooklyn navy yard on which J. Rich Stears Inc. is general contractor.

Philadelphia — The reinforcing bar market is the firmest in months with the published price quoted in most instances. More work is reported coming out.

Seattle—Important tonnages are pending, the largest 7000 tons for foundations of the Bonneville power house, bids postponed from Aug. 20 to Aug. 30.

San Francisco — Movement of reinforcing bars continues well sustained and awards aggregated 7266 tons, bringing the total to date to 111,908 tons, compared with 102,731 tons for the corresponding period in 1939.

Reinforcing Steel Awards

2000 tons, naval supply base, Norfolk, Va., through Virginia Engineering Co., Newport News, Va., to Concrete Steel Co., Norfolk, Va.

2000 tons, navy yard improvements, Portsmouth, N. H., to Bethlehem Steel Co., Bethlehem, Pa., through Bancroft-Martin, Aberthaw Co., contractor.

1850 tons, Union Electric Co. plant, Venice, Ill., to Laclade Steel Co., St. Louis, through Western Foundation Co., contractor.

600 tons, navy yard machine shop building, Norfolk, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Rust Engineering Co., Pittsburgh.

586 tons, buoys for submarine net across Golden Gate, San Francisco, to Columbia Steel Co., San Francisco.

500 tons or more, Coulee dam projects to Bethlehem Steel Co., Seattle; by reclamation bureau.

500 tons, miscellaneous buildings, Albrook field, Canal Zone, to Republic Steel Corp., Cleveland, through Robert E. McKee, contractor.

480 tons, foundation, machine shop, navy yard, Mare Island, Calif., to Herrick Iron Works, Oakland, Calif.

400 tons, factory addition, Campbell Soup Co., Chicago, to Calumet Steel Co., Chicago.

260 tons, bridge substructure, Peoria, Ill., sec. 15-B, to Inland Steel Co., Chicago, through Great Lakes Dredge & Dock Co.

250 tons, Vineyard housing, Wheeling, W. Va., to West Virginia Rail Co., Huntington, W. Va., through Don J. Byrum Inc., contractor.

210 tons, court house, Appleton, Wis., to Ceco Steel Products Corp., Chicago.

160 tons, equipment repair building, Duncan field, Texas, through H. Moeller, contractor, San Antonio, Tex., to Ceco Steel Products Corp., Omaha, Nebr.

150 tons, Alpine dam, San Rafael, Calif.,

MAKE HIS WORK
LESS *BORING*



Photo—Warner & Swasey

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STEEL CO.**

900 EAST 67th STREET, CLEVELAND, OHIO

Pig Iron

Pig Iron Prices, Page 98

to Gunn, Carle & Co., San Francisco.
 150 tons, bridge and highway, Franklin, N. H., to Bancroft & Martin Co., Portland, Me.
 150 tons, Metropolitan Edison Co. power plant, Reading, Pa., to Republic Steel Corp., Cleveland, through L. H. Focht & Sons, contractor.
 120 tons, factory at Kewanee, Ill., to Inland Steel Co., Chicago.
 120 tons, Erie railroad grade elimination, Johnson City, N. Y., to Bethlehem Steel Co., Bethlehem, Pa. through Binghamton Construction Co., Binghamton, N. Y.
 119 tons, underpass, Palo Alto, Calif., to San Jose Steel Co., San Jose, Calif.
 110 tons, state highway project No. 163, Warren county, Ohio, to Republic Steel Corp., Cleveland.
 110 tons, General Motors Corp. diesel division plant, Detroit, to Great Lakes Steel Corp., Detroit, through Taylor, Davis, Bryant & Detwiler, contractors.
 110 tons, state highway bridge, Carsonville, Mich., to Bethlehem Steel Co., Bethlehem, Pa. through J. H. Baker, contractor.

1000 tons, navy yard subassembly shop, Brooklyn, N. Y., Walter Kidde Inc., contractor.
 700 tons, Cargill grain elevator, St. Clair county, Illinois.
 400 tons, ten hospital buildings, Willowbrook, N. Y.; bids Aug. 14.
 385 tons, two bridges, Huntingdon county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Aug. 16.
 360 tons, subway, route 110, section 10, board of transportation, Brooklyn, N. Y.; general contractors' bids Aug. 27.
 313 tons, belt parkway Brooklyn, N. Y., contract E-3; bids Aug. 15.
 275 tons, shop building, naval station, Newport, R. I.
 200 to 250 tons, two bridges for New York, New Haven & Hartford, No. 769 and No. 785, over Hutchinson river, Baychester, N. J.; bids asked.
 192 tons (also 68 tons shapes), Washington state highway projects in Stevens and Lincoln counties; bids at Olympia, Wash., Aug. 20.
 166 tons (also 85 tons other metal items), rearing ponds, etc., Winthrop, Wash., fish hatchery; bids at Coulee City, Aug. 23; materials by reclamation bureau.
 129 tons, highway work, Orange county, Calif., for state; bids opened.
 111 tons, Sauvies Island pumphouse; Kuckenbergh Construction Co., Portland, Ore., general contractor.
 100 tons or more, addition to Anchorage, Alaska, postoffice; bids pending.
 100 tons, including miscellaneous, rearing ponds, Entiat, Wash., fish hatchery; W. T. Butler, Seattle, general contractor.

Pittsburgh—Production is moving upward, and all 40 stacks active in the district are being pushed to capacity. No plans have been announced for blowing in additional stacks, although it is known this is being considered. Coke supply is apparently the key factor.

Chicago — In line with expectations, foundry melt has started to improve and pig iron releases have grown heavier. Sellers are confident current rate of shipments will hold throughout the month, and this would bring August tonnage well above that of July.

Boston — Pig iron consumers are covered through the quarter and many have larger reserves, buying being small currently. Shipments are improved and melt is gaining substantially. Foundry coke shipments are steady and substantial. Demand for castings is broadening, with larger work increasing. A Beverly, Mass., shoe machinery builder has a large order for 37-mm. gun mounts, requiring heavy castings.

New York—Pig iron specifications are being well sustained, with producers using from stocks to meet current demands. There is little new buying, however, as most consumers have contracts for the quarter. Export demand continues quiet. Heavy shipments are going to England, but against contracts placed earlier in the summer.

Philadelphia—Except for two or three round lots of pig iron, ranging up to 1000 tons, buying is relatively light. Specifications already entered for August indicate an increase of 10 to 25 per cent in deliveries over July. Foundry operations average 75 to 80 per cent, although two or three jobbing shops are closer to 60 per cent. Requirements of non-integrated steel mills have expanded sharply. Great Britain is pressing for additional tonnage, especially of low phosphorus iron, which is comparatively scarce. It is understood Great Britain might pay as high as \$30. Recent British purchases include 50,000 tons placed with Ohio and Pennsylvania furnaces and 50,000 tons with an eastern interest.

Buffalo — Pig iron production jumped 7½ points to 92 per cent of capacity as the Hanna Furnace Corp. started its third blast furnace, to put the plant on a capacity basis. Twelve of the district's thirteen blast furnaces are now active.

Cincinnati—Demand for pig iron is well sustained despite seasonal

Reinforcing Steel Pending

7000 tons, foundations Bonneville power house; bids to United States engineer, Bonneville, Oreg., postponed Aug. 20 to Aug. 30.
 2500 tons, Kingsboro housing project, Brooklyn, N. Y., Caldwell-Wingate Co., New York, low on general contract.
 1250 tons, navy yard, Brooklyn, N. Y.; award by J. Rich Stears Inc., general contractor, New York, expected momentarily.

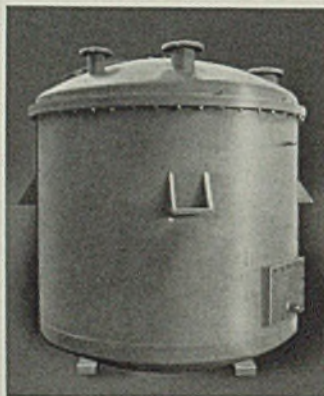


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- SILVER-PLY has been successfully produced by the Jessop Steel Company for over two and one half years.
- Over 1,500,000 lbs. of SILVER-PLY sheets and plates have been rolled during this period.
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SILVER-PLY Stainless-Clad Steel offers the complete protection of solid stainless, while saving up to 45% in material costs. Write for free booklet describing SILVER-PLY in detail. JESSOP STEEL CO., 584 Green St., Washington, Pa. ESTABLISHED 1901.



Large processing vessel for use in the chemical industry, fabricated from SILVER-PLY by Alloy Fabricators, Inc., Newark, N. J.

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Jessop Steels of America

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 STAINLESS and COMPOSITE STEELS

slackening in some lines. Except in machine tools, national defense moves are not reflected. Southern iron melters are being asked to anticipate needs by a few days, accommodations on rush shipments being slightly retarded. One furnace at the Hamilton division, American Rolling Mill Co., is down for three months for rebuilding.

St. Louis — Shipments are off slightly so far in August, but specifications indicate little change from July in the month's total. The melt is steady, seasonal tapering in some directions being offset by gains elsewhere. Machine and engine shops and some jobbing foundries are busy. Pig iron buying is quiet and consumers apparently will carry more iron into fourth quarter than was expected a short time ago.

Scrap

Scrap Prices, Page 100

Pittsburgh — Last week brokers paid \$18.50 for No. 1 heavy melting steel against orders at an unknown level but higher than that figure. Buying by at least one mill has been at around \$19. Brokers holding orders below that level have found some difficulty in covering. Bidding was relatively high on the Pennsylvania list, and while most of this material is expected to go east, part of it will probably come into this district.

Cleveland — Two local steelmakers have done some desultory buying of open-hearth grades at the top of current quotations for No. 1 heavy melting steel. Blast furnace material is active and the market undertone is stronger. Prices at Youngstown are slightly weakened by delivery restrictions there and at Pittsburgh.

Chicago — Market is definitely firmer and most prices moved upward last week. No. 1 steel is quoted \$17.50 to \$17.75, chiefly on the basis of current dealer-broker trading, which ranges as high as \$18. Though the last confirmed mill sale was at \$17.50, brokers now are holding out for higher levels. Foundries, operating better, are increasing purchases. Mills, continuing at capacity, are again interested. Scrap trade in general is definitely cheerful over the price and demand situation.

Boston — Scrap prices are steady, the decline in most grades apparently being stopped. Some advances are noted. Domestic buying is light, foundry consumers having bought several weeks ago and now are operating from stock. Most activity is for export. One boat re-

cently sailed for Japan with 7000 tons and another is loading at Boston for that destination and at least two for England.

New York — A stronger undertone prevails in scrap, with brokers' buying prices higher on melting steel. The prime grade is holding at \$15 to \$15.50, f.o.b. New York, for domestic consumption, and No. 2 auto steel at \$13.50 to \$14. Domestic buying shows some improvement, although still rather inactive; foreign demand is quiet, but shipments are being maintained in good volume, particularly for England and Japan.

Buffalo — Possibility of sales developing soon was seen by the narrow margin prevailing between bid and offering prices. Reports that recent railroad lists brought \$19.50 a ton for No. 1 heavy melting steel did not alter the price range of \$18 to \$18.50 for regular No. 1 steel, but did tend to bolster sentiment among dealers.

Philadelphia — Scrap is definitely stronger with several grades 50 cents higher. Steelmakers are cutting into backlogs and are more interested in further supplies. A broker paid \$19.15 for 3500 tons of new compressed sheets on an automotive list. The navy yard sold

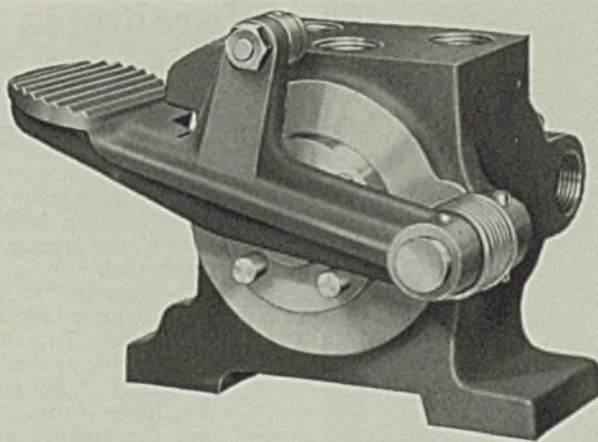
200 tons of No. 1 heavy melting steel to a broker at \$18.03, f.o.b., equivalent to \$19.56 delivered, mill.

No difficulty has been encountered in obtaining licenses for export of No. 1 heavy melting steel. In fact, Japan has purchased several additional round lots, paying about \$18.50 for No. 1 steel and \$17.50 for No. 2.

Detroit — Spurred by strong demand for electric furnace scrap for shipment to Buffalo, Canton, O., and other centers of electric furnace steel production, the scrap market here is decidedly more active, with increases of 50 cents to \$1 per ton registered in nearly all items except cast grades and turnings. Low-phosphorus plate advanced \$1, to \$17.50-\$18.00. Some dealers are intensely bullish on this item and foresee sharply higher prices and possible shortage.

Cincinnati — Iron and steel scrap has developed a stronger undertone, although quotations are unchanged. Mills do not anticipate needs heavily, although steelmaking levels are high.

St. Louis — Activity in scrap is retarded partly by seasonal influences, but the tone is firmer. Dealers look for heavier buying this month in view of favorable pros-



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Simple, positive control of air operated equipment is easily obtained with this heavy duty rotary valve. One pressure operates the cylinder, second pressure reverses the cylinder. Disc-type design without packing prevents leak-

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AIR CONTROL

pects for steelmaking and foundry operations. Price changes are mixed, principally adjustments with other markets. Most quotations are nominal in the absence of consumer buying.

San Francisco — Due primarily to the possibility that a practical embargo may be placed on export of scrap, prices in this district have receded 50 cents a ton. No. 1 heavy melting steel f.o.b. cars, net tons, in the metropolitan area of Los Angeles and San Francisco is now priced at \$13.00 to \$13.50 with No. 2 at \$12.00 to \$12.50.

Steel in Europe

Foreign Steel Prices, Page 99

London — (By Cable) — Iron ore and scrap supplies in Great Britain are sufficient for immediate needs but reserves are not large enough for comfort. Supplies of hematite iron are becoming light. Export trade in steel is gradually improving, especially in black and galvanized sheets and there is fair tin plate trade with Australia and South America. Domestic foundries are taking larger tonnages on government orders.

Warehouse

Warehouse Prices, Page 99

Chicago — Bookings show a slight gain, sufficient to return demand to levels of two weeks ago. This month is confidently expected to be the best August since 1929, with the exception of 1937, when bookings were at slightly higher level, which might yet be exceeded.

Boston — Buying from warehouses is improving, more orders appearing for fill-in needs. Demand is broadening with shapes and plates in larger volume. Alloy and specialty lines are more active. Sheets and pipe are the weaker spots in an otherwise fairly firm price structure.

New York — A distinct improvement in demand for shapes and plates is noted in the local warehouse market. Some distributors report business in these lines since the first of the month is the best since 1937. Particular demand is noted for wide plates, reflecting undoubtedly rapidly extending mill deliveries on these larger sizes.

Cincinnati — Although building items continue dull, volume of warehouse sales is well sustained, chiefly by industrial needs. Early August specifications are fully up to July tonnage. Prices are unchanged and firm.

Buffalo — Some disappointment

was shown by distributors over a mild lull in buying the past week. Volume is still substantial but a shade under the level for July. Sellers report the galvanized sheet market continues weak at the low price of 4.00c.

Seattle — Sales are consistently higher than normal seasonal levels and continued improvement is expected. All items are in good demand. Prices in the Seattle area are steady, although still at lower levels on important items than in Portland territory.

Michigan Steel Tube To Make Welded Tubing

Michigan Steel Tube Products Co., Detroit, announces it is now supplying electric resistance welded steel pressure tubes for various applications such as boiler tubes, condenser tubes, preheater tubes, hot water heater tubes, refrigerator and air conditioning equipment tubes, furniture tubing and stainless steel tubing.

The organization has had 32 years of experience in manufacture of welded steel tubing. Its plant covers 200,000 square feet of floor space under one roof.

Range of sizes of the new tubing is from 1/4-inch to 4 inches outside diameter and from 8 to 22 gage wall thickness. Pressure tubes are made to A.S.M.E. specifications.

Warner & Swasey Files

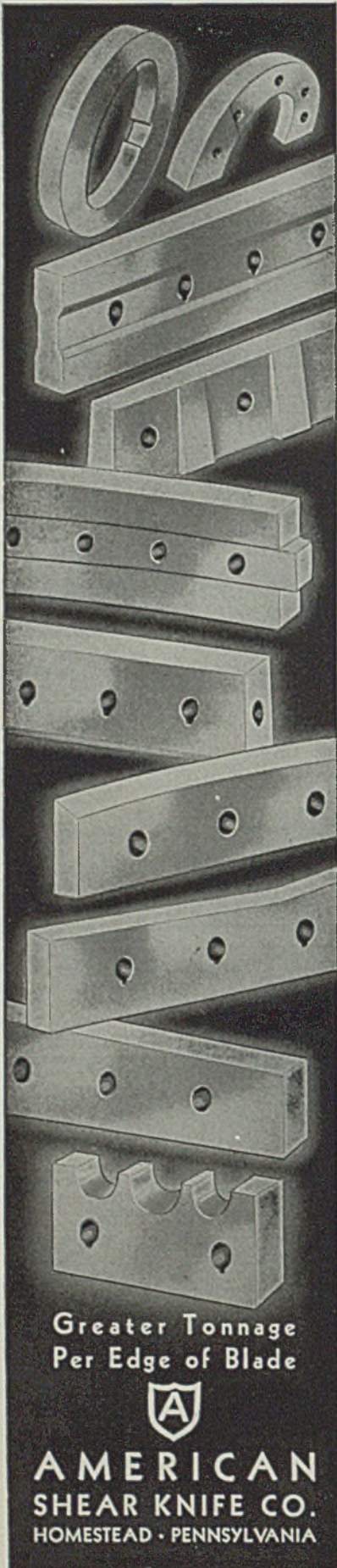
Warner & Swasey Co., Cleveland, last week filed with the securities and exchange commission a registration statement covering 276,580 shares of no par common stock, to be offered the public through underwriters. An indeterminate amount of common will be reserved for exchange for the company's \$100 par value 6 per cent cumulative preferred, shortly after the public offering.

Special stockholders' meeting will be held at Cleveland, Aug. 20. Stockholders will be asked to approve a recapitalization plan (STEEL, July 29, p. 74).

Metallurgical Coke

Coke Prices, Page 97

Pittsburgh — Demand for coke continues to increase and beehive coke prices are stiffening. Price on foundry grade coke is now \$5.25 to \$5.50, while furnace coke is mostly \$4.50. Some additional ovens have been added and total now in operation runs close to 3800 out of 6600 available. This compares with more than 5000 ovens operating last



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Nonferrous Metal Prices

fall. Operators intimate they will not put more ovens in operation unless sales are guaranteed, with cash in advance to facilitate operations. There is some indication that integrated companies will shortly put in more ovens to augment current supplies.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 97

Better bolt and nut business is in prospect during August, and the industry's operations have been advanced to 55-60 per cent of capacity. Specifications from navy yards and miscellaneous users have been heavier recently. Recent price reduction in machine bolts and nuts sold to western railroads is not reflected in like revisions in other lines. Export demand is principally from South Africa and the British dominions. South American inquiry has slumped sharply.

Ferroalloys

Ferroalloy Prices, Page 98

New York—While consumption is high, deliveries of ferromanganese still reflect the heavy buying in June, prior to the \$20 price advance on contracts. This buying, in fact, will probably have an influence over the remainder of the quarter. The current market is \$120, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen is holding at \$36, Palmerton, Pa., for 19 to 21 per cent material, and \$49.50 for 26 to 28 per cent. Most consumers of spiegeleisen covered rather substantially at the time of the price increase in June, with a result that current orders are well below consumption.

Nonferrous Metals

New York—Unwillingness of smelters to carry large stocks of copper and lead in view of uncertainty regarding the outcome of the European war, resulted in declines in those markets last week. Smelters reduced prices in seeking to find a level at which demand would absorb their daily intakes. Tin prices also declined while zinc displayed a firm to strong tone.

Copper—Custom smelters cut prices one-quarter cent to 11.00c on Tuesday and a like amount further to 10.75c on Wednesday when leading mine producers cut their prices to the former level. Rolled and drawn product prices and scrap quotations were revised downward in line with the primary market.

Lead—All leading sellers reduced prices 15 points on Tuesday and 10

Aug.	Copper		Casting, refinery	Straits Tin, New York		Lead East St. L.	Zinc St. L.	Aluminum 99% Spot, N.Y.	Anti-mony Amer. Spot, N.Y.	Nickel Cathodes	
	Electro, del. Conn.	Lake, del. Midwest		Spot	Futures						
3	*11.25	11.50	10.87 1/2	52.12 1/2	50.87 1/2	5.00	4.85	6.25	18.00	14.00	35.00
5	*11.25	11.50	10.87 1/2	52.25	50.87 1/2	5.00	4.85	6.25	18.00	14.00	35.00
6	*11.00	11.50	10.87 1/2	52.25	50.87 1/2	4.85	4.70	6.25	18.00	14.00	35.00
7	*10.75	11.00	10.50	52.12 1/2	50.75	4.85	4.70	6.25	18.00	14.00	35.00
8	*10.75	11.00	10.50	52.00	50.62 1/2	4.85	4.70	6.25	18.00	14.00	35.00
9	*10.75	11.00	10.50	51.75	50.37 1/2	4.75	4.60	6.25	18.00	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 11.00c Conn. copper

Sheets	
Yellow brass (high)	18.23
Copper, hot rolled	19.62
Lead, cut to jobbers	7.00
Zinc, 100 lb. base	11.50

Tubes	
High yellow brass	20.98
Seamless copper	20.12

Rods	
High yellow brass	13.26
Copper, hot rolled	17.12

Anodes	
Copper, untrimmed	16.87

Wire	
Yellow brass (high)	18.48

OLD METALS

Nom. Dealers' Buying Prices
No. 1 Composition Red Brass

New York	6.75-7.00
Cleveland	7.25-7.50
Chicago	7.00-7.25
St. Louis	7.75

Heavy Copper and Wire

New York, No. 1	8.37 1/2-8.62 1/2
Cleveland, No. 1	8.25-8.50
Chicago, No. 1	8.25-8.50

St. Louis	8.75
-----------	------

Composition Brass Turnings	
New York	6.37 1/2-6.62 1/2

Light Copper	
New York	6.37 1/2-6.62 1/2
Cleveland	6.25-6.50
Chicago	6.25-6.50
St. Louis	6.75

Light Brass	
Cleveland	3.50-3.75
Chicago	4.25-4.37 1/2
St. Louis	4.25

Lead	
New York	4.25-4.35
Cleveland	3.60-3.75
Chicago	3.50-3.75
St. Louis	3.50-3.75

Zinc	
New York	3.50-3.75
Cleveland	3.00-3.25
St. Louis	3.25-3.50

Aluminum	
Misc. cast, Cleveland	8.50
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.00
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, S5-5-5-5, less carloads	11.75
Standard No. 12 aluminum	13.50-14.00

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points further on Friday, making the going level 4.60c, East St. Louis. Weakness in this market was attributed to the active competition of Mexican metal for outlets here.

Tin — Domestic trading continued orderly despite political tension in the Far East. Straits spot slipped to only 51.75c at the close from the previous week's close of 52.62½c.

Zinc — Sustained active consumption as reflected in the 73 per cent galvanized sheet output rate has been an important factor in holding prime western zinc on the basis of 6.25c, East St. Louis, in the face

of easiness in other major markets. Good export demand also has supported present levels. The statistical position remains strong, total stocks having declined 5717 tons during July to only 59,510.

Antimony — Only routine business was done on the basis of 14.00c, New York, for American spot.

■ Commercial steel castings bookings in June were 59,661 net tons, compared with 50,346 tons in May and 37,774 tons in June, 1939, the bureau of the census reports. For six months this year orders aggregated 272,006 tons, against 230,156 in first half, 1939. June production was 50,651 tons, in May 50,034 tons and in June, 1939, 40,272 tons. Six months production was 132,009 tons, compared with 66,354 tons in the same period last year.

ing about \$35,000. Dunbar Co., 8201 Cedar avenue, is contractor.

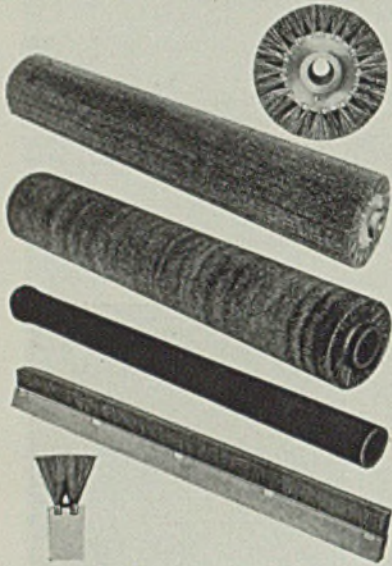
COLUMBIANA, O.—Columbiana Boiler Works Co. will build addition with 10,500 square feet floor space, including steel building extension and leanto. Company has government order for \$368,000 worth of chemical containers.

NELSONVILLE, O.—City plans waterworks improvements and has applied for WPA funds. Estimated cost \$180,000. Burgess & Niple, 368 East Broad street, Columbus, O., are engineers.

Connecticut

STAMFORD, CONN.—Norma-Hoffman Bearings Corp., Hamilton avenue, has let general contract for one-story additions 65 x 122 and 16 x 22 feet to Vuono Construction Co., 217 Bedford street, to cost about \$40,000. Fletcher-Thompson

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CONSTRUCTION and ENTERPRISE

Ohio

CANTON, O.—Everhard Mfg. Co., 1592 Seventh street, will build an addition 95 x 188 feet, to cost about \$20,000. Warren Hoffman Co., 312 Third street, has general contract.

CLEVELAND—Ice Club of Cleveland, E. H. Brandenburg, president, Euclid and Twenty-fourth street, is having plans prepared for a two-story 112 x 280-foot ice and hockey arena to cost about \$150,000. C. H. Hinman, 1836 Euclid avenue, is architect.

CLEVELAND—Guarantee Welding Co., 1973 East Fifty-fifth street, has been incorporated by Peter Schwerko, who formerly operated as an individual, and will build a shop of its own.

CLEVELAND — Wheelock-Lovejoy & Co. Inc., 5205 Hamilton avenue, will

■ Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 110 and Reinforcing Bars Pending on page 112 of this issue.

take bids soon for warehouse and office building, 97 x 211 feet at Marquette and Lakeside avenues, including craneway, four electric cranes, rolling steel railway door. Edward C. Bartlett is manager.

CLEVELAND—Standard Oil Co., Midland building, Howard West in charge, is preparing \$500,000 program of gasoline refining plants at Cleveland, Lima, O., and Latonia, Ky., to use Houdry catalytic refining process. M. W. Kellogg Co., 225 Broadway, New York, is engineer and general contractor.

CLEVELAND—Cleveland Metal Abrasives Co., 887 East Sixty-seventh street, will take bids soon for an addition of 3600 square feet. W. H. Hatch, Hippodrome building, Cleveland, is engineer.

CLEVELAND—S.A.E. Steel Co., 1408 East Forty-seventh street, Arthur B. Betz, in charge, will build 15,000 square feet additional steel storage space, cost-



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GARAGE IN CONNECTION

—Construction and Enterprise—

Inc., 1336 Fairfield avenue, Bridgeport, Conn., is engineer.

Maine

BATH, ME.—Bath Iron Works Corp., A. M. Maln, vice president, has let general contract for assembly plant, 90 x 600 feet, with six spur tracks, to Morton C. Tuttle Co., 862 Park Square building, Boston. (Noted Aug. 5.)

New York

NEWBURGH, N. Y.—City plans construction of sewage disposal plant and will ask PWA funds. Cost estimated at \$850,000. T. F. Bowe, 110 William street, New York, is engineer.

New Jersey

BLOOMFIELD, N. J.—Scientific Glass Co., 49 Ackerman street, has let general contract for two-story manufacturing building 60 x 80 feet to Becker Construction Co., 361 Grove street, Newark, N. J.

Pennsylvania

MEADVILLE, PA. — Champlon-Dearment Tool Co., South Main street, is adding heat-treating building 50 x 140 feet and warehouse 40 x 40 feet. Henry Shenk Co., 1115 Sassafrass street, is general contractor.

Michigan

DEARBORN, MICH. — Dearborn Specialty Mfg. Corp. has been incorporated to deal in electric appliances, with 100 shares no par value, by A. Jerome Geisler, 6610 Chase road.

DETROIT—Electric Welding Machine Co., 1440 East Larned street, has given general contract to Barton-Malow Co. for a factory building costing about \$20,000.

DETROIT—Davis Tool & Engineering Co., 6381 Epworth street, plans a factory building with about 40,000 square feet floor space.

PONTIAC, MICH.—Wilson Foundry & Machine Co. has given general contract to C. A. Handeyside Construction Co., Detroit, for additions and alterations to its plant. Plans by L. J. Heenan, Pontiac, architect. (Noted Aug. 5.)

Illinois

CHICAGO — Automatic Engineering Works, 3344 West Gladys avenue, has let general contract for one-story 50 x 180-foot plant at Laflin and Adams streets, to N. Dubin & Son, 1312 South Harding avenue, Chicago.

CHICAGO—Bartlett Traller Corp., 3830 South Michigan avenue, will build a plant, one story, 72 x 280 and 72 x 100 feet, at Archer and Ashland avenues, costing about \$80,000. Charles C. Henderson, 134 North LaSalle street, is architect.

OTTAWA, ILL.—Ottawa Silica Co. will let contract soon through Laramore & Douglass, engineers, 327 South LaSalle street, Chicago, for a one-story power plant 100 x 100 feet.

Indiana

PORTLAND, IND. — Board of public works, C. Wilson, clerk, plans waterworks improvements, including 1000-gallon fuel oil tank, pumps and other accessories, to cost about \$25,000. Bevington, Williams Inc., 730 Indiana Pythian building, Indianapolis, is consulting engineer.

VEVAY, IND.—Southern Indiana Light & Power Co. plans construction of new powerhouse costing \$75,000 or more, in-

cluding installation of new equipment.

Alabama

BESSEMER, ALA.—United States Pipe & Foundry Co., G. F. Jones, resident manager, will build a machine shop addition costing about \$45,000.

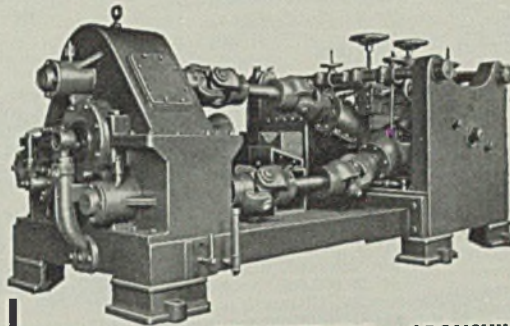
Maryland

BALTIMORE—Glenn L. Martin Co. is considering plans to decentralize aircraft production operations and may establish second unit in unused General Aviation Co. building at municipal air-

port. Survey is being made for one and possibly more additional plants.

HAGERSTOWN, MD.—City receives bids Aug. 15 for two steam generating units for municipal electric generating plant. Cost of units and building about \$260,000

SPARROWS POINT, MD.—Rheem Mfg. Co., Richmond, Calif., maker of steel barrels and containers, has bought a 25-acre site here and will build a one-story plant, the third addition to the company's plants in a year. Brown & Matthews Inc., New York, has the general contract.



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		REDUCING RATINGS AT 5000 RPM									
		100	200	300	400	500	600	700	800	900	1000
1	1.10	4.00	2.00	1.33	1.00	0.75	0.60	0.50	0.43	0.37	0.33
2	1.25	4.50	2.25	1.50	1.12	0.85	0.68	0.56	0.47	0.40	0.36
3	1.50	5.00	2.50	1.67	1.25	0.94	0.75	0.62	0.52	0.44	0.40
4	1.75	5.50	2.75	1.83	1.38	1.03	0.82	0.68	0.57	0.48	0.44
5	2.00	6.00	3.00	2.00	1.50	1.12	0.89	0.74	0.62	0.52	0.48
6	2.25	6.50	3.25	2.17	1.63	1.22	0.96	0.80	0.67	0.56	0.52
7	2.50	7.00	3.50	2.33	1.75	1.33	1.03	0.86	0.72	0.60	0.56
8	2.75	7.50	3.75	2.50	1.88	1.44	1.11	0.92	0.77	0.64	0.60
9	3.00	8.00	4.00	2.67	2.00	1.56	1.20	1.00	0.84	0.70	0.66
10	3.25	8.50	4.25	2.83	2.13	1.67	1.28	1.06	0.89	0.74	0.70
11	3.50	9.00	4.50	3.00	2.25	1.78	1.37	1.14	0.95	0.79	0.75
12	3.75	9.50	4.75	3.17	2.38	1.88	1.46	1.22	1.02	0.85	0.81
13	4.00	10.00	5.00	3.33	2.50	2.00	1.56	1.30	1.10	0.92	0.88
14	4.25	10.50	5.25	3.50	2.63	2.11	1.65	1.38	1.16	0.97	0.93
15	4.50	11.00	5.50	3.67	2.75	2.22	1.74	1.46	1.23	1.03	0.99
16	4.75	11.50	5.75	3.83	2.88	2.33	1.83	1.54	1.30	1.09	1.05
17	5.00	12.00	6.00	4.00	3.00	2.44	1.92	1.62	1.37	1.15	1.11
18	5.25	12.50	6.25	4.17	3.13	2.56	2.01	1.70	1.44	1.21	1.17
19	5.50	13.00	6.50	4.33	3.25	2.67	2.10	1.78	1.51	1.27	1.23
20	5.75	13.50	6.75	4.50	3.38	2.78	2.19	1.86	1.58	1.33	1.29
21	6.00	14.00	7.00	4.67	3.50	2.89	2.28	1.94	1.65	1.39	1.35
22	6.25	14.50	7.25	4.83	3.63	3.00	2.37	2.02	1.72	1.45	1.41
23	6.50	15.00	7.50	5.00	3.75	3.11	2.46	2.10	1.80	1.51	1.47
24	6.75	15.50	7.75	5.17	3.88	3.22	2.55	2.18	1.87	1.57	1.53
25	7.00	16.00	8.00	5.33	4.00	3.33	2.64	2.26	1.95	1.63	1.59
26	7.25	16.50	8.25	5.50	4.13	3.44	2.73	2.34	2.02	1.69	1.65
27	7.50	17.00	8.50	5.67	4.25	3.56	2.82	2.42	2.10	1.75	1.71
28	7.75	17.50	8.75	5.83	4.38	3.67	2.91	2.50	2.17	1.81	1.77
29	8.00	18.00	9.00	6.00	4.50	3.78	3.00	2.58	2.25	1.87	1.83
30	8.25	18.50	9.25	6.17	4.63	3.89	3.09	2.66	2.32	1.93	1.89

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WASHINGTON — Bureau of supplies and accounts, navy department, will receive bids as follows: Aug. 13, schedule 2618, four motor-driven vertical turret lathes for Newport, R. I.; schedule 2627, motor-driven toolroom precision lathe for White Plains, Md.; schedule 2626, motor-driven heavy-duty lathe for White Plains, Md.; Aug. 16, schedule 2631, two motor-driven horizontal milling machines for South Boston, Mass.; schedule 2632, two motor-driven heavy-duty vertical milling machines for Portsmouth, N. H.; schedule 2633, motor-driven milling machine for Boston; schedule 2634, two motor-driven plate scarfing and plate edge planers for Philadelphia; schedule, 2643, steam drophammer for Norfolk, Va.; schedule 2644, motor-driven vertical turret lathe for Philadelphia; schedule 2645, three electrically controlled motor-driven lathes for Newport, R. I.; schedule 2646, two motor-driven air hammers for Norfolk, Va.; schedule 2652, twenty-eight motor-driven heavy-duty engine lathes for Portsmouth, N. H.; schedule 2636, two motor-driven vertical-type milling machines; schedule 2637, two motor-driven horizontal boring, drilling and milling machines for Philadelphia; schedule 2642, motor-driven open side planer for Norfolk, Va.; schedule 2654, twenty-six motor-driven medium heavy-duty lathes for Boston; schedule 2657, steam or air-driven forging hammer for Boston; schedule 2662, ten motor-driven geared-head engine lathes for Newport, R. I.; schedule 2663, six motor-driven turret lathes and equipment for Newport, R. I.

WASHINGTON—Rural electrification administration of department of agriculture, Harry Slattery, administrator, has invited suppliers of poles, wire, transformers and pole line hardware to confer with him on rural construction requirements for the coming year in connection with the \$100,000,000 program approved by congress.

Kentucky

MADISONVILLE, KY.—City has had

survey made by Burns & McDonnell Engineering Co., 107 West Linwood avenue, Kansas City, Mo., for power plant to cost about \$450,000. Bond issue is projected.

Tennessee

CHATTANOOGA, TENN.—Lloyd E. Jones Co., Central avenue, has bought site on Manufacturers road and will build steel fabricating plant 180 x 200 feet, equipped with 20-ton traveling crane.

NASHVILLE, TENN.—Nashville electric power board plans expenditure of \$650,000 for additions and improvements during new fiscal year.

Virginia

NEWPORT NEWS, VA.—Newport News Shipbuilding & Dry Dock Co. is about to build a shipway and dry dock designed for production of large aircraft carriers. Another shipway is also under consideration.

RICHMOND, VA.—Reynolds Metals Co., Federal Reserve Bank building, will erect plant to produce aluminum, site not selected, first unit to have capacity of 20,000,000 pounds of aluminum annually. Ultimate plant will contain three such units. Company has RFC loan of \$15,800,000.

Missouri

JEFFERSON CITY, MO.—Bi-partisan advisory board, state building commission, Edgar M. Eagan, acting secretary, is taking bids to Aug. 26 on construction of deep well, pump, pumphouse and piping, according to plans obtainable from E. L. Williams, chief engineer, Jefferson City.

MOUNT VERNON, MO.—Bi-partisan advisory board, state building commission, Edgar M. Eagan, acting secretary, is taking bids to Aug. 26, at Jefferson City, Mo., for installation of boiler,

stoker, power plant piping plant and boiler instruments at state sanitorium. Plans from E. L. Williams, chief engineer, Jefferson City.

ST. LOUIS—Electric Slug Rejector & Mfg. Co., I. J. Lee, president, 703 Academy avenue, has been incorporated with \$60,000 capital to manufacture slug rejectors for coin-operated machines.

ST. LOUIS — Quick Meal division, American Stove Co., Arthur Stockstrom, president, 2001 South Kingshighway boulevard, plans a one-story addition for manufacturing purposes, to cost about \$300,000, with equipment.

ST. LOUIS—Carter Carburetor Corp., Hugh H. C. Weed, vice president, 2840 North Spring avenue, has started erection of a four-story boilerhouse addition with 67,000 square feet floor space, to cost about \$200,000.

ST. LOUIS—A. Leschen & Sons Rope Co., Harry J. Leschen, president, 5909 Kennerly avenue, plans an addition containing 5250 square feet floor space, including traveling crane and other materials handling equipment. Cost, with equipment, over \$65,000.

ST. LOUIS—Missouri Boiler & Sheet Iron Works, Emil N. Tolkacz, president, 908 South Twenty-third street, is building a one-story addition with 7040 square feet floor space, costing about \$40,000, with equipment.

ST. LOUIS—Messmer Brass Co., Joseph Messmer, president, 2700 South Seventh street, has bought adjoining property and plans a plant addition containing 24,000 square feet of floor space.

Wisconsin

MADISON, WIS.—Deere & Co., Moline, Ill., will build a plant addition 120 x 230 feet here, with electrical equipment, at total cost of \$125,000.

WAUSAU, WIS.—Minnesota Mining & Mfg. Co., manufacturer of abrasives will let contract soon for several plant additions here, including laboratory, warehouse, etc. Toltz, King & Day Inc., Pioneer building, St. Paul, is architect and engineer.

Minnesota

KERKOVEN, MINN.—City, J. F. Floren, clerk, will take bids about Aug. 15 for construction of municipal power plant and distribution system costing about \$100,000. Ralph D. Thomas & Associates, 1200 Second avenue South, Minneapolis, are consulting engineers.

MINNEAPOLIS, MINN.—City, E. F. McMillin, clerk, takes bids to Aug. 15 for electric light, heat and power plant, including generating machinery, powerhouse, distribution system and accessories. G. M. Orr & Co., 342 Baker Arcade building, Minneapolis, are consulting engineers.

NEWPORT, MINN.—Cudahy Packing Co. will start construction soon on a waste disposal plant to cost about \$200,000. Alvord, Burdick & Howson, 20 North Wacker drive, Chicago, are consulting engineers.

RUSH CITY, MINN.—City, Harry L. Sherman, clerk, will take bids about Aug. 15 for construction of municipal power plant and distribution system, costing about \$200,000. Ralph D. Thomas & Associates, 1200 Second avenue South, Minneapolis, are consulting engineers.

ST. PAUL—E. A. Walsh, state adjutant, state capitol, is having plans prepared for a hangar 146 x 470 feet at the municipal airport for 109th air squadron.

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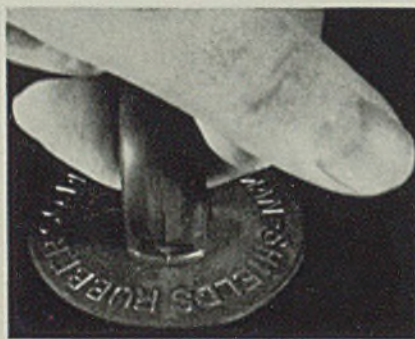
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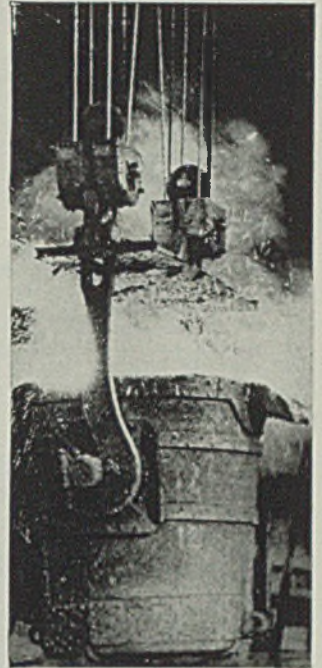


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WILLMAR, MINN.—City council, E. H. Brogren, city clerk, has approved construction of a city garage and maintenance shop, 44 x 112 feet.

Texas

HOUSTON, TEX.—Arkansas Portland Cement Co., Okay, Ark., J. F. Kaufman, superintendent, has had plans made tentatively for doubling capacity of local plant to increase finish and raw grinding departments, install additional kiln and four concrete silos 30 feet in diameter and 90 feet high.

Kansas

KANSAS CITY, KANS.—Rearwin Aircraft & Engines Inc., Fairfax airport, will build a one-story plant addition for parts production and assembly, to cost \$50,000 with equipment.

WICHITA, KANS.—Beech Aircraft Co., R.F.D. No. 4, Wichita, has let general contract for three one-story buildings as additions to its parts and assembly plant to O. W. Armagost & Son, 915 West Thirteenth street. Overend & Boucher, Brown building, are architects. (Noted June 10.)

North Dakota

DEVILS LAKE, N. DAK.—North Dakota state highway department, J. S. Lamb, highway commissioner, Bismarck, N. Dak., plans one-story maintenance shop for division highway office, costing \$30,000.

GRAFTON, N. DAK.—Walsh county plans construction garage 40 x 100 feet and maintenance shop 50 x 100 feet. Theo. B. Wells, Grand Forks, N. Dak., is architect.

Iowa

BROOKLYN, IOWA—REA has allotted \$160,000 to T. I. P. rural electric co-operative to finance 175 miles of rural lines. K. R. Brown, 803 Valley Bank building,

Des Moines, Iowa, is consulting engineer.

MERON, IOWA—J. M. Mason, town clerk, will take bids soon for a waterworks system, including a 50,000-gallon elevated tank, watermains, pumps, etc., to cost about \$25,000. C. L. Snyder Engineering Co., Columbus, O., is engineer.

MUSCATINE, IOWA—City, H. H. Hanson, recorder, is having survey made for construction of sewage disposal plant.

WATERLOO, IOWA—City, Knapp Mathews, clerk, is taking bids on four sewage pumps at cost of about \$8000. Nathan B. Barber is city engineer.

WATERLOO, IOWA—Rath Packing Co., John W. Rath, president, has awarded general contract to W. A. Klinger Inc., Warnock building, Sioux City, Iowa, for four-story packing plant addition 55 x 82 feet. Henscheln, Everts & Crombie, 59 East Van Buren street, Chicago, are engineers.

WOODBINE, IOWA—City will build a municipal power plant, including three diesel generators, 600 to 750 BHP. capacity, accessories and distributing system. A. S. Harrington, Brown building, Omaha, Nebr., is consulting engineer.

Montana

HARDIN, MONT.—REA has allotted \$188,000 to Big Horn electric co-operative, Carl J. Sloan, president, to finance 157 miles of rural lines, serving 490 customers.

KALISPEL, MONT.—City, F. J. Robischon, clerk, has selected Joseph Schmidt, Lewiston, Mont., as consulting engineer to prepare plans for sewage disposal plant and appurtenances and 15,000 feet of sewer, at cost of about \$53,000.

MISSOULA, MONT.—Montana Power Co. plans 20-inch steel pipe line near Missoula, costing \$50,000. C. H. Christensen is division manager.

TOWNSEND, MONT.—Bond issue of \$75,000 carried at recent election, to finance sewage disposal plant and sani-

tary sewers, to be built this fall. Frank T. Hooks is city clerk and Oscar A. Baarson, Helena, Mont., is consulting engineer.

Idaho

LEWISTON, IDAHO—REA has allotted \$192,000 to Clearwater rural electric co-operative to finance 130 miles transmission lines.

California

BURBANK, CALIF.—Vega Airplane Co., 3815 Empire avenue, will build a warehouse costing \$11,000.

BURBANK, CALIF.—Lockheed Aircraft Corp., 1705 Victory place, will build an assembly plant costing \$48,000.

BURBANK, CALIF.—Premier Metal-hung Window Corp. has been organized with \$60,000 capital, represented by Edward C. Olson, 224 North Olive avenue, Burbank.

DOWNEY, CALIF.—Vultee Aircraft Co., 842 Lakewood avenue, will build an office building with 5700 square feet floor space, costing \$20,000.

EL SEGUNDO, CALIF.—Walters Aircraft Corp. has been organized with \$200,000 capital by Thomas Walters, Los Angeles, and Edward Lawler, El Segundo. Bernard Lawler, 25 Converse building, El Segundo, Calif., is correspondent.

PASADENA, CALIF.—Vard Mechanical Laboratory is building office and factory building, 75 x 120 feet, costing about \$22,500.

SAN DIEGO, CALIF.—Ryan Aeronautical Co., 2930 Pacific avenue, will build a plant addition covering about 26,000 square feet floor space at cost of \$75,000.

Canada

HAMILTON, ONT.—Canadian Westinghouse Co. Ltd., 286 Sanford avenue, will take bids soon on a 65 x 450-foot addition on Aberdeen avenue, including 60-foot traveling crane. Hutton & Souter, 36 James street South, Hamilton, are architects.

HAMILTON, ONT.—B. Greening Wire Co. Ltd., Queen street North, has given general contract for \$25,000 plant addition to Frid Construction Co. Ltd., 128 King street East. Prack & Prack, 36 James street South, are architects.

LONG BRANCH, ONT.—Department of munitions and supply, Ottawa, Ont., will build an ordnance plant on Lake Shore road, here, including 100,000 square feet floor space. C. D. Howe, Ottawa, Ont., is in charge.

TORONTO, ONT.—Precco Progress & Engineering Corp., 60 Front street West, has been organized to manufacture aircraft parts, wheels, brakes, undercarriages, etc., and has taken over plant on Jarvis street formerly occupied by F. A. Colyer Co., pending plant erection.

TORONTO, ONT.—John Inglis Co. Ltd., Strachan avenue, is considering plans for building 45 x 1100 feet, to double facilities for gun production.

TORONTO, ONT.—Modern Tool Works Ltd., 15 Van Horne street, has taken over building at 67 Pelham avenue, and will install horizontal boring and gear-cutting machinery costing \$55,000.

TORONTO, ONT.—Hamilton Gear & Machine Co. Ltd., 76 Van Horne street, will build a plant addition costing \$75,000.

SOREL, QUE.—Sorel Steel Foundries Ltd. has awarded structural steel for an \$80,000 plant addition, to Ferand & Delorme Ltd., 385 St. Martin street.

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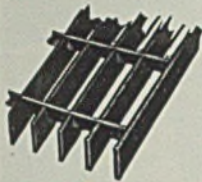


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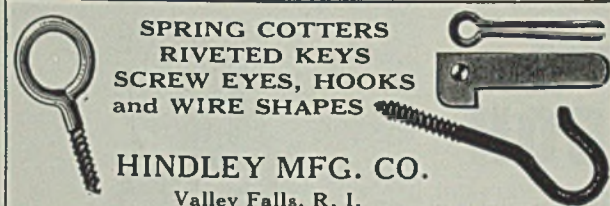
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