STEEL

PRODUCTION · PROCESSING · DISTRIBUTION · USE

For forty-eight years—IRON TRADE REVIEW

Contents . . . . April 26, 1937

Volume 100 - No. 17

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single issues (current copies) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1937 by the Penton Publishing Co.

Published by the PENTON PUBLISHING CO., Penton Building, Cleveland, O.
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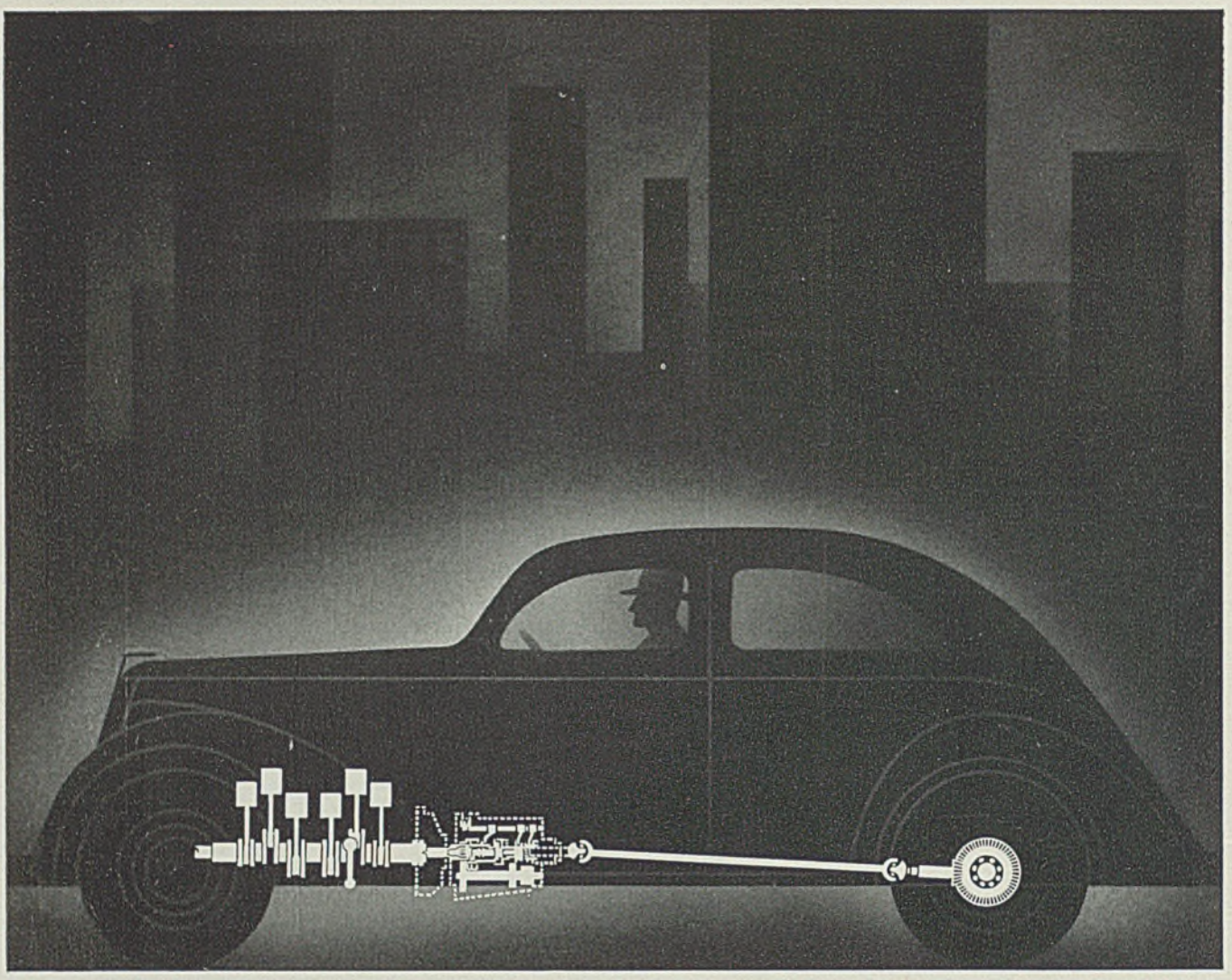

The "backbone" of the modern automobile

To THE automotive industry's everlasting credit it can be said that it has never relaxed in striving to make motor cars still safer, still more efficient, and of still greater dollar-for-dollar value. "Make it tougher, stronger, longer lasting," is the relentless self-imposed command. And, though the limits often seem to have been reached, engineering and metallurgical science usually manages to raise the standard another notch.

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As the Editor Views the News

SOME of the uncertainties which have kept many business men in a constant state of jitters during recent months now seem to be fading out of the picture. The threat of labor trouble seems to be diminishing. Questions as to how much of an additional burden would be imposed by sharp wage increases are in process of being answered. Prices, which a month ago seemed to be headed into speculative channels, now are tending toward more rational levels. Demand for materials and industrial products (p. 23)—once in danger of being artificially expanded to top-heavy proportions—is assuming a more realistic and substantial character.

• • •

All of these factors are working toward short-term stability at home and abroad. Steel output in the United States and in England is establishing a new all-time peak. While the race for armaments is a strong influence in the European situation, that does not detract from the fact that a strong resumption of normal activity in construction, engineering, railroads, shipbuilding, automobiles and domestic appliances (p. 27) is occurring in England and on the continent. In the United States it is gratifying to note that the tendency in fabricated structural steel (p. 25) is away from government-sponsored projects and toward privately financed work.

Stability Is In Prospect

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In view of this encouraging prospect for stability during the next few months, the present would be an ideal time for the federal administration to change its tactics. Instead of continuing to keep the nation in a turmoil over threatened uncertainties and experiments, it might well introduce in reality the "breathing spell" which the President once promised but never delivered. Such freedom from meddlesome and unnecessary governmental activity would be a particular godsend if it were accompanied by a sincere effort on the part of the executive and legislative divisions in Washington to introduce economies in the expenditure of public funds and to begin to improve the government's financial position. This would be a wonderful service to the cause of real recovery. It would help, more than anything else that could be done under government auspices, to prolong the life of the present indicated stability.

Good Time for Breathing Spell

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Residential construction throughout the country is proceeding at a rapid rate, but there appears to be some reluctance to make extensive use of steel-frame or all-steel houses, despite the fact a wide variety of designs in steel is available. It is difficult to ascertain just where the fault lies. One engineer sees objections in the necessity of fitting parts together in the field, and in welding, drilling and tapping parts for field assembly. As a solution he has developed (p. 46) an all-steel dwelling with basic framework bolted together and lighter preformed sheet steel members rigidly interlocked in such a way as to allow the structure to expand or contract with temperature changes. No riveting or welding required.

Another Idea In Steel Houses

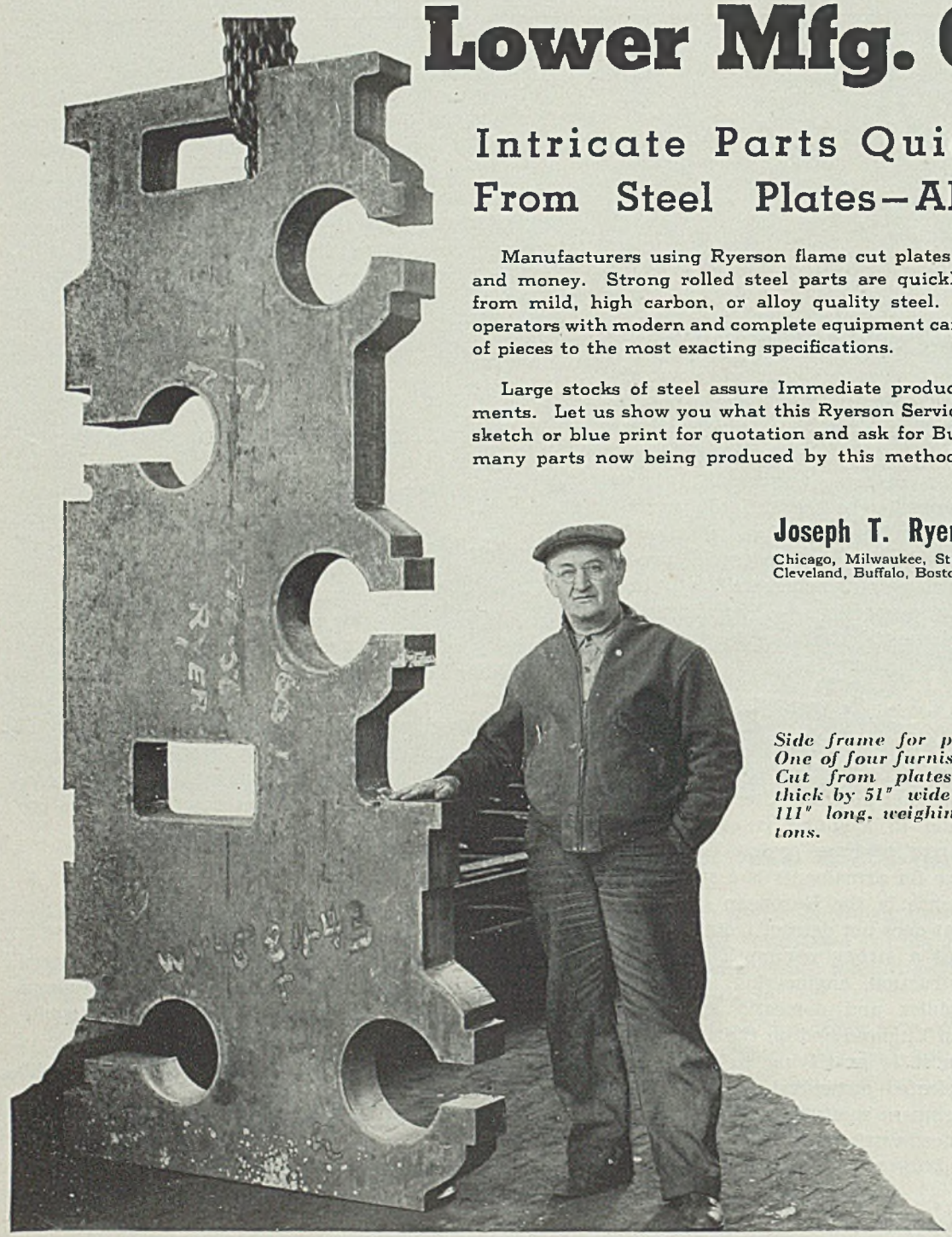
• • •

Mechanization of hand sheet mills lately has placed these units in a position to compete with continuous strip-sheet mills, especially on "short" or small-tonnage orders, and the future of these modernized mills (p. 60) appears bright. . . . A leading industrial relations director gives his formula (p. 77) for creating better understanding between management and men: (1) Be scrupulously fair in dealing with employes; (2) Be honest; (3) Attempt to create a mutual understanding of problems. . . . A midwestern plant, faced with the problem of erecting lineshafts where no ceiling was available (p. 67), clamped 10-inch I-beams between concrete columns and then clamped wood planks between the I-beams to support the shafting.

Mechanization Saves the Day

E. L. Shaner

Ryerson Flame Cut Plates Lower Mfg. Costs



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Solder
Refined Iron
Stainless Steel
Babbitt
Alloy Steel
Tool Steel
Floor Plates
Safety Treads

RYERSON

Wage, Price, Production Developments

Point to More Stability

STEEL wage and price developments in recent weeks appear to have provided the setting for what may be an extended period of stabilization for the industry.

Admittedly, expectations of stability are tempered by memories of the turbulent times experienced the past few years as well as by the knowledge that many unusual factors today guide the path of national economics.

Still the short-range view indicates the continuation of an even trend in steel production, steady prices and a more balanced situation between supply and demand. Such is the outlook now for most, if not all, of the balance of 1937.

Steelmakers announced last week an extension of current prices into third quarter. The action was taken sooner than usual and was prompted by the fact that second quarter capacity already has been absorbed by orders at hand.

Stability Rather Than Inflation

Probably the sellers' market existing today not only in this country but also abroad could have taken further price advances in stride, but the decision to go along at current figures is considered a constructive move in the direction of stability rather than inflation.

Whether prices can equal the steadiness attained from late 1934 to early 1936 is questionable. Changes were minor during that period, some products holding at the same figures for 24 months. Any marked dropping off in steel demand would be reflected in lower prices, while a general inflationary trend or successful demands for materially higher wages would move prices higher.

Producers now have an approximate idea of their costs during the coming several months. Not until the end of April will they have a full month's figures covering the cost of the recent wage boost, but the new scale has been in effect sufficiently long to give a fair idea of these charges. Iron ore prices have been established.

Scrap is a temperamental commodity, susceptible to rapid price changes. The recent break in the scrap market seems to have demonstrated, however, that for the present at least there is a limit to which quotations can ascend before the heavier flow of material which these high values set in motion starts to weaken the price structure.

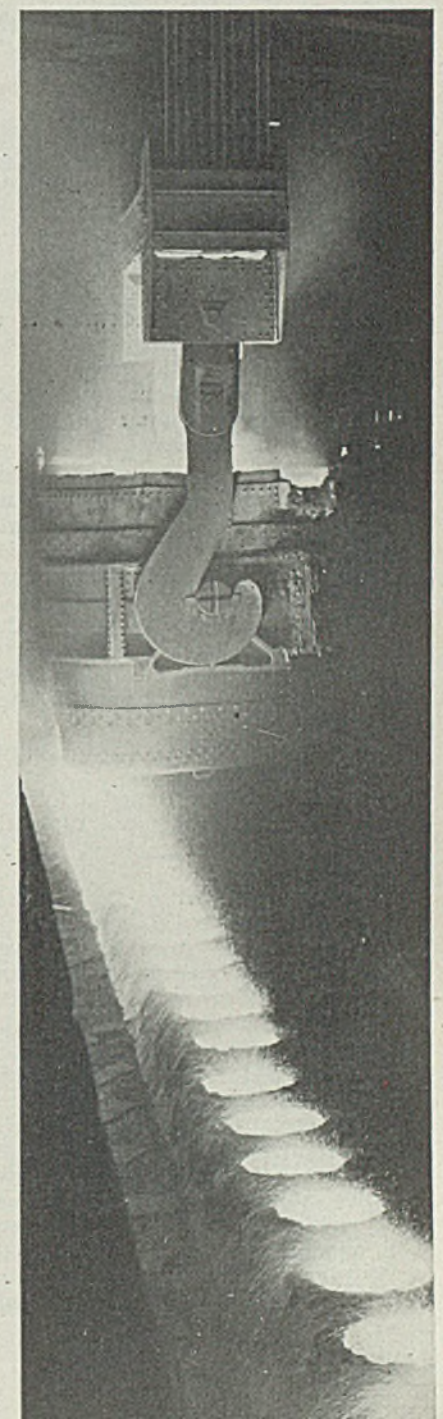
Scrap Prices at Peak?

It seems unlikely that the price of scrap during the next 60 days will average higher than it has the past two months. It is hazardous to predict over a longer period, but there is precedent for the expectation that scrap prices will not break through their recent peaks before the end of the third quarter. In the past when scrap has had a sustained advance followed by a reaction, the immediate recovery has been slight.

While steelmaking has continued below full theoretical capacity so far this year, operations have been pushed to the limit of the facilities available for use. Additional units steadily have been pressed into service, but some idle open-hearth furnaces which still are considered in figuring operating percentages are old and uneconomical, hardly worth the investment necessary to rehabilitate them. Operations, consequently, have about reached their limit.

With backlogs extending through July on most finished steel products and through third quarter on some items, it will be necessary for production schedules to be held near their current rate at least well into the summer.

Not since war years have opera-



tions persisted so steadily at a high level. In 1926 and 1928 a dip developed during the second quarter. In 1929 the slide started after June. The current peak has been attained after consistent advances which prevailed with only minor interruptions throughout last year.

Steady production at a high level naturally is welcomed by the industry since lower costs go hand in hand with uniformly heavy schedules. Less congestion or order books and absence of an inflationary price trend also are desired. Extension of present prices is expected to quiet somewhat the recent scramble for steel in those cases where price inflation fears were responsible. With mills geared to a higher rate of shipment there is added opportunity for making inroads into backlogs now existing.

The probable trend in consumption over the balance of the year is predictable in only a general way, but it seems natural to expect a falling off in needs of some users, including the automotive industry, by summer. Requirements of railroads should continue fairly steady. Building, still lagging in the recovery race, has some handicaps to overcome before it can match the comeback in general business activity.

SWOC Now Claims 76 Contracts with Companies Employing Over 400,000

ACCORDING to the Steel Workers Organization committee, 76 contracts have been signed since March 1 with iron, steel and metalworking companies, and 559 additional lodges have been formed for the Amalgamated Association of Iron, Steel and Tin Workers.

The number of employes in plants covered by the 76 contracts is reported to exceed 400,000. The committee continues to issue lists of company names as they are signed, these including some important metalworking interests.

Last week it announced it had signed contracts with Wheeling Steel Corp., for all of its plants; McKeesport Tin Plate Corp., McKeesport, Pa., and Blair Strip Steel Co., New Castle, Pa.

The committee also stated that "preliminary conferences" started Thursday between H. E. Lewis, chairman, Jones & Laughlin Steel Corp., and Philip Murray, SWOC chairman, relative to a wage agreement.

"Mr. Murray presented a form of contract and hopes for a reply the latter part of next week," it announced.

Negotiations for a contract with American Bridge Co., subsidiary of United States Steel Corp., were completed covering northern plants of the company, and, it is understood, is to be signed shortly. Details concerning the southern plant of the company, the Virginia Bridge & Iron Co., are to be worked out at conferences in Birmingham.

Reorganization of many of the steel industry's employe representative groups is under way, following withdrawal of financial support in compliance with provisions of the Wagner act.

Employes of Jones & Laughlin Steel Corp., Pittsburgh, and Weirton Steel Co., Weirton, W. Va., were among the first to consider revising their representative plans.

Thomas Owens, chairman of the ERP at the Jones & Laughlin's South Side works said that the revised organization probably would be known as the Pittsburgh Works Employes association, which would collect dues of 25 cents per month and remain independent of outside organizations.

Thomas Grogan, chairman of the ERP in the Vandergrift plant of Carnegie-Illinois Steel Corp., announced that his group had decided to disband.

Abolishes Industrial Council

International Harvester Co. has discarded its industrial council plan at all works in the United States. In a letter to employes, S. G. McAllister, president, stated, however, that the management will continue its past policy of meeting and dealing with individual employes or with the authorized representatives of any groups who wish to discuss any matter.

SWOC announced the appointment of Elmer J. Maloy, former employe representative in the Duquesne works of Carnegie-Illinois, as "contact man" between plants of Carnegie-Illinois and company officials in matters of grievances. A few days later Maloy said he had completed negotiations centering around application of the 40-hour week, and that the following notice had been sent to all mills:

"It has now been ruled that we will pay time and one-half for all hours worked in excess of 40 in any established seven-day work period of 168 hours. Turns worked need not be on consecutive days. The established 168-hour work week will be from 11 p.m. Saturday to 11 p.m. Saturday. This ruling is retroactive to March 16."

According to Maloy, some of the workers complained they were working more than 40 hours in a swing-turn arrangement which permitted them to return to their jobs after 24 hours had elapsed from end of one turn to beginning of another.

Comment

STRIKES LIKE "TWO WEEKS RAIN AT PLOWING TIME"

AUTOMOBILE production will continue at high levels through the summer, says E. J. Kulas, president, Otis Steel Co. and Midland Steel Products Co., Cleveland.

"The outlook for the automobile business for the remainder of the year has not suffered because of labor difficulties. It is true that strikes in automobile plants have considerably reduced output thus far this year—but this represents in the main simply a delay in production. Strikes have meant just about what two weeks' of rain would mean to farmers at plowing time."

PUBLIC DETERMINES WAGES, SAYS MR. VERITY

Both capital and labor will profit most when working together in a cooperative spirit, asserted George M. Verity, founder and chairman, the American Rolling Mill Co., Middletown, O., over the radio last week.

"In the final analysis the public determines wages, by their acceptance or rejection of a product's price," he stated.

Middletown citizens last week presented Mr. Verity a bronze plaque likeness of himself inscribed "in grateful appreciation of his example and encouragement in the development of a higher type of citizenship in our community." The occasion was Mr. Verity's 72nd birthday.

Grace Declines Continuance As Institute President

Speculation as to who will be the next president of the American Iron and Steel institute, which will hold its general meeting in New York, May 27, is developing as Eugene G. Grace's second term nears an end.

Under the institute's by-laws the president cannot serve longer than 740 days, whether or not consecutive. A movement under way in some quarters to waive this rule and continue him in office is reported to have met with vigorous opposition by Mr. Grace. He is known to approve strongly the by-laws on this point and to have refused to be a candidate.

Industry Taking Up Slack In Government Construction

FOR some months federal construction work requiring structural steel has been tapering, while the slack has been more than taken up by private initiative in the industrial field.

This situation was apparent some time before the President's recent observation concerning high steel prices.

Public work made possible by federal loans or grants to states and municipalities still is an important factor, but such projects are taking relatively little steel, per job. Fully as many bridges are planned, but most of them are smaller than formerly; post offices coming out for bids are fewer in number, and generally for small towns or cities, with little structural steel.

Private Building Bulks Large

Several large public engineering works are going ahead, notably tunnels and subways in New York, but typical of how private work is coming along in greater volume is the record of building permits in New York state during the first quarter. Estimated cost of private construction there was $93,811,681, with public work only $12,287,621.

Tonnage included in contracts for fabricated structural steel throughout the country in the first four months this year surpasses by more than 25 per cent that booked during the same period last year. The number of individual contracts are far more numerous. During the past two months, both the number of structural steel projects and the weight of plain material booked, fabricated and shipped has turned upward sharply compared with last year.

By May 1 close to 500,000 tons will have been awarded fabricators since Jan. 1. First quarter bookings last year totaled 367,224 tons and the four-months volume fell considerably under a half-million tons.

The American Institute of Steel Construction reports the following comparation bookings:

	1937	1936
	Tons	
January	130,651	120,102
February	88,946	140,411
March	180,000	106,711
Totals	399,597	367,224

Backlogs, tonnage booked for fabrication, but not shipped aggregated about 100,000 tons, or 25 per cent larger at the start of the second quarter than at the same time, 1936. During April this ratio has been slightly increased.

Expiring protections on specified projects with rising prices on plain material, fabricating and other costs have driven in much business in the last eight weeks. Seasonal influences also are adding to the momentum.

Compared with the high activity of 1929-1931, structural steel fabrication and erection this year have been 55 to 60 per cent of the average of those periods.

Tonnage figures compared alone, however, do not give a true gage to the upturn in construction and current building activity. New trends developed in the latter half of last year. Construction jobs taking 100 to 500 tons each have been and are multiplying rapidly. Those ranging from 1500 to 1000 tons have about equaled the number of last year, contracts calling for more than 1500 tons have been fewer. Those under 100 tons are much more numerous.

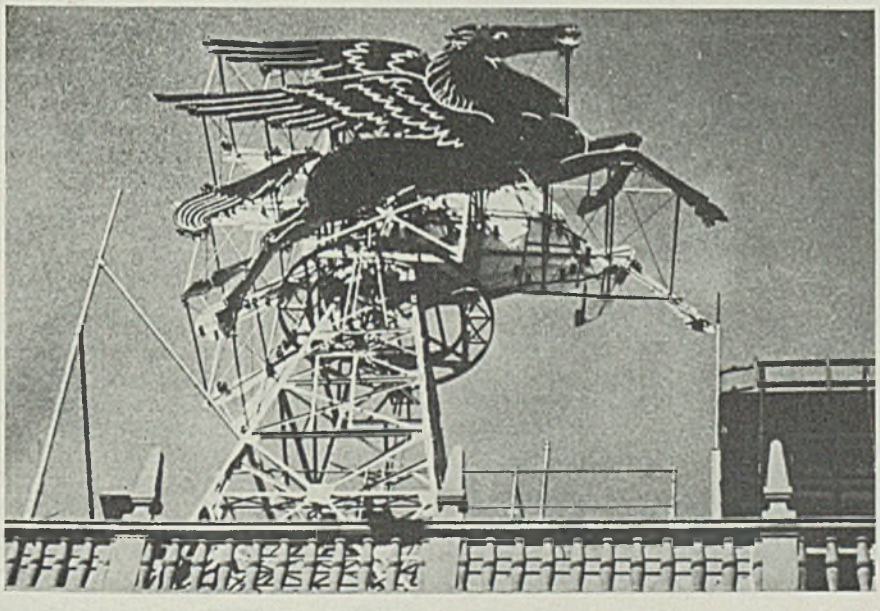
Welding Stimulates Construction

More, but smaller contracts, have resulted in lighter sections going through the shops. In some instances welding has stimulated construction work. Lighter fastenings and joints are used on a greater part of shop work. The smaller independent district fabricators have benefited with a greater spreading of fabrication among these shops. It is conservatively estimated independents are comparatively busier than the mill fabricating shops. The trend is toward a type of construction well fitted to facilities of the smaller plants, often located reasonably near the site.

New industrial plants, expansions and repairs are taking more steel. Not since 1929-31 has the demand been as heavy. This improvement has come along with the upturn in expenditures for capital goods. The steel industry itself has been a leader in the industrial expansion.

A year ago, and for several years previous, public building supported the structural backlog. Many of the individual contracts called for large tonnage. A few such projects frequently made up the bulk of the weekly and monthly totals. The type of work, however, did not appeal and was not available to a considerable number of fabricators.

Mythology Gave the Idea; Steel the Means



THIS illuminated Pegasus atop the Magnolia Petroleum building in Dallas, Tex., is 30 x 40 feet. It revolves upon a 50-foot steel tower weighing 12,000 pounds. The sign itself, made largely of steel, weighs 5000 pounds. It is revolved by a 3 horsepower electric motor through the medium of a Link-Belt Co. chain drive. Photo courtesy Texlite Inc., Dallas, Tex.

80 Submit Bridge Designs

Highway bridge designs were submitted by 80 engineering and architectural students at 16 colleges in the ninth annual highway bridge design competition sponsored by the American Institute of Steel Construction, New York. Cash awards were presented for the three adjudged best and honorable mention for the next three.

Europe at Peak Output Feels Shortage of Raw Materials

By VINCENT DELPORT
European Manager, STEEL

JUST about a year ago, the first definite and active signs of business recovery on the continent of Europe were reported in these columns. Sometime earlier there had been occasion to mention the revival of trade which had started in Great Britain, where there was talk of shortage of pig iron and semi-finished steel at the beginning of last year.

In the past 12 months consumption generally, and in the steel industry in particular, has risen by leaps and bounds and has outstripped production capacity, taxing to the limit the resources of every producing country.

The race for armaments which has extended all over Europe and has reached proportions hitherto unequalled in peace time, is partly responsible for the increased demand for steel, but it is possible that the spectacular aspect of this particular field disguises the strong general resumption of more normal activities in construction, engineering, railroads, shipbuilding, automobiles and domestic appliances.

It is true that government contracts for the army, navy and air force take precedence over private enterprise and that certain lines of manufacture may suffer in consequence, but it may be said that the present intensified rhythm of production is due in the main to a revival of business confidence. In some instances, however, governments have been responsible for work and contracts of a certain artificial nature.

Situation Changed Rapidly

There is another aspect of the present position that is somewhat disturbing. Not so long ago, the business world, both in Europe and America, was lamenting the almost hopeless task of resuming so-called normal industrial and trade conditions. Now the world has hardly had time to get used to a new state of affairs which, in some instances, almost approaches prosperity, and another kind of crisis appears, due to the shortage of raw materials and, here and there, the inadequacy of means of production.

Furthermore, and notwithstanding improving conditions, sporadic disturbances in the relations between employers and labor have sprung up in various places and, at times, have assumed a novel and apparently dangerous aspect. It would seem, therefore, that crises in the past, and even the more recent ones experienced by present generations, have not taught us to acquire foresight; or possibly we are not yet individually and collectively adapted to increasingly rapid material progress, which at times gets beyond control.

Shortage of raw materials and semi-manufactured products undoubtedly is one of the principal factors now retarding the evolution of the steel industry in Europe. One may wonder, however, whether this famine is not partly due to a panicky state of mind, inducing people to ask for more than they really want as a precaution against the possible arrival of that very shortage which such people are helping to create.

This view was expressed quite recently by the general manager of a leading British steel concern, who was addressing members of one of the works councils. He urged that people ask only for what they needed. Obviously, it is better reasonably to restrain oneself than to have to submit to various forms of official control and rationing.

The crux of the matter in this question of supply of raw materials is that the intensified demand is not restricted to one particular center, but has grown and expanded all over Europe and America during the same period. At present, Great Britain is producing at the rate of approximately 12,000,000 tons of steel and 8,000,000 tons of pig iron in one year. This is an all-time record for Britain, and furnaces are working to capacity.

Steel Outruns Pig Iron

Comparing with the previous year of combined high output, 1929, we find that in that year the output of steel was 9,636,000 tons, and pig iron, 7,589,000 tons. At the present stage, therefore, steel output has far outrun production of pig iron, and insofar as pig iron is a raw material as regards steel production, the situation is more critical today than it was in 1929.

The situation could be met if Britain could increase the volume of pig iron imports from other countries. But as the position repeats itself to a large extent in these countries, less foreign iron is available all round than there was in the past.

The Red Army Must Know Its Steel

BEGINNING a new five-year plan Russia includes visits to steel plants in its course of education for members of the workers' and peasants' red army. This illustration shows a group of recruits watching steel pouring into a ladle. The new five-year plan aims at production of 20,000,000 *tons of steel and* 16,000,000 *tons of pig iron in* 1937. *Sovfoto*

The same conditions apply to furnace coke, and scrap is perhaps even more difficult to procure than iron. The Spanish situation has caused a curtailment of iron ore supplies which affects Great Britain in particular, and Germany uses a considerable tonnage of Scandinavian ore, so that the ore position is not easy.

Apart from the question of actual supplies of raw materials, increasing costs also have to be taken account of. Since the beginning of the year, in Great Britain, the price of heavy steel scrap and of steelmaking pig iron has risen by a minimum of 10 per cent, and furnace coke by about 25 per cent. In certain Continental countries these prices, especially as regards pig iron and scrap, have increased to a still greater extent. Wages also have increased. As a result, the prices of finished steel products have themselves increased. As a result, the prices of finished steel products have themselves increased more or less substantially, both for home and export trade, all over Europe.

Demand for steel from all countries of the world has, however, become so much intensified that premiums of as much as 20 to 25 shillings (gold) per ton, according to the class of product, are being offered from overseas markets for reasonably prompt shipment.

The British Steel Export association is endeavoring to discourage this form of business and to maintain prices at a level proportionate with the recent rise in costs. An idea of the serious rise in prices recently attained is afforded by the official basis export quotation of the steel cartel for merchant bars, which is now £5 (gold) f.o.b. Antwerp, against £3 15s (gold) at the beginning of the year, an increase of 33 1/3 per cent.

Seek American Supplies

In the face of scarcity in nearly all lines of steel and iron Great Britain and Continental Europe have looked to the United States to supply raw and finished materials. Some large tonnages of pig iron have been engaged and tin plate has been bought in considerable total, at premium prices. Scrap in tremendous lots has been taken and recently efforts have been made to buy ferromanganese from the United States, thus reversing the usual current in that material.

As already stated, industrial activities in Great Britain generally at this time constitute a record. The number of persons employed March 15 was 11,242,000, according to the ministry of labor, the highest total ever recorded. The number of unemployed on the register was 1,601,201, which is 280,330 less than a year before. Most trades are benefiting from the revival but mainly the steel industry, construction, shipbuilding, automobiles, etc. The coronation preparations give a further fillip to retail trade. Active conditions can be expected to continue well into the early summer.

Production of steel ingots and castings in Great Britain in the first quarter this year amounted to 3,104,300 gross tons, compared with 2,830,300 tons in the period last year, while output of pig iron was 1,934,700 tons, against 1,813,800 tons in the first three months of 1936. This indicates the steady rate of high production, and also reflects gains made possible through additions to plant and modernization in 1936.

Situation Obscured in France

In France and Belgium there is, undeniably, a revival of industrial activities, but the situation is obscured, more especially in France, by difficult adjustments relative to higher wages and the shorter working week. The 40-hour week is being established in France in most fields, whereas in Belgium the measure is applied to so-called non-salubrious industries; it does not apply to steelworks and mills.

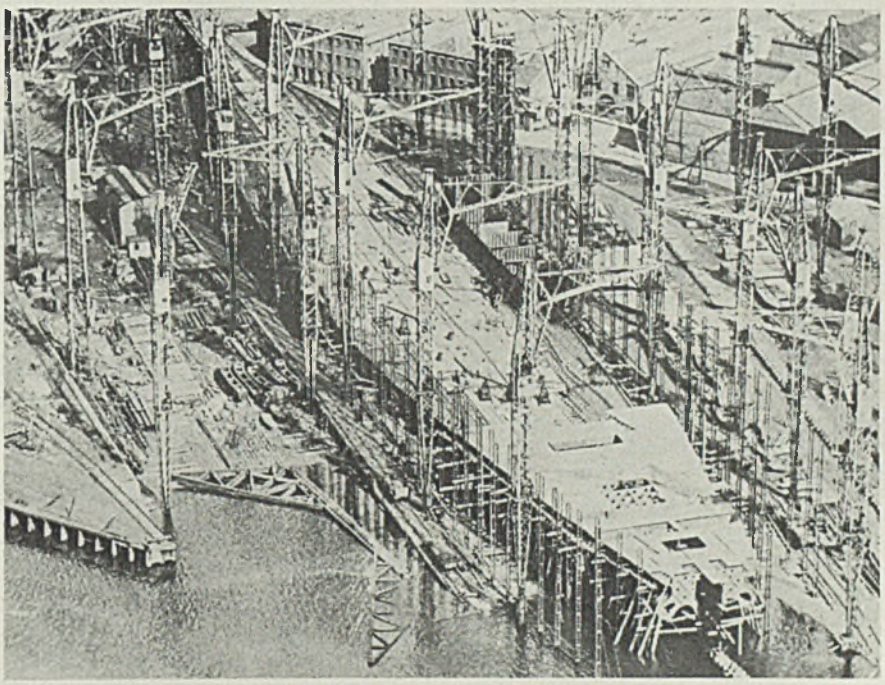
Every now and then strikes break out in France and are usually settled by substantial concessions to the workers. Thus the cost of production is rising, and the cost of living fatally rises, too, so that in a very short time the workers lose most of the purchasing power which they derive from higher wages.

In Germany and Italy conditions are active and steelworks are operating almost to capacity. The state takes a large part in giving work to industry. There is plenty of employment, but wages are relatively low, and the problems of national finance remain acute.

Russia is planning to embark upon a new five-year plan which provides for an output in 1937 of 16,000,000 tons of pig iron and 20,000,000 tons of steel, and she claims that the previous plan has been successfully achieved. Sweden, Czecho-Slovakia, Poland, to mention only steel-producing countries, also give the spectacle of considerable activities. All these countries are increasing their output of steel, but with the possible exception of Russia, none is reaching record outputs to the extent of British production figures.

The internationally known Schneider munitions works at Le Creusot, France, has been nationalized by a recent act of Parliament. It applies only to the arms-producing section of the company's works at Le Creusot and does not extend to Schneider factories at Havre, Bordeaux and elsewhere where locomotives, bridges, boilers, turbines and furnaces are manufactured.

Another Great Liner in Britain's Revived Shipbuilding



SHIPBUILDING is contributing considerably to heavy demand for steel in Great Britain. More tonnage is on the ways than at any time in the past seven years. This view shows "Cunarder 552"—not yet named, a sister ship of QUEEN MARY, *now under construction. About 35,000 tons of steel will be required for hull and fittings for the "Cunarder 522." Wide World photo*

Financial

NET profit of the Youngstown Sheet & Tube Co. for the first quarter amounted to $4,886,020, compared to $1,897,299 in the first quarter of 1936. The earnings figure is without deduction for any federal surtax undistributed profits, and is subject to adjustment in the annual closing of accounts.

Profit from operations before providing for depletion of minerals and plants but after deducting provision for estimated federal income tax.....	$7,599,347.23
Add other income.....	375,015.64
Together	$7,974,362.87
Deduct other charges.....	558,631.95
Balance	$7,415,730.92
Deduct interest on funded debt and other interest charges	758,294.88
Net profit before depreciation	$6,657,436.04
Deduct provision for depletion of minerals and depreciation of plants.....	1,771,416.48
Net profit for quarter ...	$4,886,019.56

* * *

A 63 per cent increase in 1937 first-quarter earnings over the corresponding 1936 period was reported by Allegheny Steel Co. April 20. Net profits were $551,054 after depreciation and taxes, excepting possible federal surtax on undistributed earnings. The earnings were equivalent, after deducting preferred dividends for the period, to 65 cents a share on 752,285 common shares. Net income for the corresponding 1936 period was $336,964, or 45 cents a share on 612,685 common shares.

* * *

Interlake Iron Corp.'s first quarter operations resulted in net profit of $372,202, equivalent to 18 cents a share on 2,000,000 no-par shares. This compares with $17,301, or 1 cent a share in first quarter 1936. The corporation's offering of $10,000,000 of ten-year sinking fund 4 per cent convertible debentures was completed last week, when an underwriting group headed by Hayden, Stone & Co. offered publicly the debentures not subscribed for through the exercise of warrants previously granted to common stockholders. Net proceeds will be applied to redemption of previous issues.

* * *

Acme Steel Co., Chicago, reports net income for the quarter ending March 31, as $1,094,941, equal to $3.33 a share on common stock. This compares with $391,853 in the quarter last year, and $711,022 in the final quarter of 1936.

* * *

Colorado Fuel & Iron Corp., Denver, reports net income of $532,283 for the quarter ending March 31, compared with $726,270 in the period last year. No provision has been made for possible surtax on undistributed profits.

* * *

Sharon Steel Corp.'s first quarter net profit was $475,778, against $482,482 in the preceding quarter and $212,615 in the first quarter last year.

* * *

Continental Steel Corp., Kokomo, Ind., has first quarter net income of $279,447, equal to $1.17 a common share. This compares with $87,280, or 21 cents a share last year.

* * *

KOPPERS CO. PROFITS DOUBLED IN YEAR

Koppers Co., Pittsburgh, reports for the year ending Dec. 31, 1936, net profit of $3,065,630, compared with a revised 1935 net income of $1,588,132. Net sales and operating revenues last year totaled $37,153,513, compared to $32,224,685 in 1935. Income available for interest charges and amortization of debt discount and expense totaled $5,094,466 for 1936, and $4,082,866 in 1935.

Koppers Co. divisions represented in the financial report are: Engineering & Construction, Pittsburgh; Seaboard, Kearney, N. J.; Brooklyn, Brooklyn, N. Y.; Minnesota, St. Paul; Tar & Chemical, Pittsburgh; Bartlett, Hayward and American Hammered Piston Ring, Baltimore; and Western Gas, Ft. Wayne, Ind.

Regular quarterly dividends on the 6 per cent preferred stock totaling $1,200,000, and a dividend of $700,000 on the common stock, were paid last year.

* * *

GENERAL ELECTRIC SALES UP 43 PER CENT

Sales billed by the General Electric Co. for the first quarter amounted to $73,412,420, or 43 per cent more than in the same quarter last year. Profit available for dividends amounted to $11,626,408 against $7,086,830. This is equivalent to 40 cents a share for the 1937 quarter and 25 cents a share for the 1936 quarter. Orders received amounted to $105,747,030, 78 per cent higher than last year.

Anti-Trust Suit Filed Against Aluminum Co.

The department of justice last week announced that it has filed a case in the federal district court for the southern district of New York for dissolution of the Aluminum Co. of America on charges of monopolistic control. Twenty-five subsidiaries and affiliated companies and 36 officers also were named defendants..

Large Attendance At Tool Forum

WESTINGHOUSE ELECTRIC & MFG. CO.'s second machine tool electrification forum, in East Pittsburgh, Pa., April 19-22, was attended by at least 90 representatives of leading machine tool companies. This was the largest assemblage of engineering executives of the industry since the machine tool show in Cleveland in the fall of 1935.

The object of the forum was to bring about a meeting of minds between builders and users of electrical drive and control equipment. Several users appeared on the program as speakers, and visiting engineers entered much more freely into the discussion.

Meetings were held each day from 9 until 5, with a number of interludes for trips to departments in the East Pittsburgh works, to the research laboratories and the Westinghouse Nuttall gear works. New models of electrical control equipment especially suitable for machine tool applications were demonstrated.

Motors and Starters Dependable

An interesting reaction on the part of the machine tool delegates was that with motors and starters now generally dependable, the next problem is to attain comparable ruggedness and dependability in lesser details such as limit switches, solenoid mechanisms and relays.

Among machine tool men who contributed papers to the forum were: F. L. Chapman, Gisholt Machine Co.; D. K. Frost, Mattison Machine Works and Sundstrand Machine Tool Co.: George Highberg, Cushman Chuck Co.; H. Earl Morton, Morton Mfg. Co.: E. E. Opel, National Automatic Tool Co.; and W. Trible, Cincinnati Milling Machine Co. and Cincinnati Grinders Inc. Papers from the viewpoint of machine tool users were presented by E. L. Bailey, Chrysler Corp., and J. S. Booth, Duquesne works of Carnegie-Illinois Steel Corp. Also, there was a paper on welding in the machine tool industry by H. S. Card, National Electrical Manufacturers association.

Amsler-Morton To Sell New Type Open Hearth

Amsler-Morton Co., Pittsburgh, will market a new one-way-fired recuperative open-hearth furnace developed and patented by Martin J. Conway, fuel engineer for Lukens Steel Co., Coatesville, Pa. The design may be executed in units of any desired capacity.

Production

INGOT production continued at 91½ per cent last week. Slight gains were noted in some districts.

Detroit—Down 5 points to 95 per cent as one open hearth was taken off for repairs. No further slackening is indicated.

Cleveland-Lorain — Advanced 3 points to 79½ per cent as one unit was added, making a total of 31 out of 39 active.

Youngstown—Remained at 86 per cent, with 72 open hearths, three bessemers and 21 blast furnaces active.

New England—Operations at 100 per cent, with all open hearths active. A drop to about 85 per cent is indicated this week.

Chicago—Increased to 84½ per cent, a gain of ½ point for the week and a new high for the year. Some additional steelmaking units are being made ready for operation but all of such facilities may not be in use until early next month when a still higher rate is in prospect. Blast furnace schedules are steady, with 31 of 39 stacks active.

Central eastern seaboard — Unchanged at 59 to 60 per cent. Operations are expected to continue in this range for some time, as backlogs are heavy.

Cincinnati—Steady at 86 per cent.

Pittsburgh—Held at 95 per cent for the fourth consecutive week. Forty-eight stacks continue active.

Wheeling — Operating schedules have been steady and the rate continues at 96 per cent.

Colorado—Averaged 94 per cent, with 15 furnaces melting.

St. Louis—Unchanged at 82 per cent, this rate having prevailed for the past three months.

Birmingham—Held at 80 per cent.

Buffalo—Operations advanced to the high point on record here, with 40 of the 43 open hearths in production.

District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended April 24	Change	Same week 1936	Same week 1935
Pittsburgh ..	95	None	63	37
Chicago	84½	+½	70½	52
Eastern Pa...	59½	None	44	29
Youngstown..	86	None	79	56
Wheeling	96	None	92	76
Cleveland ...	79½	+ 3	79½	57
Buffalo	93	+ 3	70	34
Birmingham..	80	None	69	54½
New England	100	+ 3	75	25
Detroit	95	— 5	100	82
Cincinnati ...	86	None	84	†
St. Louis	82	None	†	†
Colorado	94	†	†	†
Average....	91½	None	69½	46

†Not reported.

Federal Complaint Against Industrial Rivet Makers

Federal trade commission has issued a complaint against the Institute of Tubular-Split and Outside Pronged Rivet Manufacturers, Waupun, Wis., its president and 13 member companies. It is charged that section 5 of the federal trade commission act is violated by an unlawful agreement to suppress competition and create a monopoly.

The companies do not manufacture the type of rivet used in heavy construction but the commission says they constitute a substantial majority of all manufacturers of industrial rivets. They are:

Shelton Tubular Rivet Co., and Shelton Tack Co., Shelton, Conn.; Tubular Rivet & Stud Co., Boston; Judson L. Thomson Mfg. Co., Waltham, Mass.; Milford Rivet & Machine Co., Milford, Conn.; Chicago Rivet & Machine Co., Chicago; Manufacturers' Belt Hook Co., Chicago; National Rivet & Mfg. Co., Waupun; Scovill Mfg. Co., Waterbury, Conn.; Penn Rivet Corporation, Philadelphia; Townsend Co., New Brighton, Pa.; John Hassall Inc., Brooklyn, N. Y., and J. W. Coombs Mfg. Co. Inc., Fort Washington, Pa.

Armco's March Shipments Set New Monthly Record

March shipments by the American Rolling Mill Co., Middletown, O., exceeded those of any prior month in its history by approximately 15 per cent. Middletown, Zanesville, O., and Butler, Pa., plants established records while the Ashland, Ky., plant which was flooded in February, came within a few hundred tons of a new high.

Continuing demand indicates, according to company officials, that second quarter shipments will be the company's largest for the period.

Foundry Equipment Orders Continue To Increase

Foundry equipment orders in March continued the sharp rise registered in February and the index reached 293.2, compared with 248.5 in February, and 115 in March, 1936. Index of shipments in March was 285.6 compared with 201.8 in February and 124 in March, 1936. The unfilled order index in March was 244.8, in February 241.2, and in March, 1936, it was 117.4. Indexes are based on the averages of 1922-24 as 100.

Scrap Directors Against Embargo

INSTITUTE of Scrap Iron and Steel directors apparently have taken a definite stand against an embargo on scrap exports.

A resolution, it is reliably reported, was passed at the recent meeting of the directors in Canton, O. It declared that the best interests of producers and consumers are served by an open market operating on the law of supply and demand, that services of small collectors, yard dealers and brokers are jointly essential for maintaining an open market, further, that legislative restraint would constitute an artificial and unwarranted interference with a free market.

Hence, according to the resolution: "The institute opposes, except in war times, any legislative or administrative restrictions on scrap as a commodity, and instructs its executive secretary to take such steps as may be necessary to protect the purpose and intent of this resolution."

At Washington last week it was stated that the executive committee on commercial policies to which the Schwellenbach-Koppleman scrap embargo bills were referred has not yet completed its investigation, but the report is expected to be made to the senate military affairs committee within a week or two. Indications last week were that the report will be against placing an embargo by legislation.

The Independent Steel and Iron Producers Committee on Scrap issued a statement that it is now backed by more than 300 independent rolled steel, gray iron, cast steel and malleable iron producers, and "is firmly convinced" the situation can be handled only through legislative action.

Metal Trades Employment In Eighth Monthly Gain

Metal trades employment in 22 leading centers increased during March to 100.4 per cent of the 1925-1927 monthly average, according to the National Metal Trades association. This is the eighth consecutive monthly increase and brings employment to the highest level since the middle of 1930. A year ago the employment index was 81.4 per cent, while two years ago it was 70.1 per cent. The March increase occurred despite sharp reduction in automotive employment at Detroit and Toledo. Milwaukee, Peoria, Ill., and the Tri Cities continue to show the largest gains.

Meetings

A.F.A. NAMES RECIPIENTS OF ACHIEVEMENT MEDALS

THREE medals recognizing achievement and service to the foundry industry are to be awarded by the American Foundrymen's association at its annual convention and exhibition in Milwaukee, May 3-7. Awards and recipients follow: John A. Penton medal to John W. Bolton, Lunkenheimer Co., Cincinnati; J. H. Whiting medal to Dr. James T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.; and William H. McFadden medal to Charles W. Briggs, naval research laboratory, Anacostia station, Washington. Presentation will take place at the annual dinner, May 6.

ELECTRICAL ENGINEERS WILL VISIT BETHLEHEM MILL

Applications of electricity to steel production will be one of the subjects discussed at the northeastern district meeting of the American Institute of Electrical Engineers, Hotel Statler, Buffalo, May 5-7. L. A. Umansky, General Electric Co., Schenectady, N. Y., will present a paper, "Design Trends in Steel Mill Electrification," at a morning session, May 6. In the afternoon, F. D. Egan, Bethlehem Steel Co., Lackawanna, N. Y., will contribute a paper "Electrical Applications—Bethlehem 72-Inch Strip Mill," after which a visit will be made to the mill.

A.S.T.M. ARRANGING PROGRAM FOR NEW YORK MEETING

American Society for Testing Materials is completing the program for its fortieth annual meeting at the Waldorf-Astoria, New York, June 28-July 2. This will be the second meeting which the society has held in New York, the previous one having been there in 1912 during an international congress on testing materials.

Several symposiums comprising groups of papers are scheduled, among them being one on significance of tests of coal and coke, another on correlation of laboratory and service tests of paints, and a third on present-day practice in consistency measurements. An extensive series of papers will deal with cast iron.

Most of the society's standing commitees will present reports on the results of their standardization and research work during the year. During the week the society will sponsor its fourth exhibit of testing apparatus and related equipment. Exhibits are held at two year intervals. In addition to displays of commercial apparatus and supplies, a number of committees will present exhibits of their work. These committees will include those which have extensive corrosion test programs under way and committee E-4 on metallography.

STEEL ENGINEERS ANNOUNCE BUFFALO MEETING PAPERS

Five technical papers are scheduled for presentation at the spring engineering conference of the Association of Iron and Steel Engineers at Hotel Statler, Buffalo, April 28-29.

Papers for the first session, Wednesday evening, are: "Radiant Tube Annealing Covers," by R. J. Cowan, Surface Combustion Corp., Toledo; and "Electrical and Mechanical Developments of Modern Cold Strip Mills," by A. F. Kenyon, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; and John L. Young, United Engineering & Foundry Co., Pittsburgh.

Contributions for the second session, Thursday morning, are: "Some Heating Furnace Control Problems," by Martin J. Conway, Lukens Steel Co., Coatesville, Pa.; "Diesel Electric Locomotives in Steel Mill Service," by F. H. Craton, General Electric Co., Erie, Pa.; and "Simplicity of Stress Distribution in Arc Welded Joints," by E. W. P. Smith, Lincoln Electric Co., Cleveland.

Rail Output Up 71.4 Per Cent in Year

PRODUCTION of steel rails in 1936 was 71.44 per cent larger than in 1935. Total output was 1,219,846 gross tons, compared with 711,537 tons in 1935 and 1,010,224 tons in 1934. In the latter year buying was stimulated by government aid. The larger tonnage in 1936 was evidence of the better railroad financial position. In 1932 rail buying dropped to 402,566 tons. These figures are from the American Iron and Steel institute.

Slightly more than half the rails in 1936 were between 100 and 120 pounds per yard, this class totaling 611,527 tons. Between 120 and 136 pounds per yard the output increased from 154,367 tons in 1935 to 368,470 in 1936. In weights over 136 pounds per yard tonnage fell from 58,858 tons to 22,680 tons.

Active rail mills number 18, five in Pennsylvania, three in Alabama, two each in Ohio, Indiana and Illinois and one each in New York, Maryland, West Virginia and Colorado. Mills in the state of Pennsylvania rolled 301,724 tons, this tonnage being slightly less than 25 per cent of the total.

In 1936 bessemer rails totaled 289 tons, open-hearth 1,185,176 tons, and all others 34,381 tons.

Production of Rails by Processes

Gross Tons

Years	Open-Hearth Rolled from ingots	Open-Hearth Rolled from new seconds, etc.	Bessemer and Electric	Rolled from old rails	Total	Included in Total Girder and high tee	Included in Total Alloy
1921	2,019,988	7,227	55,564	96,039	2,178,818	89,162	6,276
1922	2,032,004	996	22,317	116,459	2,171,776	128,878	3,163
1923	2,721,578	17,201	25,995	139,742	2,904,516	130,056	2,142
1924	2,295,755	11,778	16,069	109,730	2,433,332	85,533	5,167
1925	2,678,536	13,287	9,687	83,747	2,785,257	98,620	4,009
1926	3,098,776	9,216	12,533	97,124	3,217,649	116,374	4,216
1927	2,712,287	5,578	1,566	87,055	2,806,486	99,621	1,265
1928	2,573,608	6,533	3,156	64,196	2,647,493	113,150	6,453
1929	2,651,397	10,766	4,209	55,766	2,722,138	109,678	1,965
1930	1,829,143	5,790	2,182	36,118	1,873,233	69,814	4,687
1931	1,132,433	3,118	828	21,372	1,157,751	44,652	533
1932	390,816	2,198	64	9,488	402,566	29,003	565
1933	388,420	9,372	300	18,204	416,296	17,561	437
1934	970,428	11,645	2,032	26,119	1,010,224	29,988	1,598
1935	684,661	7,004	565	19,307	711,537	25,940	520
1936	1,176,232	8,944	289	34,381	1,219,846	41,383	448

General Electric Awards Six Coffin Fellowships

Advanced scientific research will be carried on during the coming year by eight selected students in leading universities under provisions of the Charles A. Coffin fellowships, it is announced by Dr. W. R. Whitney, vice president, General Electric Co., Schenectady, N. Y.

Established by General Electric Co. in 1922 to honor its retiring president and founder, these fellowships, totaling $5000 annually, are awarded each year to college graduates who have demonstrated they could undertake or continue advantageously research work in educational institutions in this country or abroad. Since 1923, approximately 100 students have accomplished important studies through these fellowships and about $75,000 has been paid to their holders.

Of the 1937-38 fellowships, two are renewals. Among the four new recipients, H. P. George, Lehigh university, will engage in research work at Carnegie Institute of Technology to ascertain the rate of diffusion of grain boundaries of metals. Minimum award in a fellowship is $500.

Men of Industry

L. F. BURRESS, assistant superintendent of Gary works, Carnegie-Illinois Steel Corp., has been appointed to the newly created post of division superintendent, division of coke plants and blast furnaces, Gary works, and also including those at Joliet, Ill. R. F. Campbell, superintendent of all open hearths at Gary since 1930, has been named division superintendent, division of open hearths and central mills. R. B. Hancock, superintendent of the merchant mill, wheel mill and axle mill since 1925, has been made division superintendent, division of west mills, including all merchant mills, the 38-inch hot strip mill, wheel and axle mills. These latter two are also new posts.

Thomas R. Owens has been appointed superintendent of the Gary sheet mills of Carnegie-Illinois, succeeding the late A. J. Skemp. Mr. Owens joined United States Steel Corp. subsidiaries in 1908, when he was employed at the Old Meadow works of the former American Sheet & Tin Plate Co. at Scottdale, Pa. He has been employed at the Gary sheet mill since 1916, recently having been night superintendent of the hot sheet mills. He has been succeeded in that capacity by Phillip H. Dilley, formerly turn foreman in the hot sheet mill.

♦ ♦ ♦

T. M. Sinclair has been made purchasing agent, Line Material Co., South Milwaukee, Wis.

♦ ♦ ♦

W. J. Auburn, Gerrard Co. Inc., and H. L. Brueggenman, Acme Steel Co., have been elected to the board of governors, Chicago Purchasing Agents' association for a three-year period. M. C. McGowan, Electro-Motive Corp., has been named for one year.

♦ ♦ ♦

L. A. Bedard has been made manager of sales, Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.

♦ ♦ ♦

H. Lawrence has been elected controller, Pittsburgh Screw & Bolt Corp., Pittsburgh. John M. Auty, former controller, continues as secretary-treasurer.

♦ ♦ ♦

D. E. Sadler, has been elected assistant controller, Cleveland-Cliffs Iron Co., Cleveland, a new office. He has been identified with Cleveland-Cliffs 25 years.

♦ ♦ ♦

W. B. Dexter has been appointed general manager, National Iron Works, San Diego, Calif. He will supervise a program of modernization and expansion.

♦ ♦ ♦

Harry Rooke, identified with Page-Hersey Tubes Ltd., Toronto, Ont., since 1906, first as secretary-treasurer and later as vice president and director, has retired.

♦ ♦ ♦

Edward L. Bohn has been appointed sales manager of the fire clay refractories division, Chas. Taylor Sons Co., Cincinnati. He formerly was connected with the North American Refractories Co.

♦ ♦ ♦

H. E. Field has resigned as vice president, Continental Roll & Steel Foundry Co., East Chicago, Ill. C. W. Hellstrom, chief engineer, who also has resigned, has been succeeded by W. R. Duda. Walter L. Berghoefer has been appointed manager of casting sales, with headquarters at East Chicago, and Clarence W. Howat has been appointed district sales manager. Mr. Howat and Mr. Duda will be located in the company's office in the Grant building, Pittsburgh.

♦ ♦ ♦

Frank O. Henshaw has been elected president and treasurer, Flexlume Sign Co., Buffalo, succeeding Allan C. Stoneham who resigned last October. Mr. Henshaw formerly was secretary and treasurer.

♦ ♦ ♦

E. D. LeMay, for several years assistant to J. L. Perry, president, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been placed in charge of the personal relations department, recently established by the company. He has been associated with the company since 1911.

♦ ♦ ♦

Don McCormick has been appointed arc welding consultant for the Kansas City, Mo., office of Lincoln Electric Co., Cleveland. Heretofore he has been welding supervisor for the Sheffield Steel Co., Kansas City.

♦ ♦ ♦

Malcolm S. Clark has resigned as general manager of Taylor-Winfield Corp., Warren, O., to become president and general manager, Federal Machine & Welder Co., Warren. He joined Taylor-Winfield in 1929 as chief engineer.

♦ ♦ ♦

Carl J. Hochenauer, vice president, Southwest Supply Co., Pittsburgh, and a well known oil well supply man with headquarters in Tulsa, Okla., has been elected a director, Driscoll Construction Co., Pueblo, Colo.

♦ ♦ ♦

R. H. Young, formerly with Sherwood Advertising Co., Hartford, Conn., has organized R. H. Young

Named in Carnegie-Illinois Steel Corp. Promotions

L. F. Burress

R. F. Campbell

R. B. Hancock

Thomas R. Owens

and Associates, to serve as advertising and industrial sales counselors. Headquarters are in the Holo-Krome Screw Corp. plant, Brook street, Elmwood, a suburb of Hartford.

♦ ♦ ♦

Charles Southerland, safety director, Wheelwright mines, Inland Steel Co., Wheelwright, Ky., has been made president, Big Sandy-Elkhorn Mining institute, a new organization designed to promote safety in the Big Sandy-Elkhorn field of eastern Kentucky.

♦ ♦ ♦

Harry A. Kraeling, former president, Standard Alloys Co. and formerly president, Standard Steel Propeller Co., has become vice president and general manager, Pittsburgh Gear & Machine Co., Pittsburgh. Henry E. Rea, identified with the company 17 years, has become sales manager and secretary.

♦ ♦ ♦

R. M. Marshall, secretary since 1935, Woodward Iron Co., Birmingham, Ala., has been made vice president. He will continue his duties as secretary. Before becoming associated with Woodward in 1935, Mr. Marshall was vice president and general manager, Sloss-Sheffield Steel & Iron Co.

♦ ♦ ♦

J. J. McDermott, V. F. Ache and C. A. Donley have been reelected president and general manager, treasurer, and secretary, respectively, Wrought Iron Co., Lebanon, Pa. Re-elected directors include: C. P. Lineaweaver, C. A. Ernst, J. Marechal Brown Jr., and Mr. McDermott.

♦ ♦ ♦

Elmer H. Neff has retired as New York representative, Browne & Sharpe of New York Inc., subsidiary of Browne & Sharpe Mfg. Co., Providence, R. I., after 40 years association with the company. Until further notice the New York office will be under the direction of Arnold K. Brown.

♦ ♦ ♦

Carl A. Gerlach, recently assistant to the general manager, Electro-Motive Corp., LaGrange, Ill., has been appointed general manager, General Household Utilities Co., Chicago. He succeeds William C. Grunow, who continues as president. Mr. Gerlach had been associated with subsidiaries of General Motors Corp. for the past 20 years.

♦ ♦ ♦

G. H. Bucher, executive vice president, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and president of Westinghouse Electric International Co., has been elected a director of the former company. David K. E. Bruce, Paul D. Cravath and Marshall Field have been reelected directors.

♦ ♦ ♦

F. A. Emmons, vice president and general sales manager, Foote Bros. Gear & Machine Corp., Chicago, who recently returned from a trip throughout the mid-continent oil fields, reports a favorable outlook for the sale of oil well pumping equipment in most fields and of particular interest a trend toward heavier pumping equipment.

♦ ♦ ♦

Hon. Michael Dwyer, minister of mines for Nova Scotia, has been elected president, Canadian Institute of Mining and Metallurgy. Mr. Dwyer attained considerable prominence a year ago in connection with the rescue work at the Moose River gold mine in Nova Scotia. He is a brother of Pat Dwyer, engineering editor, *The Foundry*.

♦ ♦ ♦

H. O. Hartdegen, sales engineer, has been placed in charge of the territory comprising northern New York state and eastern Pennsylvania by Driver-Harris Co., Harrison, N. J. He will also handle some accounts in the New Jersey territory. This territory was formerly assigned to J. B. Shelby who has been advanced to the management of the foundry division, where he will act as co-manager with J. Sammon.

♦ ♦ ♦

T. F. Patton, resident counsel of Republic Steel Corp., Cleveland, for the past year, has been appointed general counsel of the corporation. A. J. Gentholts, a member of the corporation's legal department for the past seven years, has been named assistant counsel. Mr. Patton was a partner in the firm of Belden, Young & Veach, Cleveland, whose senior partner, the late William P. Belden, was general counsel for Republic until his death. Mr. Gentholts served Bourne-Fuller Co. as counsel from 1919 to 1930, when Republic was formed and acquired that company.

T. F. Patton

A. J. Gentholts

♦ ♦ ♦

David W. Jenkins, for the past ten years general sales manager, Henry Disston & Sons Inc., Philadelphia, and a member of the Philadelphia Rotary club, has been appointed to the chairmanship of the hardware section at the Rotary international convention which will be held at Nice, France, starting June 9. Garrett Mouw, manufacturer of tools, Royal Oak, Mich., has been appointed secretary of the section.

♦ ♦ ♦

Walter J. Kohler, recently president, Kohler Co., Kohler, Wis., manufacturer of plumbing fixtures, heating equipment and electric light plants, has resigned to become chairman of the board of that company. He has been succeeded as president by his brother, Herbert V. Kohler. Other new officers elected include: Vice presidents, O. A. Kroos, formerly secretary and treasurer, and H. J. Thorkelson, assistant to the president since 1928; treasurer, John M. Kohler, previously manager of the Chicago office; and secretary, Walter J. Kohler Jr.

♦ ♦ ♦

David C. Arthurs has been elected president, Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill. Other new officers elected are: Executive vice president, L. G. Sever; vice president and plant manager, G. C. Beishline; secretary-treasurer, Owen Harvey; assistant treasurer, Robert Harvey; assistant secretary, Harold Wood, assistant to president, W. L. Settlemire.

H. H. Cust, who has been with the company 19 years, was elected vice president and secretary, but immediately tendered his resignation. He will, however, continue as a director.

♦ ♦ ♦

N. L. Van Tol, general superintendent of the Ensley and Fairfield steelworks, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been made works manager in charge of all manufacturing operations, with headquarters at Fairfield. J. M. Spearman, assistant general superintendent, Fairfield works, has been made general superintendent. E. C. Kain, assistant superintendent, open hearth department of Ensley works, has been named assistant

general superintendent at Fairfield. C. R. Bottenfield, formerly superintendent of the hot strip department, Gary sheet and tin mill, has been appointed general superintendent, Fairfield tin mills. A. H. Chalmers, superintendent, Fairfield coke works, has been made assistant general superintendent, Fairfield tin mills. J. J. Phillips, chief operator, Fairfield coke works, succeeds to Mr. Chalmers' former post. Dudley Vaughan, assistant superintendent, Fairfield open hearth, has been made superintendent, succeeding L. C. Henkel, resigned. R. L. Bowron, assistant general superintendent, Ensley works, has become general superintendent and J. A. Lowman, general foreman, Ensley open hearth, has been made superintendent, Ensley open hearth.

♦ ♦ ♦

Franklin P. Clark has been appointed Buffalo district sales manager, Wickwire Spencer Steel Co., New York. A graduate of Sheffield Scientific school of Yale university, Mr. Clark has been associated with the Wickwire Spencer rope sales department at Buffalo for the past six years. Before becoming affiliated with the Wickwire company he represented the sales and engineering departments, Good Roads Machinery Co. in New England from 1926 to 1931.

Bolt, Nut and Rivet Institute Names Officials

Arthur D. Morris, president, Bayonne Bolt Co., Bayonne, N. J., was re-elected president of the American Institute of Bolt, Nut and Rivet Manufacturers at its sixth annual meeting in New York last week. Herman H. Lind was re-appointed executive vice president.

Beale E. Poste, president, Columbus Bolt Works, Columbus, O., was elected vice president, succeeding George S. Case, president, Lamson & Sessions Co., Cleveland. James D. Eggers was re-elected secretary-treasurer.

Members of the executive committee: For three years, Mr. Case, A. M. Jones, general sales manager, Buffalo Bolt Co., North Tonawanda, N. Y., and Theodore F. Smith, vice president, Oliver Iron & Steel Corp., Pittsburgh. For two years, C. L. Brackett, president, National Screw & Mfg. Co., Detroit; Charles R. Ferguson, Pittsburgh Screw & Bolt Corp., Pittsburgh, and Evans Ward, Russell, Burdsall & Ward Bolt & Nut Co., New York. For one year, Meyer Paper, president and treasurer, Lewis Bolt & Nut Co., Minneapolis; H. C. Weidner, president, Townsend Co., New Brighton, Pa., and J. Edward Weit, vice president, Atlas Bolt & Screw Co., Cleveland.

The executive committee has been set up on a rotating plan, making it possible each year to bring in three new members.

Franklin P. Clark

Warehouse Association Chapters Elect Officers

American Steel Warehouse association chapters have elected officers for the coming year as follows, W. S. Doxsey, executive secretary, Cleveland, announces:

Buffalo: President, George R. Stuart, Peter A. Frasse & Co. Inc., Buffalo; vice president, W. B. Kline, Burke Steel Co., Rochester, N. Y.; secretary-treasurer, C. C. Kuehneman, Drennan Hardware Co., Syracuse, N. Y.

Connecticut: President, R. B. Shearer, C. S. Mersick & Co., New Haven; vice president, B. R. Dwyer, L. L. Ensworth & Son Inc., Hartford; secretary-treasurer, G. S. Brousso, C. S. Mersick & Co., New Haven.

Detroit: President, H. B. Reno Jr., Edgar T. Ward's Sons Co., Detroit; secretary-treasurer, A. N. Koch, Steel Plate & Shape Corp., Detroit.

New England: President, George R. Beasom, Scully Steel Products Co., Allston, Mass.; first vice president, Murray C. Harvey, Arthur C. Harvey Steel Co., Allston; second vice president, H. C. Wills, Joseph T. Ryerson & Son Inc., Cambridge, Mass.; secretary-treasurer, James A. Parsons, Edgar T. Ward's Sons Co., Boston.

New York: President, P. F. Benedict, Faltoute Iron & Steel Co., Newark, N. J.; vice president, H. B. Royer, Jones & Laughlin Steel Service Inc., Long Island city; vice president, Fred Koetzle, Kasper & Koetzle Inc., Brooklyn; secretary-treasurer, Charles Kramer, Scully Steel Products Co., Newark, N. J.

Northern California: President, George R. Borrmann, Geo. R. Borrmann Steel Co., Oakland; first vice president, E. H. Breidenbach Jr., Ducommun Metals & Supply Co. San Francisco; second vice president, A. U. Good, Pacific Steel Sales Co., Oakland; secretary-treasurer, R. D. Cortelyou, San Francisco.

Northern Ohio: President, Roy L. Stofer, Paterson-Leitch Co., Cleveland; vice president, M. L. Derge, Trumbull Mfg. Co., Warren; secretary, George Bissett, Bissett Steel Co., Cleveland.

Pacific Northwest: President, J. N. Barde, Barde Steel Co., Portland, Oreg.; vice president, H. Erskine Campbell, A. M. Castle & Co., Seattle; secretary-treasurer, Everett W. Hawkins, Portland, Oreg.

Died:

WALTER LUTTRINGHAUS, 73, president, Stainless Steel Products Co., La Grange, Ill., in La Grange, April 5.

♦ ♦ ♦

George C. Lucas, president, Cleveland Frog & Crossing Co., Cleveland, in that city, April 14.

♦ ♦ ♦

Alfred H. Swayne, 67, vice president and a director, General Motors Corp., in New York, April 16.

♦ ♦ ♦

Reinhard Volkwein, 68, founder, Volkwein Bros. Iron & Wire Works Co., Pittsburgh, in that city, April 11.

♦ ♦ ♦

John Conrad Fox, 64, traffic manager, Highland Iron & Steel Co., Terre Haute, Ind., in Terre Haute, April 13.

♦ ♦ ♦

Alexander M. Fairlamb, 61, assistant treasurer, Air Reduction Co. Inc., New York, in Larchmont, N. Y., April 4.

♦ ♦ ♦

Oscar A. Berge, 40, sales representative, Youngstown Sheet & Tube Co. in New England, at Cambridge, Mass., April 6.

♦ ♦ ♦

John G. Miller, western representative, Ajax Metal Co., with headquarters in Chicago, in that city, April 11.

♦ ♦ ♦

John E. Clayton, 68, founder and many years president, Ontario Refractories Works, Fort Erie, Ont., in that city, recently.

♦ ♦ ♦

William R. Gellatly, 41, president, Superior Railway Products Corp., Pittsburgh, at his winter home in Miami Beach, Fla., April 8.

♦ ♦ ♦

William C. Hedgcock, 48, chief mechanical engineer, American Steel Foundries, Chicago, in Evanston, Ill., April 18.

♦ ♦ ♦

Thomas Dransfield, sales engineer, Bethlehem Steel Co., Bethlehem, Pa., at his home in Roslindale, Mass., April 10. He had been associated with Bethlehem since 1927.

♦ ♦ ♦

John G. Miller, 74, identified with the railway supply business at Chicago since 1904 and district representative there for the Ajax Metal Co., Philadelphia, in Chicago, April 11.

♦ ♦ ♦

Walter S. Droppers, 66, secretary-treasurer, Galland-Henning Mfg. Co., Milwaukee, maker of baling presses, mineral aggregate screens, and malting machinery, at Miami, Fla., April 8.

Government Preserves Ancient Furnace; Blast Book Tells Story of Early Days

INTERESTING information as to how iron was made in Hopewell furnace, Pennsylvania, which supplied arms and ammunition for Revolutionary soldiers and is one of the oldest cold-blast charcoal furnaces still standing in this country, has just been revealed in the discovery of one of its blast books.

The book, which tells a detailed story of operations between 1852 and 1875, and old letters and accounts, were discovered in the garret of a stable in old Hopewell village by a national park service research assistant. The furnace, which played a large part in the early iron-making days of Pennsylvania, is being restored by the service in connection with its general French creek recreational demonstration area involving 7500 acres. Consideration is being given to possible development of the village as a whole as an historic site.

Historians differ on the date of establishment of Hopewell furnace by William Bird, some choosing 1759 and others 1771. It was operated during the Revolution by his son, Col. Mark Bird, and for over 100 years after that, finally abandoning operations in 1883.

Hopewell furnace is still primitive, since it was never rebuilt for steam power and coal burning. Water power was used exclusively throughout its history, except for the three years from 1880 to 1883, when steam supplemented the water when the race was low. It is about the only existing furnace still possessing the water wheel and blowing tubs needed for primitive restoration and so presents a unique opportunity for restoration of a valuable relic of the pre-machine age.

The whole region around Hopewell is replete with iron ore, furnace and forge lore. Valley Forge is only 20 miles away. Washington, in crossing the Delaware river, used the sturdy barges of the Durham iron furnace.

Old documents prove that the furnaces at times were very profitable, one showing a $27,611 profit in 1799, a fine income for those days. But most of the "iron-barons" eventually lost their fortunes.

Old reports state that a single Pennsylvania furnace produced artillery for the government valued at £2984 and that early furnaces in Berks county employed 1483 workmen, and 779 horses, produced 14,690 tons of pig iron and 2868 tons of cast iron pots and stoves and other utensils, in 1828-30. For Hopewell furnace alone, there were 168 workmen, 1600 dependent persons, 84 horses, 1500 cords of wood, 1279 tons of pig iron, 500 tons of casting, 2100 bushels of wheat, rye and corn, and 30,000 pounds of beef and pork for 1828, 1829 and 1830. Iron sold for $28 to $45 a ton and one year, during the Civil war, reached an all time high of $99 per ton, giving Hopewell furnace a one year's earning of $30,000.

Farmers and teamsters received $16 per month, with house furnished free and other concessions. Cord wood was cut for as little as 25 cents a cord and slaves were bought at public auction for the estate. From 1771 to 1840, the principal products of Hopewell were castings and the famous 10-plate stoves mentioned by Benjamin Franklin in his diary as vastly superior to wood stoves. After 1840 molding ceased and most of the iron was sold to forges.

Hopewell furnace's stack is only 30 feet high from the hearth to the tunnel head. When in use, the stack was filled about half way up with charcoal without any iron ore. Then, with each barrel of charcoal, the workers would begin to put in ore and a little limestone. The first charge of ore would be about 50 pounds, increasing by 25 pounds with each charge, so that when the stack was full approximately 375 pounds of ore would be put into every 15-bushel charge of charcoal and about three shovelfuls of limestone.

Furnace Practice Revealed

The furnace then would be lighted in the hearth and left burning for two or three days without any blast. When the ore reached the blast-nozzle, the blast was turned in. Strangely enough more ore could be melted per charge on really cold days than at any other time.

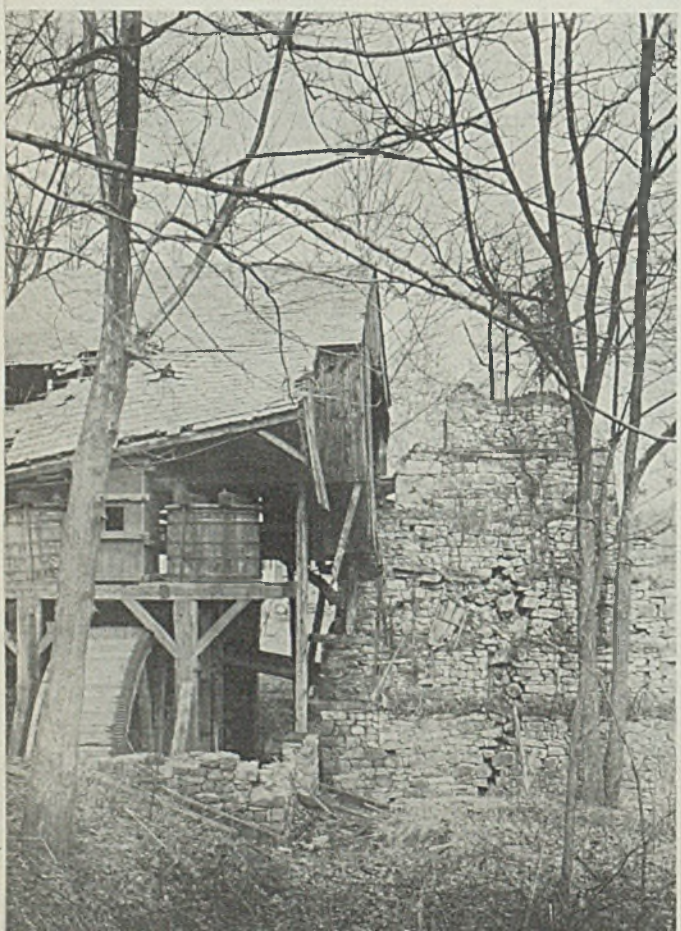
Only one filler and one keeper were employed on each 12-hour turn, and one gutterman could carry out the iron and haul the cinders to the dump. There were also blacksmiths, wheelwrights and several farmers.

The "Blast Book's" story starts with measurements of the stack for each blast which was blown in practically every year. For 1852 it reads:

"Notes for Blast of 1852. Size of hearth 18 by 20 inches. Width of bosk, 6 feet, 5 inches; Batter of bosk, 6 feet, 5 inches. Fired the furnace on Wednesday at 8 o'clock in the morning. Put on ore at 12 o'clock Friday night and Blow'd on Sunday Morning, February 8, 1852 at 6 o'clock A. M. Blow'd out March 16, 1853."

It also includes records of amounts of ore used, pig iron produced, purchasers, and cost figures.

Principal points of interest, in addition to the furnace itself, are the Big House, home of the owner of the village, the stone tenant houses, the blacksmith and wheelwright shops, vegetable and flower gardens, orchard, old barn, icehouse, springhouse, smokehouse, and schoolhouse.



LIKE setting a jewel from within, the National Park Service is restoring the stone stack of Hopewell Furnace. Concrete mix is forced from inside the stack, passing through the spaces between stones where mortar and clay has weathered away in the 166 years since it was laid. This gives the walls solidity without affecting the appearance of the exterior. The illustration is an unusual view of the ancient stack, showing the waterwheel, the piston rods and the blowing tubs which furnished blast

Activities of Steel Users and Makers

PITTSBURGH ROLLS CORP., Pittsburgh, a Blaw-Knox Co. subsidiary, is modernizing and expanding its equipment. Three air melting furnaces, formerly hand-fired with coal, or oil fired, are being equipped with a pulverized coal burning system. A complete coal handling system is to be installed. To provide greater horsepower capacity, an electrical 22 kilovolt loop station is being erected. Additional equipment also will include two new roll grinders of their own design, and a 1300 cubic foot air compressor. Added to an original six, these new grinders will give the mill a range from 20 to 60 inches.

♦ ♦ ♦

Koppers Rheolaveur Co., Pittsburgh, will build a new coal tipple and washing plant for the United Electric Coal Cos. at Dunfermline, Ill., where a new stripping operation will be started on a 1500-acre tract containing 15,000,000 tons of Illinois No. 5 coal. Work will be started about July 1 and the plant placed in operation Oct. 1.

Consumer demand for wash coal has increased sharply during the past ten years, according to J. I. Thompson, president, Koppers Rheolaveur Co. Only 5.3 per cent of all bituminous coal mined in 1927 was washed. By 1935, 12.3 per cent of this washing was done in plants using the Rheolaveur process.

♦ ♦ ♦

Wheelco Instruments Co., Chicago, has moved to larger quarters at 1929-1933 South Halsted street.

♦ ♦ ♦

Hyman-Michaels Co., dealer in iron and steel scrap, is moving its main offices from 20 North Wacker drive, Chicago, to the Peoples Gas, Light & Coke building, that city.

♦ ♦ ♦

Foote Bros. Gear & Machine Corp., Chicago, has been awarded the contract for all operating machinery and equipment for the first unit of the Atlas Malting Co. malt house in Bay City, Mich.

♦ ♦ ♦

A-B Stoves Inc., Battle Creek, Mich., has contracted with the Ferro Enamel Corp., Cleveland, for a new 5 x 12-foot Alundum "V" bottom type porcelain enameling furnace to increase its porcelain enameling capacity.

♦ ♦ ♦

Business formerly under the name of the Dravo-Doyle Co., Pittsburgh, manufacturer of grating and treads, now is being conducted by the Dravo Corp., machinery division, Pittsburgh. This change, it is announced, was made April 1.

♦ ♦ ♦

Bethlehem Steel Co., Bethlehem, Pa., has removed its Milwaukee offices from the Warner theater building to suite 934-938 in the First Wisconsin National Bank building, 735 North Water street. L. L. Bassett is resident manager.

♦ ♦ ♦

Can-O-Lites Mfg. Corp., Youngstown, O., recently has been organized to manufacture new type of cigar lighter said to have capacity for 1000 lights per filling. The lighters are made of tin plate with metal match and striking plate.

♦ ♦ ♦

Osborn Bronze Works, Clarksburg, W. Va., has absorbed J. F. Osborn's Sons and the Clarksburg Foundry and has moved its offices and plant from 707 West Main street to Milford road, Clarksburg. The company will manufacture brass, bronze and aluminum castings. The Osborn works is owned and operated by Alexander C. Osborn, grandson of the original founder of the firm, established in 1863.

♦ ♦ ♦

Allis-Chalmers Mfg. Co., Milwaukee, has opened an office at 211 North Champion street, Youngstown, O., in charge of C. H. Legler, and will operate as a branch of the company's Pittsburgh district office, which is in charge of G. V. Woody, manager.

♦ ♦ ♦

J. I. Case Co., Racine, Wis., shortly will start operations at the former plant of the Showers Bros. Furniture Co., Burlington, Iowa. This plant recently was purchased by the Case company for the manufacture of farm implements. Additional land is available for future expansion.

♦ ♦ ♦

Henry & Allen Inc., Auburn, N. Y., have placed in production a line of replacement threshing machine teeth, drop forged from special formula steel, heat treated and sized by precision presses. This activity is an outgrowth of the company's long experience in producing teeth for original equipment in threshing machines.

♦ ♦ ♦

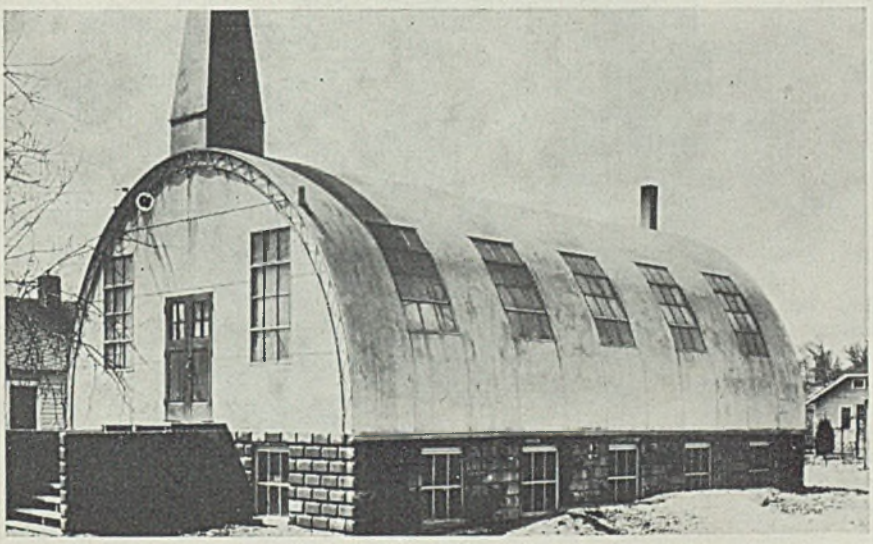
Ford Motor Co. will build a 2,500,000-cubic foot holder to store blast furnace gas at the Rouge, Mich., plant, it has announced. It will be of all-welded construction, 128 feet in diameter and 225 feet high.

Under construction at the Rouge plant is a 10,000,000-cubic foot holder to store coke oven gas. When completed in late summer the two tanks will insure a steady supply of fuel for the plant's blast furnace gas system at all times.

♦ ♦ ♦

American Engineering Co., Philadelphia, has appointed the following new representatives to handle sales of its Lo-Hed electric hoists: James B. Barten Jr., Atlanta, Ga.; J. A. McCoy, Des Moines, Iowa; George R. Douglas, Memphis, Tenn.; F. E. Bennett, Portland, Oreg.; Murray-Jacobs Co., Seattle; F. H. Gill, Chicago; C. G. Forshey, Houston, Tex.; L. E. Kenney, New Orleans; E. V. Brown, San Francisco; Hart Machinery Co., Tampa, Fla.; Peter H. H. Dunn, Washington.

All-Welded Steel To Form Church Cost Only $2000



CHURCHES of many kinds serve many creeds, but illustrated is what is believed the first of its type ever built. It is constructed of steel, erected and joined together entirely by electric welding. To six half circles of plate welded to trusses, curved plates were welded to complete the roof structure. Total cost of designing, fabricating and erecting steel work at Peoria, Ill., was only $2000.
Photo courtesy James F. Lincoln Arc Welding Foundation, Cleveland

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MULT·AU·MATICS

- Small work requiring higher speeds and higher feeds can usually be done more Profitably on smaller high-speed machines.

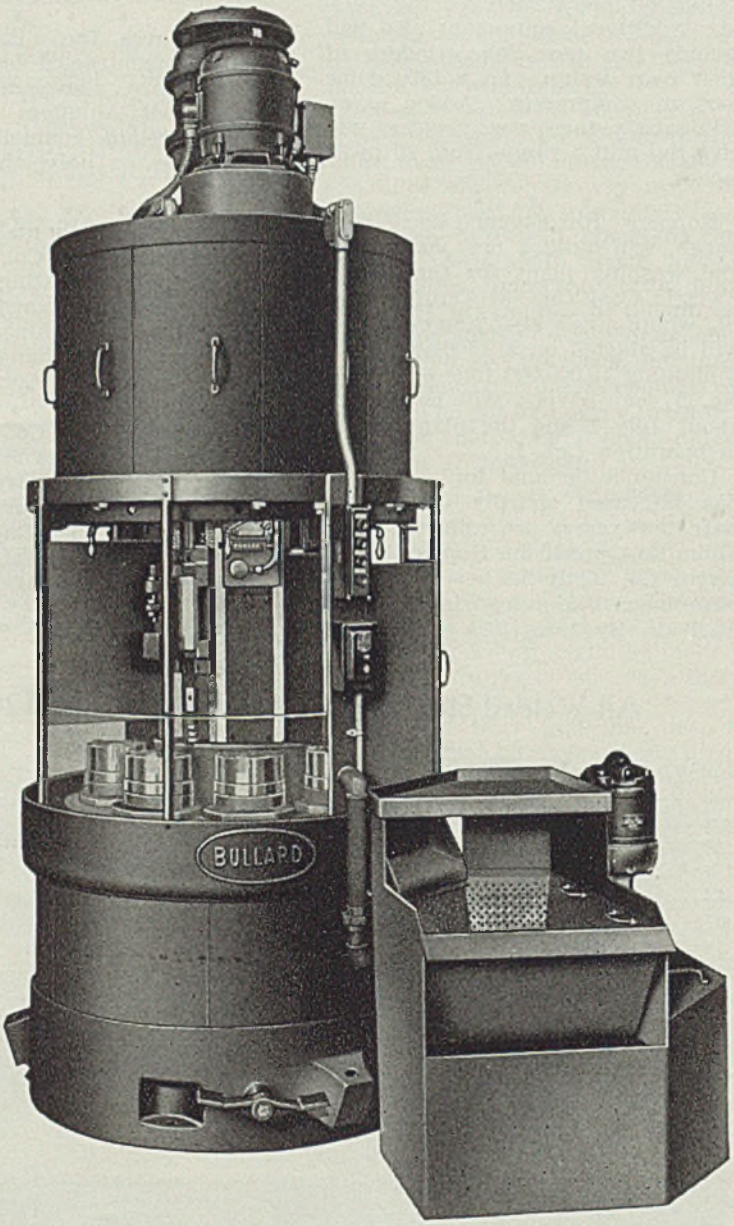
- To meet the demands in this field, the Bullard Type "J" Mult-Au-Matic is available. It includes many of the features of the heavier Type "D" series, but has in addition many features found necessary for the Efficient operation of higher speed units.

- Exceptional feed and speed ranges, individually independent and variable at each station, broaden the scope and possibilities of time reduction on many operations. Mechanical power operated chucking facilitates the loading and unloading of work in the minimum periods of time allowed by the fast cycle time.

- Electrical push button stations provide for ease and flexibility of control and manual operation.

- Double Index is obtainable to meet the requirements of 1st and 2nd chucking on the same machine.

- Fast Indexing and Rapid power traverse of tools to and from point of cutting minimize lost time between cuts.



TYPE "J"
MACHINE SIZES

7 inch—8 Spindles
11 inch—8 Spindles

Time Saved is Money Earned. Don't delay your investigation of these machines as applied to your jobs. Ask for Estimates, and compare these with the best previous methods used.

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MIRRORS OF MOTORDOM

DETROIT

BASEBALL took the play away from sitdown strikes here last week as the 1937 season opened Tuesday, and Detroit, with customary gusto, dropped other matters to welcome the Tigers home.

Unhampered by labor troubles, new cars continue to stream from assembly lines of all major producers and sales departments daily are revealing new records achieved by dealers in all sections of the country. For the next two months at least, prospects are for a steady level of high production.

Department of commerce figures for March production of cars and trucks show a total of 518,715, far exceeding preliminary estimates and bringing first quarter production in the United States and Canada to 1,301,681. This is a new high since 1929 but if the deficiency accruing from sitdown strikes is taken into account the first quarter of this year would have seen an all-time record for auto production.

Labor, as represented by the UAW, for the moment is at peace, but behind an exterior calm is laying ambitious plans for coming months. The proposed drive against Ford has been postponed for probably six months, chiefly because of a lack of any substantial membership there. Routine protests filed with the labor relations board against certain Ford practices have been dubbed "a lot of hot air" by plant officials.

What Will Ford Do?

Meanwhile Ford is reported to be readying plans on wages and hours which will make UAW demands look ridiculous. One version is that minimum wage will be $1 an hour with a 6-hour day; another has minimum daily wages $10. Either of these plans would be characteristic of Ford and their imminence is causing the rest of the industry no little concern.

As a second phase of his plan to "demonstrate some real competition," talk is heard of a cut in Ford retail prices. At a time when other companies are considering how far to move prices up on new models, such a decision by Ford would certainly throw consternation into the ranks of the competition.

The tipoff on a Ford price reduction is supposed to have been a recent radio address by W. J. Cameron in which he pointed out that when "intelligent management" is faced with increased labor and material costs, as the industry is today, it seeks ways to increase production and make its product available to more people—in other words, cut prices.

End of Cost Department

The situation recalls to many a well-authenticated incident which occurred years ago at the Ford Highland Park plant when William F. Knudsen and Charles P. Sorensen were running the production end of the business for Mr. Ford. After an extensive survey, the cost department submitted figures to Knudsen and Sorensen purporting to show the necessity of increasing price of the model T $100. The two managers took the figures in to Mr. Ford and explained the matter to him in detail. Ford thought a moment and then declared prices should be cut $100 per car instead.

Astounded, Knudsen and Sorensen showed the figures from the cost department to prove their case. Mr. Ford listened attentively and then repeated his opinion that still it would be better to knock $100 off the price. In the meantime, he said, he would look into the cost department report. Later he visited the cost department where seven men were hard at work on cost figures, surrounded by piles of volumes containing cost history and other data. He interviewed a number of the men, glanced over several of the cost records, then left.

That night every single volume of cost records was carted from the department, tossed into a furnace and burned. In the morning employes of the cost department found their jobs no longer in existence. Price of the Model T was cut $100, and Ford had one of the busiest and most profitable years of his history.

There are countless stories of this type, some legendary, some fact, of Ford doing the impossible and succeeding, but it is of course a fact Ford has no stockholders to answer to and his balance sheets are shroud ed in much mystery. Nevertheless his genius at management appears to be unquestioned.

Like anyone else, however, his decisions have occasionally been wrong. Such as the time he became convinced there was no future in a V-8 engine and ordered production stopped until a 4-cylinder engine could be developed. It took a lot of persuasion by his son Edsel to convince Mr. Ford he had made a bad move and to permit production lines to be started again.

How To Meet Bottlenecks

Should Ford cut prices now with the aim of boosting production up to new levels, there is some basis for the belief he would be bottlenecked in the motor assembly department, unless additional facilities were provided. Two 8-hour shifts are now working on engines, turning out 450 hourly, and taxing the equipment available.

Ford might also find a bottleneck in steel. Difficulty is being experienced in buying sufficient semifinished steel to keep the continuous mill in steady operation, and a considerable tonnage of other grades of steel is bought in the open market. The last buy was for 1,000,000 cars and inquiries are now out for tonnages to supply an additional 125,000 cars.

Engineering work has been completed on rebuilding and enlarging three or four of the Ford 150-ton open-hearth furnaces and work is expected to start on this project shortly, although all nine furnaces in the plant are now going full.

It develops the new consolidated tool and die shop at the Rouge plant

MIRRORS OF MOTORDOM

will be located at one end of the steel mill building which is being ripped out and rebuilt to accommodate the necessary equipment.

CONFIRMATION of reports heard here several weeks ago concerning the organization of a new type of labor union known as the American Labor League was given Wednesday in an announcement by Daniel M. Robins, president of the movement and a clerk in the maintenance department of Chevrolet's gray iron foundry at Saginaw, Mich.

The league was incorporated under Michigan laws March 11 and is claimed by its sponsors to be the first labor union in the country to assume legal responsibility through incorporation; first to charter units by trade, craft, profession or entire industry; first to admit executives, managers and foremen to associate or honorary membership; first to admit factory or office workers on a general basis; first definitely to outlaw sitdown strikes, seizure of property or unnecessary picketing; and first to put dues on a reasonable basis and limit officers' salaries.

Initiation fee has been set at 50 cents and monthly dues probably will be the same amount. Officers' salaries are limited to $5000 annually. Steps already have been taken to arrange for benefit policies with a large life insurance company.

The league claims to have 3000 members in Detroit plants alone and is making a drive successfully in Saginaw, Bay City, Lansing and other cities.

Officers, in addition to Robins, include J. E. Perryman, vice president and director of organization; Mark McDonald, secretary and treasurer; J. F. Reuter, chairman of the executive council; George Collins, secretary, and Thomas Foster, counsel.

It is interesting to contrast the salary limitation on officers of $5000 with some of the fabulous sums which CIO leaders and organizers are reputed to be receiving. It is said on good authority some of the latter are being paid upward of $60,000 a year.

INQUEST on the recent sitdown strikes here is being conducted by both the companies involved and the UAW, in the form of leaflets reviewing the strikes and the results. Alfred P. Sloan Jr., president of General Motors, has mailed to stockholders the story of the General Motors strike and devotes considerable space to a consideration of the "sitdown" technique.

In part he declares: "First (it is) a demonstration of power to paralyze the productivity of industry . . . this being accomplished through coercion of workers and illegal seizure of property. . . . Next comes the capitalization of the power thus demonstrated by forcing additional workers to join the movement. Then comes the demand to represent all workers exclusively. Next the closed shop . . . Finally comes the checkoff. Then each worker must pay not only for his job, but in addition, special assessments, whenever and for whatever purpose the organization demands. And the worker is in no position to resist. The tribute is taken out of his pay envelope by the employer on the demand of the union. That is the final step. It is the real objective.

"Manifestly, such a procedure carries with it the implications of the greatest possible danger. It places the productivity of industry at the mercy of a labor leadership, responsible and accountable to neither the law nor the workers, and restricted solely by its own desires and ambitions. The dangers of such a centralized control of the American workers are obvious. Its political implications challenge democracy as a fundamental principle of government. To the extent it succeeds it means the economic and political slavery of the worker and an important step toward an economic political dictatorship."

This sanguine view of the method and goal of the UAW is shared by many in Detroit and it is not difficult to get an even-money bet the entire automotive industry within a year will be 100 per cent unionized and operating under the checkoff system to which Mr. Sloan refers.

Union Funds Exhausted

On the other side of the fence, the UAW has prepared a leaflet which it will distribute to Chrysler workers explaining what the settlement of their strike means and detailing why it was ended. The message is designed to "place the entire picture of the strike settlement before the members in order to prevent misunderstandings which might lead to further sitdown strikes."

In agreeing to end the strike, the UAW professes to have considered "human needs, the welfare of the union, the newness of the organization itself." Apparently the combination of pressure from evicted families, men in danger of losing new cars which they had bought, dwindling funds in the union treasury to supply food for strikers, and the rise of dissension in the union's own ranks was sufficient to persuade the negotiating committee to capitulate.

The UAW presented a list of 22 demands to officials of Packard last week who met Wednesday to consider them. They included the usual demands for recognition as sole bargaining agency, 85-cent minimum wage rate, seniority provisions, etc. Prospects were good for an amicable settlement, marking a change from the union policy of calling a strike and then negotiating.

On other labor fronts, a final agreement between Briggs and the UAW was announced after 32 days of negotiations. It followed the standard pattern of other agreements now in force. Union members at Ternstedt presented a new set of demands to

(*Please turn to Page* 114)

Automobile Production

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

	1935	1936	1937
Jan.	300,335	377,306	399,426
Feb.	350,346	300,874	*383,540
March	447,894	438,992	518,715
3 Mos.	1,098,575	1,117,172	1,301,681
April	477,059	527,726	.....
May	381,809	480,571	.....
June	372,085	469,355	.....
July	345,297	451,474	.....
Aug.	245,075	275,951	.....
Sept.	92,728	139,785	.....
Oct.	280,316	229,989	.....
Nov.	408,550	405,702	.....
Dec.	418,317	519,132	.....
Year	4,119,811	4,616,857	.....

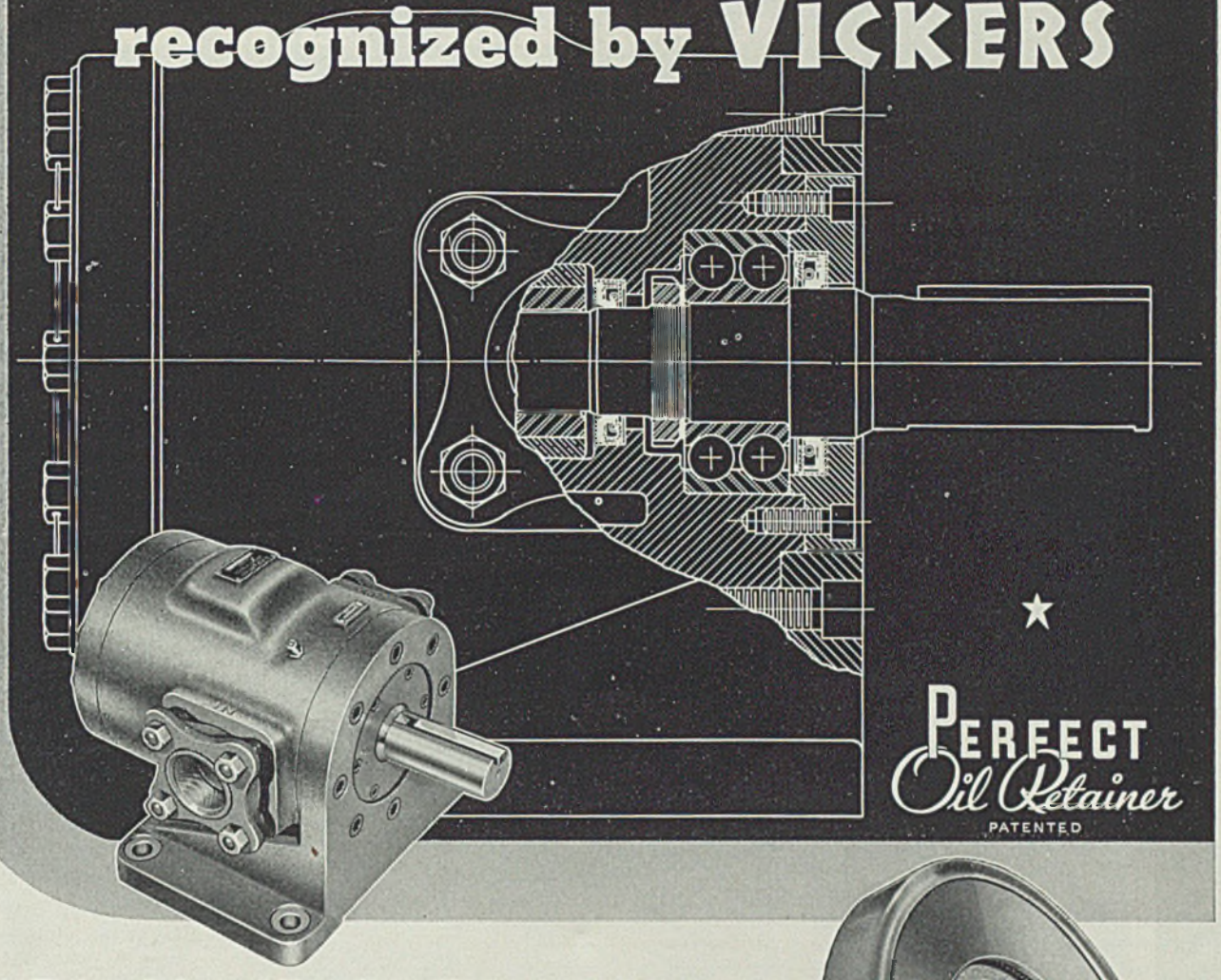
Calculated by *Cram's Reports*

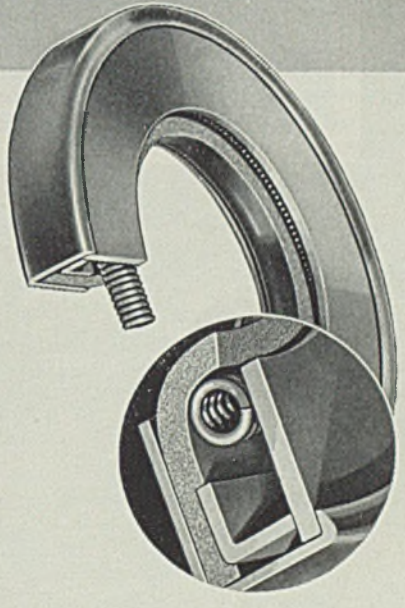
Week ended:	
March 27	101,046
April 3	97,005
April 10	*99,196
April 17	124,970
April 24	132,340

*Revised.

	Week ending April 24	April 17
General Motors	52,580	52,155
Ford	34,850	34,850
Chrysler	28,500	22,200
All others	16,410	15,765

Value of "Perfect" Oil Seals recognized by VICKERS





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Chicago Rawhide "Perfect" Oil Seals are incorporated in many of these pumps for two very important reasons:

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2. They protect the system against entrance of dust, grit or foreign matter.

This is only one of many applications of "Perfect" Oil Seals to heavy duty equipment which must function dependably and effectively. If your equipment requires similar protection, ask for suggestions from Chicago Rawhide engineers.

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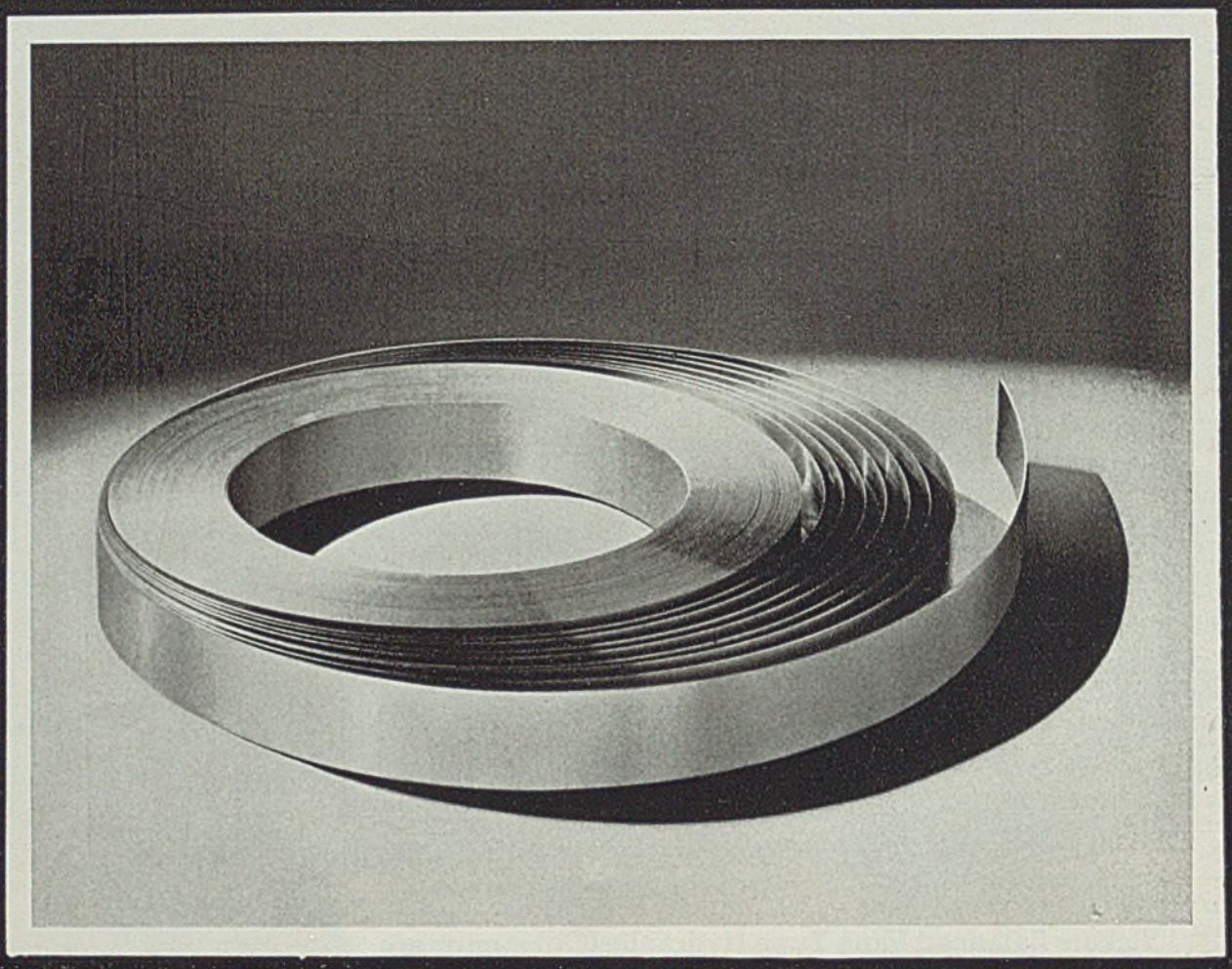
59 Years Manufacturing Quality Mechanical Leather Goods Exclusively

PHILADELPHIA CLEVELAND NEW YORK DETROIT BOSTON PITTSBURGH CINCINNATI

Better FLAT STRIP

makes better parts for you



To obtain uniform parts you must have uniform metal. It must have an acceptable chemical composition; it must be clean both on surface and inside; it must have the correct heat treatment to give the desired resilient qualities; it must have been worked sufficiently to give the correct microscopic structure for the greatest toughness; the size of the strip must be uniform within very narrow limits and the surface and edges must be unblemished.

Washburn Flat Strip is made from our own open hearth furnaces to final operations under the watchful eyes and constant care of highly skilled wiremakers.... Many of our foremen and department heads obtained their diplomas in the old Washburn-Moen days.

We will be pleased to submit samples, or work with you to produce a uniform material to your special specifications.

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Washburn Flat Strip is obtainable in cold-rolled high or low carbon steel, in widths from $\frac{1}{16}$" to 4" and thicknesses from .004 to .125 and in various finishes including tinned, galvanized and bronzed. Write for quotations.

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CLEAN UNIFORM BILLETS – STRIP – RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

WINDOWS OF WASHINGTON

WASHINGTON

LABOR meetings were in the ascendency here as news last week, headed by a combination labor-industrial meeting called by Secretary Perkins of the labor department.

The executive committee of the A. F. of L. met and made an effort to call a special convention of the main organization to expel the CIO but was unsuccessful, due to disagreement among the members of the committee. The CIO also had some conferences with its labor leaders here.

Both Lewis and Green attended the Perkins conference, stated to be the first of many to be held at the request of the secretary. Other labor leaders were present, including the omnipresent Major George L. Berry.

William Beye, counsel for Carnegie-Illinois Steel Corp., attended the conference in the absence of Myron C. Taylor, who had been invited but was unable to be present. A number of other industrial leaders were there, including the presidents of the United States Chamber of Commerce and the National Association of Manufacturers.

More Conferences Planned

Of course, it was an executive session but following the conference Miss Perkins expressed pleasure at the co-operative spirit.

Further conferences are to be called by Secretary Perkins but just when has not yet been announced. All announcements state that the labor department is trying to get industry and labor together to see if some rules can be worked out which will be mutually satisfactory as the result of the Wagner decisions by the Supreme Court. It was stated after the conference last week that both sides have agreed that the Wagner act is the law of the land now and that therefore everyone will abide by it. Of course, it is much easier for labor to agree than industry.

Among other things there was a discussion at the Perkins conference of the incorporation of labor unions. It must be taken into consideration, however, that it will require some time to work this out and the industrialists present did not have authority to speak for any large group.

SCRAP EXPORT ACTION AWAITS FURTHER DATA

There has been little activity the past week in connection with legislation dealing with regulation of iron and steel scrap exports. The case seems to be in statu quo pending a report which the senate military affairs committee expects from the departments of state and commerce.

It was reported from New York last week that Donald Richberg had been retained as counsel by the military affairs committee of the senate, but this was denied by the committee. It may be true that Richberg has been employed by some group, but this could not be confirmed here, Mr. Richberg being out of the city.

As mentioned last week, a joint resolution has been drawn up to take care of the situation, but that has not yet been introduced in either house of congress.

The senate military affairs, to which the bill was referred, states that no date has been set for hearings and that the bill has merely come before it in the most routine manner and has not been discussed in any way by the members of the committee. However, as a routine matter, the departments of state and commerce were asked for a report. This is along the line of regular procedure.

The reports of these departments also will be submitted to Danny Bell, acting director of the budget before they are submitted to congress. This is in accordance with an order of the President made at the beginning of the present session of congress that all communications to congress must clear through the budget bureau. This is to prevent two separate government departments making varying reports on the same bill or communication. This order has not been generally publicized but it is reported by those in the know that this system, tried out this year for the first time, is working well as far as the administration is concerned.

A new resolution for possible presentation to congress is as follows:

That "in the interest of national defense, and for the conservation of natural resources, it is hereby declared to be the policy of congress and the purpose of this joint resolution, to protect and preserve all domestic sources of iron and steel, to restrain the depletion of iron ore deposits, to retain for domestic use, in the production of iron and steel, all iron and steel scrap, which can be and will be used in such domestic production, and to avoid so far and so long as possible dependence of the United States upon foreign sources of materials essential to national defense and to the preservation of American industries.

Scrap Definition Made

"There shall not be exported from the United States, after the expiration of 30 days from the adoption of this resolution, any iron and steel scrap, except upon license issued by the President of the United States. The President is authorized to grant licenses upon such conditions, under such regulations and in conformity with the public policy herein declared, whenever he shall find that such licenses are necessary in the public interest or for the fulfillment of public obligations, provided that in the granting of such licenses fair and equitable consideration shall be given to the interests of all domestic producers and users of such iron and steel scrap.

"The term 'iron and steel scrap' is hereby defined to include all materials heretofore and hereafter clas-

sified as iron and steel scrap in official publications issued by the bureau of standards in the department of commerce.

"Any violation of the provisions of this joint resolution shall be a misdemeanor and shall be punished by a fine of not more than $500 or by imprisonment of not more than one year, or by both such fine and imprisonment."

COMPANY UNIONS MAY NOT BE ENTIRELY OUTLAWED

There is still considerable discussion in Washington as to whether the Supreme Court's labor decisions really outlawed company unions. While there is no specific statement to this effect in any of the decisions many observers are of the opinion that it was strongly implied. This does not agree with the idea of attorneys for the National Association of Manufacturers.

Counsel for the association state that the Wagner decisions of the court applied the commerce power to a new field but did not extend to all employment relations in industry. In other words, they are of the opinion that freely-chosen employe representation plans or legitimate workers' organizations confined to the plant were not outlawed by the court. Of course there is a difference of opinion among lawyers for this association and many other attorneys and especially some of the industrial lawyers located at the capital. It is just one of those things that apparently will sometime or other have to be threshed out by the court itself.

Counsel for the association in an analysis on this point state that "the act as interpreted does not compel contract or agreement with anyone, individually or collectively. The obligation created is that of reasonable negotiation with the true representatives of the majority of employes, whether such representatives be from within or without the employe working force. No legitimate organization confined to the plant of any freely-chosen employe representation plan is outlawed. If the employes prefer an organization confined to the plant for the purpose of collective bargaining it is their right to form one and deal with their employer through it and it is the business of the law to recognize and protect."

OPPOSES CORPORATE UNIONS

When questioned at a press conference last week on his position on the incorporation of trade unions, John Lewis, head of CIO, explained how such a move could be used against unions in an extremely detrimental way, and give unfriendly employers an additional means to attack labor organizations, such as "planting" spies and provocative agents inside a local to try to induce unsuspecting members to take some action for which the national organization could be held financially responsible.

"If the object is to destroy trade unions, they should be incorporated," said Lewis. When asked if it was not true that trade unions in England were incorporated, Lewis replied emphatically that they are not. He explained that they are merely registered.

It was stated at the conference that certificates of affiliation for approximately 300 miscellaneous union groups in varied industries are being prepared by CIO headquarters and will be issued shortly. Requests for charters, he said, continue to come in from all over the country.

CHAMBER OF COMMERCE WILL DISCUSS WAGNER ACT

One of the principal topics for discussion at the annual convention of the Chamber of Commerce of the United States to be held here April 26-29 will be the decisions of the Supreme Court on the Wagner labor law.

Apropos of this discussion the national chamber has sent to its membership a comprehensive review of the decisions. It is pointed out in this connection that "the national labor relations act of 1935 and the railway labor act as amended in 1934 use similar principles as to collective bargaining and protection of rights of employes in self organization. The railroad act contains further provisions, not included in the labor relations act, for the settlement of labor disputes. These further provisions were not involved in the recent decisions of the Supreme Court, but only provisions substantially common to the two acts—the one act being intended to apply to businesses other than carriers subject to the interstate commerce commission and the other being intended to apply to carriers so subject, and extended by enactment of 1936 to include common carriers interstate by air and air mail."

ROPER LIKES WAGNER ACT

Secretary of Commerce Roper last week had the following to say with regard to the Supreme Court decision on the Wagner labor act: "The decision carries forward in principle the idea of the responsibility of the employe and looks to industrial peace through the procedure of common counsel.

"I have always believed," he continued, "disputes could be settled through the conference method, each group being brought to understand its respective relationship and provided with proper instrumentalities in the interest of fairness to both, for co-ordinating and harmonizing views. The great need of the country today is stabilization which results from understanding and from an attitude and disposition to co-operate in working out mutual problems. The Wagner decision looks to that end in that it seeks more harmonious industrial relations and therefore should encourage business."

ASKS LOWER EARNINGS TAX

Modification of the surtax on undistributed corporate earnings in the present session of congress is being urged by Harper Sibley, president of the United States Chamber of Commerce. He contends that corrective legislation should be enacted to eliminate inequalities and hardships suffered under the present law.

Letters to members of the house ways and means committee and the senate finance committee have been sent by Mr. Sibley in his appeal for this legislation.

"We are not unaware of the paramount importance of obtaining a balance of the federal budget," said Mr. Sibley in his communication. "It seems to us, however, that a very moderate lowering of the scale of federal expenditures would permit such changes in the corporate surtax as would avoid the present consequences which seem detrimental to both public and private interests. It would appear probable, too, that the usual rule would be found to apply, in that a more equitable tax would contribute to greater and more stable revenues."

JAPAN REMOVES DUTIES

A Japanese imperial ordinance was promulgated recently, according to a cablegram received by the department of commerce from Commercial Attache Williams at Tokyo, which exempts certain iron and steel articles from any import duty until March 31, 1938.

Among the items are included; pig iron, bars, rods, rails, plates, sheets, wires, strip, hoop, pipes, tubes, etc. This is considered a matter of considerble importance, due to the fact that Japan is now and has been for some time in the market for a large amount of iron and steel of various kinds.

HIGHER RATES ARE REFUSED

An opinion has been rendered by the interstate commerce commission in which it was held that proposed increased rates on iron and steel railway material, in carloads, from, to and between points in the southwest are not justified. The commission has ordered the suspended schedules canceled and the proceeding discontinued.

Editorial

Industry Does Its Bit, But Relief Still Is Major Problem

NOW that steel production is being maintained at or above the highest levels recorded in 1929, it is possible to compare certain aspects of the steel industry—before and after the depression—on the basis of comparable volume of output.

Such a comparison reveals significant contrasts. For instance, steel ingot production in the first quarter of 1929 totaled 13,874,612 gross tons. During the first quarter of 1937 the output was 14,390,787. Weekly output in one or more weeks of April will set new all-time records.

But in all respects except volume of output, the industry in 1937 differs radically from what it was in 1929. In February of this year, steel producers were employing 556,000 workers, as compared with 458,000 in the same month of 1929. Payrolls in February, 1937, as reported by the American Iron and Steel institute, totaled $74,278,000 as against $50,250,000 in February, 1936, and this sharp gain does not reflect the general increase in wages put into effect on March 16, 1937.

Employs More Men, at Higher Wages, Working Fewer Hours; Heavy Industries Still Lag

In the current February, wage earners worked an average of 42½ hours per week, reflecting a nominal 40-hour week, whereas in 1929 the 98,000 fewer wage earners were on a nominal 48-hour week and probably were averaging well over 50 hours per week.

In 1929 the demand for steel was largely from the "heavy" industries. STEEL'S distribution figures for that year showed the following consumption of finished rolled steel: Railroads, 18.44 per cent; automotive, 17.57; buildings, 14.70; oil, gas and water, 9.01; exports, 4.83; and all other 35.40 per cent. Assuming that demand in the first quarter of 1937 is similar to that of the year 1936, the distribution, according to STEEL'S compilation for 1936, would be: Automotive, 20.87 per cent; buildings, 13.87; railroads, 11.33; metal containers, 8.44; exports, 3.79; and all other, 41.70 per cent.

The principal change in consumption is that the trend since 1929 has been away from the heavy or durable goods industries toward the light or consumers' goods industries. This shift is emphasized by the marked tendency toward the broader use of flat rolled steel. Strip, sheets and tin plate have been in the ascendancy, whereas rails, plates, shapes, bars and track accessories have been declining.

Another marked contrast can be drawn in the distribution of gross income. Undoubtedly more of the income dollar in 1937 went to employes and less to the stockholders than in 1929. It is infinitely more difficult to make a profit on a ton of steel in 1937 than it was in 1929. This probably is a source of great gratification to those persons who have been contending that a planned economy, such as that attempted by the present federal administration, is an effective way of forcing a more equitable distribution of wealth.

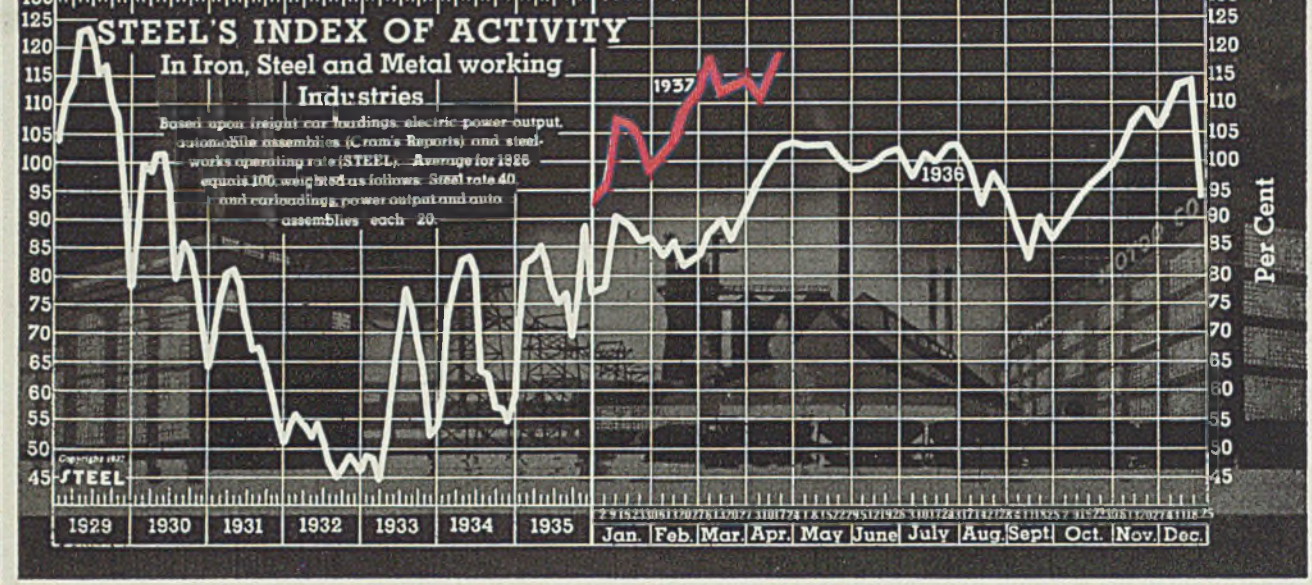
Planned Economy Fails To Bring "Abundant Life" to Under-Privileged Persons on Relief

But thus far, have we any definite proof that the working of the planned economy has produced any tangible benefits for the nation as a whole; or for the so-called under-privileged, who presumably were to be benefited by the redistribution of wealth or income?

According to the statistics cited in the foregoing paragraphs, the steel industry has "spread" employment, has shortened the work week and increased unit wages. Probably it has done as good a job in these respects as any major industry, and certainly far better than the average for all industry. Steel operations and steel employment are at all-time peaks, and yet the alleged number of unemployed and the army of persons on government relief have been reduced only slightly from the depression peaks.

Obviously something is wrong, and instead of continuing to throw the blame on industry, politicians should now look for some more plausible goat. That four-footed animal probably could be found lurking in the vast corridors of the temples of government in Washington, where theorists and experimenters,—in their attempts to redistribute income by punitive methods—have created so much uncertainty as to the safety of long-term business commitments that they have discouraged much of the private initiative for capital goods expenditures.

The result is that industry is getting along quite well on a diet of consumers' goods demand, but the better balance and the increased employment that would result from a removal of the obstacles to capital goods expenditures are being withheld by the mule-like obstinacy of a prejudiced government administration.



STEEL'S index of activity gained 6.5 points to 119.2 in the week ending April 17:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Feb. 27	112.8	83.4	81.1	76.8	47.4	55.1	75.8	99.7
March 6	117.9	87.7	82.0	78.6	43.4	54.1	79.2	93.8
March 13	112.7	89.7	84.0	79.9	42.7	54.8	80.6	97.5
March 20	113.1	86.0	84.0	79.7	44.6	54.4	81.3	98.1
March 27	114.0	91.2	84.3	79.3	45.2	53.5	80.6	99.6
April 3	112.0	86.8	83.4	79.6	49.1	53.4	81.5	97.6
April 10	112.7†	99.6	85.4	82.2	52.6	52.6	80.9	102.3
April 17	119.2*	103.1	86.3	85.0	55.8	53.4	81.1	103.1

*Preliminary. †Revised.

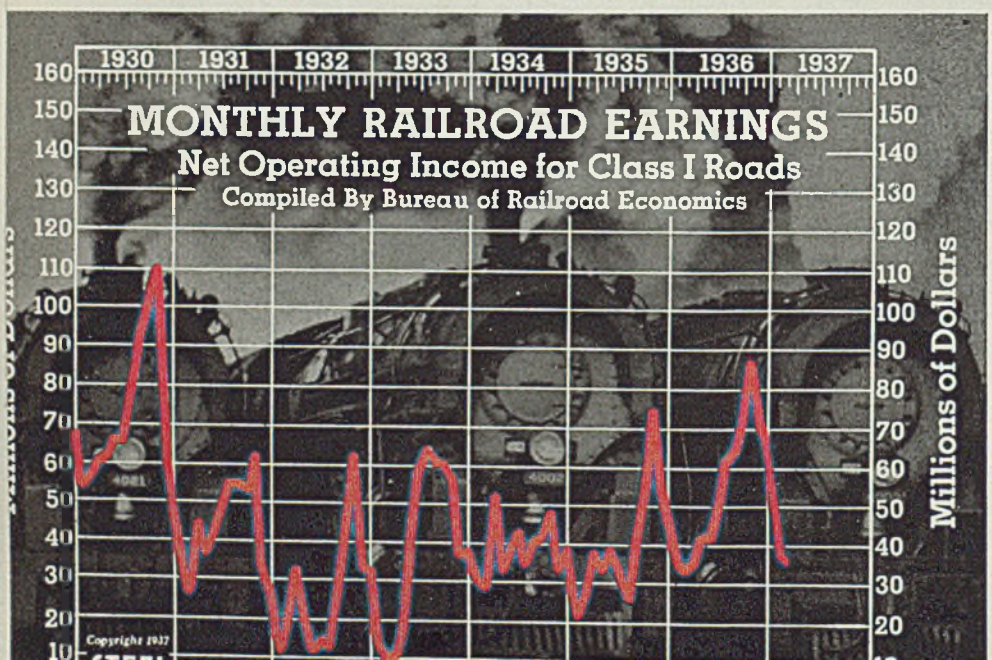
Strikes Abated, Activity Rises to Near-Record Heights

WITH labor discord diminishing, at least temporarily, with demand holding steady and with prices adjusting themselves to a sounder basis, the outlook for business for the remainder of the second quarter appears somewhat brighter as the end of April approaches.

Indicative of what can happen under present conditions when strike trouble is held at a minimum, STEEL'S index of activity in the week ending April 17 stood at 119.2. This is about 7 points above the average in recent weeks when the automobile strikes were in progress. In other words, peace in motordom adds about 6 or 7 points to the national index of activity.

This fact now has been substantiated on two occasions. Since Feb. 1 the automobile industry has enjoyed only two weeks of freedom from strike trouble. One was the week ending March 6 and the other the week ending April 17. STEEL'S index for these weeks were 117.9 and 119.2, respectively. The index in the strike-tormented weeks was around 112.0.

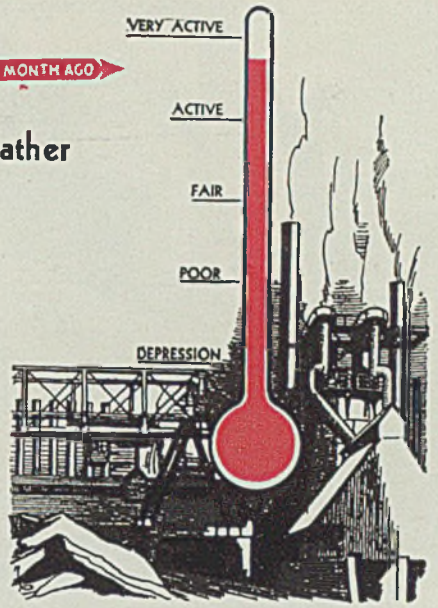
The index of 119.2 for the week ending April 17 is the highest for any week in 1937 and also is a new high for the recovery period. It is only slight-



	1937	1936	1935
Jan.	$38,436,679	$35,728,532	$21,934,645
Feb.	38,358,638	33,594,718	26,296,411
March	.....	35,205,513	38,129,871
April	.....	41,547,644	34,708,718
May	.....	41,842,147	39,598,511
June	.....	50,312,580	34,102,703
July	.....	61,773,765	26,919,343
Aug.	.....	64,680,717	42,156,706
Sept.	.....	70,166,026	57,349,265
Oct.	.....	89,851,409	75,454,501
Nov.	.....	72,410,571	54,224,290
Dec.	.....	70,519,601	46,020,695

BUSINESS TREND

Industrial Weather



TREND:
Upward

ly below the index numbers recorded in the peak weeks of 1929.

In comparing present activity indexes with those of 1929 it must be remembered that the two are not strictly comparable. For instance, freight car loadings figures are not a reliable indication of freight traffic in the two periods. The increase of freight handled on motor highways since 1929 means that current freight car loadings understate the actual movement of freight by a considerable margin.

A corrective factor also would be desirable in connection with steelworks operations. Today the steel rate is 91.5 per cent of capacity, as against 98 per cent in the same week of 1929. However the present rate is based upon an annual steel ingot capacity of 68,290,862 tons, whereas the 1929 rate was figured on an annual capacity of 63,784,389 tons.

On the basis of actual steel output, production today is at or near the all-time peak for the industry. Considering the current obstacles, this is a remarkable showing.

Where Business Stands

Monthly Averages, 1936 = 100

	March, 1937	Feb., 1937	March, 1936
Steel Ingot Output	128.8	122.6	85.6
Pig Iron Output	132.7	128.7	78.7
Freight Movement	108.3	100.1	87.2
Building Construction		87.7	91.7
Automobile Production	127.4	99.8	115.0
Wholesale Prices	112.4	111.3	97.6

The Barometer of Business

Industrial Indicators

	March, 1937	Feb., 1937	March, 1936
Pig iron output (daily average, tons)	111,233	107,857	66,004
Machine tool index	192.4	207.7	109.4
Finished steel shipments	1,414,399	1,133,724	783,552
Ingot output (daily average, tons)	193,683	184,361	128,711
Dodge building awards in 37 states (sq. ft.)		29,942,100	31,308,100
Automobile output	*490,000	383,637	442,545
Coal output, tons	50,720,000	42,110,000	31,233,000
Business failures; number	820	721	946
Business failures; liabilities	$10,922,000	$9,771,000	$16,271,000
Cement production, bbls.		5,837,000	5,263,000
Cotton consumption, bales	779,000	664,000	549,000
Car loadings (weekly av.)	750,875	694,564	604,746

*Estimated.

Commodity Prices

	March, 1937	Feb., 1937	March, 1936
STEEL'S composite average of 25 iron and steel prices	$39.92	$36.74	$33.20
Bradstreet's index	$11.34	$11.23	$9.85
Wheat, cash (bushel)	$1.58	$1.52	$1.14
Corn, cash (bushel)	$1.29	$1.24	80c
Petroleum, crude (bbl.)	$1.20	$1.20	$1.08

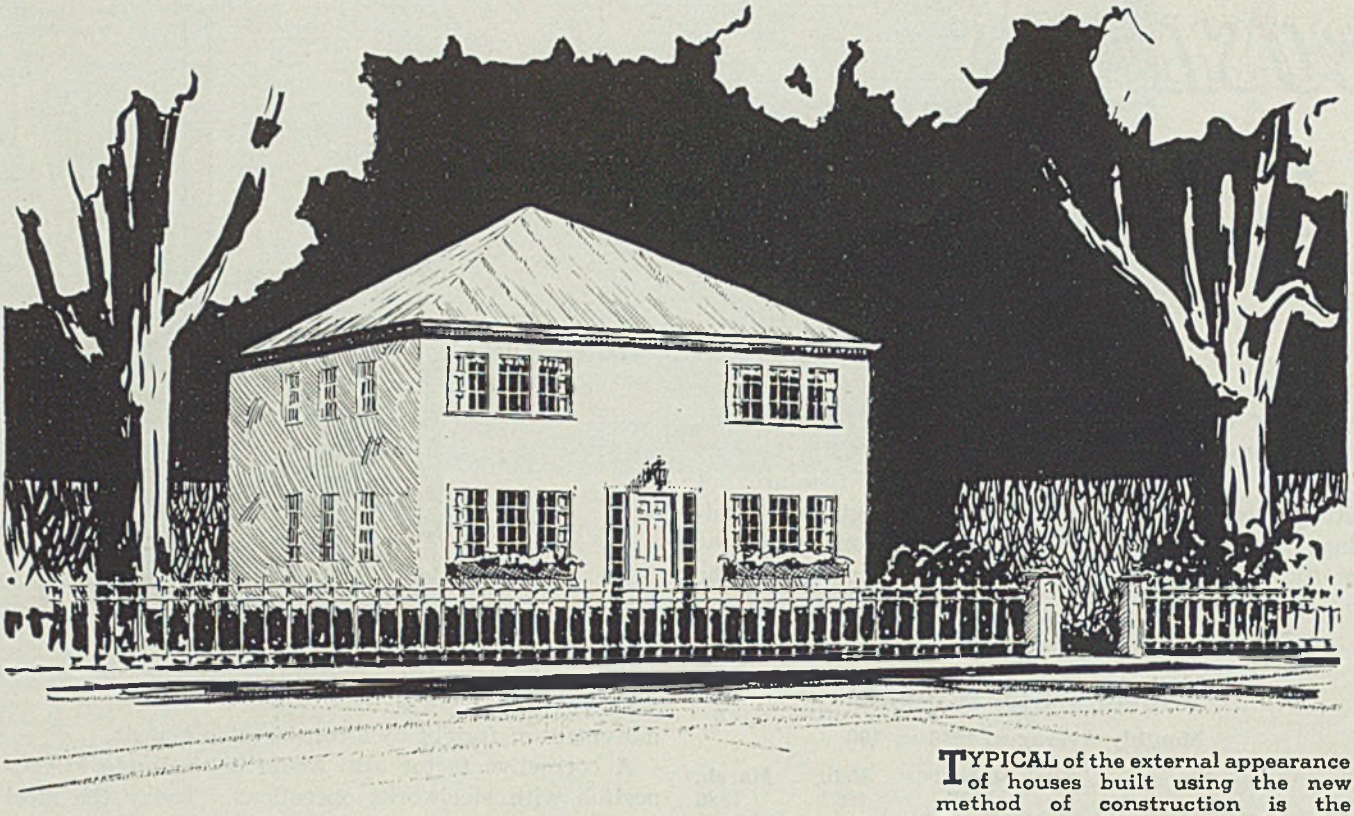
Financial Indicators

	March, 1937	Feb., 1937	March, 1936
25 Industrial stocks	$226.69	$232.09	$202.99
25 Rail stocks	$48.39	$44.68	$38.50
40 Bonds	$87.92	$89.45	$87.88
Bank clearings (000 omitted)		$23,718,000	$26,610,000
Commercial paper rate (New York, per cent)	1	¾	¾
*Commercial loans (000 omitted)	$9,366,000	$8,649,000	$8,204,000
Federal Reserve ratio, per cent	80.5	80.4	78.2
Railroad earnings	†$38,358,638	$38,436,679	$33,594,718
Stock sales, New York stock exchange	50,344,350	50,255,060	51,025,148
Bond sales, par value	$422,053,300	$285,187,800	$285,429,900

*Leading member banks Federal Reserve System.
†February, January and February, respectively.

Foreign Trade

	March, 1937	Feb., 1937	March, 1936
Exports		$232,504,000	$195,336,000
Imports		$277,805,000	$200,295,000
Gold exports			$2,315,000
Gold imports		$120,326,000	$7,795,000



TYPICAL of the external appearance of houses built using the new method of construction is the Georgian type home pictured in this architect's drawing. In other illustrations are shown views of a cutaway section of this house

New Construction Features Minimize Steel Home Disadvantages

BY R. L. HARTFORD
Editorial Representative, STEEL

PREFABRICATED steel homes without the attendant difficulties of boxlike construction, transmission of noise through walls and sweating between the walls are promised by H. L. Walters, construction engineer with a large steel company and the designer of a new construction method to be used in these homes. Resulting from several years of experimenting, the new structures are built with an eye to future requirements and in accordance with the demands of present day home buyers.

Of steel construction throughout, the homes are entirely prefabricated at the plant and assembled in the field. As a result of specially constructed joints in both external and internal walls and in trim, bolts are necessary at a few points only, and no riveting or welding is required in assembling the homes in the field. Accurate fitting of parts is assured since the wall panels and trim are stampings and are of standard size and shape. A wide variety of plans is available by varying the number and location of the standard parts so that each individual buyer can plan his own home; thus standardized homes in the sense of identical or similar external appearance are not implied in this type prefabricated structure.

Among the objections to steel constructed homes up to the present has been the necessity of fitting various parts in the field, and the requirement of either welding the various parts together or drilling and tapping for assembly. Such work is costly and lacking proper metal working facilities in the field, finished workmanship is not attained.

Further—stresses caused by rigid fastenings produce, after varying temperature changes, waves or buckles on finished surfaces destroying the finished uniform appearance essential to a satisfactory job.

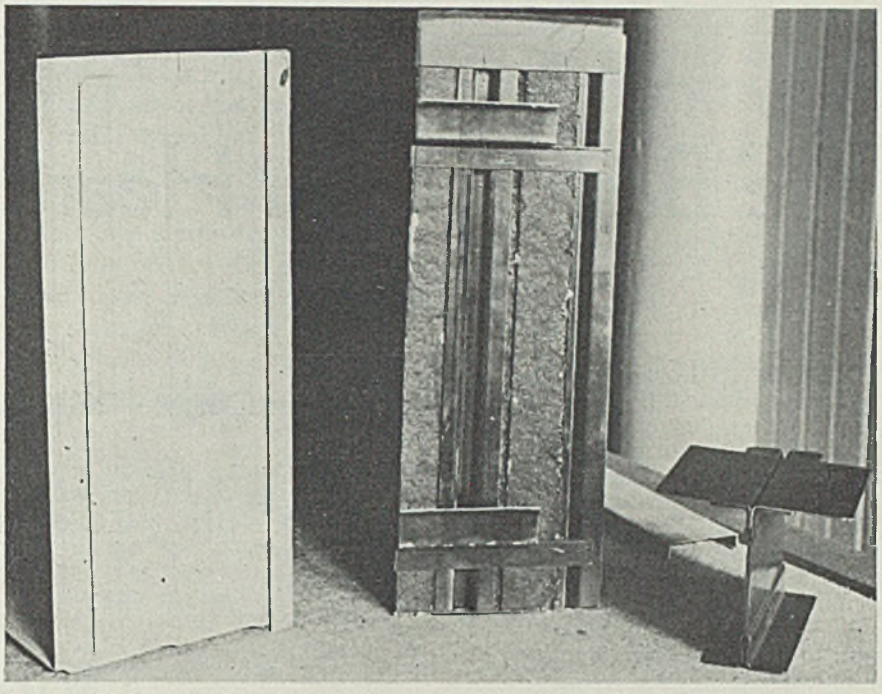
It has been such problems that have retarded all-steel housing developments and being aware of them, engineering on this product was directed toward their solution.

Steel used in the construction is low carbon "metal furniture" sheet. Sizes used include 14 gage for foundation supports, 16 gage for beams supporting floors and walls and 18 gage wall panels and trim. The heavier members are bolted together to form the basic framework, and lighter members are interlocked to form a rigid structure. Method of interlocking employed allows the entire structure to expand and contract with temperature changes without buckling the thinner sheets or causing undue strain on the joints, according to the builders.

Although the fabricated pieces provide large tolerances for erection the final assembly fits closely and

the joints are tight enough to be well concealed by painting. In order to provide accurate construction of this type, special shapes have been designed. All-steel joints in the shape of I-beams are rolled in two halves and welded at the web, leaving a special slot in the top and bottom. Floor and ceiling panels are sharply flanged, the flanges being bent to conform with the slots in the joists. These panels are placed in correct position and snapped into the joists by a slight pressure. The natural spring of the joist holds the panel securely, and when the adjoining panel is pressed into the slot, both are locked in position.

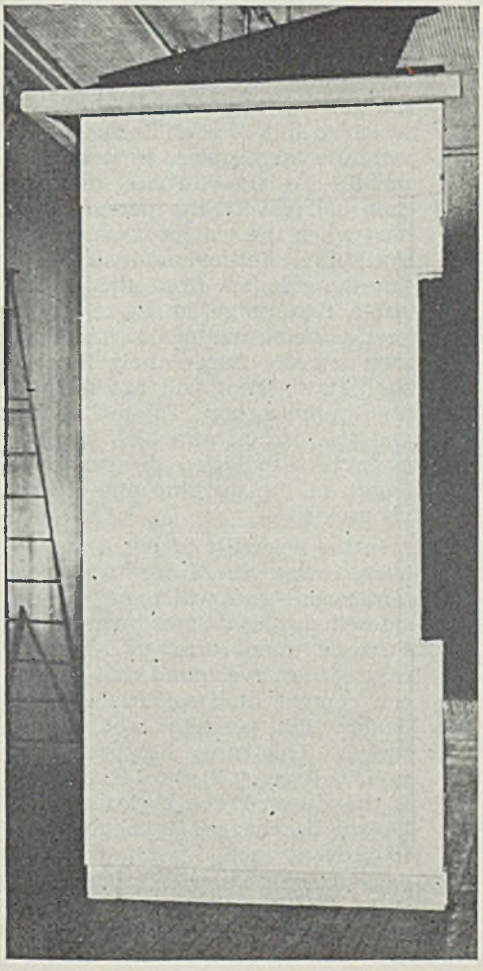
Sidewall and partition frames are built up from two vertical and four horizontal channels, dividing each wall into three separate sections. Channels are mounted with the U-section upright and wall panels are hung from them by means of four projecting strips which lock over the edges of the U-section. In order to prevent metal-to-metal contact and transmission of temperature changes and sound through the walls, strip insulation is cemented over all upright edges of the channels in all walls. For further insulation, wall panels are backed up by sheet insulation over the entire inside surface, removing objectionable metallic ringing from the walls.



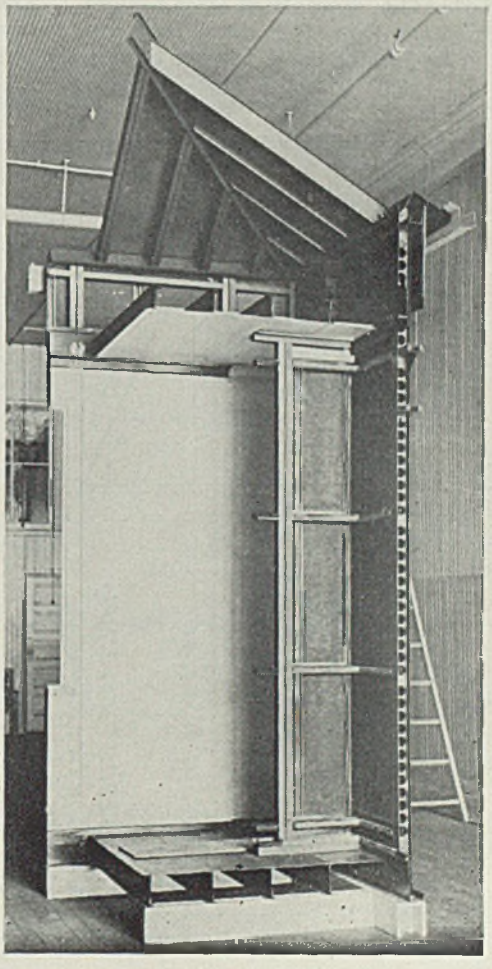
SEGMENTS of the elements used in the construction are shown above. At left is a section of molding, rear view; center a portion of a wall panel, rear view, showing the insulating board backing and the method of fastening the panels to the framework; right shows an I-beam with two adjoining sections of floor paneling attached

Of special interest is the cellular construction of the walls. As an inherent part of the construction, three ducts are formed within the walls. These ducts, each separate from the other at all points, are

(*Please turn to Page* 87)



CORNER section of the home illustrated on the preceding page is shown here. Left is a rear view of the structure, showing two seams, one of which is practically invisible at left, while the other has not yet been covered by the metal strip provided for the purpose. Right is a front view showing the construction details



The Basic Open Hearth Process-IV

Origin, Early History and Present Day Practice and Equipment are Discussed

BY H. L. GEIGER

IN STUDYING over the log of the heat discussed in Part 3 it is plain that during the time this heat was in the furnace there were five distinct periods in which different actions were taking place. These were as follows:

1—The charging period, 7:28 p.m. to 11:58 p.m. or 4 hours and 30 minutes;

2—The melting down period, 11:59 p.m. to 3:20 a.m. or 3 hours and 21 minutes;

3—The period of lime boil, 3:21 a.m. to 5:10 a.m. or 1 hour and 49 minutes;

4—The working and shaping up period, 5:11 a.m. to 8:58 a.m. or 3 hours and 47 minutes;

5—The deoxidation period, 9:00 a.m. to 9:41 a.m. or 41 minutes.

Total time on heat was 14 hours and 3 minutes.

Division of time between these periods is not as sharp as one might conclude from the above, nor are the lengths of these periods exactly the same from heat to heat. A furnace using a smaller stone charge and molten pig iron instead of cold pig, would have a shorter charging period and a shorter lime boil. The approximate ratio of time of each of these periods might, however, be the same. There is an overlapping of these periods. For instance, the melt-down period may be considered as extending on through to the end of the lime boil as all of the limestone does not rise until the scrap over it is completely melted, yet the lime boil starts in all of its violence before the scrap is completely melted. So for the sake of reference the furnace man describes as the lime boil the action noted on the surface of the metal bath and which to him is a guide as to what action is taking place in the molten metal. To the furnace man the lime boil covers the period in the heat when the violent boiling starts until it is finished and all of the limestone is up from the bottom. After that stage he describes his heat as being melted. Most furnace men try to charge their furnaces so that the heat will not melt too high in the carbon. The melt carbon and the carbon at which the heat is to be deoxidized determine the length of the working and shaping up period.

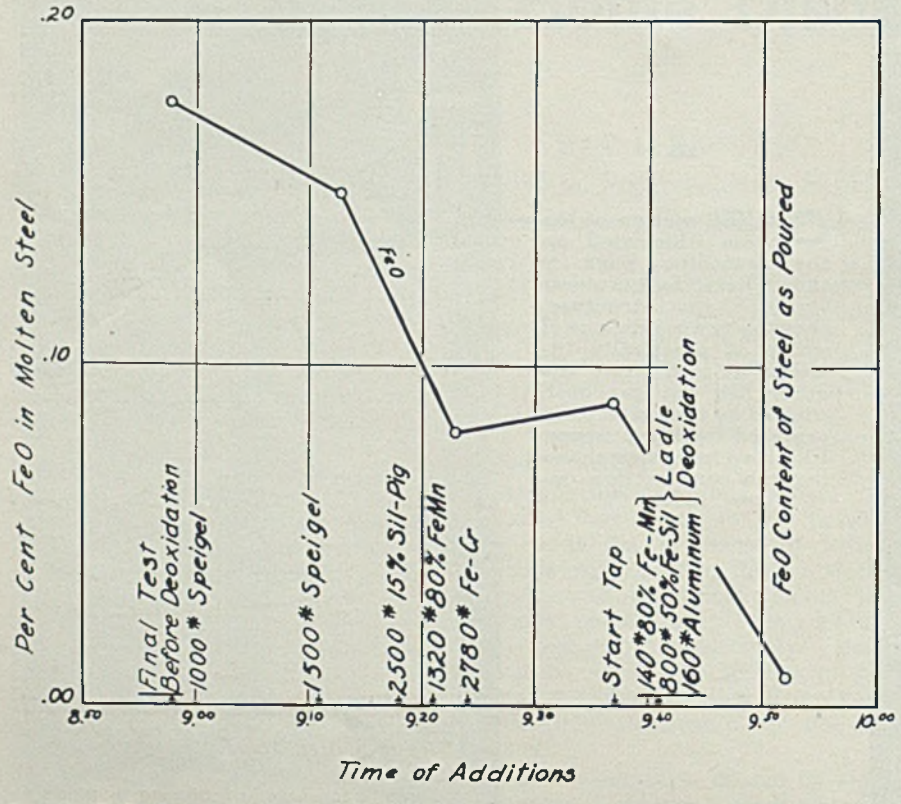


Fig. 11—FeO content of metal during deoxidation period of Specification SAE X-3140 heat

In the selection of pig iron for a basic charge there are two important constituents which must be considered, silicon and manganese. Furnace men through years of experience have found that the silicon content of basic iron must be held within certain well defined ranges. This range has been found to be between 0.80 and 1.25 per cent. If the silicon is too high more lime has to be charged to neutralize it to prevent excessive attack on the basic hearth lining. By increasing the limestone charge to insure sufficient basicity for slag reactions

the volume of slag is increased, preventing rapid reactions and a satisfactory heat transfer from the flame to the metal. To prevent this slowing up of the process, the desire is to hold the silicon under 1.25 per cent.

If the silicon is too low the heat would melt too soft in carbon. Because silicon is the most readily oxidized constituent of the pig iron it is considered a safeguard against excessive oxidation of iron and carbon during the melting down period. If the per cent of silicon is too low an excess of ferrous oxide will be formed in the metal, reducing the carbon in the metal to a point too low by the time the limestone is all up from the bottom of the hearth to permit working and shaping up of the molten steel. The heat then is said to have melted "soft" and extra pig iron has to be charged to increase the carbon in the metal bath to a point where shaping up is permitted. For this reason furnace men do not like to use pig iron with a silicon content much under 0.80 per cent.

Increase Manganese Content

Manganese content of basic pig iron has been increased in recent years. Starting with 1.00 per cent, some furnace operators observed a few years ago that a higher manganese content in their pig iron was somewhat conducive to higher carbon melts and to lower sulphur in the steels made from these higher manganese irons. Consequently, manganese was increased to a range of 1.25 to 1.50 per cent and, as more of the manganiferous iron ore bodies were opened up, some of the open hearths commenced to use 1.50 to 1.75 per cent manganese irons for their basic heats while others increased the manganese to 2.00 per cent. Some plants in Europe run the manganese as high as 4.00 per cent in their irons.

In the basic process manganese combines with sulphur in the molten steel, forming manganese sulphide which floats to the slag layer and is absorbed by the basic slag. In this way part of the sulphur is removed from the steel. It also prevents excessive oxidation of the metal, although residuals of 0.30 manganese may exist in the molten steel baths with an FeO content of 0.16 to 0.18, as shown in Fig. 12.

In the selection of steel scrap, larger sections in which less area is exposed to the oxidizing flame per unit of weight will produce less ferrous oxide during the melting down period and therefore is more desirable. Since considerable sulphur is picked up from the fuel during the melting down period the heavier melting scrap is desirable for the same reasons.

This is Part 4 and the concluding installment of an article by Mr. Geiger. Herewith is presented a discussion of the log of a heat of basic open hearth steel set forth in Part 3 which appeared in STEEL of April 12. This installment describes the various reactions that take place in a basic open hearth furnace and the steps by which these reactions are controlled

When alloy scrap is used in the charge the melter can figure on 100 per cent recovery of the nickel content and the same per cent recovery of the molybdenum, neither of these elements being oxidized in the melting down period. Vanadium and chromium are oxidized in the melting down operation and the melter may figure a 100 per cent loss of vanadium and a 25 to 50 per cent final loss of chromium depending on the melt down conditions.

Most furnace men like to melt down their scrap charge with a hot flame and a resulting fast melt. This holds the oxidation to a minimum.

As indicated in the log the lime boil is evidenced by a violent boiling action in the bath, first locally and finally reaching a violence covering the entire molten metal surface. As the limestone rises to the slag surface in the form of mushy lumps or as fully calcined lime, the boiling action slows up until it finally ceases, terminating this period in the heat. The violent action is due to the following reaction:

(1) $Ca\ CO_3$ + Heat $CaO + CO_2$

The boiling action is due to the large volume of CO_2 given off by the heated stone. As the CO_2 rises through the metal bath it picks up some of the carbon from the metal by the following reaction:

(2) $CO_2 + C\ 2CO$, so that a mixture of CO and CO_2 is given off by the lime boil and during this period the metal may lose as much as 40 points of carbon an hour in the second reaction. In the first reaction the CaO floats to the slag level to form the principal constituent of the basic slag. During the last hour of the lime boil the CaO content of the slag may increase from 20 per cent to 38 or 40 per cent.

A typical slag analysis at the beginning of the lime boil is as follows:

CaO	SiO_2	FeO	Fe_2O_3	MnO	MgO
23.70	21.50	16.20	0.65	21.30	6.40

At the end of the lime boil it would be somewhat as follows:

CaO	SiO_2	FeO	Fe_2O_3	MnO	MgO
39.40	14.80	16.21	4.80	13.85	7.34

Only the principal constituents

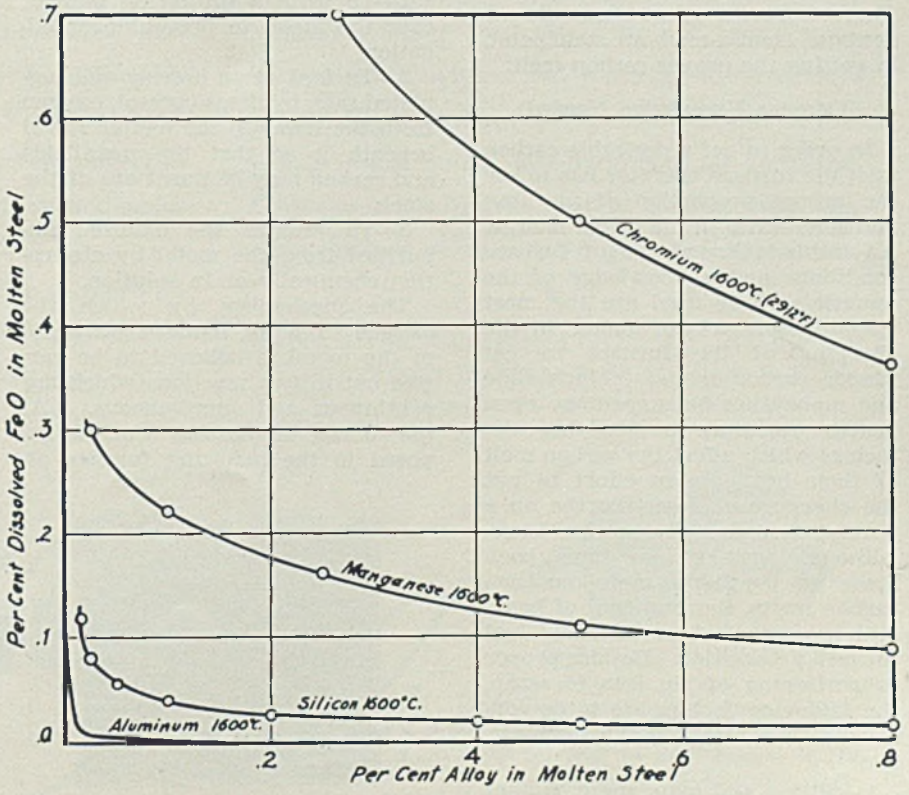


Fig. 12—Relative deoxidizing power of chromium, manganese, silicon and aluminum in molten steel at 1600 degrees Cent., after Chipman

are given. Because of the endothermic reactions which take place during the lime boil the furnace man has to watch his flame and metal temperatures quite closely to prevent chilling of the metal.

Working Period Is Short

At the end of the lime boil the heat is said to be "melted" and the per cent carbon in the metal at this time is very important. As pointed out previously, the carbon when the lime is all up from the hearth bottom, and the carbon content of the metal at which the heat is to be deoxidized, determine the length of the working and shaping up period. Furnace men do not like to have a long working period. If it is too long, ore has to be used in working of the heat to speed up the reactions. This sometimes has a tendency to so thin the slag by the time the heat is to be deoxidized as to have an over oxidizing condition in the metal. If the carbon is too low at the melt, that is, if the heat melts "too close" or if it melts "soft," not enough time is permitted to put all of the limestone in solution; hence the furnace man does not have sufficient time to get his metal at the proper temperature for good deoxidation and casting conditions. In other words the heat should melt "just right" which usually means that at the end of the lime boil the carbon in the metal should be about 50 to 60 points above the carbon at which the melter intends to deoxidize the heat. There is also a great economic advantage, from a ton-hour standpoint, in getting the proper carbon melt.

Furnace Knowledge Needed

In order to get a desirable carbon melt the furnace operator has to use the proper proportion of pig iron and steel scrap in the initial charge. An intimate knowledge of furnace conditions and a knowledge of the materials to be used are the most valuable aids to the melter in the charging of the furnace to get proper carbon melts. Much time and money has been spent by open hearth operators in studying the factors which affect the carbon melt of their heats in an effort to put the charging of open hearths on a purely scientific and empirical basis. Although vast strides have been made in obtaining more uniform carbon melts, the charging of heats still is somewhat of an individual furnace proposition. Besides proper proportioning of pig iron to scrap, the following factors are to be considered in controlling the melt carbon:

1—Silicon and manganese content of pig iron;

2—Type of fuel;

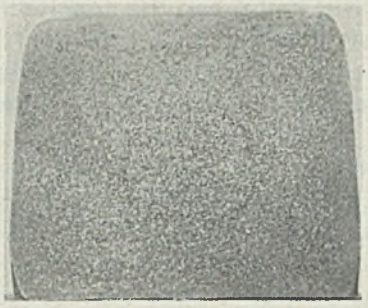


Fig. 13—Deep etch of cross section of X-3140 billet with 0.20 silicon and 1.3 pounds aluminum added per ton of steel

3—Per cent limestone charged; this governs the amount of CO_2 and 2CO given off;

4—Age of furnace; this factor affects the amount of FeO produced by slow or fast melt down;

5—Nature of scrap;

6—Physical condition of pig iron, whether molten or cold cast pigs.

When the heat is melted the furnace man is ready to "work" or "shape up" his heat. Flame reversals are continued at 15 to 20-minute intervals to keep the metal and slag molten so that the chemical reactions may continue at an orderly rate throughout the working period. The chemical reactions are carried on by FeO which is furnished to the metal from the flame through the slag. The slag plays an important part in the working of a heat of steel, its manifold functions being principally:

1—To form a protecting blanket over the metal to prevent over-oxidation;

2—To feed at an orderly and regulated rate, by flame control, oxygen from the flame to the molten metal beneath it so that the metalloids and carbon may be burnt out of the steel;

3—To remove the oxidized impurities from the metal by absorption chemically or in solution.

The mechanism by which the oxygen from the flame is conveyed to the metal is believed to be carried out in two reactions which are continuous and simultaneous. At the surface of the slag which is exposed to the oxidizing furnace atmosphere the following reaction may be predominant:

(3) $O + 2FeO \rightarrow Fe_2O_3$

Any concentration of Fe_2O_3 which is built up in the slag is changed at the slag-metal contact face to FeO by the following reaction because of the high concentration of iron at this point:

(4) $Fe + Fe_2O_3 \rightarrow 3FeO.$

Fig. 14—Deep etch of semi-silicon killed heat, no aluminum was used

Rate Controls Slag Content

Part of the FeO formed by this reaction is dissolved in the metal where it carries on its oxidizing function.

The rate at which the above reactions were carried on governs the amount of FeO + Fe_2O_3 which will be found in the slag and in the metal. If the amount of oxygen fed to the metal equals the amount picked up by the slag the FeO content of the slag should remain constant throughout the working period. Likewise, if the amount of oxygen fed to the metal equaled the amount used to burn out the carbon, manganese, phosphorus and chromium, the FeO content of the metal should be constant throughout the working period. This is not the rule, however, as there is always a slight building up of FeO in both the slag and the metal during the working period. The FeO in the slag may increase from 1 to 5 per cent while the FeO in the metal may increase as much as 0.08 per cent and sometimes as much as 0.10 per cent. Actually much more entered the bath but it is removed by the following reactions:

(5) $C + FeO \rightarrow CO + Fe$

(6) $Mn + FeO \rightarrow MnO + Fe$

(7) $2P + 8FeO \rightarrow 3FeO \cdot P_2O_5 + 5Fe$

Carbon Removal Reaction

The fifth reaction represents the removal of carbon from the metal. It is this reaction that gives the bath the appearance of "boiling," due to bubbles of CO gas that break out over the entire surface of the bath. Since a gas, CO, is a product of this reaction it goes to an end point and is not reversible. This boiling action is continuous throughout the working period of the heat and is distinguished from the lime boil by its less violent action.

The sixth reaction represents the oxidation of manganese. Manganese is oxidized to MnO and is absorbed by the slag. Under certain temperature conditions the manganese content of the slag may revert back to the metal and the manganese content of the metal may increase as much as 3 or 4 points, that is, from 0.30 to 0.33 or 0.34. In most heats reversion of manganese does not occur. The seventh reaction possibly is the action by which phosphorous is removed

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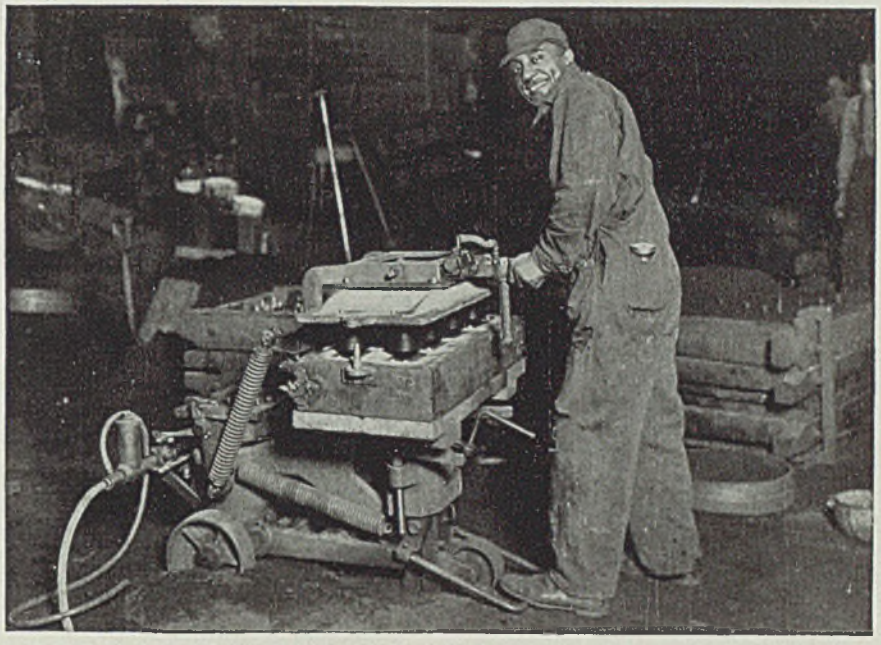

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from the metal. The following is the reaction by which it probably is absorbed by the basic slag:

(8) $3FeO \bullet P_2O_5 + 3CaO \rightarrow 3CaO \bullet P_2O_5 + 3FeO$.

Since the compound $3CaO \bullet P_2O_5$ is quite stable there is no reversion of phosphorous back to the metal.

Thus, in the heat under discussion the oxygen fed to the metal through the slag reduced the carbon from 0.86 to 0.29, the manganese from 0.47 to 0.29, the phosphorous from 0.033 to 0.018 and the chromium from 0.24 to 0.16 during the working period of 3 hours and 47 minutes. For the carbon this was an average drop of 15 points per hour and 14 points during the last hour. A clever furnace man will slow down the rate of oxidation the last hour of the working period and, by so doing, hold the oxygen content to a minimum in the metal. Lowering of the concentration of the metalloids towards the end of the working period also slows up reactions.

CaO Is Absorbing Base

In the slag reactions, the absorbing base as already pointed out is CaO which combines early in the heat with SiO_2. This calcium silicate is a very stable compound. MgO from the furnace lining and from the limestone generally is recognized to exist in the slag in the uncombined state. MnO and FeO also are believed to exist in solution the same as MgO, that is, uncombined with CaO, while part of the Fe_2O_3 has been found to unite chemically with CaO. The sulphur present in the metal as FeS and MnS is removed by direct contact with the slag as CaS.

Inability of the acid slag to absorb phosphorous and sulphur and its non-oxygen carrying nature are the main differences of this type of slag from the basic slag. In the basic slag, which is definitely an oxygen carrier, there may pass through it several tons of oxygen during the working period, and yet the FeO and Fe_2O_3 may maintain an equilibrium with the other constituents of the slag.

For example, in the heat under discussion, to remove 57 points of carbon as CO gas, 2130 pounds of oxygen are necessary, all of which has to pass through the slag. Compare the following analysis of the slag taken just before deoxidation with the analysis at the carbon melt:

CaO	SiO	FeO	Fe_2O_3	MnO	MgO
41.93	12.80	17.35	5.18	10.87	6.84

It will be observed in the log that although it was to be tapped at 0.40 carbon, the melter had to work the carbon down to 0.29; the carbon of this heat was "caught on the way down." This was necessary to allow for a pick-up of carbon from the high carbon ferroalloys, ferromanganese and ferrochrome. The melter has to know the carbon content of both these alloys and of the spiegeleisen in order to make exact calculations beforehand to determine the limit of the carbon drop so that he may "hit the carbon" in the final analysis. In this heat the melter figured on an 11-point carbon pickup through additions of the ferroalloys.

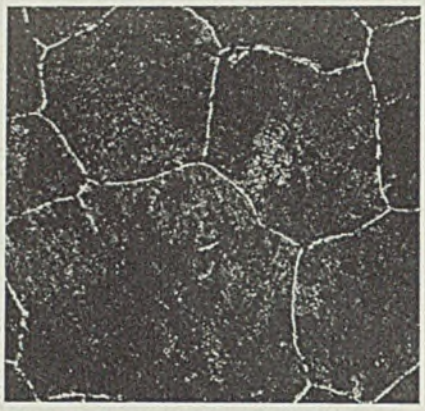

Fig. 15—McQuaid-Ehn grain at 100X of 0.22 silicon, silicon killed heat. Carburized at 1700 degrees Fahr. for 10 hours and treated with Nital etch

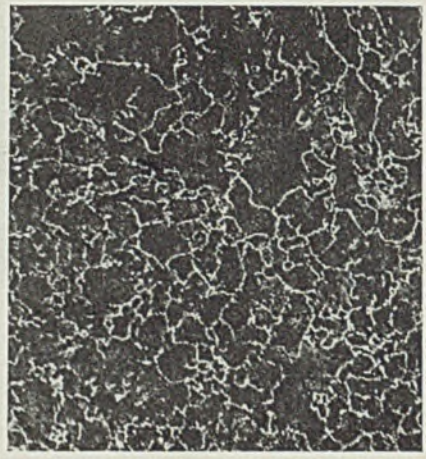

Fig. 16—McQuaid-Ehn grain at 100X of a heat which was furnace deoxidized with silicon and manganese and ladle killed with 1 pound of aluminum per ton of steel, after carburizing at 1700 degrees Fahr. for 10 hours and treated with Nital etch

Fig. 17—McQuaid-Ehn grain at 100X of a heat deoxidized with 1.6 pounds of aluminum in the ladle per ton of steel, carburized at 1700 degrees Fahr. for 10 hours and treated with Nital etch

The method of deoxidation used in this heat should not be taken as standard as deoxidation methods vary from shop to shop and all types of deoxidizers are being used. Some shops use only silvery iron to deoxidize heats. Some use a combination of spiegel and silvery pig, while others use special deoxidizers of silicospiegel and silicomanganese. Each has its advantages and each is used differently in respect to the amount added and the time intervals allowed for deoxidation products to clear up by floating to the slag. One thing is common with all and that is that manganese and/or silicon are used in practically all cases as primary deoxidizers.

Manganese Not Deoxidizer

Necessity for deoxidation already has been pointed out. In the above heat the furnace man had to remove 0.172 residual FeO from the metal after it completed its function of lowering the carbon and manganese to 0.29. Referring to Fig. 11, it will be seen that the two additions of spiegel pig had only a small effect on the amount of FeO reduced in the metal. This may be understood after examining the equilibrium curves of Fig. 12 which values were derived from carefully conducted tests with laboratory melts. It will be seen that the deoxidizing power of manganese is not very great. After the addition of 15 per cent silicon pig and 80 per cent ferromanganese there is a substantial drop in the FeO content due principally to the deoxidation action of the silicon. At the point in the heat prior to the chromium addition the residual silicon was 0.08 and the FeO 0.089.

Temperature of the metal was about 3000 degrees Fahr. Addition of the chromium had a negligible effect in reducing the oxide content since chromium, as shown in Fig. 12, has a low deoxidizing action, especially in the presence of a low oxide content metal. In some heats a recovery of 95 to 98 per cent of the chromium is experienced, the balance, of course, passing into the steel as non-metallic inclusions. The loss of chromium depends to a large extent on the method of deoxidation prior to the chromium addition. Ladle additions of silicon, manganese and aluminum complete the de-

(*Please turn to Page* 78)

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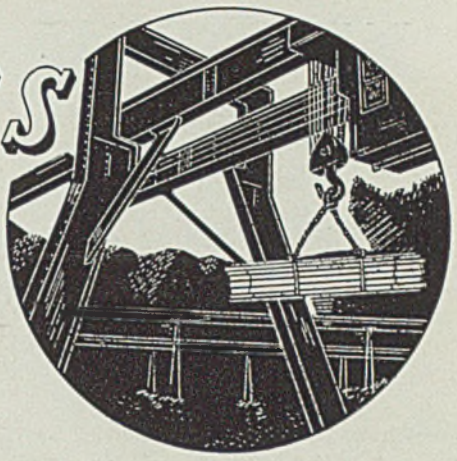
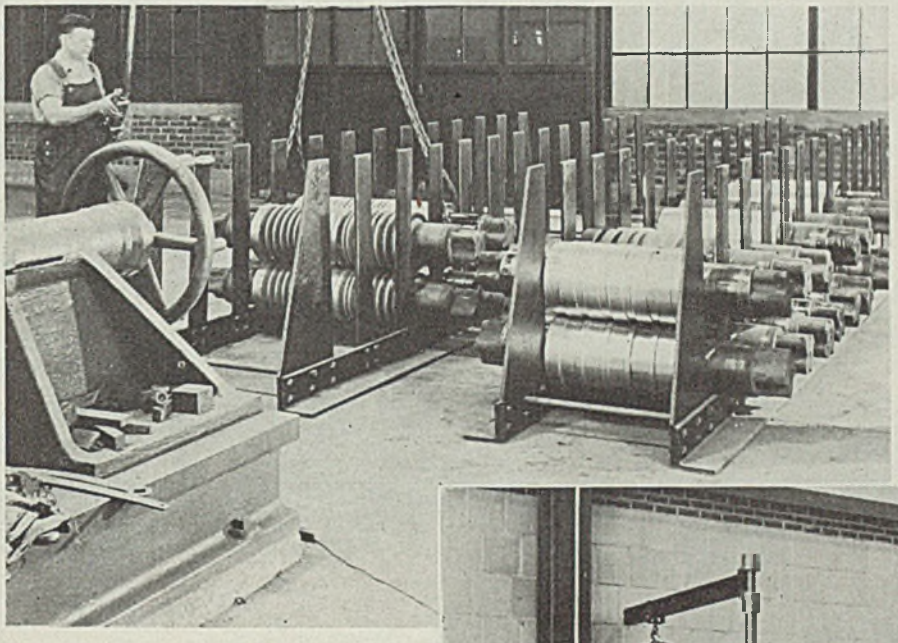
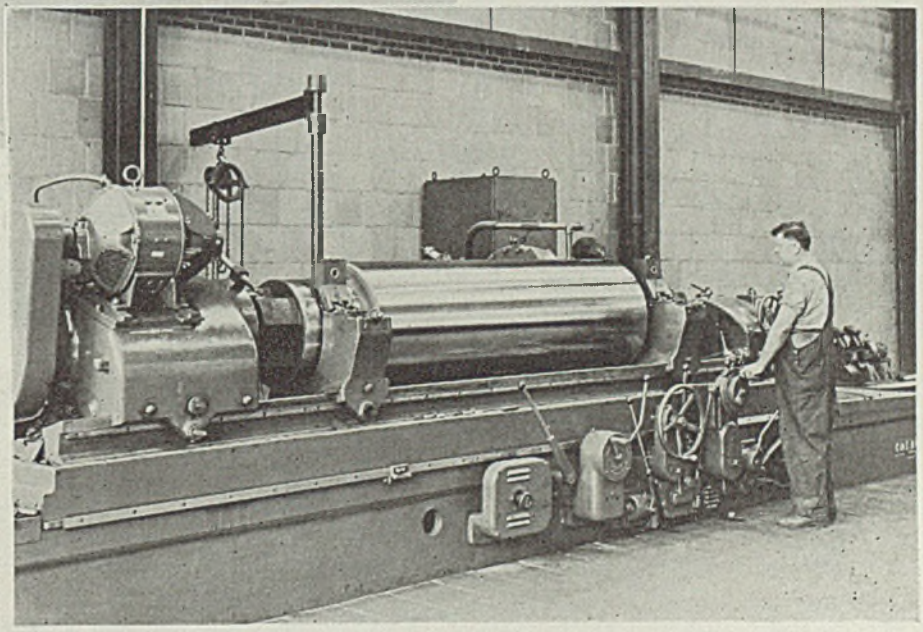


Modern Methods Shown in Roll Grinding Shop

SIXTY-EIGHT buildings and 65 acres. That's the score at the plant of Henry Disston & Sons Inc., Tacony, Philadelphia. It is suggestive in itself of a great story in materials handling because any aggregations of buildings spread out over such an area, all dovetailed into production of thousands and thousands of different items, naturally involves physical distribution on a large scale. The Disston company was founded away back in 1840 and has been in its present location since 1872. Within the past few months the major portion of a large "obsolescence program," adopted in 1932, was completed when the company's roll turning shop was completed.

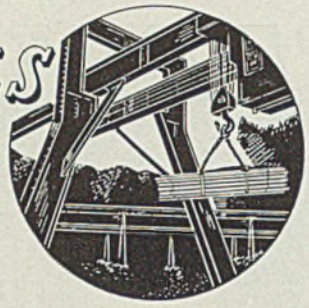
At the recent ceremonies at which S. Horace Disston, vice president and general manager of the company, laid the cornerstone of this new roll turning shop, officers of the company and members of the steel plant force attended. The cornerstone carried a steel inlaid design of the Disston trademark and an emblem symbolizing a steel mill roll. As was explained by an executive of the company, the laying of the cornerstone of a building of this size—it is only 85 by 65 feet—is not of any material importance in itself. Its significance is more because it marks an important chapter in the Disston obsolescence pro-





ABOVE is shown a close-up of special steel racks in which rolls are stored in pairs. Craneman on floor guides overhead crane by push-button control. Right is a view of a large roll being ground in the new machine

MATERIALS HANDLING



gram, which was inaugurated when business showed indications of recovering from the depression. Early in 1934, work of replacing and rebuilding equipment was started. Many machines are scrapped and replaced with more modern equipment. The entire program is said to have cost in the neighborhood of a million dollars.

Modernity Is Emphasized

Of conventional steel frame construction, the new roll turning building sets a high example of the manner in which modern methods combine to provide comfortable surroundings for employes, and efficient layout and equipment. The side walls and 20 per cent of the roof are constructed of actinic glass, which gives a maximum of diffused daylight with a minimum of glare and shadow. Unit heaters and high pressure mercury vapor lighting units are spotted at convenient overhead points, the ceiling being sufficiently high to permit plenty of clearance between lamps and overhead cranes. The ceiling of the office portion is of concrete. In this space is provided floor space for lockers and wash room intended for the use of employes in the shop.

Rolls are brought over from the steel mills on specially designed transfer trucks of 10-ton capacity. The superstructure of the truck is curved to form a cushioned cradle, cushioning being provided by fabric belt facings. Arrangement provides a main bay and a smaller wing bay. Principal items of production machines are a 28- by 144-inch roll grinder and two roll turning lathes. Handling service from truck to grinder and lathes is by cranes equipped with heavy wire rope slings. The main unit in the large bay is a 10-ton overhead electric traveling crane, with runway traversing the entire length of the building. It is floor-operated, with push-button control, the operator having control of all movements by merely pressing one or another of the buttons suspended at waist height. Three smaller lathes will be moved into the wing bay from another department of the plant in the near future. These will be served by a 2-ton crane equipped with hand-operated chain hoist, the runway covering the entire length of the smaller bay. After rolls have been turned, they are lifted off the machines and transported to the lower end of the building, where they

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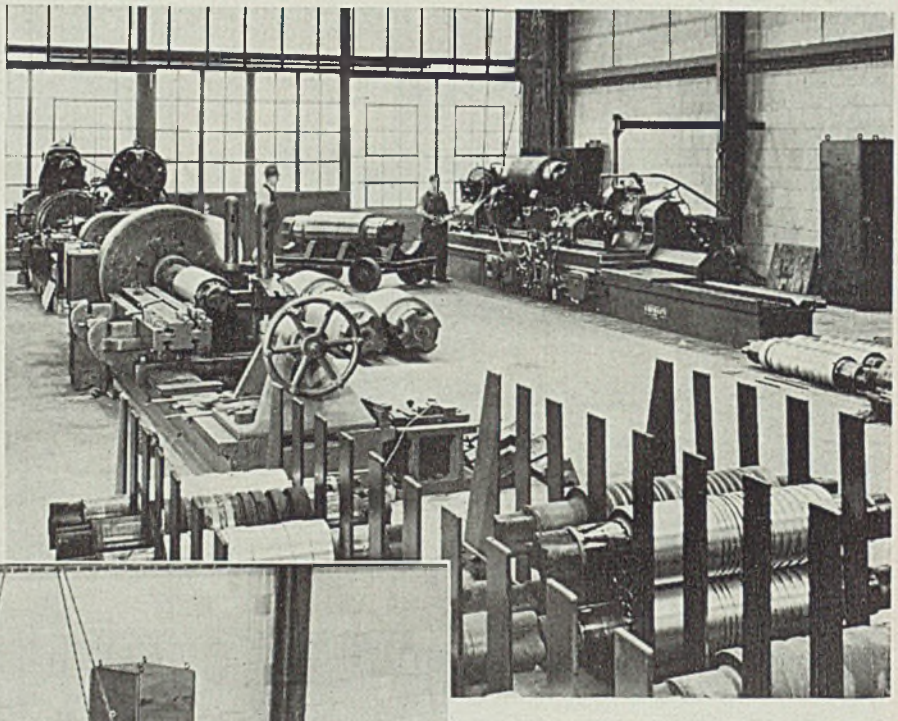
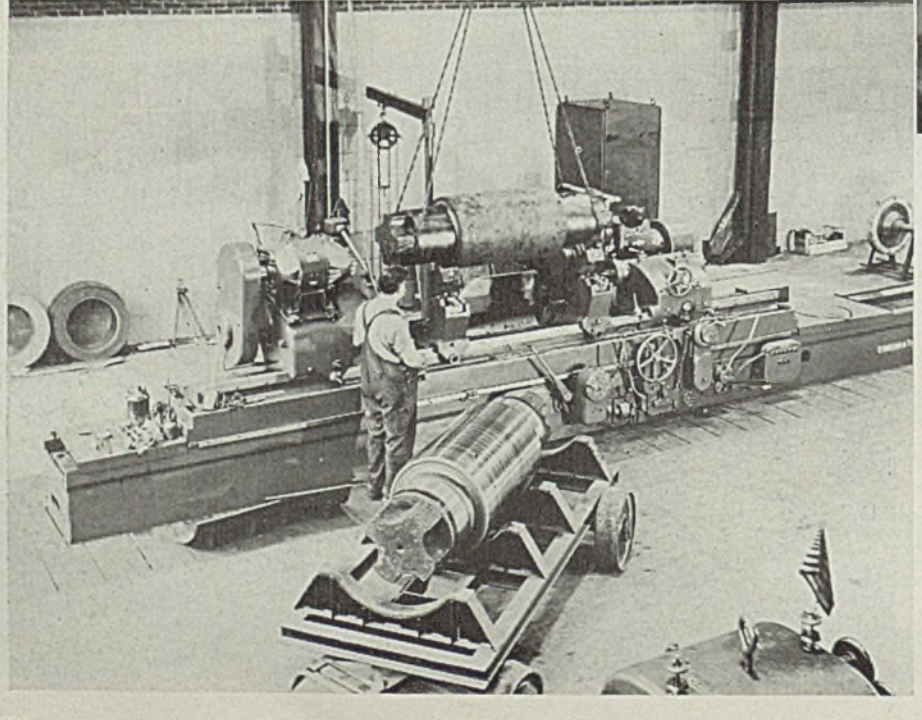
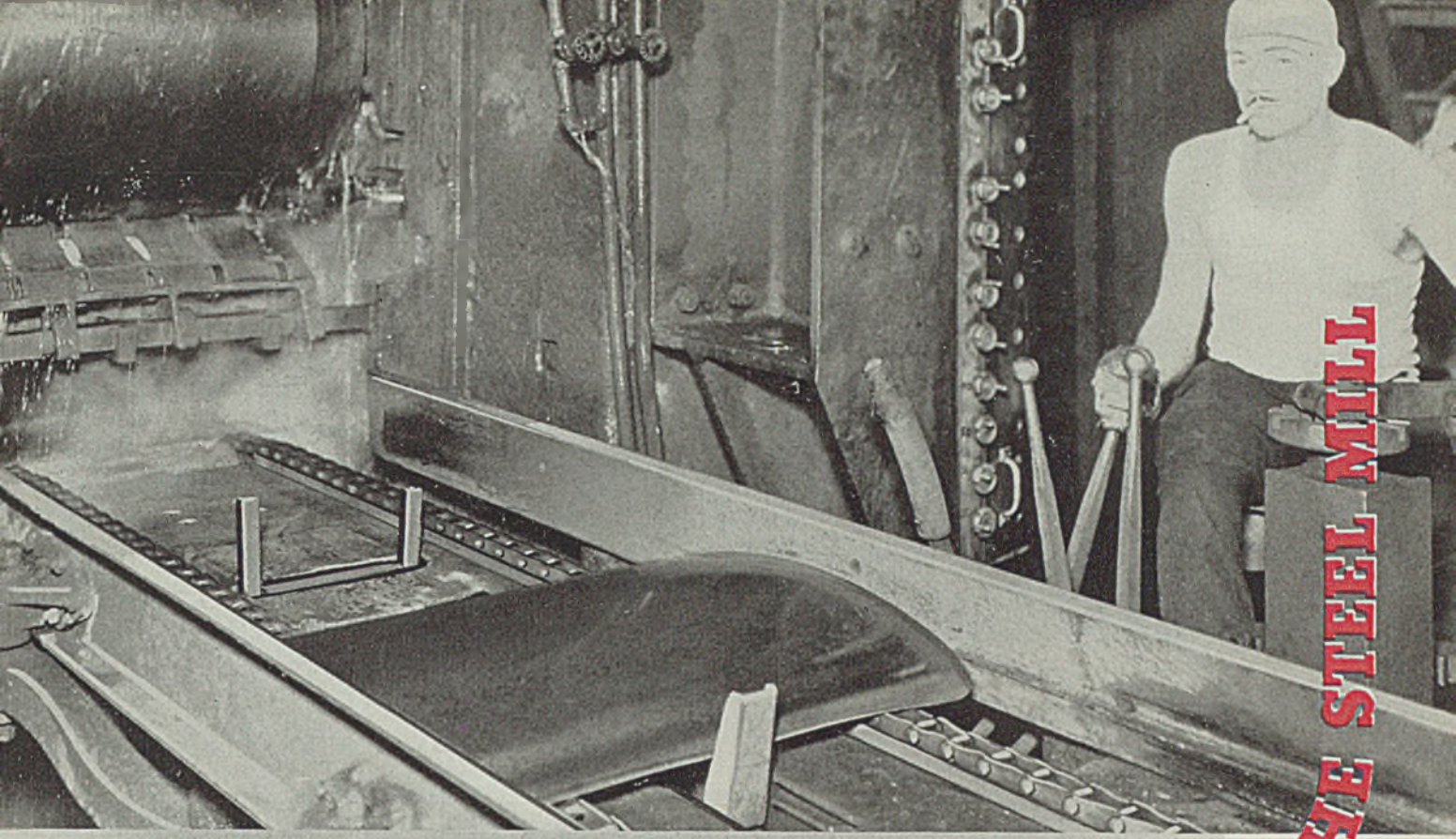




LEFT is a close-up of a 10-ton transfer truck on which cushioning is provided by fabric felt. Upper photo shows a view of the roll turning shop looking towards large roll grinder demonstrating method of handling rolls on and off the machine with 10-ton crane unit



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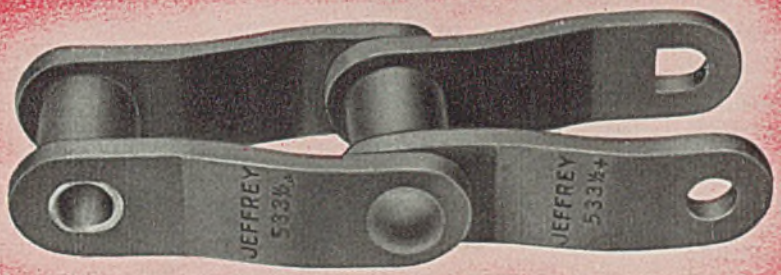

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Research in Steel Brings Long Life To Heavy Tools

RESEARCH in the steel industry is going a long way toward reducing costs and saving time on construction work by providing the materials for better tools. Breakage and the necessity for frequent regrinding are being reduced to a minimum through the concerted efforts of tool steel producers and the makers of tools.

Whether a tool works well or badly has much to do with the cost of any project, and it also has much to do with the amount of time needed for the completion of the work.

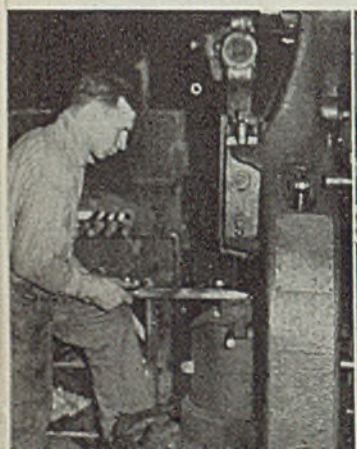
For example, we might take a relatively simple tool, a moil point, which is one of the types of chisels used in pneumatic hammers for breaking concrete and other hard materials preparatory to the starting of actual construction work. While this tool does not appear difficult to make, some conception of the quality which must be built into it is had when it is considered that the hammer works under pressure of from 60 to 90 pounds per square inch and strikes about 3000 blows a minute. Often the tool is used on concrete or hard stone and occasionally strikes such obstacles as reinforcing steel or street car rails. To stand up under such treatment without breaking or losing its edge requires a tough, clean metal, properly developed and heat treated.

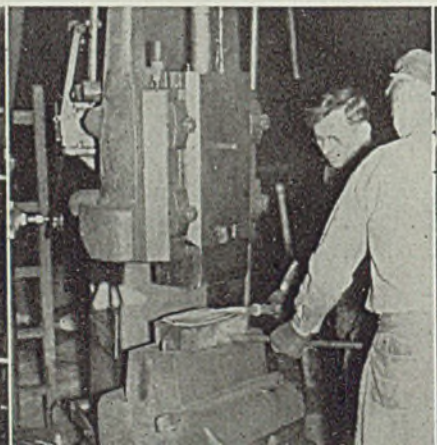
The experiments conducted by a single company might be taken as typical of the work that the steel industry has been doing to help solve municipal construction problems. A long period of research work was required for the development of a particular type of steel known to the trade as Jessop's shock-proof steel. This alloy steel was developed by the Jessop Steel Co., Washington, Pa. After perfecting the steel to meet certain tool requirements, the company then set out to find additional fields for its application. One of these fields appeared to exist in the production of moil points for breaking concrete with air hammers. For years considerable trouble had been experienced in the form of shank breakage.

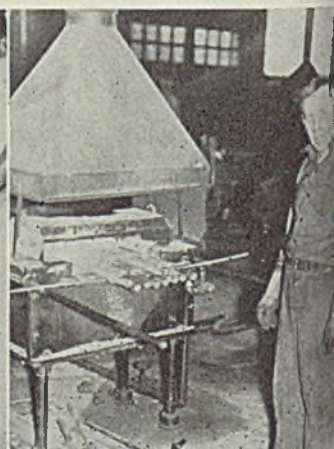
Through the co-operation of Brunner & Lay Co., Chicago, moil points were finally developed from this steel which are standing up under 38 to 40 hours of operation before redressing. This performance is considered unusually high, as other types of points often required redressing after four or five hours. After redressing, these moil points were found to give further service of about 22 hours before a second redressing. The variation in the life of the point of the tool between the time it was first put into service and the time when it was redressed is due to the fact that redressing usually was conducted in an open forge fire at the job without any facilities for testing correct heats.

The first trials of the new tools were conducted on work being undertaken by the city of Chicago, and the success of these experiments later resulted in wide use of these tools on street car lines and government projects.

Below are shown, left to right, point being formed by skilled hand worker; forging a "spade", designed for work in soft materials; method of forging the shank to eliminate a large part of the breakage; and a heating process performed on the steel after selection, which is the key to its performance







YOUNGSTOWN

UnCANny!

The mere thought of a world without cans baffles the imagination

★"We may live without friends, we may live without books, but civilized men cannot live without cooks". So sang the Earl of Lytton two generations ago. Today it can be paraphrased to "We might live without pots, we might live without pans, but modernized homes cannot live without cans."

★YOUNGSTOWN has played a prominent part in the amazing expansion of packaging in tin. YOUNGSTOWN activities have included not only the manufacture of dependable standard grades of tin plate but also the development of special sheets to meet the special forming requirements of unusual containers. The latter is a service which YOUNGSTOWN metallurgists are always prepared to render.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices-YOUNGSTOWN, OHIO

Tin Mill Black Plate, Special Coated Manufacturing Ternes; Sheets; Plates; Pipe and other Tubular Products; Conduit; Bars; Rods; Wire; Nails; Unions; Tie Plates and Spikes.

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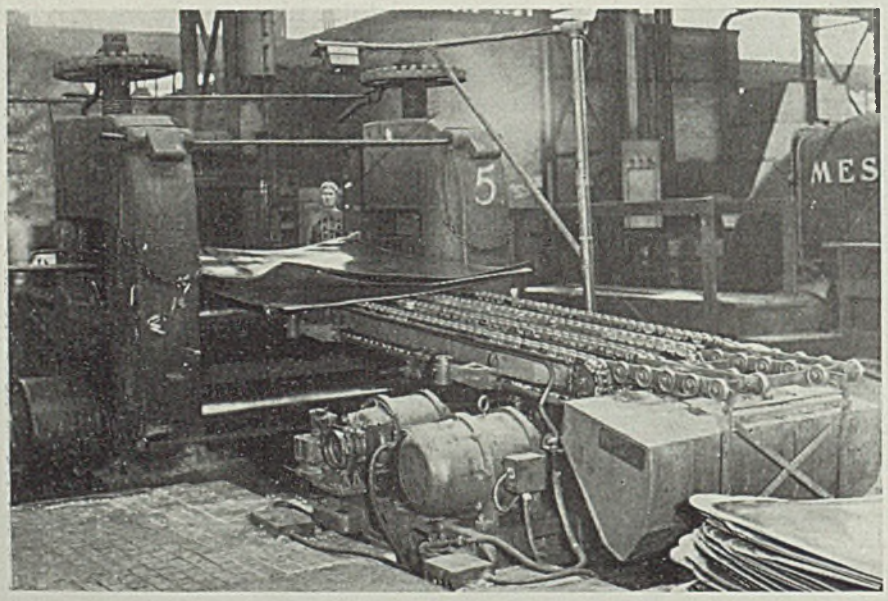
PROGRESS IN STEELMAKING

Mechanizing Hand Sheet Mills Effects Lower Cost of Production

ALTHOUGH the product of continuous strip mills now is firmly in the saddle in the flat rolled steel industry, all signs indicate that there is a bright future for sheet mills. Many old sheet and tin mills formerly operated by hand have been modernized during the past five years by equipping them with mechanical feeder and catcher tables and automatic furnaces. Such improvements, together with the addition of a 3-high stand for breaking down bars, have been costing in the neighborhood of $2 to $2.50 per ton of rolling capacity. On a mill with capacity of 200,000 tons of sheets per year, for instance, the capital expenditure for such improvements would not be more than $500,000.

Looking at the other side of the ledger, it is found that in representative cases where such improvements have been made, the cost of production has been lowered at least $4 per ton of finished product. In other words, it does not take much figuring to show that such an investment quickly pays for itself during periods like the present when the demand for sheets is heavy. That operators appreciate the possibilities is shown by the fact that more than 90 per cent of the operating sheet mills, have been modernized.

Not much has been said about the minimum order which economically can be rolled on a continuous strip mill. That there is a minimum limit is implied by the fact that a slab for a continuous strip mill weighs 8000 pounds or more. It would seem that a minimum economic order for a strip mill would have to involve considerably more than one slab. In other words, it is clear that there will always be an important place for the sheet mill in producing so-called short orders.



Hot sheet mill equipped with mechanical feeder and catcher

Adopt Standard Practice

This is true for integrated as well as nonintegrated companies. At least some of the integrated companies have approached a standard practice in their flat rolled steel business. Determination as to which items can be rolled most economically on sheet mills easily is made. The practice more and more with the integrated companies is to furnish hot strip breakdowns for finishing in sheet mills. So useful are the sheet mills that a number of the integrated companies recently have added to their number of modernized sheet mills. In some quarters it is believed that the number of sheet mills now being operated by integrated companies is the lowest possible under present requirements.

Well informed observers do not believe that there ever will be a time when all tin plate is produced from cold reduced strip. Rather, they feel that a balance eventually will be struck between such product and the product of the old tin mill. At the present time at least seven companies are producing tin plate from cold reduced strip and it is estimated that at least 25 to 30 per cent of the tin plate is being produced in this way. Tin plate falls into a narrow zone as to sizes and there are only a few special specifications for tin plate.

The chief breakdown in tin plate is in the degree of ductility or stiffness required, and it is in this re-

spect that producers of tin plate from cold reduced strip encounter trouble. A stiff plate is a product produced with some difficulty on a cold reducing strip mill. It requires skin passes and proper annealing. Restoration of temper in the skin passes is not always uniform because of the small variations in gage which cannot be avoided. This is a problem that may be solved in the future. At the present time, tin plate from cold reduced strip is preferred where ductility is desired. In some cases at present, can tops and bottoms are produced from strip tin plate, because of the ability of this product to take a draw, and the can bodies are made of stiff tin plate produced on hot tin mills.

Light Gage in Demand

One of the results brought about by the advent of strip tin plate is a trend toward use of lighter gages. Where 30-gage formerly was used, much 31 and 32-gage tin plate now is used. This economy to consumers is the result of automatic sorting, both as to weight and gage, at the strip mills. This sorting or classifying operation has been of great help in stimulating sales of strip tin plate. Such sorting or classifying never has been practiced at the old fashioned sheet and tin mills but there is no reason why it cannot be done. The same equipment and methods used at the strip mills can be applied at the hot tin mills, with resulting better service to customers.

Some recent calculations of the cost of production on modernized sheet and tin mills and on strip mills are interesting. In one case it was found that 27-gage sheets for galvanizing can be made more cheaply on a sheet mill than on a continuous strip mill. In another case a company making tin plate both on modernized hot mills and on cold strip mills found that the difference in cost was negligible.

One important outlet for sheets that has not yet been entered by strip is the galvanized sheet industry. So far this field belongs entirely to the sheet mill.

Small Tonnages Are Produced

In some cases comparatively small producers of flat rolled steel have solved their problem by installing reversing hot strip mills which produce the same product as continuous strip mills but in smaller tonnages. For such units, equipped with furnaces into which the strip coils and is heated between passes, good cost figures have been reported recently. Considerable tonnage of hot strip produced on this type unit now is being cold reduced and tinned.

Now in the engineering stage is a new type unit designed especially for companies making about 10,000 to 15,000 tons of sheet steel per month and usually operating with old, high-cost bar mills. The plan for such companies provides a modified strip mill with a number of stands, starting with slabs and delivering hot strip. This strip could be rolled economically on existing modernized sheet mills. It could be supplemented with a single stand, reversing, cold mill for producing cold rolled sheets and strip. This equipment would serve for producing a wide range of product including tin plate and galvanized sheets.

Many new practices in the flat rolling field are in process of development. Practice at one plant now permits production of tin plate without the usual white pickling operation. Instead, the black plate is cleaned by abrasive material which is thrown against the plate, thus avoiding the use of moisture-containing compressed air. The problem of continuous tinning of continuous black plate appears headed for an early solution. Following the lead of one company, as reported in STEEL, of July 6, 1936, a number of companies are investigating the possibilities of producing tin plate by electrodeposition.

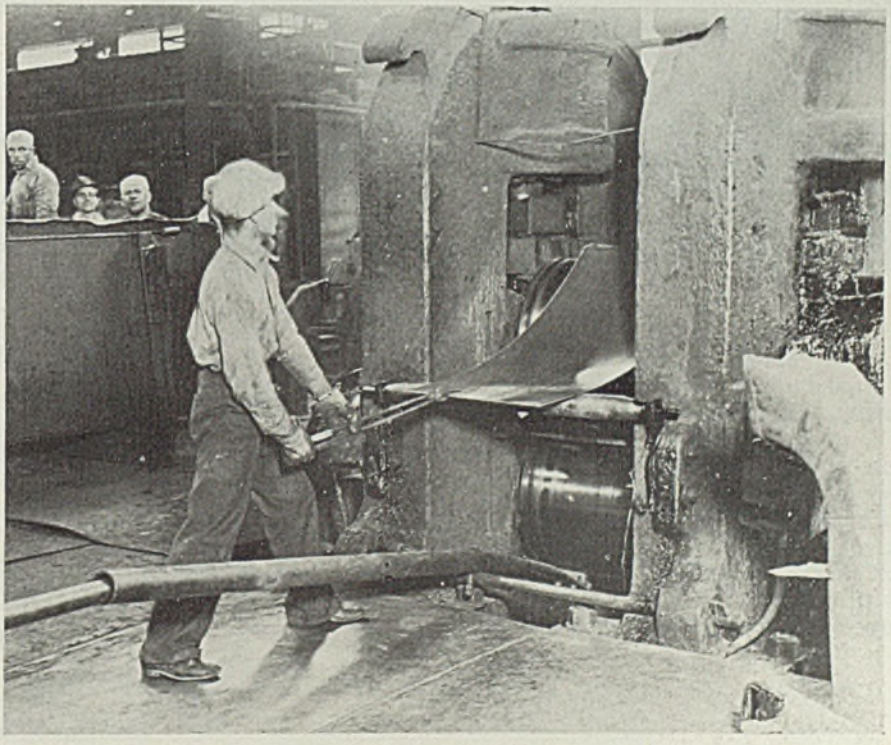
New Treatment Being Studied

Some thought now is being given to abrasive treatment of the product of continuous strip mills so as to produce surfaces specially intended for subsequent finishes, including plating, porcelain enameling and lacquer coats. At present strip is strip and no attempt is being made to develop surface conditions and finishes beyond those normally specified by the trade. Abrasive and other methods of treatment, it is felt in some quarters, will enable strip producers to provide surface conditions of great advantage from a customer standpoint.

◆ ◆ ◆

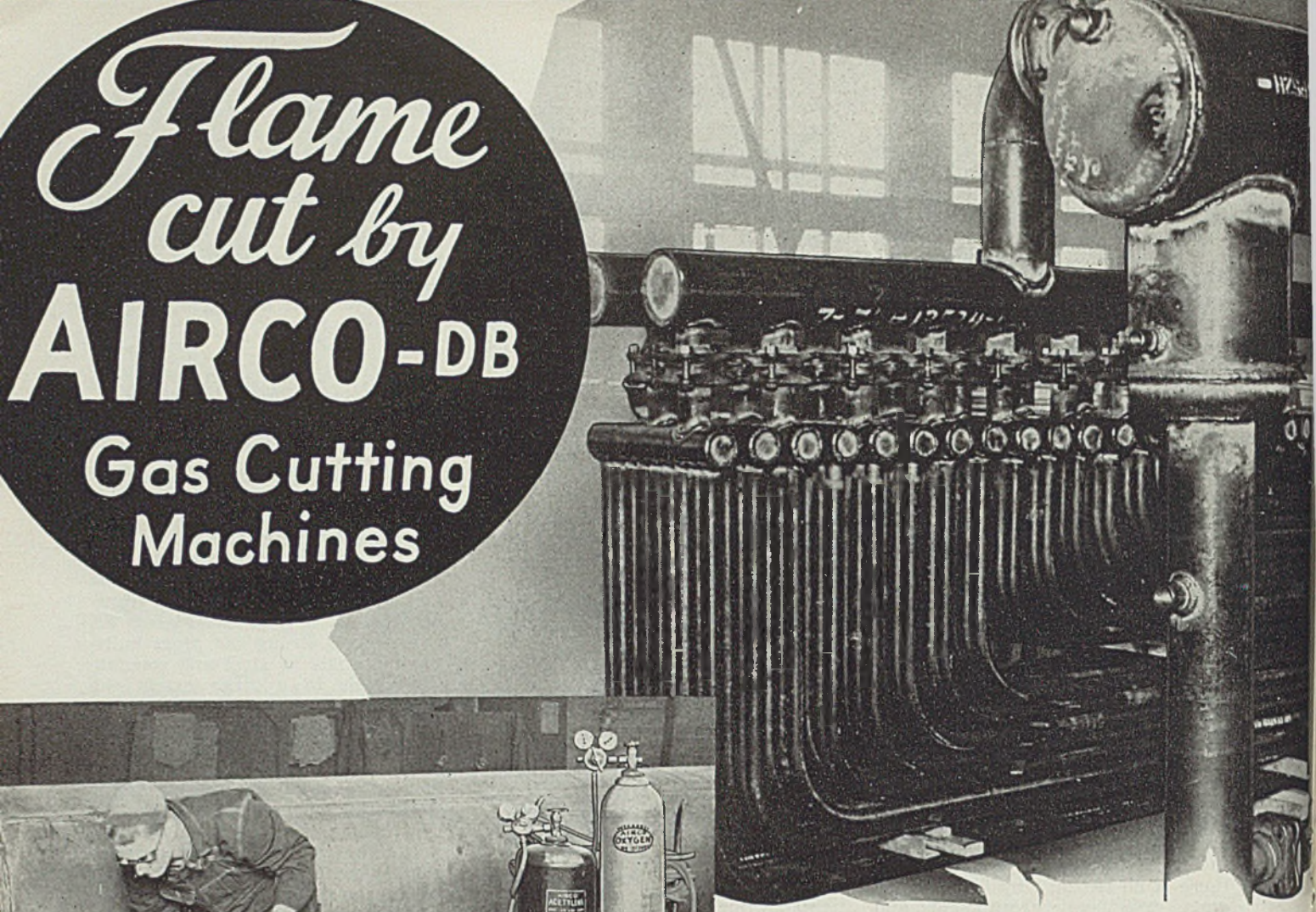
Lead Plates Are Used As Vibration Absorbers

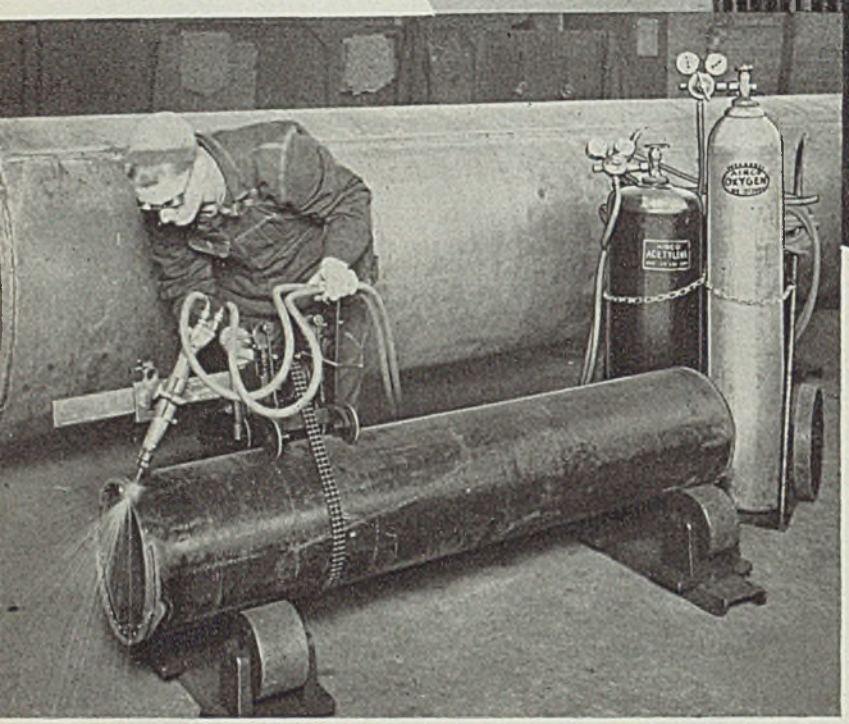
Lead is being used as a shock absorber under buildings and bridges, according to Dutch Boy Quarterly, published by National Lead Co., 111 Broadway, New York. Because lead is a relatively soft and malleable metal it takes up rather than transmits shock impulses. Placed between such strong but rigid building materials as steel and concrete it reduces to a large extent the transmission of jars and vibrations from one to the other. As an illustration, sheet lead plates 13 x 15 inches and ⅛-inch thick are used in the Seaview undercrossing of the Great Northern railway in Seattle. The bridge is constructed of precast concrete slabs resting on horizontal steel girders. The slabs weigh about two tons each and are anchored to the steel understructure by bolts. The rail bed and ties rest directly on top of the concrete. The lead sheets, placed between the concrete and the steel members conform to any irregularities in them.



Sheets being rolled by hand on conventional type 2-high hot mill

Flame cut by AIRCO-DB Gas Cutting Machines





Pipe and shells from 8" to 42", having wall thickness of $\frac{5}{16}$" to $\frac{3}{4}$", were cut on this job. The close-up photo shows the remarkably accurate, clean-cut, uniform work done. This machine is but one of the comprehensive line of Airco-DB Gas Cutting Machines which cover the entire range and scope of machine gas cutting.

The Vilter Manufacturing Company fabricated this super flooded ammonia brine tank coil and suction accumulator at its plant in Milwaukee, Wisconsin.

On this job, the pipe was *cut to fit*, cleanly and quickly, and beveled ready for welding on the spot with an Airco-DB Pipe Cutting and Beveling Machine, saving time and money. And, of course, economical high-purity Airco Oxygen and Acetylene were used.

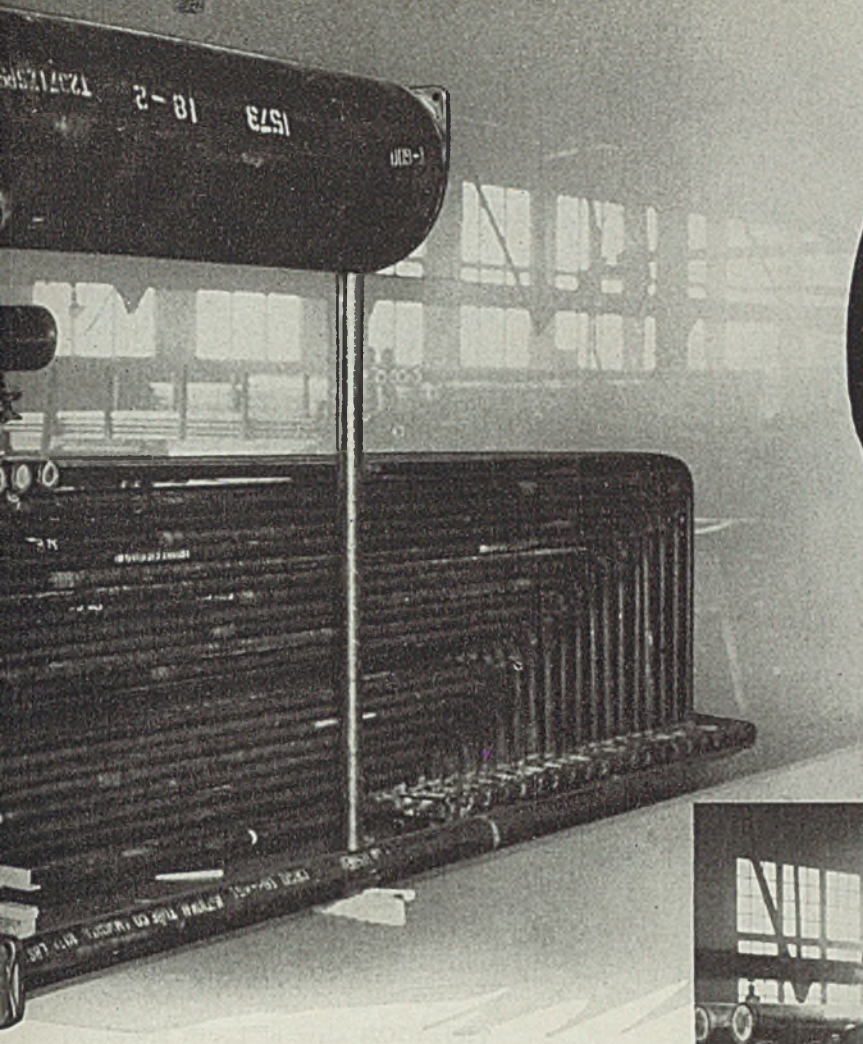
The practical cooperation of Airco's field engineers contributed to the successful completion of this fine piece of modern welded fabrication. This cooperation is available to all users of Airco products—which cover every welding and cutting need.

AIR REDUCTION SALES COMPANY

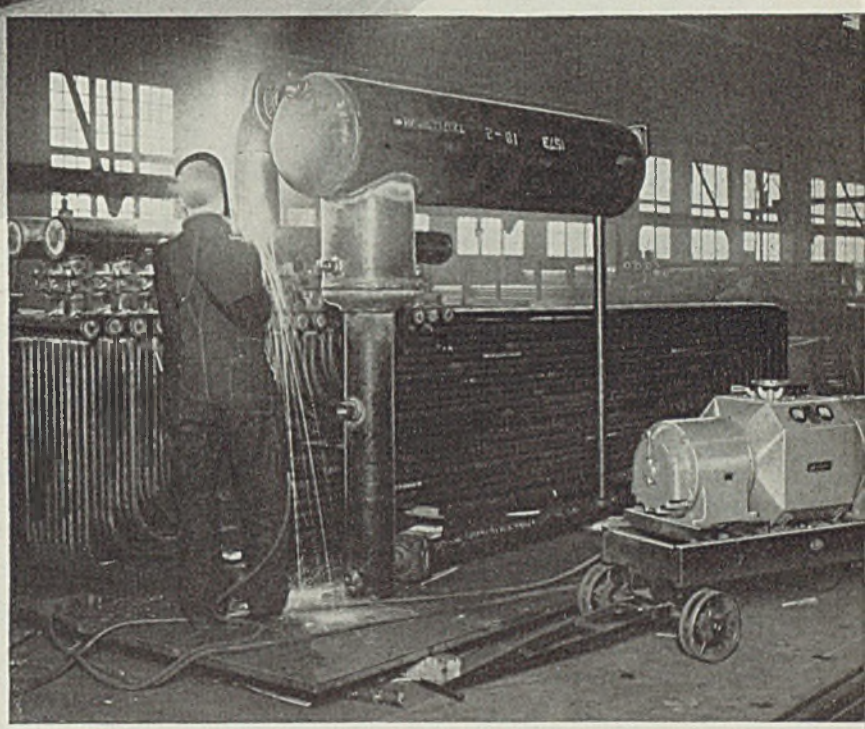
General Office: 60 East 42nd St., New York City

DISTRICT OFFICES and DISTRIBUTING STATIONS in PRINCIPAL CITIES

AIRCO THE NATI



Welded by WILSON Electric Arc Welders



The welds on this job had to be sound, leak-proof, maintenance free, and economical. This was done—all parts and piping being welded with a Wilson Arc Welder.

Wilson Welders provide voltage and current adjustments which make it possible to establish an arc of just the right character for the particular welding job at hand . . . and once established, Wilson Welders "*make the arc behave*". It is this inherent ability to establish and maintain a stable, uniform, heat-generating arc that makes arc welding easier to perform and brings down its cost.

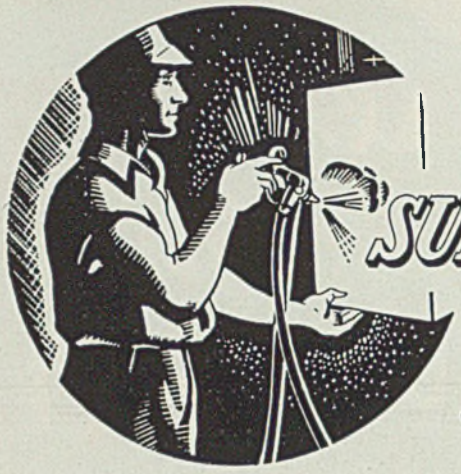
Write for the Wilson Welder Bulletin which contains full details including types and capacities.

Welding on the suction accumulator in progress. This shows the WILSON One Arc motor generator unit—one of the WILSON line which includes types and capacities suitable for all arc welding needs.

WILSON WELDER & METALS COMPANY, INC.

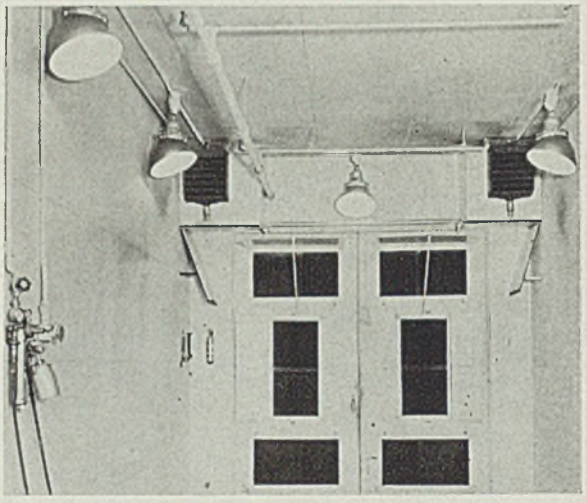
General Office: 60 East 42nd St., New York City

DISTRIBUTED THROUGH AIR REDUCTION SALES CO.



SURFACE TREATMENT AND FINISHING OF METALS

Model Paint Shop Finishes Delivery Trucks in One-Third Usual Time



INTERIOR view of booth showing heating units in upper corners and filter units in doors. Sprinkler heads and fire extinguisher also can be seen

DELIVERY trucks in door-to-door retail service are constantly bidding for favor from women who may base their opinion as to the quality of the products they buy partly on the appearance of the truck which carries them. Be cause customers have shown an increasing desire to patronize bright, "spick-and-span" trucks, appearance has come to mean much in actual dollars and cents.

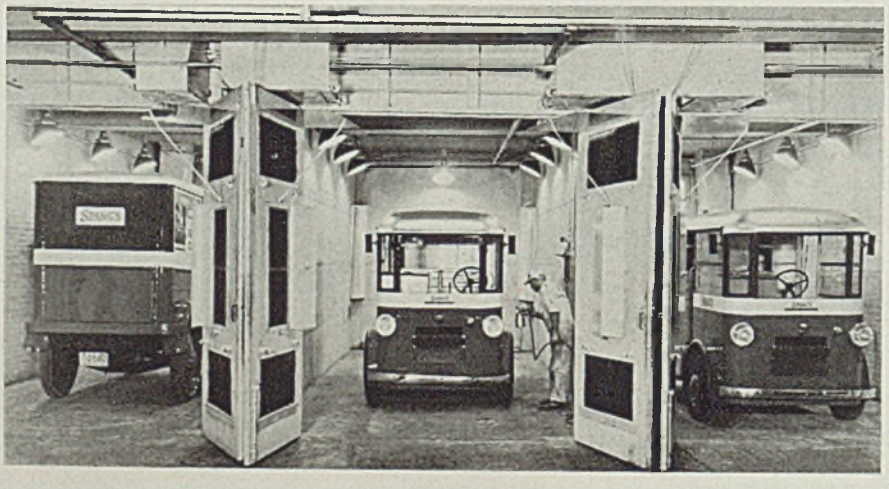
Operators of large fleets of trucks have found the maintenance of the desired appearance to be a costly matter and have sought widely for a satisfactory means of painting and refinishing their trucks at the lowest possible cost consistent with quality. Spang Baking Co., Cleveland, which operates a fleet of 275 trucks, has not only met this problem but solved it.

Because the once-distinctive "Spang red wagons," a familiar sight in Cleveland since horse-and-buggy days, no longer stood out among large numbers of delivery trucks after red became an almost universally popular color, the company decided to change to a red white and blue color scheme patterned after its bread wrapper. This necessitated extensive painting operations which the company was not equipped to handle. For some time previous to this, routine painting of the trucks had been handled in connection with the repair shop and although assisted by outside paint shops it was difficult to keep the appearance of all the trucks satisfactory.

The old hand methods were obviously too slow for the company to handle the changeover in its own shop and the traffic superintendent, Mr. Frank Slife, decided to call in representatives of Acme White Lead & Color Works, Detroit and De Vilbiss Co., Toledo to co-operate with him in setting up a paint shop which could handle the job. The result was an innovation in spray painting practice.

It was decided to build three

Photos courtesy *Electrical Production*



One operator can finish three trucks in a minimum of time by working from booth to booth as shown here. During actual production doors to all booths are closed. Note adequate lighting facilities provided

CHEMICALLY

there are five elements other than iron to consider in the usual wires of industry . . . carbon, manganese, phosphorus, sulphur and silicon. Here we briefly discuss sulphur. Other advertisements discuss other elements.

SULPHUR in WIRE

makes it free-cutting

4th in a series of advertisements designed to help you make a better selection of wire for maximum value per unit of cost.

Sulphur in steel wire can be either helpful or harmful. Up to about 0.055% its presence is not felt. Sulphur in excess of 0.055% imparts brittleness. Combined with manganese, however, in the form of manganese sulphide in fine particles, it produces a free-cutting characteristic. This is most desirable for applications where machining operations are employed as in clock pinions, typewriter parts, and other screw stock products that do not require bending.

Tell us in which qualities you are interested. Knowing how your product is used may enable us to suggest a better wire for your purpose.

WICKWIRE SPENCER STEEL COMPANY New York City, Buffalo, Chicago, Worcester. Pacific Coast Headquarters: San Francisco. Warehouses: Los Angeles, Seattle, Portland. Export Sales Department: New York City

Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Dent Spacer Wire—Reed Wire—Clock—Pinion—Needle-Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wissco technical man on your wire problems, however large or small.

WISSCO WIRE
by Wickwire Spencer

booths which would be combination spray booths and drying ovens. This was a radical departure from conventional practice and all construction was necessarily pioneer work. To use closed booths made in necessary they be provided with proper ventilation equipment, heating units which would provide high temperatures, automatic temperature controls, and absolute fireproof facilities. Since three colors were to be applied it was decided to build three booths.

A site was selected in a convenient section of the garage in direct line with the repair shops. Repaired vehicles could thus be moved directly from the repair shop to the paint shop. The booths were also convenient to the street so that new or well-conditioned vehicles could be brought in from the parking area or street.

Booth partitions were set up using a light framework. Matched ⅞-inch lumber was applied to both sides of this frame, followed by a layer of 5/16-inch sheet rock. The entire assembly was finally covered with 22 gage sheet steel. The same materials were used in the ceiling and front walls. Finished booth size was 13 x 30 feet.

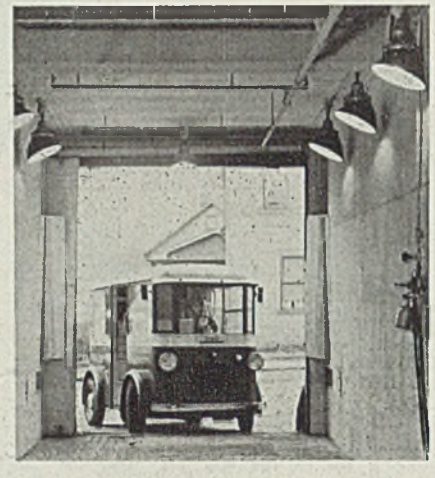
Three sets of well matched swinging doors were then constructed for the fronts of the booths. In addition to this a door was cut through the rear wall of the center booth which opened directly to the street to permit the direct entrance of large trucks. This door was fully insulated with wood, sheet rock and metal.

Manufacturers Are Consulted

Next to be considered was ventilation. The first step was to consult the paint manufacturer and obtain recommendations on the volume of air required to insure quick drying and healthful working conditions. Two straight exhaust shafts, leading directly to the roof, were constructed of 22 gage galvanized sheet steel in each of the two outside booths. Those toward the inside booth were built larger to provide double capacity. Vents were cut through from the center booth thus requiring only four shafts.

De Vilbiss exhaust fans were placed at the top of each shaft, with the motors located away from the air passage and connected to the fans by belts. Safety and clean motors were thus assured. The double shafts were powered by 1-horsepower motors and the single shafts by ½-horsepower motors. The large fans provided for the elimination of 7700 cubic feet of air per minute while the smaller fans removed 5350 cubic feet per minute. As a final safety precaution one open head sprinkler was located directly in each of the four shafts in case of fire.

Two separate vents were cut at the bottom of each shaft. The upper vent was triangular in shape with the point located approximately 7 feet from the floor. The base of the triangle, 8 inches in width, was located 4 feet from the floor. This vent was to take care of the spray vapor as paint was applied to upper sections of the truck. Since spray is heavier than air and settles, the capacity of the opening was purposely increased as it drew toward the bottom. The second vent was cut square and located at the bottom of the shaft. It was covered with a trap door which could be opened as required. This vent was



Center booth can be entered directly from street for the convenience of large trucks and trucks taken directly from service for refinishing

to take care of dust and spray in the lower levels.

Fresh air was drawn into each booth through 14 Libbey-Owens spun glass filters, each 20 x 20 inches, as recommended by ventilating engineers. Twelve filters were located in the front doors of the booths leading to the garage and two in the front corners of the booths near the ceiling. The latter two will be mentioned again in connection with the heating system.

Two unit Ilg steam radiators were located in the upper front corners of each booth. Each unit was set in a boxlike duct leading to the inside garage. The two filters mentioned above are located in these duct openings. Another opening, which may be closed off, was placed in the bottom of the duct inside the booth. When spray operations are being carried on these openings are closed and fresh air is drawn through the filters from the garage. A total of 15,600 cubic feet per minute of air is moved through each booth.

When the heat is turned on all filter openings are closed and bottom openings in the heater ducts are opened. These openings are shown in an accompanying illustration. The heater fans then set up a rotary motion of the air within the booth and the paint dries rapidly. Temperature in the booths is controlled by Detroit Lubricator Co. automatic heat controls. Thermostats in each booth hold the temperature at any desired point between 70 and 170 degrees Fahr. The higher temperature is used for drying primers and surfacers and the lower for finish coats.

All switches (fan motor and lights) are located in vapor-proof switch boxes just outside the booths. Pull chains, also outside the booths, are used to turn the heat on and off. As an additional fire precaution eight 220-degree sprinkler heads are spaced equally in the ceiling of each booth.

De Vilbiss spray equipment is used throughout with double air connections in each booth. Air is supplied by an Ingersoll-Rand compressor. Since spraying operations are carried out with the doors closed, a powerful system of lights was installed to provide complete illumination. These can be seen in the accompanying illustrations.

Painter Has No Idle Time

The Spang trucks are finished with a blue upper panel and red lower panel with a white stripe between. The roofs are finished with aluminum paint. High-grade synthetics are used throughout.

The complete finishing system consists of a primer, surfacer, two color coats and one clear coat. The usual procedure under production is to have a truck in each booth. The painter applies the primer to the truck in the first booth, closes the booth, turns on the heat and proceeds to the second booth. Here he follows the same procedure and continues on to the third booth. By the time he has finished with the third truck, the primer in the first booth is dry. He then proceeds from booth to booth applying the surfacer, then the color coats and finally the clear coat.

Application of color coats calls for some manipulation. The first color to be applied is the white stripe between the upper and lower panels using paper masks to block it off. When this is dry a paper drape is hung from the top of this stripe over the entire lower portion while the blue is applied to the upper half. When dry this drape is raised to cover the upper half while the red color is applied to the lower half. Trade marks and other decorations are applied by the decalcomania process after which the

(*Please turn to Page* 88)

POWER DRIVES

Ways to Mount Lineshafts In Reinforced Concrete Buildings

BY F. J. RILEY
Superintendent, Machinery Division, The Liquid-Carbonic Corp., Chicago

WHEN this four-story reinforced concrete manufacturing building was erected, no provision was made for mounting lineshafts. The machinery division is located on the top floor which has high concrete monitor roofs precluding any ordinary methods of construction.

At that time practically all machine tools except the largest were lineshaft driven. Group drives are still favored wherever the machinery can be grouped to advantage. A number of machines are individually driven but most of these are special, operate independently, or have been added one at a time and set up in other sections of the plant as the original department space is now filled.

Character of Work

The machine shop operates on what might be classed as medium-heavy work; the largest is gray iron castings 60 inches in diameter machined on boring mills and some machine frames. This work requires a full line of general machine tools with a few screw machines and turret lathes but practically no punch press work. Sheet metal work is performed mostly on shears, press brakes or by hand. Punch presses are used in our soda fountain division and tank shop.

The machinery division produces and assembles a line of bottle washing, filling, crowning and labeling equipment, mixers and pasteurizers for bottling plants. Other products are tavern bars and soda fountains, largely of sheet metal, and equipment for these. Our foundry supplies bronze, aluminum and brass castings up to 1000 pounds and 72 inches in diameter; iron castings are obtained outside. Liquid carbon dioxide and dry ice are other products of this plant.

The fact that the ceiling had nothing on which to mount the lineshafts did not interfere seriously as the high ceiling permitted ample headroom. The octagonal concrete building columns on 16 x 20-foot spacing offered the only means of support. Special clamps were attached to the columns to hold 10-inch I-beams on the 20-foot cross spans. These clamps are held on by four 1-inch bolts bent to fit the column and brackets.

The superstructure for mounting the lineshaft consists of two parallel 3 x 10-inch clear yellow-leaf pine plank on edge about 30 inches apart on the 16-foot span and clamped to the I-beam at the ends. Shaft hangers are bolted to 2 x 6-inch planks which are fastened to the vertical 16-inch planks by lag screws.

No Difficulty with Alignment

After this installation had been in operation about 16 months the shafts were checked to see how well alignment was maintained as many other engineers expressed doubt about the ability of the construction to hold up without sagging. When the belts were thrown

IN the new addition to the Liquid-Carbonic plant ceiling inserts are cast in the concrete on 4-foot centers. Channel stringers are mounted below overhead pipes by using pipe spacers


It's TOO BIG
MULTIPLY 1,745,299 x 18 x 4
HANDY FOR PASTING IN MACHINE DESIGNERS' HATS
Built 30% Lighter with USS MAN-TEN
They're all COR-TEN built!
HERE IS LIGHT-WEIGHT AND ECONOMY IN CONSTRUCTION, OBTAINED AT NO SACRIFICE OF STRENGTH
USS HIGH TENSILE STEELS
UNITED STATES STEEL

. . . TOO IMPORTANT

to be told in any one advertisement

BASICALLY, the story of USS High Tensile Steels is very simple — simply the ability of these stronger, tougher steels to carry present loads with less weight of metal, to reduce dead weight, to eliminate parasite poundage.

But the interesting, important facts are the savings these USS High Tensile Steels (COR-TEN, MAN-TEN, and Stainless) make possible wherever heavy equipment moves.

Would you like to know more about successful applications in the field of your own special interest? In railway equipment? in street cars? in trucks? in buses? in mining and excavating equipment? Then ask us to send you appropriate reprints — and to include your name in the mailing list for our new complete COR-TEN booklet soon to be released.

Better still, send along the details of your problem. Let our engineers submit sound recommendations for reducing the weight of your equipment. From their wide experience in many fields our high tensile specialists can often suggest new wrinkles for saving time, saving money, or both.

U·S·S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, *Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

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

UNITED STATES STEEL

off, one man could turn 50 to 75 feet of shaft by hand.

The installation is easy to install and to make shifts either of hangers or of the entire superstructure. The main consideratioin is to use good seasoned lumber and bolt tight with ample level bearing surfaces and to keep the structure tight.

Similar construction is used for mounting motors either on top or below the plank superstructure, preferably near an I-beam; and also for ventilating and exhaust fans. On large machines like boring mills which are individually driven, the I-beam monorails for the hoists to service machines are supported in the same manner. Similar construction is used in other parts of the plant.

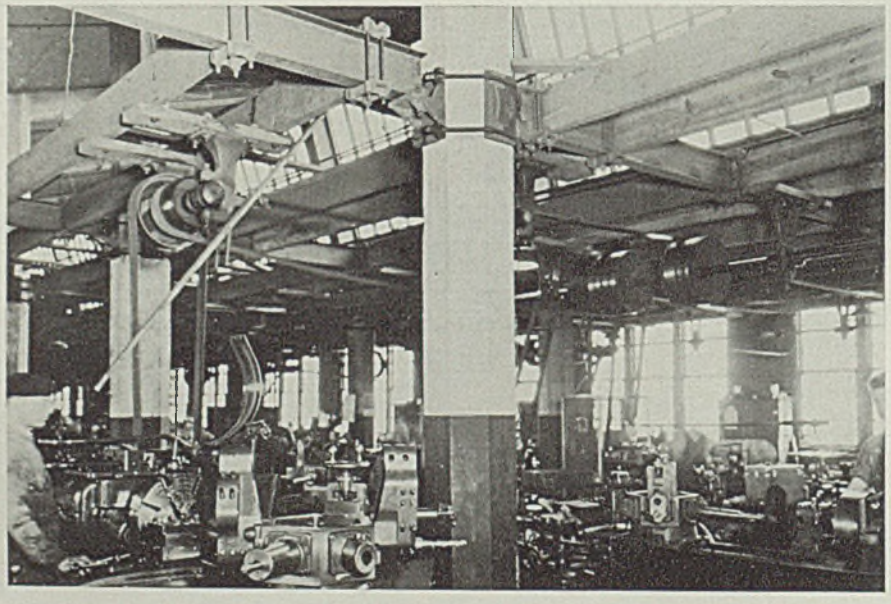
Hangers for the 2 7/16 and 2 15/16-inch shafts are mounted on 8-foot centers. Shafts are operated at 180 revolutions per minute. The reliability of capillary-oiled babbitt bearings, if well serviced, is indicated in this installation where the bearings have operated practically without trouble for 27 years. These are checked and oiled weekly with a good grade of lubricant.

Where Pipe Lines Interfere

In the new addition to the plant special inserts for bolts to screw in are set in the concrete ceiling on 4-foot centers. Here sprinkler and other lines interfere with placing the superstructure against the ceiling. To mount the shafting two parallel lines of 2 x 6-inch channels laid flat with the flanges up and welded together at the ends are attached to the ceiling by ¾-inch bolts with 4-inch pipe spacers 30 inches long maintaining the position.

The shaft hangers are mounted on 2 x 6-inch wooden cross footings bolted to the channels. A bearing plate at the ceiling prevents the pipe from wearing and cutting into the concrete as a result of vibration or pressure. This mounting has been very satisfactory; however, it is not used in as heavy service as the other type of mounting in the machinery divisioin. This drops the entire installation below all sprinkler heads and pipe lines but is sufficiently open to permit working on the lines and not to obstruct the flow in case of fire.

WHERE no facilities exist for mounting lineshafting, a special superstructure of I-beams and planks on edge is supported on brackets bolted around the columns



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Circuit Diagram Up-To-Date

SOME time ago a plant engineer assuming control in a factory discovered that the only information on location, size and installation of feeder and distribution circuits was in the head of the foreman electrician. This man had been with the concern for years and had installed or supervised every line in the plant, which would be classed as fairly large. Every day the plant engineer worried for fear of what might happen if the foreman should quit or die.

Ordinarily the first procedure would have been to make a complete survey of the plant and draw feeder and circuit diagrams. Because of the expense and also since the new plant engineer had been brought in to supervise changing from direct to alternating current, which would require entirely new circuits, the drawing was not made. However, the plant engineer did not quit worrying until after the change was made and diagrammed on blueprints.

This is a somewhat unusual case but in many plants the diagrams represent conditions several years back. This is particularly true of changes made during the depression when, in attempts to economize, much of such work went unrecorded.

With production back to normal it would be wise to check up on unrecorded changes, not only of circuits but also of equipment and bring all records up to date. The value of such records is never disclosed except in emergencies and when planning. In an emergency the old record may be worse than useless. Much time, effort and expense may be lost if used for planning.

Why Labor Wants More And How To Obtain it

Labor's Search for More, by Malcolm Keir; cloth, 527 pages, 5½ x 8½ inches; published by the Ronald Press and furnished by STEEL for $3.50, plus 15 cent for postage; in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London.

In presenting a work of this kind it is possible for an author to follow one of three courses. He can write from the laborers' angle, from the industrialists' viewpoint, or he can portray the progress made by treating the subject in an unbiased manner. The author, who is professor of economics, Dartmouth college, has chosen the last course, he has assembled the important facts pertaining to the labor situation from frontier days to the present and points out that more security, more wages, more leisure, and for farmers, more income are the objects of labor's search, and that therefore it is essential to know something of the recent record of the struggles of ordinary persons to improve their lot.

The author also states that regardless of what labor or anyone else wants in the way of economic improvement the only source of gains is in enlarged production. No executive or student, the author states, can evaluate current labor crises unless judgments are based on knowledge of labor experiences in the past generation.

The rise of labor unions to power, great strikes of the past and famous labor cases, such as the Buck Stove & Range Co., the Danbury hatters, the Sacco and Vanzetti case, the Mooney-Billings case, the Eugene V. Debs case and scores of others are described. Employers' activities, labor in politics, the red movement, the plight of negro workers and numerous other interesting subjects are discussed at length.

The author presents his subject in a clear and concise manner and his book should prove of great value to industrialists.

SPECIAL MATERIALS

Inherent Advantages of Composite Steels Rather Than Original Cost Should be Stressed

BECAUSE a portion of the composite material is apt to be a relatively inexpensive steel it is often assumed that the net cost should be lower than a similar-sized piece of the expensive alloy only. For large stainless clad plates it so happens that there is a cost advantage which greatly increases the possible range of uses. On the other hand there are various applications wherein the superior heat conductivity of clad over solid renders the clad advantageous.

* * *

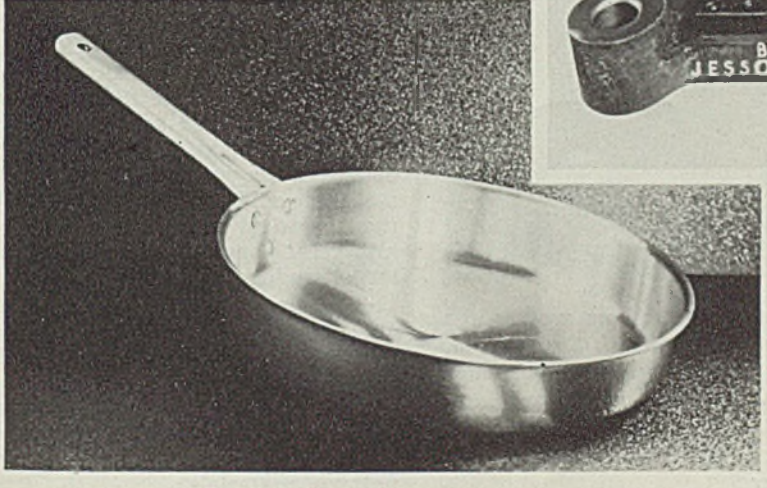
In the tool and die steel fields the composite types have shown savings in machining time (since much of the material is easily machinable); they have the great advantage that dowel holes etc. may be drilled after hardening because the soft steel is not hardened up appreciably; dies made of composite may give increased life in production because the soft material absorbs the shock better and reduces possible cracking. Also by using a composite material a harder cutting edge may be safely used since the tough backing reduces breakage tendencies.

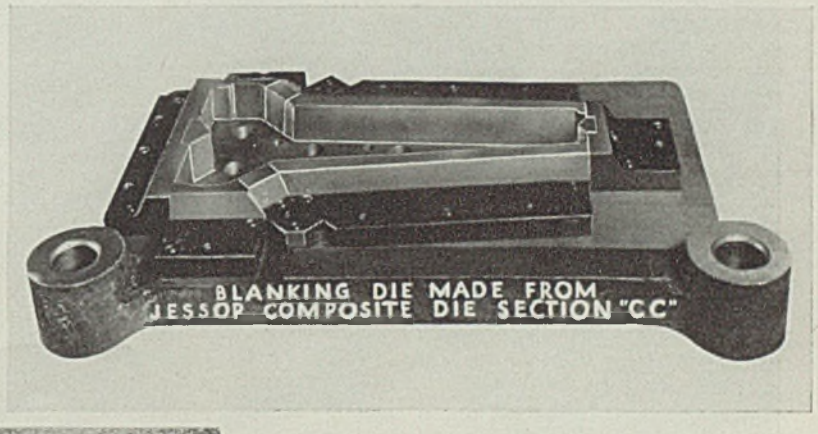
* * *

Extraordinary Care Urged in Buying Composite Steels

The manufacture of Composite Steels has been likened to the manufacture of Jewelry. Infinite care and strict adherence to complex principles are absolutely necessary. The Jessop Steel Company of Washington, Pa. was among the very first to institute research in this field, and has many times proven the value of its composite products. In addition to the patents and processes perfected in its own plant, the company has worked in cooperation with other experts and patent holders in the hope of making available to the trade a type of composite steel having specific advantages not possessed by other steels, and also often permitting savings in original cost.

FIG. 1 (below)—Frying pan made from 3 Ply Composite Stainless Steel—18-8 cladding—better than solid stainless steel pan because of superior heat transfer properties. Fig. 2 (right)—Stove leg die made from Rolled Composite Die Section Steel—savings in original and manufacturing costs achieved.





WELDING, ETC.

BY ROBERT E. KINKEAD

How Long Will Welding Industry Be Prosperous?

MANUFACTURERS of gas, electric arc and resistance welding equipment and supplies surpassed 1929 production in 1936. This year, the 1936 production will be exceeded by at least 30 per cent according to present estimates. The question in many minds is—How long will production continue to increase? No one knows. Our own guess is four or five years at a decreasing rate of expansion after 1937, but it is a guess pure and simple.

Increasing concern among business men over the discomforts of inflation are amply justified. The error seems to be in thinking that inflation is something that is about to happen on an increased scale. The facts indicate to this writer that what is coming is the cure for a disease that already exists. Thus a man has pneumonia long before he has fever. The fever is nature's effort to kill the pneumonia before the pneumonia kills the patient. The painful experiences of the immediate future are the cure for inflation, not the disease itself.

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

This view is well supported by a recent United Press survey which showed that the total debt of the states and their subdivisions amounts to about 3.1 million million dollars. This does not include national debt or private or corporate debts. Neglecting these, the per capita debt of the states and their subdivisions is roughly $24,000. Another way of putting the same thing is to estimate the national income in prosperous times at 100 billion dollars per year and divide the debt by this figure. This indicates that the debt referred to has become so large that the total income of the nation for 31 years would be required to pay it off.

We are about to take the cure for the sins of the past. It has happened many times in the history of the world. As always, men of courage and understanding will lead the rest and will do the best they can under the circumstances to reduce the suffering of the particular classes which will bear the brunt of the cure which will come about from reduction of purchasing power of the dollar. Neither the country nor the world are going to the dogs; on the contrary, civilized people are becoming more civilized and the world is becoming a better place to live in.

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Uniform vs. Composite

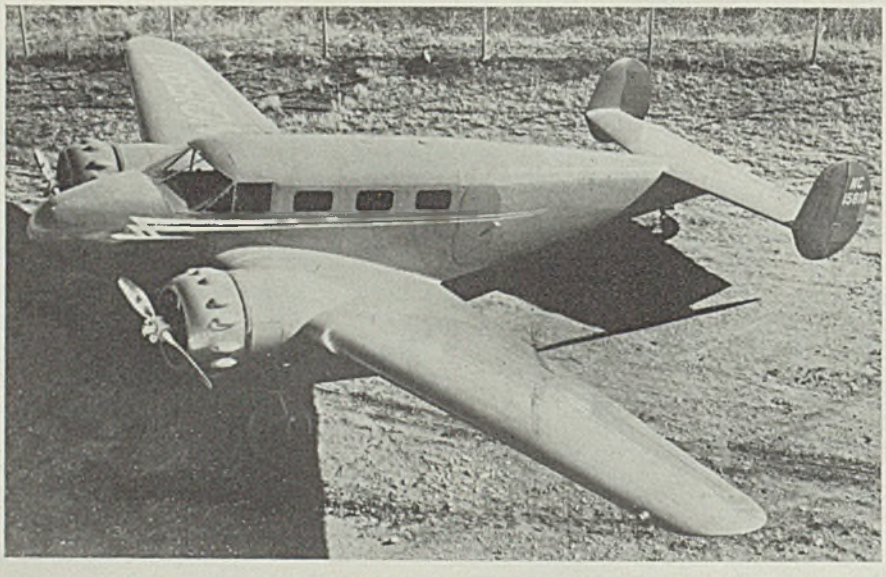
IMPROVEMENT of steel rails by heat treatment at the mill together with hardening of the rail ends marks the latest departure of steel producers from the idea steel is a product which must be made uniform throughout in the mill. Heretofore the tendency has been for the mill to cling to the idea it could make only a uniform product and the buyer of the steel could, by welding, heat treating, plating or other processes adapt the product to his needs. While cladding has been done by some of the more progressive producers, the tonnage involved has been small as compared with the tonnage of treated rails to be produced.

About the time rising costs take the profit out of steel at the price at which it can be sold in volume, welding in the steel mills will come into its own. Steel as a uniform and standardized product is sold as a commodity. Steel as a composite material particularly adapted to customer's and user's needs is a specialty for which there is likely to be no basis of price comparison in a competitive sense.

Thus, solid stainless at $600 per ton is a basis of comparison with stainless-clad material at $300 only if all competitors can furnish clad material. All competitors can furnish solid material but few can bid on clad material. When the days of "profitless prosperity" return for materials sold on a commodity basis, the specialty materials will come into great popularity—even with the large producers.

Composite metals are on their way into production in the mills as illustrated by the case of steel rails. The next five years will see great progress in the evolution of this idea throughout the hundreds of products now made in the mills as uniform materials.

Welding Takes to the Air



AMONG the first aircraft in which electric arc welding has been used to any great extent is this new transport ship built by the Beech Aircraft Co., Wichita, Kans. Landing gear, motor mounts, wing braces and a number of fuselage members were fabricated by welding from S.A.E. X-4130 steel airplane tubing of 0.065-inch thickness. All welded portions of the plane were tested under department of commerce supervision and were found to have the required safety factor of 6 plus or better

Whitey Sez:

"The old adage — 'A thing done right today means less trouble tomorrow' — was probably coined for the welder using his first parcel of MAURATH *electrodes."*

MAURATH, INC., CLEVELAND

BUILDER OF BETTER WELDING ELECTRODES IN ALL ANALYSES

Where was YOUR produc

1

2

3

when the Cash Register RANG?

Did it go out with the Customer or back on the shelf?

COST, design, and appearance are the important factors that lead customers into buying some manufactured products and rejecting others.

Products fabricated from American Quality Cold Rolled Strip Steel have the smooth eye-appealing finish that helps move merchandise off the dealers' shelves and counters. It helps keep prices within the range of your customers' pocketbooks, too. For its cost is much lower than some of the more expensive metals. The ease with which it can be fabricated will reduce your rejections and wasted metal to a minimum.

Perhaps you can find a means for improving your own product at worth while savings through the use of American Quality Cold Rolled Strip Steel. Our sales representatives will be glad to offer you assistance in the application of cold rolled strip steel to your needs.

American Quality Cold Rolled Strip Steel is uniformly rolled from the finest materials. It is made in a complete range of widths, edges, tempers and finishes and is available in coils or in cut lengths according to your requirements. An investigation of the advantages and economies in the use of cold rolled strip steel may help you improve your products and reduce your manufacturing costs.

U·S·S AMERICAN QUALITY COLD ROLLED STRIP STEEL

AMERICAN STEEL & WIRE COMPANY

208 South LaSalle Street, Chicago · Empire State Building, New York

COLUMBIA STEEL COMPANY, San Francisco
Pacific Coast Distributors

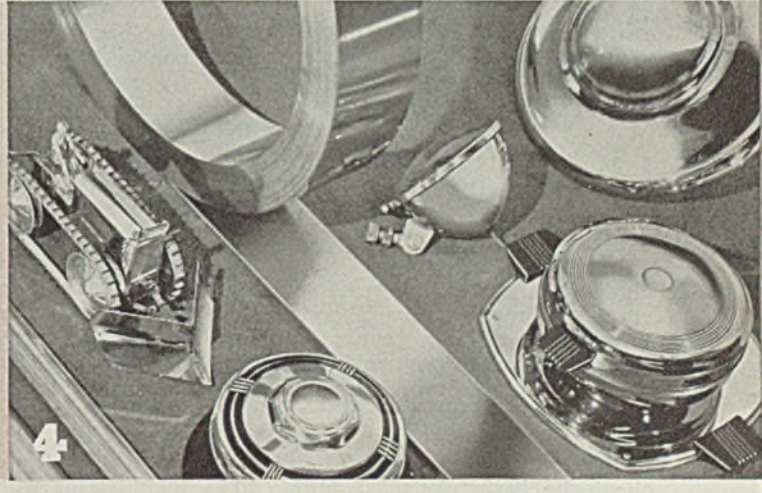
UNITED STATES STEEL PRODUCTS CO., New York
Export Distributors

1. Whether you order American Quality Cold Rolled Strip Steel a few coils at a time or in carload lots you are sure of getting the same high quality. Every coil of our Cold Rolled Strip Steel is subjected to rigid laboratory examinations to prove that its quality is all that we claim it to be.

2. Deep draws present no problems to our Cold Rolled Strip Steel. Here is a typical example of the way in which American Quality Cold Rolled Strip Steel simplifies deep drawing problems.

3. Temper, an important property of strip steel, is meaningless except when accurately controlled and defined. Sensitive Rockwell hardness determinations are therefore part of the rigid control applied to American Quality Cold Rolled Strip Steel.

4. The variety of products which lend themselves easily to fabrication from American Quality Cold Rolled Strip Steel is without limit. An investigation of your own products may point out how you can make them better and more economical by fabricating them wholly or in part from American Quality Cold Rolled Strip Steel.



UNITED STATES STEEL

Production Conference Turns Attention to Personnel Problems

PERSONNEL problems occupied a prominent position among the topics for discussion at the eleventh annual production conference of the American Management association, held at the Palmer House, Chicago, April 21-22. Free discussion and heavy attendance marked each session.

Included in the personnel questions considered were the subject of creating better understanding between the employer and employe, training of skilled men, and labor as a political problem.

Other topics covered the planning and production control department under current conditions, how can maintenance costs be controlled?, organizing for effective product inspection, and measured day work. Abstracts of various of the papers follow:

How Can We Train Skilled Men?

By Thomas Turner, general superintendent, Westinghouse Electric & Mfg. Co., Newark, N. J.

HOW can promising men in the common labor and semiskilled classes be located and developed for skilled jobs?

In the Westinghouse plant in Newark, a system of grading each employe is maintained. The grading is reviewed twice a year. Grading covers the points regarded the most important to the individual and the company, namely: Cleanliness, orderliness, respect for property, equipment and materials, habit of obedience, industriousness, ability to work, quality of work, capacity, suggestions, versatility and working safely. This grading is done by a group of five people who are in close contact with the individual, namely: The foreman, study man, inspector, production man and group leader. These grades are weighted and recorded on a reference sheet, and from this record it is possible to select the best prospects for promotion.

How To Train Labor

When production requirements change with the rapidity which the past year has shown, it is impossible to train common labor into skilled help in a short period, or even any period that will satisfy demand conditions. Plant loading has changed from 25 to 120 per cent which brought about the problem of new help in practically every class of work. How then can this situation be overcome with a minimum amount of inconvenience?

With every job classified, the lowest class of work being the job which can be filled most easily, promotion by grading was put in effect completely. This plan permits selection of the most promising men and transferring them to work for which they show capabilities, thus getting them started on the type of work in which at some future date they may expect to be the leaders.

By transferring the best man of the lower skill requirements to a job requiring a slightly higher skill, the company has immediate use of a man who in a short time can fulfill the requirements of such a class of work. This, then, will in turn permit transfer of the best man on the latter class of work to be stepped up the next higher class, and the action is repeated until the required job is filled. Only a short period of time has elapsed in filling the need which otherwise would probably have meant endless effort in trying to hire the right man.

True, this method involves some disadvantage, due to disturbing several groups in succession, but the plan gives the supervisor or foreman a versatile group of people who can perform various operations. This, of course, makes his problem decidedly more simple, considering the variable production schedules with which most are faced, due to increasing and decreasing production.

With this method, the company has been able to step up production over the whole plant, with but a few exceptions. The most outstanding exception, of course, is the toolroom.

By grading the employe, a selection can be made readily and by the promotion method the positions all the way from common labor to skilled help can be filled smoothly.

Shall certain equipment be set aside from the direct production line for training men under a foreman who would function more as a teacher than a supervisor?

This problem depends upon two conditions, namely: labor turnover and type of work which the training will cover.

If labor turnover is high, it is possible and perhaps highly desirable to have equipment set aside for training purposes, as the cost of a set-up of this kind can then be justified. It is necessary, if the product is manufactured on a line basis, to have trained people able to step into the line and keep up the operating pace of the rest of the operators, and this is difficult where frequent hiring conditions exist due to large turnover. To be able to step in line means that specialized training must be given learners. A general training would not equip them sufficiently to keep pace with the rest of the line and dissatisfaction would thereby result. Thus, the further question arises, "Can highly specialized training be given economically and the operator held until a vacancy occurs?"

Discover Suitable Work

The answer in most cases will be "no." Therefore, the training of production or repetitive operation workers can best be economically accomplished by setting aside the necessary equipment and instruction, only up to the point of discovering the type of work for which the operator is best suited. This is followed by a general training in motion economy and quality workmanship without attempt at specialization. The operator who has received this general training is then available for any place in the plant for such type of work and is soon

able to meet the necessary standards for the lower class of work.

This type of training is well worth while when a plant is operating at a rate near normal. Personnel changes always are with us to a more or less degree, and the flow of production is not seriously handicapped when the operator has received a general training.

During a recent visit to England the writer saw this general training carried on in a rather large scale and the English background made this general training highly desirable. The age for starting work is lower than in America, as boys and girls in the main start work at 14 years and are paid a rate based on their age and are re-rated on every birthday until they reach 21.

On the lowest type of work it is necessary for cost reasons for the English manufacturer to keep boys and girls performing these operations in the lower ages, and transfer them as soon as they are re-rated. A rather large labor turnover occurs for girls and women, because in the industrial section few married women continue to work in the factories. Therefore, this type of training is well worth while especially for female workers. This means that at a normal activity, there is a constant flow of help necessary and a general training department fills this need admirably.

Organizing for Effective Product Inspection

By Bert S. Taylor, assistant general superintendent, processing division, B. F. Goodrich Co., Akron, O.

MANY specifications are written with minimum requirements for certain qualities. Such a specification implies that 100 per cent testing will be employed. One hundred per cent testing is impossible in most cases and is a wasteful, costly process. In considering any quality of a product, it should be recognized that this quality varies over some range. If a large number of samples are tested or analyzed this range can be determined with a reasonable degree of accuracy.

If the various values are plotted against the number of occurrences of each value a frequency curve is the result. The peak of this distribution curve represents the expected value. From a comparison between this value and the individual test results the standard deviation can be calculated. These two factors must be considered in setting new specification requirements, whether for raw materials, processing or finished goods.

Since there is often a limit beyond which no more than a small percentage of the test results should go, a third factor may enter into satisfactory specifications. This is called the fraction of samples outside an absolute limit. When applying statistical control to reference test data, an inspection division must have reasonable assurance of the similarity of the processes in which a product is made.

For instance, if a shipment which consists of a material produced by two different methods of manufacture is sampled, it may give results falling entirely within the established acceptable expectancy curve when only a limited number of samples are taken. However, a considerable proportion of the shipment might actually be outside of the limits. This could be avoided either by increasing the number of samples or by identifying the portions of each manufacture. In the latter case, a limited number of samples and tests on each portion would reveal the true facts. This is one reason why it is customry to have a specification carry the identity of the shipping point when a supplier has a number of small units making the same product.

Choice of the proper number of test samples is of extreme importance in setting up specifications while the choice of the proper criterion in a specification often is as important as running the proper test. Many materials and products cannot be controlled on the basis of an average quality. Often the most important factor is the deviation or range of values as determined from a number of samples. At other times it is best to consider the fraction of samples allowable outside of a definite limit.

If no attention is paid as to which requirements are enforced, the cost of inspection will rise over a period of years because of complaints either within the organization or from customers. Nearly every complaint results in some new test being made or a larger number of samples being taken for test. These two causes of increase in cost may be made permanent parts of specifications even after the immediate need has been served. A continuous scrutiny of specifications, number of samples, and types of tests must be made to prevent useless testing.

Creating Better Understanding Between Management and Men

By J. A. Voss, director of industrial relations, Republic Steel Corp., Cleveland

HOW is it done? First by being scrupulously fair in our dealings with our employes. Second, by being honest; and third, by attempting to create a mutual understanding of each other's problems, realizing that only with understanding is there co-operation and sympathy.

We try to be honest in our answers to the questions our men throw at us when we get together to discuss mutual problems. We have no hesitancy in telling our men what it costs to produce a ton of steel, how much money we are making, or where our products are being sold. In our employe representation plan, officials of Republic Steel spend two to three days a week for more than two months going from plant to plant and sitting down with the representatives.

A year or so ago, the men in one of our plants wanted a raise. We did not go in and tell them dogmatically that they could not have a raise, but instead took in to the meeting, the sales manager and the auditor. The sales manager told the men what the company was selling and where, what its prospects were, what its delivery problems were and a host of other things in that particular field. The auditor broke down the balance sheet so that even the least arithmetically minded person present could understand the company's financial story.

When we got through, the men withdrew their request for a raise and were perfectly satisfied because they knew as much about that particular business as they could possibly absorb. And they felt that the facts which had been presented were honest facts, honestly stated.

Create Understanding

The third point in this triumvirate is to attempt to create a mutual understanding between employer and employe. We do this to a considerable extent by being fair and by being honest, but there are still some other factors which must receive consideration. Consider any plant which you choose. There are in that plant certain traditions, certain ideas, certain little precedents that have grown up over a period of years which mean a great deal to the men and which cannot be comprehended by someone who has never worked with them. If we know from personal experience what our men are thinking about, what their ambitions are, what they're hoping for, we can readily create an understanding of sympathy and co-operation.

Men want to meet their bosses. Men want to sit down and discuss problems with them. And the employe representation plan seriously undertaken and seriously carried out, is in our estimation, the most successful method of employer-employe bargaining. But you have to give the plan just as much thought and care and attention and energy to make it work as you do in mapping out a sales campaign or in licking a production problem. In

making it work, you have to be fair and honest.

Control of Maintenance Costs

By L. J. King, chief industrial engineer, United States Steel Corp., New York

SUBSIDIARY companies of United States Steel Corp. during 1936 expended for ordinary repairs and maintenance, including blast furnace and coke oven relinings, etc., the sum of $85,406,068.

In an integrated organization such as the Steel corporation with its subsidiary companies, methods used to control cost of maintenance and repairs are varied. However certain fundamental principles are applicable to all.

Principles of Cost Control

These principles may be briefly stated as follows:

1. Proper design of equipment. The primary consideration in developing the right materials to be used and the right design is the work expected to be performed by the equipment. Particular consideration should be given to latest developments in light-weight alloy steels and welded construction.

2. Proper installation of equipment.

3. Operation of equipment. Care should be exercised to operate equipment in the manner originally intended. Overloads, etc., should be avoided.

4. Variable budgetary control. To control the costs of labor and material in repairs and maintenance.

5. Competent personnel under the direction of plenty of good supervision.

6. Use good modern equipment and tools in maintenance and repair work.

7. Planned inspection of equipment.

8. Method of lubrication, type of lubricants and scheduling of lubrication. As a suggestion, this can be developed between the lubrication engineer and specialists from oil companies.

9. Engineering department to investigate failures or breakdown of equipment with idea of endeavoring to improve design or materials.

10. Planning and control system for all shop work.

11. Incentives be developed.

12. Industrial engineers, a staff organization working with the maintenance and repair department, to aid in the reduction of costs by improving methods, etc.

It is believed that if all the principles outlined were adhered to, management would be well on toward solution of their repair and maintenance problems.

Hardware Groups Arrange Program For Triple Convention in Memphis

A WIDE range of topics is provided in the program for the annual triple convention of the Southern Supply and Machinery association, National Supply and Machinery Distributors' association and American Supply and Machinery Manufacturers' association at Hotel Peabody, Memphis, Tenn., May 10-12. The three organizations will conduct joint sessions each morning and separate sessions in the afternoon. Social features include a golf tournament on the afternoon of May 11 and the annual dinner dance in the evening.

Details of the program follow:

Monday, May 10

MORNING

Joint Session Three Associations

Opening remarks by C. A. Dillon, president, Southern association; P. Ridings, president, National association; George H. Halpin, president, American association.

Special report on manufacturer-distributor relations, prepared by joint committee.

AFTERNOON

Southern Association

Reports of officers.

"Increased Cost to Distributor Making Out-of-Stock Delivery Prices and Long Haul Truck Deliveries," by W. M. Given, Young & Vann Supply Co., Birmingham, Ala.

Committee reports.

National Association

Reports of officers.

Discussion of following topics: Need for more adequate margins; Robinson-Patman act; functional differentials; manufacturers' selling policies; distributors' selling policies; need for greater uniformity in manufacturers' cash discounts.

"Work of Committee on Manufacturers' Relations," by H. E. Ruhf, Cleveland Tool & Supply Co., Cleveland.

American Association

Reports of officers.

"Technique of Wage Negotiation and Adjustment," by W. F. Cook, Kimberly-Clark Corp., Neenah, Wis.

"Distributor Relations Committee," by H. F. Seymour.

Tuesday, May 11

MORNING

Joint Session Three Associations

Report of governing board of Industrial Supply Research bureau, by Alvin M. Smith, Smith-Courtney Co., Richmond, Va.

Report of advertising committee, by C. C. Chamberlain, Jenkins Bros., New York.

"The Power Transmission Council—How It Helps Sales," by A. P. Homer, president Power Transmission council, Boston.

Wednesday, May 12

MORNING

Joint Session Three Associations

"Why Industrial Distributors Should Operate in Their Natural Economic Territory," by C. A. Dillon, president Southern association.

"How Rising Costs Affect the Distributor's Efficiency," by Edward F. Stauss, Oliver H. Van Horn Co. Inc., New Orleans.

Report of committee of American association on sales promotional literature, by C. F. Connor, B. F. Goodrich Co., Akron, O.

"The Salesman's Part in Efficient Merchandising," by Jack B. Dale, Briggs-Weaver Machinery Co., Dallas, Tex.

"Relation of Adequate Records to Efficiency," by M. G. Murray Jr., Columbus Iron Works Co., Columbus, Ga.; and Charles E. Curtis, Western Iron Stores Co., Milwaukee.

AFTERNOON

Southern Association

Business meeting and election of officers.

National Association

Report of committee on small orders, by E. E. Stvan, Strong, Carlisle & Hammond Co., Cleveland.

Business meeting and election of officers.

American Association

"The Robinson-Patman and Fair Trade Acts," by Felix H. Levy.

"Sales and Promotion Literature — Its Makeup and Proper Use," by C. F. Conner.

Business meeting and election of officers.

Joint Session Three Associations

Introduction of newly elected officers.

Business meeting.

Basic Open Hearth

(*Continued from Page* 52)

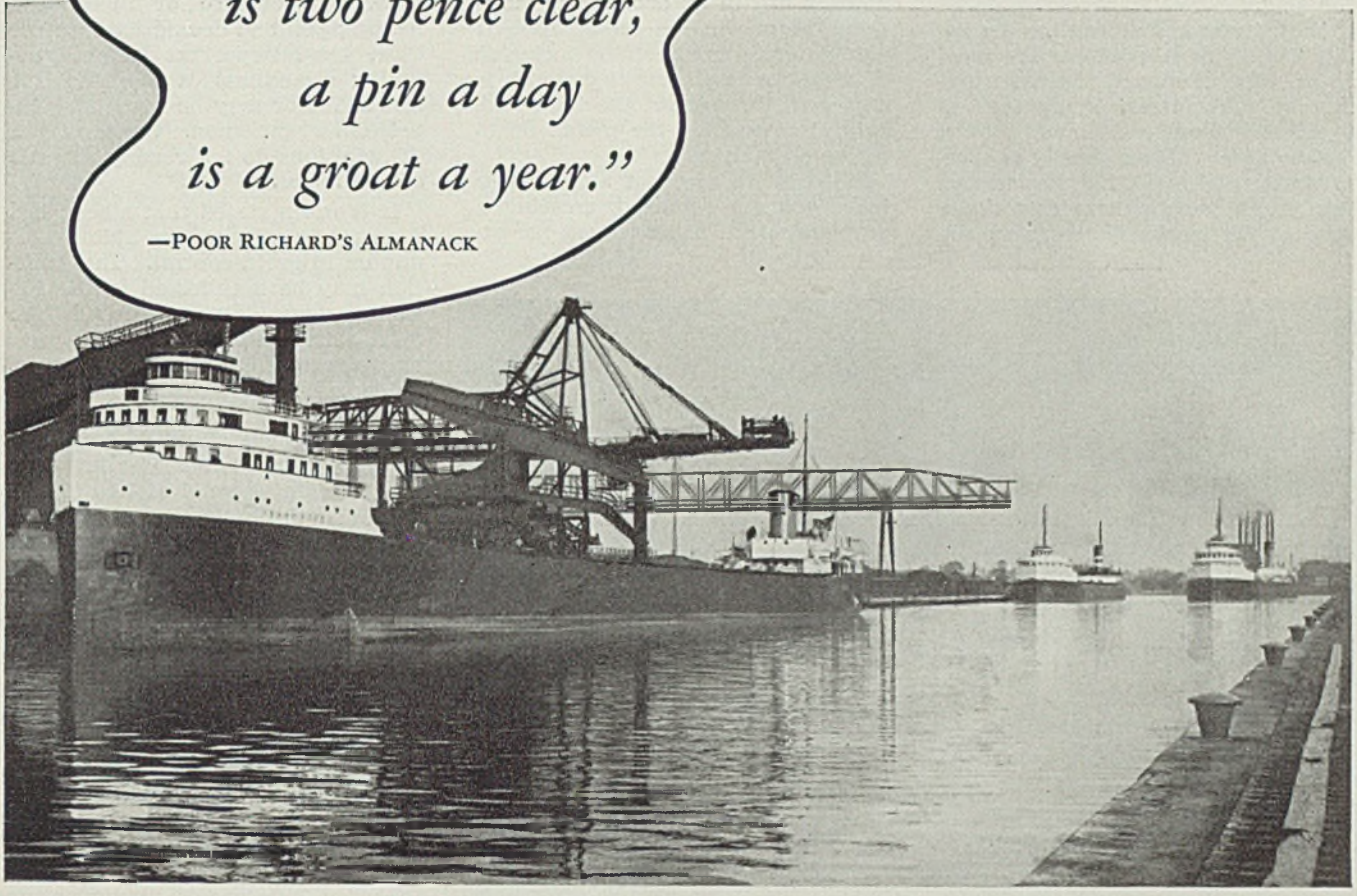
oxidation. Besides being used as a grain controlling medium, aluminum also is a very vigorous deoxidizer, being far more active than silicon. It is responsible mainly for the very low FeO content, 0.009, of the steel as poured in this heat.

Fig. 13 shows a typical deep etch of an X—3140 heat made by the above method. As a matter of comparison Fig. 14 is presented to show the effects of over oxidation and lack of complete deoxidation. No aluminum was used in this heat and after deoxidizing with silicon a residual of 0.072 FeO was present in the steel as poured, enough to permit the formation of gas pockets when the steel solidified, producing the porous deep etch shown. The steel was slightly abnormal to the Ehn test because of the high oxide content.

In the above deoxidation practice spiegeleisen was added in order to introduce a certain amount of manganese to the metal so that it could react with the residual FeO, followed by a second dose. With these two additions enough FeO was converted to MnO to practically stop its reaction with carbon. The addition of the 15 per cent silicon pig introduced enough silica completely

"A penny saved is two pence clear, a pin a day is a groat a year."

—POOR RICHARD'S ALMANACK



RAINBOW ON THE RIVER

THERE'S a rainbow on the River Rouge by the Ford plant — oil in a thin coating, washed from metals and parts by the water used to cool or clean them.

To most folks that thin, colorful coating spelled just oil; no more. To Ford men it spelled "waste." They dipped their fingers in it. . . . Rubbed them together, speculatively. . . . Ruminated.

A few days later a strange device was installed where the stream flows through a narrow channel into the mooring slip. It was an oil skimmer.

Each month that skimmer reclaims thousands of gallons of oil. Reclaimed, it is used as fuel in the open-hearth building.

Poor Richard said straws show how the wind blows. And that's how the wind blows at the Rouge. Pennies saved where pennies can be saved safely, multiplied by Ford big-scale operations into thousands and millions — those pennies are translated into extra value, added quality, lower price.

Reclaiming and using waste industrial oil is only one Ford device to save production pennies. There are hundreds of others. The amount saved by Ford operating and production skill reaches an eight-figure total each year.

In the light of all that, the little rainbow on the waters of the Rouge swells to enormous significance.

At the end of that rainbow lie better value and added pleasure for a million and more new Ford owners each year.

Ford

FORD MOTOR COMPANY

to stop the reaction between carbon and FeO with the formation of SiO_2. This SiO_2 combined with the MnO to form a readily fluxed nonmetallic inclusion of Mn SiO_3 which, being lighter than the steel, readily floats to the slag layer and is absorbed by the slag.

Manganese and silicon besides being useful as deoxidizers are used as alloying elements. In the usual run of alloy steels manganese is specified variously in amounts from 0.40 to 0.90. Silicon usually is specified from 0.15 to 0.25. Experience has taught steelmakers that residuals of these two elements in the above amounts usually insure a fairly well deoxidized metal. When a manganese content of 0.60 is specified, this, to the steelmakers, usually means a manganese addition of about 0.90, as a third to a quarter of the overall addition of this element is lost in its deoxidizing function; the product of deoxidiation is a non-soluble non-metallic inclusion of the oxide or silicate type which is dispersed throughout the bath and, being lighter than the metal, floats to the slag layer.

Needless to say, not all of these inclusions are removed, creating a problem which has engaged the attention of most steelmakers in recent years, namely, production of a steel that is thoroughly deoxidized and at the same time free from inclusions. This is because the deoxidizers are at the same time the inclusion producers. The time element, temperature of metal and melting point of deoxidizers are the three most important factors governing cleanliness of the steel. A fourth factor may be listed as composition of inclusion. Certain types of inclusions do not readily rise out of the metal.

It is often stated that silicon has a marked influence in aiding aluminum in grain control. This function may be manifested in the following way: Since silicon is the most active deoxidizer of the three, manganese, chromium and silicon, its deoxidizing effect in the bath has the greatest influence on the amount of FeO present when the metal is tapped into the ladle. For instance, if there is a residual of 0.10 to 0.12 silicon in the bath, there will probably be 0.07 to 0.10 FeO remaining in the metal, as shown in Fig. 12, just before the stream of molten steel starts to flow in the ladle. This controlled amount of FeO may be just sufficient to combine with the 1 to 1.25 pounds of aluminum per ton of steel which is needed to produce a fine grain. If the heat were tapped in the undeoxidized state it would probably be necessary to add several pounds of aluminum per ton to obtain a fine grain. Control of this oxide content by the silicon probably is its greatest contribution to grain control.

Meeting Analysis Needs

At the end of the furnace deoxidation and clean-up period the metal is tapped into the ladle. In the above heat it was necessary to add 800 pounds of 50 per cent ferrosilicon, 140 pounds of 80 per cent ferromanganese and 160 pounds of stick aluminum to the metal as it ran into the ladle. These additions of manganese and silicon were made to meet the analysis requirements. The aluminum was added to control the grain of the steel. The manganese and silicon additions carry out a slight amount of deoxidation in the ladle, but the very vigorous deoxidizing capacity of the aluminum permits it to perform the large portion of the remaining deoxidation which is to be carried out in the ladle. Aluminum is the most vigorous of the deoxidizers commonly in use in steelmaking and in the case of the above heat reduced the FeO content of the metal to 0.009, at the pouring platform, low enough to render it very sound and free of porosity and seams. In its deoxidizing function it converts the remaining FeO in the metal to Al_2O_3 or as

an aluminate; there seems to be a difference of opinion.

These particles are dispersed in colloidal suspension throughout the mass of the molten metal and, when the metal freezes, remain dispersed in sub-microscopic suspension, acting as neuclei from which the metal grains grow on reheating in the solid state. The distance between neuclei will determine roughly the size of the grain. Thus, aluminum has a dual role, that of final deoxidizer and also as a grain controlling medium. Ferroaluminum or the ternary alloy of aluminum, iron and silicon known as Alsifer, is used to control grain and proves satisfactory in this respect. The question may arise as to what would be the McQuaid-Ehn grain size if no aluminum were added but if enough silicon instead were added fairly well to deoxidize the steel and have a final analysis of 0.25. The answer would be that a No. 1 to 3 grain, probably a No. 2, would be obtained. Additions of aluminum up to ½-pound per ton under these conditions would still leave the grain a No. 2, but additions of aluminum over this amount and under 1 pound per ton would probably result in a mixture of fine No. 6 and coarse No. 2 grains. Steelmakers have found considerable difficulty in controlling a No. 3 or 4 grain, due to this tendency for duplex structure.

Behavior of Nickel

Fig. 15 is a photomicrograph at 100 diameters of a silicon killed heat, silicon 0.22, in which no aluminum was used. This is the natural gain of a silicon killed heat. Fig. 16 is the grain size of a heat that has been furnace deoxidized with silicon and manganese and ladle killed with 1 pound of aluminum per ton, Fig. 17 is the same type of heat, treated the same way with the exception that 1.6 pounds of aluminum per ton in the form of Alsifer was added to the ladle for grain control and final deoxidation.

No mention was made of the behavior of nickel in the above heat. Since nickel is not oxidized in the steel melting and refining process there is a 100 per cent recovery. A complete recovery of nickel in the scrap, and of the nickel added as metallic nickel to meet the analysis, always is experienced. This behavior of nickel makes it possible for the melter to "hit the nickel requirements on the head." Nor does he have to worry about losses due to deoxidation. Since nickel is not a deoxidizer the melter does not have to worry about its behavior during the clean-up period to rid the molten metal of deoxidation products. It will be noted in the heat log that the bath contained 1.26 nickel but that the final analysis after casting was 1.24. This drop was due to dilution by the addition of the ferroalloys and deoxidizers.

It is a long way from the incubator stage of open hearth development, as represented by the furnaces of the Sieruil Steel Co. and Landore-Siemens of the seventies to the present open hearth shop. More and more science has entered the field of steelmaking and each year finds it a step closer to scientific control. Chemical control laboratories on the open hearth floor are equipped to report to a melter the contents of his molten steel in as little as 15 minutes, something unknown in the time of Siemens and the Martins. Analysis control of the bath, close control of the materials used, and a fundamental understanding of the scientific principles of deoxidation probably are most responsible for the strides made in sound steel production, yet it is agreed by a large percentage of steelmakers that steelmaking still is an art. To this any first helper who has spent 10 to 20 years "studying the whims and temperaments" of the various furnaces in which he has had to cook his heats of steel will testify.

Michigan Foundrymen Discuss Physical Testing at Fifth Lansing Conference

FOUNDRYMEN in Michigan spent a profitable two days at their fifth annual conference held at Michigan State college, East Lansing, Mich., April 9-10. About 100 attended the conference which was sponsored jointly by the American Foundrymen's association, the Detroit chapter of the association and the college. Reflecting conditions in the Detroit area, this attendance was somewhat less than in past years, nevertheless the meeting was one of the most successful.

R. E. Kennedy, technical secretary, American Foundrymen's association, Chicago, stated that Michigan State's example has created an increasing demand for similar meetings throughout the country. At least eight technical schools wish to conduct conferences during the coming year.

Among topics discussed at the meeting were physical testing of cast iron, including wear testing; adaptability of gray iron as an engineering material; molding sands; and coremaking.

Dr. R. Schneidewind, University of Michigan, Ann Arbor, Mich., contributed a paper on testing of materials with particular regard to cast iron, in which he prefaced his remarks with an historic outline of materials testing, mentioning the first recorded test used in Damascus to investigate swords made there. In general, four types of tests were employed, namely: Actual service, accelerated service, accelerated model service, and physical.

The speaker discussed methods for making the hardness test, tensile test, transverse test, impact test and repeated impact test. Regarding the latter, he pointed out that it is difficult to interpret this test in terms of service. Alloys have different effects upon impact resistance. Two different types of friction machines are used in wear testing, one to determine sliding friction and the other rotating friction. To a large extent structure determines wear resistance of materials and variation in structure is extremely important.

Better Interpretation Needed

Need for better interpretation of present tests rather than development of new tests was emphasized by Dr. Schneidewind. In work conducted at the University of Michigan, some interesting results have been obtained by determining the ratio of tensile strength to brinell hardness. When cast iron has a ratio of 200 or more, indications are that the iron is good, well made and thoroughly deoxidized. Ratios between 180 and 200 represent average irons and ratios 180 and below indicate poor irons which are badly deoxidized.

An interesting method for calculating plastic work in cast iron was given by the speaker. He showed that by using this method and assuming the modulus of elasticity at one-fourth ultimate strength, it is possible to calculate plastic work to within 0.5 per cent. Commenting upon machinability, Dr. Schneidewind asserted that uniformity is essential. Concluding, he emphasized the need for more intelligent interpretation of present test data with service data.

In discussion, H. W. Dietert, Harry W. Dietert Co., Detroit, expressed considerable interest in the method for determining the modulus of resilience and commented upon the effect of deoxidized metal on that property. W. H. Spencer, Sealed Power Co., Muskegon, Mich., re-

called the well-known fact that melting varies considerably with weather conditions and expressed the opinion that hydrogen exerts a considerable effect on grain size, particularly in chilled sections.

With regard to impact tests, S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago, pointed out that in chilled iron car wheels, the drop test is used as a test for serviceability. He declared that sometimes a wheel with high laboratory test properties fails in service and was of the opinion that at times high stresses retained in a wheel after heat treatment may help to resist certain service stresses.

F. G. Sefing, International Nickel Co. Inc., New York, asserted that in his opinion wear resistance and damping capacity are two of the most important properties of cast iron. F. J. Walls, of the same company, reiterated Mr. Sefing's statement and said their company had been obtaining some interesting data on damping capacity and that there is some possibility that damping testing might eventually lead to a better understanding of creep phenomena. He also pointed out his own investigations and indicated that there might be a possibility of correlation of structure with certain properties, and that the austenite retained in the pearlite might have some influence. He commented, too, on the possibility of a blue brittleness range for cast iron.

Gray Iron Wears Well

In presenting a paper on the adaptability of gray iron as an engineering material, G. P. Phillips, metallurgist, International Harvester Co., Chicago, stressed particularly the wear resistance of cast iron and the wide range of hardness possible. He maintained there is no correlation between hardness and wear resistance.

Referring to heat resistance of cast iron, the speaker stated that plain cast iron is used in installations in which the temperatures range from about 700 to 900 degrees Fahr., while low alloy irons are employed in high temperature service up to 1500 degrees Fahr. However, a high alloy type cast iron has been made to resist temperatures as high as 1900 degrees.

Cast iron has good corrosion resistance and alloys have been used to advantage to improve this property. Mr. Phillips emphasized the value of vibration damping capacity, pointing out especially the use of cast iron in construction of machine tools. Cast iron does not allow vibrations to build up within the machine. Furthermore, this property is responsible in some measure to success of the cast iron crankshaft.

Dealing with physical properties, Mr. Phillips stated it is possible to obtain irons in a wide range of tensile strengths from 15,000 to over 80,000 pounds per square inch. He emphasized importance of the high compressive stress possessed by cast iron, then discussed transverse strength, impact resistance, shear strength, torsional strength and endurance. Heat treatment is being used more widely, especially in the aging treatment, and in many cases quenching and drawing are performed to confer special properties for given uses.

Three papers dealing with wear testing were contributed by Mr. Massari; P. S. Lane, American Hammered Piston Ring Division, Koppers Co., Baltimore; and W. E, Jominy, General Motors Corp., Detroit.

Mr. Massari described the machine used for testing wear resistance of chilled iron car wheels and outlined the problems involved. He stated that car wheels must withstand rolling wear, brake wear and sliding wear. Designing a machine which would simulate these types of wear, yet give accurate results, presented numerous difficulties, but it is believed a satisfactory machine has been built.

Mr. Lane described the machine which his company is using with sat-

isfactory results to test piston rings. In many instances, the results obtained from the machine have been borne out in service tests. The machine makes a dry wear test in which the amount of wear is determined by the specimen's loss of weight.

From his research work, Mr. Lane is convinced that iron of large grain size and normal graphite gives better wear resistance than small grain size and eutectic graphite. Using lantern slides, he indicated the various analyses and amounts of wear as determined by weight loss of the specimen. In concluding, he presented some information on combination ferrous and nonferrous piston rings which show much progress from the wear angle.

The wear testing machine used by General Motors Research laboratory and developed according to the ideas of A. L. Boegehold, director of the laboratory, was described by Mr. Jominy. He pointed out that in any automotive cylinder there are many effects to be considered, some of which are: Surface friction, pressure, lubrication, atmosphere, load application, speed of travel, rubbing surface, etc.

Introduction of the lubricant in wear testing added a variable that is difficult to control but the difficulty has been overcome in the machine described. Mr. Jominy emphasized particularly that there is no relation between wear and hardness and he was inclined to agree in some measure with the findings of Mr. Lane.

The three papers on wear testing evoked considerable discussion. The concensus of opinion was that wear tests must be developed for each particular type of wear on which information is sought and that no one machine can be designed to take into consideration all the various factors involved in all problems.

Speaking on artificial molding sands, Dr. R. A. Smith, Michigan state department of conservation, Lansing, Mich., outlined the work being done in Michigan to determine the availability of sand deposits in the state, and work that the conservation department is doing to make the deposits usable for foundries.

Paper Covers Coremaking

Coremaking was covered in a paper by R. E. Aptekar, American Brake Shoe & Foundry Co., New York. He cited the care that should be taken in selection of sand for coremaking purposes and explained that grading and blending are two important points to be watched. He also discussed binders, core coatings, core drying and design of drying ovens.

Principal speaker at the dinner was C. C. Carlton, vice president, Motor Wheel Corp., Lansing, Mich., and president, Automotive Parts Manufacturers association, whose topic was present conditions. Other speakers included Chairman J. D. Stoddard, Detroit Testing Laboratory, Detroit; H. B. Hanley, director-elect, A.F.A.; R. E. Kennedy, technical secretary, A.F.A.; H. B. Dirks, dean, college of engineering, Michigan State college; and H. W. Johnson, chairman elect of the Chicago chapter, A.F.A.

Operates Welding School In Three Shifts Daily

Because of the shortage of welders, Lincoln Electric Co., Cleveland, now is operating its welding school in three shifts daily, from 7 to 12 in the morning, 12 to 6 in the afternoon and 6 to 12 at night. The school sessions close at noon Saturdays, thus giving each class a week of 30 hours. As a result of commitments with its customers in different parts of the country, the day classes are filled until practically next January. The course of instruction lasts a week. Present quarters accommodate 60 learners and the course is conducted by Art Madson under whom thousands of welders have learned their trade.

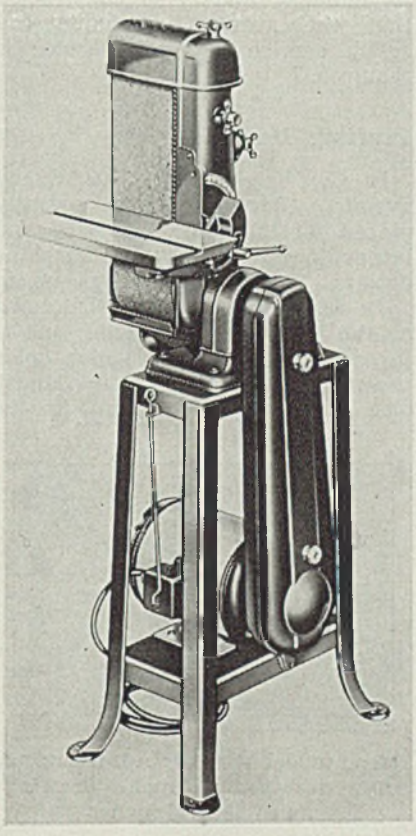
Reflector—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced a balanced symmetrical angle reflector designed for use with the 400-watt mercury lamp where intensive local lighting of vertical or horizontal sides are required. Reflector is provided with diffusing glass cover designed to give a wide distribution of light. Reflectors are made of 14-gage commercially pure etching grade aluminum sheet. The socket is rigidly mounted in the cast aluminum hood which is tapped for ½-inch conduit mounting and provided with conduit stop.

♦ ♦ ♦

Belt Surfacer—

Delta Mfg. Co., 600 East Vienna avenue, Milwaukee, has recently marketed a new 6-inch belt surfacer designed to handle a wide range of sanding, surfacing and finishing operations. It can be used either as a horizontal or vertical sanding machine for surfacing or shaping wood parts. It may be also used in the finishing of metal parts with aluminous-oxide and silicon-carbide belts. The machine is equipped with self-sealed ball bearings, and the drums which carry the sanding and finishing belts are designed to eliminate the necessity of rubber coverings and their attendant wear. All parts of the belt and the drive mechanism are enclosed completely to conform to safety requirements and enable a dust collecting system to be installed.



Delta 6-inch belt surfacer designed to handle a wide range of sanding, surfacing and finishing operations

♦ ♦ ♦

Flow Meter—

Bailey Meter Co., Cleveland, has recently placed on the market a new electrically operated flow meter

to be known as the Synchro-Meter. The unit consists of a transmitter operated by a Ledoux bell flow measuring mechanism, and a receiver consisting of the indicating, recording and integrating instrument. Transmitter is located at the point of measurement of the variable and the receiver is located at a place or places convenient for obtaining readings from the instruments as frequently as desired. No adjustments of the meter are necessary at the transmitting end, and it may, therefore, be located in a relatively inaccessible place. Several receivers may be operated from one transmitter.

◆ ◆ ◆

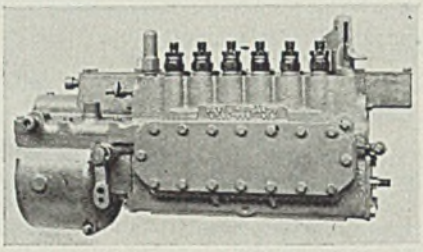
Belt Surfacer—

Walker-Turner Co., Inc., Plainfield, N. J., has recently announced a new unit which combines belt, disk, and stroke surfacing in one machine. It surfaces wood, metal, plastic, fibre and other materials. Stroke sanding with this machine enables the operator to surface large areas and panels up to 35 inches wide of any length. The belt is 4 inches wide, coated with aluminous oxide and backed with fabric; while the disk is 10 inches in diameter. Ball bearings, simple belt tensioner and die-cast aluminum pulleys combine with the other features of this device.

◆ ◆ ◆

Injector Pump—

Davis-Franco, 6619 West Mitchell street, Milwaukee, has developed a new injector pump for diesel engines. The pump is of simple design and sturdy construction, and can be installed in any engine using standard injector or magneto pads. The injector pump unit can be furnished for two, four and six-cylinder engines from 5 to 50-horsepower per cylinder. This pump has



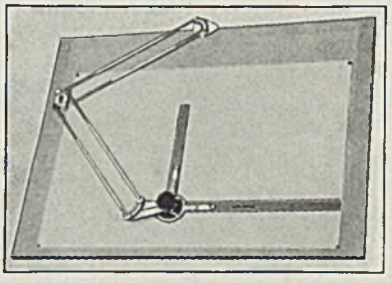
Davis-Franco injector pump for diesel engines is of simple design

long wearing qualities, according to its builders, and is so constructed that the average mechanic can easily service it when service is required.

◆ ◆ ◆

Drafting Machine—

L. G. Wright Inc., 5203 Euclid avenue, Cleveland, has recently placed on the market a new and larger Wrigraph drafting machine designed to make drawings up to 28 x 38 inches. This model, known as the R-300, is self-leveling and is provided with a clamp which holds the machine on any drafting board. The parallel mechanism is assembled with eight precision ball bearings, prelubricated and sealed at the factory. Aluminum alloy



Large model Wrigraph drafting machine designed to make drawings up to 28 x 38 inches

castings are used and all parts are given a dull, satin finish to prevent glare. Scales are made of duralumin and are readily interchangeable. The drawing edges are made of pyralin.

♦ ♦ ♦

Stretcher Lantern—

Lintern Corp., 7960 Lorain avenue, Cleveland, has recently designed a new lantern for use in industrial plants to indicate the location of a stretcher. The lantern is mounted on the wall above the stretcher with lens facing downward. Illuminated green crosses measuring 4½ x 4½ inches are placed on the three exposed sides of the unit, giving a clear signal at any angle. Lantern body is constructed of 18-gage steel, electrically welded, with white enamel interior. A hinged door allows for easy light replacement. Fittings are furnished with conduit connection and wall bracket is of ⅛ x ¾-inch round edged hot roll steel.

♦ ♦ ♦

New Construction Features Used in Steel Homes

(*Continued from Page 47*)

continuous completely around the house since the vertical I-beams or studs contain a series of openings along their entire length through which air currents may pass. These ducts are designed so they may be used for air circulation, the two lower for heated air and the upper for cooled and conditioned air, circulated by forced draft from a circulating fan. This feature provides for future application of the principle now being developed in the workshops of many heating engineers—heating directly by means of radiation from the walls themselves. The cellular construction of the walls provides for plumbing and electrical installation. This is true of the floors, since they also are of cellular construction.

Through the use of the strip and sheet insulation, outside temperatures are not at any point transmitted directly through the metal to the inner walls. Since the space between the walls is filled with circulating air and not "dead air," condensation with its consequent "sweating" and the corrosion of the metal which has so often resulted is eliminated. In order to safeguard against atmospheric corrosion, all metal surfaces are protected by a rustproofing chromate process followed by a rust inhibiting covering of basic lead chromate. Exterior surfaces are covered with any conventional house paint, while interior walls will be covered with wallpaper, paint or any desired wall covering. Many decorative expressions are possible. The basic finished surface is a flat wall; however, paneling or decorative moldings can be made available as desired.

Doors and windows are also of steel. Windows are of the steel casement or double hung type, and are outlined by moldings of conventional appearance which lock into the basic structure in a manner similar to the wall panels. The same is true of the steel door casings. Joints between wall panels are sealed by a metal strip which also locks into the framework and provides a vibration and expansion proof joint. Heavy gage metal shingles will be used on the roof and will be nailed to the steel roof joists. Shingles have been treated with a soundproofing material to avoid "tin roof" effects, and special nails which lock into the slots in the joists have been developed to attach them. These nails are also used in laying conventional wood or parquet floors over the metal floor panels.

Plans will be made available, according to the builders, for a wide variety of these homes in all price brackets ranging upward from $4000.

Finishes Delivery Trucks In One-Third Usual Time

(*Concluded from Page* 66)

entire truck is given a coat of clear synthetic lacquer.

Drying which formerly required 12 to 18 hours is now done in three hours. This is a 67 per cent reduction in painting time which means that less space is required for trucks while being painted. Trucks also lose less time from the road, an important feature in any fleet operator's overhead. Besides reducing the idle time of the trucks, the booths have made possible similar reductions in cost, have facilitated quick handling of emergency spraying, improved working conditions and bettered the quality of the finished job.

Under present operating conditions two small Twin Coaches may be wheeled into a single booth and finished together. Larger trucks must be handled individually. Only one spray operator is required. To determine the speed with which operations could be carried out, a test was made on an ordinary passenger car. This car was given two color coats and one clear coat. The entire job was completed in 3 hours and 20 minutes and the car was driven out the same day.

The efficiency of this paint shop and the speed with which it can turn out high-grade work is indicative of what can be accomplished by close co-operation between paint manufacturers, equipment manufacturers, practical painters and fleet operators who know exactly what they want.

Competition for Surface Coating on Aluminum

The Bureau International des Applications de L'Aluminium with the support of principal European aluminum producing companies, has inaugurated an international competition designed to encourage research into the chemical production of surface coatings on aluminum and its alloys. The object is to evolve a process which constitutes an improvement over the present "M.B.V." process.

The prize offered is 25,000 French francs (about $1145.00 at the current rate of exchange). Headquarters for the competition is the office of L'Aluminium Francais 23 bis, Rue de Balzac, Paris. Copies of the conditions governing entry may also be obtained from British Aluminum Co. Ltd., Adelaide House, London, E.C.4.

Protects Workers' Hands From Solvent Drying Action

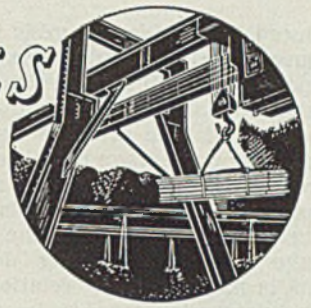
To protect its own workers' hands, Maas & Waldstein Co., Newark, N. J., has developed two special protective creams: Protective Cream No. 1 for use on the hands before beginning work, and Protective Cream No. 2 for use after work is finished. As many of the company's customers have need of a similar preparation, it has decided to put these creams on the market.

These protective creams have been found useful for protecting the hands of painters, finishers, chemical workers, printers, mechanics, handlers of gasoline, grease, and oils, and others whose hands are not wet with water during their work. According to the manufacturer, this treatment keeps the hands soft, and prevents the skin from drying out, cracking, and developing fissures and sores.

Five Colors on Tin

A large food manufacturer is now using a new mustard bottle cap. Five colors are lithographed on the tin by a new process. A total of sixteen designs, each picturing a different use for mustard, will be used.

MATERIALS HANDLING



Roll Turning Shop Is Fine Example of Modern Method

(*Continued from Page* 56)

are stored in pairs on a special rack. Final transfer back to the steel mills is effected by using the transfer truck. The latter is hauled by gas-powered tractor unit.

While this shop is the most interesting unit because it is the most recent addition to the plant, it is by no means alone in providing opportunity for study of methods of handling. Another unit added during the rehabilitation program is a finished steel storage building. This is equipped with all-steel storage racks, provided with slide-in racks for smaller sized stock. Air hoists, a plentiful supply of jib cranes and several electric hoists do the majority of the heavy lifting tasks. Down the center of the building run a 2-ton hand-operated crane and a 2-ton monorail hoist. Tractors and heavy-4-wheel trucks transport the steel from the mills to storage.

Centralization Is Difficult

Due to the number of buildings and large area over which they are scattered materials handling operations are difficult to centralize. A few years ago an attempt was made to put all interplant deliveries on a scheduled basis, but it was found that, due to the nature of the manufacturing operations, this did not work out satisfactorily and the plan was dropped. An explanation for this is found in a study of the general plan of operations. The Disston business is divided in reality into three separate parts, which together make the plant virtually a self-sufficient unit. There is the steel works division, the saw works and the file and small tool works. Each has its own peculiar problems in handling. For example, there are some 15 separate subdivisions of the saw manufacturing end of the business. Since band saws are made as large as 65 feet long, 18 inches wide and 0.125-inch thick, weighing approximately 600 pounds; hack saws are run through in units of hundred gross, circular saw plates range up to 3000 pounds and are as large as 108 inches in diameter, the supervision of materials handling has been left to the individual departments.

Most incoming raw materials are received by railroad. The plant is served by switch-tracks from the belt line, with Pennsylvania railroad delivery. Along the Delaware river front of the plant is a long dock. In earlier days, water delivery of coal and other items was common, but today, except for oil which is transported by barge and delivered at the Disston docks, entire dependence is placed upon rail carriers and, for smaller items and drop deliveries, on motor trucks.

Two locomotive cranes, operating on standard switch-tracks, supplement a large electric overhead traveling crane, magnet equipped, for yard handling. All scrap is stored outdoor in bins, and is classified according to chemical composition. Handling out of bins to electric furnaces is performed by gas tractors and heavy steel-bound trucks.

All steel plant inter-department hauling is performed by gas tractors and trailers, but inter-department hauling in manufacturing departments is simplified by the use of battery-powered electric platform lift-trucks, seven of which are in constant use. A centralized maintenance department which services all crane and truck equipment as well as other machines is housed in a separate building.

Intra-department handling in the steel works is done usually by cranes, of which there are many types. Steel is produced in Heroult type electric furnaces of 3-ton and 6-ton capacities. A 15-ton hot metal handling crane serves this department not only as far as the three bottom pour ladles are concerned, but also for moving and stripping of molds and transporting of ingots to the hammer shop which is located at one end of the building. A smaller crane of 10-ton capacity on the same runway facilitates the handling of ingots and billets for a 12,000-pound steam cogging hammer as well as for a 4500-pound, a 3000-pound and a 1500-pound finishing hammer.

Billets are loaded on steel trucks and routed through the chipping and grinding departments prior to hot rolling. These units carefully inspect and remove scabs, seams, blisters and other defects in the billets. These departments are equipped with 1-ton hand push type traveling cranes with power hoists. The billet grinder crane is of the underslung type with a cantilever end, which is necessary to avoid interference with the jib crane's support of the swing grinders.

From here, the material is moved again on steel trucks pulled by gas tractors to its next place of operation, which may be either the bar or the sheet mill. In the former, there are four units; one 18-inch,

one 12-inch and two 9-inch mills, while in the sheet mill there are four units with a capacity ranging from 22 to 84 inches in width. Gantry, jib and monorail cranes handle the materials in these departments.

Hot strip from the bar mills is finished rolled in the cold rolling department, which has four 20-inch, five 10-inch, six 8-inch and two 6-inch mills. Pneumatic hoists on monorails serve this department.

Sheets and bars which require annealing are so treated in four car type furnaces, each equipped with automatic thermal and atmospheric control for maintenance of proper annealing conditions. Two overhead 5-ton cranes travel the length of this department, facilitating loading and unloading of carburizing boxes, plates and box annealing pipes. Both cranes can be equipped with magnets or with hooks depending on the shape of the material being handled.

A large percentage of the steel produced in the Disston mills is for consumption in manufacturing the company's own line of products; a substantial balance is sold to other consumers of high grade tool steels. This major percentage is utilized for so many different sizes and styles of saws, files and other tools that requisition of steel from the steel storage to manufacturing departments is made in strict relationship to the particular sizes to be made. Requisitions received, steel is transported by truck and tractor to the shears, and there cut to size. Thence, transportation to designated manufacturing departments is by tractor and trailer.

It should be mentioned that at all stages where weight checking is desirable, scales of one type or another are provided. Several of these are weighing and counting units; one at the entrance of the plant yard is a large track scale for weighing truck loads; two others are of a type which provides a printing check on weights.

RECENT PUBLICATIONS OF MANUFACTURERS

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

Electrode Holder—Lincoln Electric Co., Cleveland. Bulletin No. 321, illustrating and describing its type T electrode holder.

Lift Truck — Lewis-Shepard Co., 267 Walnut street, Watertown, Mass. Bulletin No. 322, on lift truck platforms and lift trucks.

Metal Spray Gun — Metal-spray Co. Inc., 113 Llewellyn street, Los Angeles. Bulletin No. 700, describing its new metal spray gun.

Presses—Atlas Press Co., Kalamazoo, Mich. Catalog No. 26, describing and illustrating its lathes, drill and arbor presses.

Welding School—Lincoln Electric Co., Cleveland. Booklet No. 416, describing its welding school, giving practical and technical instruction.

Motor Driven Welders—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Bulletin No. 26-120, describing its flexarc motor driven welders and bare generators.

Wrenches—J. H. Williams & Co., 75 Spring street, New York. Booklet No. A-409, illustrates and describes its full line of supersocket wrenches, with detachable sockets. Booklet No. A-81, describes the full drop-forged carbon steel wrench line.

Electric Heating Units—General Electric Co., Schenectady, N. Y. Folder No. GED-650, describing its electric heating units and devices for small heating jobs.

Locomotive Cranes — American Hoist & Derrick Co., St. Paul. Bulletin No. LB-2, describing its gasoline and diesel operated locomotive cranes.

Microscopes—Bausch & Lomb Optical Co., Rochester, N. Y. Catalog No. D-185, describing its laboratory microscopes, type-H, and general mechanical features.

Refining Service—Handy & Harman, 82 Fulton street, New York. Bulletin No. 2, describing its refining facilities as part of a plant devoted exclusively to precious metals.

Refractory Block Insulation — Quigley Co. Inc., 56 West Forty-fifth street New York. Bulletin No. 326, describing its light weight low heat storage refractory block insulation, with service temperature 2200 degrees Fahr.; bulletin No. 281-B, describing its triple-A No. 20, heavy-duty black protective coating for iron, steel and cement.

Pyrometers — Brown Instrument Co., Wayne and Roberts avenues, Philadelphia, Pa. Catalog No. 15-C, covers its line of millivoltmeter pyrometers, indicating, recording and controlling.

Fabricated Processing Equipment —Edge Moor Iron Works Inc., 30 Rockefeller Plaza, New York. Bulletin No. 103, illustrating and describing its special fabricated processing equipment.

Threading Costs and Production Records — Landis Machine Co., Waynesboro, Pa., illustrating actual records under normal operating conditions of costs and production data, supplied by Landis users.

Die Casting—New Jersey Zinc Co., 160 Front street, New York. House organ Vol. 5 No. 2, illustrates the marked progress made in die casting; includes photographs of intricate zinc alloy die castings.

Surveying Instruments — David White Co. Inc., 315 West Court street, Milwaukee. Folder describing its new universal level-transit for use in lining up and placing machinery and general mill and construction.

Carbide Tools—Norton Co., Worcester, Mass. Booklet No. 167-IP-2-37-5000, prepared to assist tool room operators in selecting the proper grinding wheels and employing correct methods for sharpening cemented carbide tools.

Graphic Instruments — Esterline-Angus Co., Indianapolis. Catalog No. 337, describing its line of graphic instruments, illustrating seven types of instrument cases, twenty-one chart drives and twenty-four kinds of meter elements.

Oil Circuit Breakers — Westinghouse Electric & Mfg. Co., dept. 5-N, East Pittsburgh, Pa. Folder No. 33-226, describing construction, operation and applications of type F-124 indoor oil circuit breakers for industrial and central station use.

Snap Gages—Pratt & Whitney division Niles-Bement-Pond Co., Hartford, Conn. Circular No. 428, covering roll thread snap gages, tri-roll gages and a new combination of taper plain and thread plug and ring gages.

Upward Acting Doors — Cornell Iron Works Inc., Thirty-sixth avenue and Thirteenth street, Long Island City, N. Y. Catalog describing and illustrating with details and photographs its upward acting doors and grilles.

Compressors, Blowers — Allis-Chalmers Mfg. Co., Milwaukee. Bulletin No. 1910, showing all types of its blower and compressor equipment, including centrifugal, rotary and reciprocating units; leaflet No. 2247, describing its new "Utah" electro-magnetic vibrating screen which has no rotating parts.

Steel Prices Unchanged for Third Quarter

Scrap Drops Further;

Buying Pressure Off;

Output Remains High

MARKET IN TABLOID

DEMAND . . . *Buying lessens but delivery pressure holds.*

PRICES . . . . *Strong; no change for third quarter on most products.*

PRODUCTION . . *Operations steady at 91½ per cent of capacity for fourth week.*

SHIPMENTS . . . *Heavy; some improvement in delivery.*

ANNOUNCEMENT of third quarter prices at second quarter level for most steel products has done much to stabilize the market. Action by leading makers is being followed generally. Determination of prices so far before the usual date was in response to pressure by steel consumers, who found it difficult to quote on their products without knowledge of their costs.

The announcement is definite on plates, shapes and bars, wire, cold-finished and semifinished. Some grades of strip and sheets are also reaffirmed. More detailed prices will be put out shortly. Tubular goods are not yet covered.

Removal of price uncertainty by this action is expected to steady the market and remove the incentive to speculative buying. Mills expect much less pressure than in the past for place on their books. Some of this effect is already observed.

Heavy accumulations of orders are being reduced somewhat as specifications in some products are less than shipments. On other items deliveries are still remote. On the whole the delivery situation is improving gradually.

Pig iron producers have not decided on policy for third quarter, but mounting costs of labor, coke and other items may bring an advance. It is believed no decision is likely for a fortnight or more.

Insistent demand for pig iron, heightened not a little by export inquiry and tonnage already booked for foreign shipment, is causing further productive capacity to be blown in. In addition to the stack already lighted at Central Furnaces, Cleveland, and an additional stack at the Corrigan, McKinney plant of Republic Steel Corp., Cleveland, Colonial Iron Co. will blow in a stack at Riddlesburg, Pa., early in May. Other stacks in the East are being prepared for activity. Inquiries for at least 60,000 tons of pig iron for export are pending in the Pittsburgh district.

Although some producing centers have made slight increases in operations the national rate remains steady at 91½ per cent of capacity for the fourth consecutive week. Cleveland gained three points to 79½ per cent, Buffalo three points to 93, New England three points to 100 and Chicago half a point to 84½ per cent. No change was made at Pittsburgh at 95 per cent, Eastern Pennsylvania at 59½, Youngstown at 86, Wheeling at 96, Birmingham at 80, Cincinnati at 86 and St. Louis at 82. Detroit lost five points to 95 per cent.

Prolonged absence of scrap consumers from the market is causing a further decline in prices. Just how far this will continue is difficult to determine, but considerable strength is shown, apparently needing only renewed buying to develop it further. The European buying cartel is said to have placed 400,000 tons with five exporters for shipment in three months, June-August. Increased storage charges by railroads are to go into effect shortly, planned to avoid congestions of cars at ports.

Automotive production last week totaled 132,340 units, the best week since 1929. This is a gain of 7370 over the preceding week, practically all accounted for by better operations by Chrysler. General Motors turned out 52,580, Ford 34,850 and Chrysler 28,500. This rate would seem to be approaching full capacity but probably will be bettered in succeeding weeks.

Production of steel rails in 1936 increased 71.44 per cent over 1935 output, to a total of 1,219,846 gross tons. This further proves the revival in activities of the carriers and is the largest rail production since 1930. In 1932 only 402,566 tons were rolled.

Continued decline in scrap prices has brought the composite 58 cents lower than the preceding week, to $20.42. This is the fourth decline, with a total loss of $1.66 from the peak the first week in April. The composite level now is slightly higher than that of the first week in March. The same influence caused a decline of 11 cents in the iron and steel composite, to $40.36. The finished steel composite remains unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Apr. 24	Apr. 17	Apr. 10	One Month Ago Mar., 1937	Three Months Ago Jan., 1937	One Year Ago Apr., 1936	Five Years Ago Apr., 1932
Iron and Steel	$40.36	$40.47	$40.55	$39.92	$36.55	$33.10	$29.44
Finished Steel	61.70	61.70	61.70	60.70	55.80	52.20	47.62
Stelworks Scrap ..	20.42	21.00	21.60	20.95	18.12	14.39	7.76

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

A COMPARISON OF PRICES

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

Finished Material

	April 24, 1937	Mar. 1937	Jan. 1937	Apr. 1936
Steel bars, Pittsburgh	2.45c	2.40c	2.20c	1.85c
Steel bars, Chicago	2.50	2.45	2.25	1.90
Steel bars, Philadelphia	2.74	2.74	2.49	2.16
Iron bars, Terre Haute, Ind.	2.35	2.25	2.10	1.75
Shapes, Pittsburgh	2.25	2.20	2.05	1.80
Shapes, Philadelphia	2.45½	2.45½	2.25½	2.01½
Shapes, Chicago	2.30	2.25	2.10	1.85
Tank plates, Pittsburgh	2.25	2.20	2.05	1.80
Tank plates, Philadelphia	2.43½	2.43½	2.23½	1.99
Tank plates, Chicago	2.30	2.30	2.10	1.85
Sheets, No. 10, hot rolled, Pitts.	2.40	2.35	2.15	1.85
Sheets, No. 24, hot ann., Pitts.	3.15	3.10	2.80	2.40
Sheets, No. 24, galv., Pitts.	3.80	3.70	3.40	3.10
Sheets, No. 10, hot rolled, Gary	2.50	2.45	2.25	1.95
Sheets, No. 24, hot anneal., Gary	3.25	3.20	2.90	2.50
Sheets, No. 24, galvan., Gary	3.90	3.85	3.50	3.20
Plain wire, Pittsburgh	2.90	2.85	2.60	2.40
Tin plate, per base box, Pitts.	$5.35	4.85	4.85	5.25
Wire nails, Pittsburgh	2.75	2.70	2.25	2.10

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$36.40	$34.00	$28.00
Sheet bars, open-hearth, Pitts.	37.00	36.40	34.00	28.00
Billets, open-hearth, Pittsburgh	37.00	36.40	34.00	28.00
Wire rods, No. 5 to ⅝-inch, Pitts.	47.00	46.20	43.00	40.00

Pig Iron

	April 24, 1937	Mar. 1937	Jan. 1937	Apr. 1936
Bessemer, del. Pittsburgh	$25.26	$24.85	$22.31	$20.81
Basic, Valley	23.50	23.10	20:50	19.00
Basic, eastern del. East Pa.	25.26	24.76	22.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	24.80	22.21	20.31
No. 2 fdy., Chicago	24.00	23.20	21.00	19.50
Southern No. 2, Birmingham	20.38	19.88	17.38	15:50
Southern No. 2, del. Cincinnati	23.69	23.19	20.69	20.2007
No. 2X, eastern, del. Phila.	26.13	25.63½	23.13½	21.68
Malleable, Valley	24.00	23.60	21.00	19.50
Malleable, Chicago	24.00	23.20	21.00	19.50
Lake Sup., charcoal, del. Chicago	30.04	28.95	26.54	25.2528
Gray forge, del. Pittsburgh	24.17	23.75	21.17	19.67
Ferromanganese, del. Pittsburgh	99.79	90.80	84.79	80.13

Scrap

Heavy melting steel, Pittsburgh	$22.25	$22.40	$18.95	$15.75
Heavy melt. steel, No. 2, East Pa.	18.00	18.75	16.40	12.56
Heavy melting steel, Chicago	19.75	20.90	18.25	14.35
Rail for rolling, Chicago	22.75	22.25	19.40	15.75
Railroad steel specialties, Chicago	22.75	22.35	19.65	15.85

Coke

Connellsville, furnace, ovens	$4.85	$4.05	$4.00	$3.50
Connellsville, foundry, ovens	5.30	4.25	4.25	4.25
Chicago, by-product foundry, del.	11.00	10.25	10.25	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, Pa.	3.84c
New York, del.	3.88c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.78c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke, (base box), Pittsburgh	$5.35
Waste-waste, 2.75c; strip,	2.50c
Long ternes, No. 24 unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

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

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel
To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Moline, Ill.	2.35c
Cleveland	2.35c
Buffalo	2.40c

Iron

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

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo Cleve., Birm., Young...	2.60c
Gulf ports	2.65c
Pacific coast ports f.o.b. car docks	2.95c
Philadelphia, del.	2.84c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young...	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to straight or mixed carloads; less carloads $5 higher; less carloads fencing $5 over base column.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. l.)	$74.00
Single loop bale ties, (base column, c. l.)	63.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

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

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. Ni., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23½-in. Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop, Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger	60-10 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	60 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-inch	60-20 off
Do., 1 to 1-inch	60-15 off
Do., over 1-inch	60-12½ off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller Pitts., Chi., Cleve.	70 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$5.75 off

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs, no disc. on any extras	$4.05

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
¼ and ⅜	55	38½
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

½	20	1½
¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9-12	24½	10

Line Pipe

Steel

⅛, butt weld	51
¼ and ⅜, butt weld	54
½, butt weld	58½
¾, butt weld	61½
1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Iron

Butt	Black	Galv.
½	19	½
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap

1¼	18	½
1½	23½	17
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Seamless 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 for quantity, length, etc.

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.96
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A pipe $3 over Class B
Stnd. fitgs., Birm. base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo and Young.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅝-inch incl.	47.00
Do., over ⅝ to ⅞-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.75- 4.90
Connellsville, fdry.	5.25- 5.50
Connell. prem. fdry.	6.00- 6.50
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.25
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot. gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	14.75c
Do., (450 lbs.)	14.00c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100-lbs. Atlantic seaboard

Sulphate of ammonia	$1.35

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basl	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.5(	)0
Birdsboro, Pa.	25.00	25.50	24.50	)0
Birmingham, Ala.‡	20.38	.....	19.38	50
Buffalo	24.00	24.50	23.00	00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Jackson, O.	24.00	24.00	.....	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	.....	24.46	.....
Boston from Birmingham	26.37	.....	25.87	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	.....	.....
Brooklyn, N. Y., from Bmghm.	27.05	.....	.....	.....
Canton, O., from Cleveland	25.26	25.26	25.76	25.76
Chicago from Birmingham	24.22	.....	24.10	.....
Cincinnati from Hamilton, O.	24.07	25.01	24.51	.....
Cincinnati from Birmingham	23.69	.....	22.69	.....
Cleveland from Birmingham	24.12	.....	23.62	.....
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	25.26
Milwaukee from Chicago	25.00	25.00	24.50	25.00
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	.....	.....	.....
Newark, N. J., from Bethlehem	26.39	26.89	.....	.....
Philadelphia from Birmingham	25.38	.....	25.26	.....
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	.....
Pittsburgh district from Neville Island	∫ Neville, base plus 63c, 76c, ⌊ and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	25.75
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.12	.....	23.82	....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		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

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	25.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$19.00
Do., for barge	$20.00

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York N. Y.	Lead: East St. L.	Zinc St. L.	*Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Apr. 17	15.50	15.62½	15.25	58.50	57.87½	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 19	15.50	15.62½	15.25	57.37½	56.87½	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 20	14.50	14.62½	14.25	56.37½	55.87½	6.00	5.85	6.75	20.00	17.00	35.00
Apr. 21	14.50	14.62½	14.25	58.50	57.25	6.00	5.85	6.75	20.00	17.00	35.00
Apr. 22	14.50	14.62½	14.25	59.37½	58.62½	6.00	5.85	6.75	20.00	17.00	35.00
Apr. 23	14.50	14.62½	14.25	57.12½	56.50	6.00	5.85	6.75	20.00	17.00	35.00

*Carlot prices.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.50c Conn. copper

Sheets

*Yellow brass (high)	20.00
*Copper, hot rolled	22.12½
Lead, cut to jobbers	9.50
Zinc, 100-lb. base	12.50-13.00

Tubes

*High yellow brass	22.75
*Seamless copper	22.87½

Rods

*High yellow brass	16.37½
*Copper, hot rolled	18.87½

Anodes

*Copper, untrimmed	19.37½

Wire

*Yellow brass (high)	20.25

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

*New York	9.25
*Cleveland	9.50
*Chicago	8.75- 9.00
*St. Louis	9.75

Heavy Copper and Wire

*New York, No. 1	11.50
*Cleveland, No. 1	11.25
*Chicago, No. 1	10.75-11.00
*St. Louis, No. 1	11.25

Composition Brass Borings

*New York	8.75

Light Copper

*New York	9.50
*Cleveland	9.25
*Chicago	8.75- 9.00
*St. Louis	9.75

Light Brass

*Chicago	5.75- 6.00
*Cleveland	6.00
*St. Louis	6.00

Lead

New York	4.25- 4.50
*Cleveland	4.50- 4.75
*Chicago	4.75- 5.00
*St. Louis	4.50- 4.75

Zinc

New York	3.25- 3.50
*Cleveland	3.25- 3.50
*St. Louis	3.50- 3.75

Aluminum

Borings, Cleveland	10.75-11.00
Mixed, cast, Cleve.	14.00-14.25
Clips, soft, Cleve.	15.50-15.75
Mixed, cast, St. L.	13.50-14.00

SECONDARY METALS

*Brass, ingot 85-5-5-5, lcl.	14.75
Stand. No. 12 alum.	18.75-19.25

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty paid	$95.00
Do., Baltimore, base	95.00
Do., del. Pittsburgh	99.79
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot	30.00
Do., New Orleans	30.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	89.00
2% carbon, 94.00; 1%,	104.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.75
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
‡Carloads. Quan. diff. apply	

Warehouse Iron a Steel Prices

Cents per pound for delivery within metro districts of cities specified

STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.10c
Chattanooga	3.96c
Chicago (j)	3.85c
Cincinnati	3.55c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.45c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	3.96c
Baltimore*	3.25c
Cincinnati	3.55c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.96c
Cleveland (c)	2.55c
Cincinnati	3.40c
Houston	3.25c
Los Angeles, c.l.	2.45c
New Orleans*	3.14c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle, under 1 ton	4.22½c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.35c
Chattanooga	4.01c
Chicago	3.75c
Cincinnati	3.65c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (l)	4.45c
San Francisco	4.05c
Seattle (l)	4.45c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.47c
Chattanooga	4.01c
Chicago	3.75c
Cincinnati	3.65c
Cleveland, ¼-in. and over	3.86c
Detroit	3.95c
Detroit, 5/16-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	4.95c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Boston (g)	4.00c
Buffalo	3.72c
Chattanooga	3.91c
Chicago	3.85c
Cincinnati	3.50c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.50c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	3.35c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.05c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.35c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	4.10c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	4.65c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.55c
Milwaukee	5.21c-5.86c
New Orleans*	4.49c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	3.85c
Boston††	4.25c
Buffalo	3.52c
Chattanooga	4.16c
Cincinnati	3.75c
Cleveland	4.16c
Chicago	4.10c
Detroit, ¾-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.50c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	
Pittsburgh (h)	
Portland	
San Francisco	
Seattle	.5c
St. Louis	34c
St. Paul	.35c
Tulsa	3.55c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	3.52c
Chicago	4.10c
Cincinnati	3.75c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.30c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	3.70c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.15c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	5.85c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	5.85c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.39c
Chicago	3.87c
Cincinnati	3.00c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	65
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 22

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$24.70 5 0 0	$29.28	3 12 0
Basic bessemer	19.39 3 18 6*	14.23	1 15 0
Hematite, Phos. .03-.05	21.61 4 7 6	.....	.....
SEMIFINISHED STEEL			
Billets	$30.88 6 5 0	$35.59	4 7 6
Wire rods, No. 5 gage	47.55 9 12 6	48.80	6 0 0
FINISHED STEEL			
Standard rails	$43.23 8 15 0	$48.80	6 0 0
Merchant bars	2.21c 10 0 0	1.85c	5 0 0
Structural shapes	2.13c 9 12 6	1.80c	4 17 6
Plates, †¼ in. or 5 mm.	2.25c 10 3 9	2.27c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.87c 13 0 0	2.87c	7 15 0††
Sheets, gal., 24 gage, corr.	3.70c 16 15 0	3.61c	9 15 0
Bands and strips	2.21c 10 0 0	2.39c	6 10 0
Plain wire, base	2.43c 11 0 0	2.77c	7 10 0
Galvanized wire, base	3.20c 14 10 0	2.96c	8 0 0
Wire nails, base	2.65c 12 0 0	3.14c	8 10 0
Tin plate, box 108 lbs.	$ 6.05 1 4 6	.....	.....

British ferromanganese $95 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$20.50	4 3 0(a)	$18.87	425	$27.04	800	$25.34 63
Basic bessemer pig iron	20.38	4 2 6(a)	12.21	275	14.70	435	27.96 (b) 69.50
Furnace coke	6.67	1 7 0	6.08	137	5.75	170	7.64 19
Billets	30.88	6 5 0	26.20	590	25.69	760	38.82 96.50
Standard rails	1.82c	8 5 0	1.56c	780	1.80c	1,200	2.38c 132
Merchant bars	2.10c	9 10 0	1.60c	800	1.46c	975	1.98c 110
Structural shapes	2.02c	9 3 0	1.56c	780	1.46c	975	1.94c 107
Plates, †¼-in. or 5 mm.	2.17c	9 16 9	2.02c	1,010	1.87c	1,245	2.29c 127
Sheets, black	3.09c	14 0 0§	2.70c	1,350‡	2.10c	1,400‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.75c	17 0 0	4.20c	2,100	2.85c	1,900	6.66c 370
Plain wire	2.60c	11 15 0	2.60c	1,300	2.48c	1,650	3.11c 173
Bands and strips	2.27c	10 5 0	1.83c	915	2.02c	1,350	1.94c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel, a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham†	14.50-15.50
Bos. dock, No. 1, exp.	17.50-18.00
N. Eng. del. No. 1	17.5b
Buffalo, No. 1	20.00-21.00
Buffalo, No. 2	19.00-19.50
Chicago, No. 1	19.50-20.00
Cleveland, No. 1	20.00-20.50
Cleveland, No. 2	18.50-19.00
Detroit, No. 1	17.00-17.50
Eastern Pa., No. 1	19.50-20.00
Eastern Pa., No. 2	17.50-18.50
Federal, Ill.	15.75-16.25
Granite City, R. R.	17.75-18.25
Granite City, No. 2	15.75-16.50
New York, No. 1	17.00
N. Y. dock, No. 1 exp.	17.50-18.00
Pitts., No. 1 (R. R.)	23.00-23.50
Pitts., No. 1 (dlr.)	22.00-22.50
Pittsburgh, No. 2	18.50-19.00
St. Louis, R. R.	18.00-18.50
St. Louis, No. 2	16.00-16.50
Toronto, dlrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	22.00-22.50

COMPRESSED SHEETS

Buffalo, dealers	19.00-19.50
Chicago, factory	18.50-19.00
Chicago, dealer	18.00-18.50
Cleveland	19.50-20.00
Detroit	18.50-19.00
E. Pa., new mat.	19.50-20.00
E. Pa., old mat.	16.00-16.50
Pittsburgh	22.00-22.50
St. Louis	15.00-15.50
Valleys	21.00-21.50

BUNDLED SHEETS

Buffalo	16.00-16.50
Cincinnati, del.	14.50-15.00
Cleveland	16.50-17.00
Pittsburgh	20.00-20.50
St. Louis	11.50-12.00
Toronto, dealers	8.00

SHEET CLIPPINGS, LOOSE

Chicago	12.50-13.00
Cincinnati	13.50-14.00
Detroit	13.00-13.50
St. Louis	11.50-12.00

STEEL RAILS, SHORT

Birmingham	18.00-18.50
Buffalo	24.50-25.50
Chicago (3 ft.)	22.50-23.00
Chicago (2 ft.)	23.50-24.00
Cincinnati, del.	22.50-23.00
Detroit	24.00-24.50
Pitts., 3 ft. and less	26.50-27.00
St. Louis, 2 ft. & less	19.50-20.00

STEEL RAILS, SCRAP

Boston, district	†17.25-17.50
Buffalo	21.00-22.00
Chicago	19.50-20.00
Cleveland	23.00-23.50
Pittsburgh	23.50-24.00
St. Louis	19.50-20.00

STOVE PLATE

Birmingham	11.00-11.50
Boston district	†11.50-11.75
Buffalo	15.00-16.00
Chicago	12.00-12.50
Cincinnati, dealers	11.50-12.00
Detroit, net	12.00-12.25
Eastern Pa.	16.00
New York, fdry.	†12.00-12.50
St. Louis	12.00-12.50
Toron[illegible] al'rs, net	9.50-10.00

SPRINGS

Buffalo	22.50-23.50
Chicago, leaf	23.00-23.50
Chicago, coil	23.50-24.00
Eastern Pa.	25.50-26.00
Pittsburgh	27.00-27.50
St. Louis	22.00-22.50

ANGLE BARS—STEEL

Buffalo	14.50-15.00
Chicago	21.00-21.50
St. Louis	19.50-20.00

RAILROAD SPECIALTIES

Chicago	22.50-23.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	24.00-24.50
Cleveland, billet, bloom crops	25.00-26.00
Eastern Pa., crops	27.00-27.50
Pittsburgh, billet, bloom crops	27.00-27.50
Pittsburgh, sheet bar crops	26.50-27.00

FROGS, SWITCHES

Chicago	19.50-20.00
St. Louis, cut	19.50-20.00

SHOVELING STEEL

Chicago	19.50-20.00
Federal, Ill.	15.75-16.50
Granite City, Ill.	15.75-16.50
Toronto, dealers	9.00- 9.50

RAILROAD WROUGHT

Birmingham	13.00-13.50
Boston district	†10.00-10.25
Buffalo, No. 1	19.00-19.50
Buffalo, No. 2	20.00-21.00
Chicago, No. 1, net	17.00-17.50
Chicago, No. 2	19.50-20.00
Cincinnati, No. 2	17.50-18.00
Eastern Pa.	20.00-20.50
St. Louis, No. 1	15.50-16.00
St. Louis, No. 2	17.50-18.00
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	17.00-17.50
New York	13.00-13.50

BUSHELING

Buffalo, No. 1	19.00-19.50
Chicago, No. 1	18.00-18.50
Cincin., No. 1, deal.	15.50-16.00
Cincinnati, No. 2	10.00-10.50
Cleveland, No. 2	13.50-14.00
Detroit, No. 1 new	16.00-16.50
Valleys, new, No. 1	20.00-20.50
Toronto, dealers	9.00

MACHINE TURNINGS

Birmingham	8.00- 8.50
Buffalo	13.50-14.00
Chicago	11.50-12.00
Cincinnati, dealers	12.00-12.50
Cleveland	12.50-13.00
Detroit	12.25-12.75
Eastern Pa.	14.50
New York	†10.00-10.25
Pittsburgh	15.00-15.50
St. Louis	10.50-11.00
Toronto, dealers	8.00- 8.50
Valleys	14.50-15.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†8.75- 9.00
Buffalo	14.00-14.50
Cincinnati, dealers	10.75-11.25
Cleveland	13.50-14.00
Detroit	12.50-13.00
Eastern Pa.	13.00-13.50
New York	†9.50- 9.75
Pittsburgh	14.50-15.00
Toronto, dealers	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00- 8.50
Boston dist. chem.	†10.00-10.25
Boston dist. for mills	†9.25
Buffalo	14.00-14.50
Chicago	12.50-13.00
Cincinnati, dealers	10.75-11.25
Cleveland	13.50-14.00
Detroit	12.50-13.00
E. Pa., chemical	15.50
New York	†9.50- 9.75
St. Louis	10.50-11.00
Toronto, dealers	9.00

PIPE AND FLUES

Cincinnati, dealers	11.50-12.00
Chicago, net	13.50-14.00

RAILROAD GRATE BARS

Buffalo	15.50-16.00
Chicago, net	12.50-13.00
Cincinnati	11.50-12.00
Eastern Pa.	17.00-17.50
New York	†11.00-11.50
St. Louis	12.50-13.00

FORGE FLASHINGS

Boston district	†13.00-13.25
Buffalo	19.00-19.50
Cleveland	18.50-19.00
Detroit	15.50-16.00
Pittsburgh	19.00-19.50

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	23.50-24.00
Eastern Pa.	16.00

ARCH BARS, TRANSOMS

St. Louis	19.00-19.50

AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	16.00-17.00
Chicago, elec. fur.	20.50-21.00
Eastern Pa.	19.50-20.00
St. Louis	12.50-13.00
Toronto	9.50

STEEL CAR AXLES

Birmingham	22.00-23.00
Buffalo	22.50-23.50
Boston district	†20.00-21.00
Chicago, net	24.50-25.00
Eastern Pa.	28.00-28.50
St. Louis	24.00-24.50

SHAFTING

Boston district	†20.00-20.50
New York	†20.00-20.50
Eastern Pa.	25.00
St. Louis	14.00-14.50

CAR WHEELS

Birmingham	18.00-20.00
Boston dist., iron	†15.00-15.25
Buffalo, iron	19.50-20.50
Buffalo, steel	23.00-24.00
Chicago, iron	21.00-21.50
Chicago, rolled steel	22.50-23.00
Cincinnati, iron	20.00-20.50
Eastern Pa., iron	22.00-22.50
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	20.50-21.00
Pittsburgh, steel	27.00-27.50
St. Louis, iron	18.00-18.50
St. Louis, steel	21.00-21.50

NO. 1 CAST SCRAP

Birmingham	13.00-14.00
Boston, No. 1 mach.	†15.50-15.75
N. Eng. del. No. 2	17.50
N. Eng. del. textile	18.50
Buffalo, cupola	19.00-19.50
Buffalo, mach.	20.00-21.00
Chicago, agri. net	13.50-14.00
Chicago, auto	15.50-16.00
Chicago, mach. net	16.50-17.00
Chicago, railr'd net	15.50-16.00
Cinci., mach. cup.	17.00-17.50
Cleveland, mach.	20.00-20.50
Eastern Pa., cupola	21.50-22.00
E. Pa., mixed yard	18.50-19.00
Pittsburgh, cupola	19.50-20.00
San Francisco, del.	13.50-14.00
Seattle	12.00-13.00
St. Louis, No. 1	14.25-14.75
St. L., No. 1, mach.	15.50-16.00
Toronto, No. 1, mach., net	16.00-17.00

HEAVY CAST

Boston dist. break.	†14.00
New England, del.	17.00-17.25
Buffalo, break.	16.00-16.50
Cleveland, break.	15.50-16.00
Detroit, break.	14.50-15.00
Detroit, auto net	15.00-15.50
Eastern Pa.	19.00
New York, break.	†15.00-15.50
Pittsburgh	17.50-18.00

MALLEABLE

Birmingham, R. R.	15.00-15.50
New England, del.	20.00
Buffalo	23.00-24.00
Chicago, R. R.	21.50-22.00
Cinci., agri. del.	16.50-17.00
Cleveland, rail	22.50-23.00
Detroit, auto, net	17.50-18.00
Eastern Pa., R. R.	21.00-21.50
Pittsburgh, rail	21.00-21.50
St. Louis, R. R.	20.00-20.50

RAILS FOR ROLLING

5 feet and over

Birmingham	18.00-20.00
Boston	†18.00-18.50
Buffalo	23.00-24.00
Chicago	22.50-23.00
Eastern Pa., R. R.	21.00-21.50
New York	†18.00-18.50
St. Louis	20.50-21.00

LOCOMOTIVE TIRES

Chicago (cut)	22.50-23.00
St. Louis, No. 1	20.00-20.50

LOW PHOS. PUNCHINGS

Buffalo	23.00-23.50
Chicago	23.00-23.50
Eastern Pa.	26.00-27.00
Pittsburgh (heavy)	26.00-26.50
Pittsburgh (light)	25.00-25.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit. del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic ports

Foreign manganiferous ore, 45.55% iron, 6-10% man.	*17.50
No. Afr. low phos.	17.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	*15.50
Tungsten, spot sh. ton, unit, duty pd.	$23.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.00

*Nominal asking price for spot.

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	44.00
So. African, 50-52%	Nominal
Indian, 50-52%	Nominal

—The Market Week—

Bars

Bar Prices, Page 94

Pittsburgh — Hot-rolled carbon steel bar prices have been reaffirmed at 2.45c, Pittsburgh, for third quarter. As a result an easier tone in new business is expected. However, backlogs are still large and operations during balance of April and most of May apparently will not be greatly affected. Bar price clarification enables consumers to deal with own trade on more satisfactory basis.

Cleveland — Most mills report they are still taking tonnage on certain grades of commercial steel bars for second quarter delivery, but on alloy material most are booked solid. Current demand has exceeded expectations, continuing to tax production facilities. However, since prices remain unchanged for third quarter this condition is expected to ease materially. Most consumers are apparently well supplied for the present.

Chicago — Bar deliveries are unimproved, extending into July though new business lately has been somewhat less active than 30 to 60 days ago. Extension of the current 2.50c price through third quarter is not expected to stimulate new buying but near-capacity production is looked for well into third quarter. Because some builders were late in stepping up operations last quarter, production may be maintained at peak longer than usual.

Boston—While merchant steel bar buying has slowed, demand for forging, alloy and special stock is well maintained. Deliveries on the latter show no improvement. For chain-making at Boston navy yard, 195 tons of nickel-steel bars are up, all bids on 150 tons being 4.785c, delivered.

New York — With prices reaffirmed for third quarter, commercial bar sellers feel less buying pressure. Specifications against contracts continue heavy, but new orders are somewhat less numerous. In fact, the trend has been slightly off for the past fortnight. Deliveries, however, have not eased to any extent, with little available in less than five or six weeks. Current market is 2.45c, Pittsburgh, or 2.78c, delivered New York.

Philadelphia — Commercial steel bars with prices reaffirmed for third quarter are in wider demand, although deliveries are unimproved. Most mills are quoting around five to six weeks and in some instances beyond. Current market is 2.35c, Pittsburgh, or 2.74c, delivered, Philadelphia.

Plates

Plate Prices, Page 94

Pittsburgh — Hot-rolled carbon steel plates have been reaffirmed at 2.25c, Pittsburgh, for third quarter. Specifications have been heavy and backlogs have increased with the approach of the April 30 deadline on protections. In view of this and the price announcement last week, buying is expected to be light in early May. American Bridge Co. has been awarded a contract for 10 steel gates, requiring 2700 tons of plates and shapes, for the Bartlett and Mormon Flats dams in Arizona and Parker dam in California.

Chicago — Best demand for plates continues to come from railroads, freight car builders, and fabricators of tanks, line pipe and miscellaneous industrial equipment. The outlook for additional freight car buying is favorable and no let-up in plate shipments for railroad use is looked for during the coming six months.

Cleveland — Operations continue close to capacity, for backlogs are extended well into third quarter. Considerable relief was expressed by sellers here over the fact that the price policy for third quarter has been announced. Good demand is coming from miscellaneous consumers, particularly for small fabricated structural jobs. Few consumers have been forced to curtail operations from lack of supply.

Boston—Plate fabricators continue to place a fair tonnage, but the total tends downward slowly. Buyers seek delivery on current orders before the end of the quarter, generally as soon as possible. Pressure for shipments of heads, dished and flanged material continues heavy. Plates are steady at 2.65c, Boston, and 2.61c, Springfield, Mass.

The navy department will close bids June 16 on two submarines to be built in private yards, requiring about 2500 tons of plates.

New York—Award is expected before May 1 on the United States liner requiring about 16,000 tons of hull steel. Newport News Shipbuilding & Dry Dock Co. is low, with an alternate bid understood to be receiving principal consideration. Decision on three cargo boats for Panama Railway Steamship line is expected within three weeks, with Bethlehem Shipbuilding Co. lowest of four bidders. Eastern platemakers are reaffirming prices for third quarter. Business is expected to level off, particularly after the end of April, when protections expire.

Philadelphia — Eastern platemakers indicate they will follow the lead of the principal Pittsburgh producer in reaffirming prices for third quarter. The current price is 2.35c, Coatesville, Pa., or 2.435c, delivered Philadelphia. This action is expected to level off new tonnage and new business has already shown an easier tendency, although no perceptible dent has apparently been made in mill backlogs. Baldwin Locomotive Works will require 240 tons of plates for six locomotives for the Richmond, Fredericksburg & Potomac.

Seattle—Inquiry is improving, as private industries prepare for improvements and extensions. Several important projects are soon to be released. Shops have a fair volume of work in hand.

Plate Contracts Placed

2700 tons, plates and shapes, 10 steel gates, 50 x 50 x 6 feet, for Bartlett and Mormon Flat dams, Salt river project, Arizona, and Parker dam, Earp, Calif., to American Bridge Co., Pittsburgh.

465 tons, four oil tanks, White Fuel Corp., South Boston, Mass., to Graver Tank & Mfg. Corp., East Chicago, Ind.

230 tons, fuel oil tank for Seattle Gas Co., to Acme Construction Co., Seattle.

160 tons, 36-inch welded steel pipe, treasury department, San Francisco,

Invit. 3663 and 3690, to Steel Tank & Pipe Co., Berkeley, Calif.

110 tons, two boilers, Riverside county hospital, Riverside, Calif., to unnamed interest.

100 tons, 200,000-gallon tank and miscellaneous work, national guard camp, Falmouth, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh; $13,500.

100 tons, 500-horsepower boiler, state hospital, Camarillo, Calif., to unnamed interest.

Plate Contracts Pending

1500 tons, tanks and refinery equipment, Corpus Christi, Tex.

150 tons, twin screw lighthouse tender for Fifteenth Lighthouse district, St. Louis; bureau of lighthouses will open bids May 10 at Washington.

Unstated, 7100 feet of 20 and 24-inch welded water pipe, for Salem, Oreg.; bids in.

Unstated, 1200 feet of 21-inch water pipe, for Spokane, Wash.; bids April 29.

Sheets

Sheet Prices, Page 94

Pittsburgh—While no definite announcement has been made by the leading interest on third quarter sheet prices it was believed following the statement last Wednesday that most grades, such as hot and cold-rolled, were likely to be reaffirmed, although adjustment might be made on one or two. Deliveries on cold-reduced sheets have dropped from eight weeks to around six as the result of lessened demand from the automotive industry. On hot-rolled, however, deliveries range up to 23 weeks and the high rate of operations appears assured for a long time. Galvanized, common black and full finished mills have been operating at practical capacity. Foreign inquiries for substantial tonnages continue numerous. In view of the sold out condition of mills, producers have been under extreme pressure for an announcement on third quarter prices.

Cleveland — New business has fallen behind shipments for the first time in some weeks. This condition is expected to be further accentuated since prices will remain unchanged throughout the third quarter, with the possible exception of minor changes on some coated grades. Most mills have been able to clear up tonnage booked at old prices. Specifications from automotive consumers have declined materially, due to their heavy buying over the last month and because deliveries on orders placed today cannot be made until approximate time for new models.

Chicago—Sheet prices have been continued into third quarter but producers look for no marked increase in forward buying. Automotive interests are less active, the decrease being more noticeable in that direction than in others. Mills have heavy backlogs, however, which will support capacity operations beyond midyear. Shipments now are somewhat in excess of incoming tonnage.

Philadelphia—With base prices on all principal grades of sheets now being reaffirmed for third quarter, the trade looks for leveling off in new tonnage and elimination of certain of the speculative elements have entered into transactions in recent weeks. However, on the other hand, some buyers will feel more free to go ahead with their purchases now that definite prices are being named and that they have something on which to base estimates for future work. No action has yet been taken on the 300 tons of license tag stock for Pennsylvania on which bids were opened April 14.

New York—While sheet sellers generally are reaffirming prices some have stipulated these prices are subject to change, leaving the way open to revise prices on new

tonnage later if they desire. Buying is slightly less active but except for galvanized deliveries show little improvement.

Cincinnati—The leading sheet steel producer in this district has announced second quarter prices will prevail for third quarter, with some minor adjustments as yet undetermined. New orders continue above mill capacity, thus building up the third quarter backlogs. Allotment of tonnage on second quarter bookings has enabled mills to avoid serious delivery delays.

Washington — Carroll-McCreary Co. Inc., Brooklyn, N. Y., is low on 261 tons of sheets for the Norfolk, Va., navy yard at $23,381, delivered; bids April 16; schedule 380, bureau of supplies and accounts, navy department.

St. Louis — There has been little improvement in sheet deliveries, and desire on the part of users to secure material is as keen as heretofore. During the past ten days or two weeks orders for sheets and plates has receded noticeably. Third quarter inquiry has expanded further, with consumers being interested in lining up all grades.

Pipe

Pipe Prices, Page 95

Pittsburgh—Last week's price announcements did not apply to tubular goods and it is possible that decision on these products may not be made for several weeks. Meanwhile, demand in most lines continues steady. Speedy deliveries in some grades last week were reported hard to obtain, but this was only a temporary condition. Producers here have been unable to make the headway which they had hoped in rebuilding stocks. Many large pipe line projects continue on the drawing boards, including one for 300 to 600 miles. Oil country goods requirements are steady.

Cleveland — Seasonal influences have had a favorable effect on requirements for standard steel pipe from both domestic and industrial sources. Jobbers report increased stock turnover, and believe this condition will improve over the next six weeks. Demand for cast iron pipe remains almost stagnant as municipalities await decisions from federal authorities on their proposed civic improvements.

Chicago—Cast pipe demand shows occasional gains but the comparison with conditions a year ago still is affected adversely by the quieter situation in federally-financed work. Outstanding in pending business is 800 tons for Detroit, the first large purchase by that city since before the depression. Chicago is in the market for 335 tons.

New York—Cast pipe buying in small lots is slightly more active. Garden City, N. Y., has closed on 240 tons. Shafts for the Delaware river acqueduct will take 585 tons of steel pipe and fittings, to be bought by three contractors.

San Francisco—No new inquiries for cast iron pipe have come into the market and pending business does not exceed 700 tons. To date this year 13,092 tons have been placed, compared with 11,623 tons for the same period last year.

Seattle—The cast iron pipe market is not active, sales being confined to less than 100-ton lots. Demand for small gage steel pipe is improved as municipal requirements are being financed.

Cast Pipe Placed

900 tons, 24-inch and under, Wellesley, Mass., to Warren Foundry & Pipe Co., Everett, Mass.

600 tons, Bristol, Conn., to R. D. Wood & Co., Florence, N. J.

425 tons, Lawrence, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

250 tons, Springfield, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

240 tons, 8 to 14-inch, Garden City, Long Island, N. Y., to R. D. Wood & Co., Florence, N. J.
225 tons, 6 and 12-inch, Milton, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.
225 tons, 4, 6 and 8-inch for Granger, Wash., to Crane Co., Seattle.
160 tons, 6-inch, Kittery, Me., to R. D. Wood & Co., Florence, N. J.
135 tons, 6 and 12-inch, Quincy, Mass. to Warren Foundry & Pipe Corp., Everett, Mass.
125 tons, 12-inch, Lowell, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.
100 tons, 4 to 12-inch, Roseville, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

1000 tons, Salem, Oreg. water system extension; bids in.
800 tons, 12-inch, Detroit; bids April 30.
625 tons, 8 and 12-inch, State College, Pa.; bids in with alternates on steel and concrete.
335 tons, 4 and 8-inch, Chicago; bids April 29.
215 tons, 4 to 10-inch, Rocky Hill, N. J.
200 tons, sewage disposal plant, Middlesex borough, N. J.
192 ton, 4 and 6-inch, South Gate, Calif.; bids opened.
110 tons, 6 and 8-inch, Northampton, Mass.
106 tons, 4 to 6-inch, Manhattan Beach, Calif.; National Cast Iron Pipe Co., Birmingham, Ala., low.

Steel Pipe Placed

1725 tons, Detroit, to Semet-Solvay Co., New York.
150 tons, world fair project, New York, to Donaldson Iron Co., Emaus, Pa., through John Knight Inc.

Steel Pipe Pending

585 tons, various sizes with fittings, Delaware Aqueduct shafts, New York; three contracts.

Strip

Strip Prices, Page 95

Pittsburgh—Possible revisions in some strip prices for third quarter was considered here last week as a more definite announcement was awaited. On cold strip, deliveries continue at around six to eight weeks, while on hot strip they range from four to six weeks.

Cleveland—Strip steel buying has declined to the point where shipments exceed specifications. Most mills have booked tonnage well into third quarter, and on some grades and sizes are said to have little room left on rolling schedules for that period.

Chicago—While strip prices probably will continue at present levels on third quarter shipments, new business shows little change. Mills are well booked for balance of this quarter but shipments have caught up with fresh buying. Deliveries so far fail to reflect appreciable reduction in backlogs.

Boston—Moderate recession in buying is welcomed by most cold strip producers. With few exceptions mills will be able to ship by about May 1 all first quarter tonnage taken at lower prices. Cold strip deliveries are about eight weeks and hot strip five. Current buying is now considered about in line with consumer operations. While a fair number of orders have previously been booked at open prices for third quarter delivery, consumers are now showing less interest in forward buying beyond June shipment.

New York—Reaffirming of strip prices has curtailed speculative buying. Shipments of cold-rolled are heavy. Most first quarter tonnage will be cleared by mills this week. Moderate decline in new buying is expected while this material is being worked off. Already there is a gradual slowing down from recent high activity. Mill backlogs are heavy, however, indicating near capacity operations well into third quarter when an up-turn in buying against possible last-quarter advance is expected. Hot strip demand continues brisk with few mills able to deliver under five weeks.

Transportation

Track Material Prices, Page 95

Specifications for rails, accessories, and car building material are heavy and mills are unable to increase shipments. Current rail orders will provide capacity schedules for rail mills until next quarter, when some secondary buying is expected to develop. While equipment markets include only a few new inquiries for freight cars, several proposed projects are thought likely to develop within the next 30 to 60 days. The Union Pacific is taking bids on 12,000 tons of various steel products for a contemplated car building program.

Purchase of six high-speed passenger locomotives from Baldwin Locomotive Works for delivery in November has been authorized by directors of Richmond, Fredericksburg & Potomac. This road also has ordered 3000 tons of 131-pound rails.

Bangor & Aroostook is reported inquiring for six steam locomotives. Aliqu'ppa & Southern has ordered two steam switching locomotives from American Locomotive Co.

Rail Orders Placed

Richmond, Fredericksburg & Potomac, 3000 tons, to Bethlehem Steel Co., Bethlehem, Pa.

Rail Orders Pending

Colorado & Wyoming, 395 tons of rail, 50,000 tie plates, 1100 angle bars, 576 kegs of spikes and 151 kegs of bolts.

Car Orders Placed

Atlantic Coast Line, 200 automobile cars and 400 box cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; 200 automobile, 15 coaches and 15 express cars to Bethlehem Steel Co., Bethlehem, Pa.

Boston Elevated, 12 trolley coaches with Pullman-Standard Car Mfg. Co., Chicago.

Louisiana & Arkansas, fifty 70-ton hopper cars, to General American Transportation Corp., Chicago.

Car Orders Pending

Baltimore & Ohio, 2000 hopper cars.

Central of Brazil, 1000 cars.

Philadelphia Rapid Transit Co., 50 all-steel subway cars for South Broad street extension, bids May 3.

Locomotives Placed

Aliquippa & Southern, two steam switching locomotives of 0-8-0 type, to American Locomotive Co.

Richmond, Fredericksburg & Potomac railroad, six high-speed passenger locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Locomotives Pending

Bangor & Aroostook, six steam locomotives, bids asked.

Chinese Ministry of Railways, forty to sixty-five 2-8-2 locomotives and ten 2-8-4 locomotives, bids asked.

New York, New Haven & Hartford, six to ten electric locomotives, contemplated.

Buses Booked

Twin Coach Co., Kent, O.: Thirteen 31-passenger for Tennessee Electric Power Co., Chattanooga, Tenn.; nine 23-passenger for Georgia Power Co., Atlanta, Ga.; six 24-passenger and two 33-passenger for Steubenville, East Liverpool & Beaver Valley Traction Co., East Liverpool, O.; six 25-passenger for Bluebird System Inc., Chicago; four 23-passenger for Wichita Transportation Corp., Wichita, Kans.; four 31-passenger for Tennessee Electric Power Co., Nashville, Tenn.; two 31-passenger for Woodlawn & Southern Motor Coach Co., Aliquippa, Pa.; two 25-passenger for Schuylkill Valley Lines, Norristown, Pa.; two 4-passenger for Akron Transportation Co., Akron, O.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 95

Shipments are heavy despite a smaller volume of specifying compared with the active March rate. Consumption continues heavy and

requirements of railroads, freight car builders and tractor and farm implement manufacturers are expected to hold around the present rate during second quarter. Prices are steadier than during the previous several months, according to those who have been following the trend closely.

Wire

Wire Prices, Page 95

Pittsburgh — Reaffirmation of prices on principal wire products for third quarter will result in an easing in new domestic business, it is believed. Almost overshadowing price situation with certain consumers has been the delivery problem. Backlogs are large and operations are likely to hold close to present level through this quarter. Export inquiry continues active at premium prices. Jobbers' stocks are reported fairly large.

Cleveland — Mills are operating close to capacity, with shipment so far this month declining only slightly. However, specifications have declined considerably in contrast with the preceding month. Most mills have been able to clear up practically all first quarter tonnage, and far as can be determined little was of a speculative nature. While new business has declined, it is generally distributed throughout all wire products and according to those closely associated with the industry, the recession is only temporary.

Chicago—Wire mills are slow to curtail backlogs which will necessitate capacity schedules during at least the balance of this quarter. Business taken for third quarter will carry current prices. Consumption of plain wire is well maintained in most directions, while the movement of merchant products has increased steadily.

New York—Slight decline in wire buying has eased pressure for deliveries. Except for some specialties, mills are nearing end of low-priced first quarter volume. Consumers yet to receive shipments on old orders, and relieved of uncertainty as to third quarter prices, have curtailed current specifications.

Bookings for third quarter are light, limited mostly to consumers who insisted on being covered during recent heavy purchasing and extended delivery period. In some cases consumers will resume volume buying when this stock arrives. The manufacturing trade demand holds relatively higher than for other products. Operations are at capacity in many departments. Export inquiry for wire is heavy, notably barbed. Some sellers have refused much of this business while others are promising extended forward delivery only.

Boston—While somewhat lighter, incoming wire tonnage continues substantial and generally satisfactory to most sellers. Mills, as a rule, will clear backlogs of orders booked at lower prices last quarter by May 8. More second quarter orders are being shipped and operations will soon be entirely on this volume. At least one wire rod producer located outside New England is reported selling rods in this district on a Pittsburgh instead of a Worcester base. Finished wire prices are firm and unchanged.

Buffalo — Demand for wire products is on a broad scale. The local wire mill, which for many months operated only one of its four open-hearth furnaces, now has three in production for what is expected to be a long run. Second quarter tonnage of rods and wire products shipped from Buffalo mills may prove the best of any quarter since 1930.

Shapes

Structural Shape Prices, Page 94

Philadelphia—Shape makers are receiving substantial specifications, as the April 30 deadline drives in considerable tonnage. Formal awards of a number of these contracts have been announced in recent weeks, so the number of new structural contracts reported placed with fabricators at this time is not as large as might otherwise be expected. Due to a large capacity in the East and to the fact that structural business as a whole over recent weeks has continued to lag, shape deliveries are still available in four to five weeks. Bids have been asked on WPA's most recent low-rent housing project at Lackawanna, N. Y.

Eastern shape makers are expected to follow the lead of Carnegie-Illinois Steel Corp., Pittsburgh, in reaffirming shape prices for third quarter. The current market is 2.35c, Bethlehem, or 2.455c, Philadelphia.

New York—New structural projects include a Bronx river bridge; court house, Brooklyn, and more New York state bridges. Awards in this district approximate 7500 tons, including 3100 tons for a building for Columbia Broadcasting Co., New York. Fabricating shops have good backlogs and are operating near capacity.

Boston — Extension of the subway system under Huntington avenue, Copley Square to Mechanics building, Boston, appears more promising after favorable state legislative action. While there has been a decline in new tonnage placed, the number of small contracts closed is encouraging. Most shops have enough work for several weeks of high operations.

Pittsburgh—Up until last week backlogs in shapes were being added to, but inquiries and awards in the last few days have been somewhat lighter. Prices for third quarter have been reaffirmed at 2.25c, Pittsburgh. Kansas City Structural Steel Co. obtained 1900 tons for a highway bridge at Topeka, Kans.

Cleveland — Requirements for fabricated structural steel are heavier than for some time, despite the fact most awards are well under 100 tons. The largest award of the week went to American Bridge Co., Pittsburgh, for the lakefront boulevard bridges at Cleveland, involving 720 tons. Pending work aggregates considerable tonnage including a few outstanding jobs. Prices are firm.

Chicago — Fabricated structural steel awards show little increase, despite a fairly large amount of pending business. Best inquiries are coming from outlying districts, only a few major projects being in prospect in the immediate Chicago district. Little bridge work is pending in Illinois.

St. Louis — Structural shape situation is more promising than in recent weeks, for while there are no large awards, numerous small jobs have been placed, and fabricating yards have increased operations moderately.

Bethlehem Steel Co., Bethlehem,

Behind the Scenes with STEEL

Batter Up

WAVING willows are now pounding the pill in nearly all our major cities and the big league baseball season is away to a good start. Having no more grandmothers to dispense with, we missed the opener last week, but with radios blaring in every doorway and newspapers out with the story of the game almost before it is over, all a nonattending person misses is the chance to catch an errant foul or to cash in on a lucky scorecard number.

It is not hard to vision the day when the Indians and Tigers, for instance, will battle nine innings to a grandstand filled with radio announcers, technicians and newspaper reporters, while a baseball hungry public huddles around radio sets or waits with their three cents for the final edition. Then we will really have achieved utopia.

But there is something comforting, something definitely American, in the annual reappearance of the grand old game; in the hoarse shouts of encouragement to the players, most of whom are earning more money than anyone in the stands; in the rhythmic beat of feet to rattle the opposing pitcher; in the meticulous dusting of home plate by a chesty umpire.

* * *

Flamingo Goes

ANOTHER comforting sight was the reappearance of Lake City Malleable's flamingo on the back cover of STEEL for April 19. In graceful silhouette, the S-necked bird stood by the light of a dim moon, waiting for a fish to pop from the limpid pool at its feet, surrounded by deep shadows of the best grade of printer's ink.

Some years ago we received two of these metallic birds as desk ornaments. Week in and week out they stood in chummy silence abaft of an ashtray, until one day one of them disappeared. Simply took off and left no word. Since that time, the other one fared rather badly. The old glint has gone from its eyes; its once shiny plumage has dulled. Life just isn't the same.

* * *

Make-up Blues

IF YOU missed the concluding installment of Mr. Geiger's series on the basic open-hearth furnace in last week's issue, let us hasten to assure you that because of a slight complication our make-up editor was forced to omit the fourth installment from last week's issue and schedule it for this week. It appears herewith, on page 48, we hope.

Some day we mean to expose the perils of the make-up editor's job. Each week he has just so many pages to play with, so to speak, and just so many choice articles to fit in the space. Suddenly after things are all set, he finds our cruel advertising department has snatched away a few pages for late ads, leaving the poor m.e. with no place to put his selected articles.

Then he starts to grind his teeth, snap his shears and rattle his pastepot. This accomplishing nothing, the m.e. usually has a good cry and then says to hell with it. Which means occasionally that a scheduled article must be deferred a week as in the above case.

* * *

Off the Fairway

PROBABLY by now you are in the throes of getting your golf equipment together for another gala season in the rough. If so, you will be interested in the following communique from the Electro Metallurgical Co., to wit:

"In the spring, young and old alike turn their thoughts to the green fairways and the inviting flag beyond the water hazard at the first hole. While a goodly number of inveterates are busy shining up their mashies and putters, the owners of a new type of club and golf shoes (picture on request) are complacently tending to other business. No polishing for them, for the club heads and shoe spikes are stainless steel and rarely even need wiping to keep them bright and shiny."

Even if we should happen to be the proud possessor of stainless steel golf clubs and shoes with stainless steel spikes, we would be kept busy digging mud and other sundries from them, for our path over a golf course is a devious one—through woods and traps, over fences and through vacant barns, always in chase of the elusive pellet whose trajectory can never be foretold.

* * *

'Nother Neck

NO SOONER had we sounded the clarion call of giraffes in advertising than did Automatic Transportation took up the cudgel and if you will turn to page 54 of this issue you will discern another of the spotty quadrupeds staring at you.

Depend on us to call the trends!

—SHRDLU

Shape Awards Compared

	Tons
Week ended April 24	17,178
Week ended April 17	28,021
Week ended April 10	48,585
This week, 1936	13,326
Weekly average, 1936	16,332
Weekly average, 1937	27,977
Weekly average, March	28,634
Total to date, 1936	340,061
Total to date, 1937	475,616

Includes awards of 100 tons or more.

Pa., has been awarded 460 tons by the Crown Cork & Seal Co. for its new St. Louis factory.

Shape Contracts Placed

3100 tons, building, Columbia Broadcasting Co., Park avenue and Fifty-ninth street, New York, to Bethlehem Steel Co., Bethlehem, Pa.

2750 tons, regulating gates, specification No. 722, for bureau of reclamation, Arizona and California, to American Bridge Co., Pittsburgh.

1800 tons, building, Aluminum Co. of America, Edgewater, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, additions, to McKinnon Industries, branch of Canadian General Motors Corp., St. Catharines, Ont., to Standard Steel Corp., Port Robinson, Ont.

720 tons, Lakefront boulevard bridges, Cleveland, to American Bridge Co., Pittsburgh.

705 tons, state highway bridge, Alexandria, Va., to American Bridge Co., Pittsburgh.

525 tons, seminary building, Darlington, N. J., to Selbach-Meyer Co., Union City, N. J.

470 tons, state highway bridge, route No. 240, Montgomery, Pa., to Bethlehem Fabricators, Bethlehem, Pa.

460 tons, factory Crown Cork & Seal Co., St. Louis, to Bethlehem Steel Co., Bethlehem, Pa.

445 tons, Roosevelt highway bridge, United States Engineer office, Los Angeles, to Bethlehem Steel Co., Los Angeles.

380 tons, Culver boulevard bridge, United States Engineer Office, Los Angeles, to Minneapolis-Moline Power Implement Co., Minneapolis.

363 tons, River street state viaduct, Tacoma, Wash., to Pacific Car & Foundry Co., Seattle; Rumsey & Co., Seattle, general contractor.

300 tons, state highway bridges, projects FAP-195-C and 278-G, Aroya, Colo., to Minneapolis, Moline Power Implement Co., Minneapolis.

295 tons, grade crossing elimination, New York Central, Verona, N. Y. to American Bridge Co., Pittsburgh.

285 tons, viaduct, Pumpkinvine creek, Georgia to Virginia Bridge Co., Roanoke, Va.

260 tons, unit A, National Can Co., Baltimore, to American Bridge Co., Pittsburgh.

250 tons, bridge, Grand Central parkway, world's fair, New York, to American Bridge Co., Pittsburgh.

250 tons, transit shed No. 5, to Albany Leach Steel Corp., Rochester, N. Y.; through Harold J. Beissing Co., New York.

240 tons, bridge SAR 12, Sec. 32B1, Sangamon county, Illinois, to Fort Pitt Bridge Works, Pittsburgh.

240 tons, girder bridge, Craig, Mo., to American Bridge Co.

225 tons, building addition, Alco Gravure, Inc., Chicago, to Joseph T. Ryerson & Son, Inc. Chicago.

210 tons, bridge 54-8 FA 205-G, I., Butler county, Kansas to Illinois Steel Bridge Co., Jacksonville, Ill.

195 tons, depot ordnance building, Curtiss Bay, Md., to Maryland Steel Products Co., Baltimore; C. W. Schmidt, Baltimore, general contractor. Bethlehem Steel Co., Bethlehem, Pa., awarded 50 tons of reinforcing bars.

145 tons, Tabor overpass, Montpelier, Vt., to Vermont Structural Steel Corp., Burlington, Vt.; Ryan & Densmore, Claremont, N. H. general contractor.

145 tons, bridge 160-4 FA 333-D, Barber county, Kansas, to Ben Sibbitt Iron & Foundry Co., Wichita, Kan.

135 tons, state bridge, Tompkins county, New York, to American Bridge Co., Pittsburgh; through A. S. Wikstrom, Bound Brook, N. J.

135 tons, bridge Pawnee county, Kansas to George C. Christopher & Son, Wichita, Kan.

130 tons building, 112 West Thirty-first street, New York, to Fassler Iron Works, New York.

130 tons, building, New Britain, Conn., to Berlin Construction Co., Berlin, Conn.

130 tons, McCory store, Altoona, Pa., to Altoona Pipe & Steel Co., Altoona.

125 tons, bridge, West Branch, Mich., to American Bridge Co., Pittsburgh.

115 tons, foundation, Flushing river bridge, Queens, N. Y., to American Bridge Co., Pittsburgh; through Corbetta Construction Co., New York.

110 tons, high school, Evans City, Pa., to Gulbert Steel Co., Pittsburgh.

110 tons, store, Lynn, Mass., to New England Structural Co., Everett, Mass.

100 tons, underpass, Lexington-Paris road, Fayette county, Kentucky, to Midland Structural Steel Corp., Cicero, Ill.; Ruth Bros., Georgetown, Ky., general contractors; Jones & Laughlin Steel Corp., Pittsburgh, awarded reinforcing steel.

100 tons, city hall, Tuscaloosa, Ala., to Southern Steel Works, Birmingham, Ala.; through Upchurch Construction Co., Montgomery, Ala. Also 62 tons of bars to Connors Steel Co., Birmingham.

100 tons spillway Gibson dam, Sun River project, Mont., to unstated fabricator; McLaughlin Construction Co., Livingston, Mont., general contractor. Also 66 tons of bars.

Unstated, control gates and spillway, Alcova dam, Wyoming, to Commercial Iron Works, Portland, Oreg.

Shape Contracts Pending

1180 tons, state bridges, Mississippi.

1000 tons, bridge, Westchester avenue over Bronx river; bids May 4, to department of plants and structures, New York.

900 tons, Pacific Telephone & Telegraph building, Stockton, Calif.; bids April 27.

880 tons, including 369 tons of piling, Sacramento river bridge at Red Bluff, Calif.; bids May 5.

800 tons, boiler room framing and turbine supports, for Duquesne Light Co., Pittsburgh.

750 tons, bridge, over Central railroad of New Jersey, Wilson avenue, Newark; Standard Bitulithic Co., Newark, low.

700 tons, oil derricks, Houston, Tex.

500 tons, piling, improvements, contract 1, Jacob Riis park, Queens, N. Y.; Clemente Construction Co., New York, low, April 20.

500 tons, furnace Standard Oil Co., Texas City, Tex.

460 tons, overhead bridge, Project WPGH-9, Groton, S. Dak.

440 tons, piling government, work, Kaukauna, Wis.; bids in.

430 tons, addition to Mad River station, for Ohio Edison Co., Springfield, O.

400 tons, courthouse and post office, Nome, Alaska; bids June 8.

375 tons, courthouse, Erie, Pa.; bids May 4.

300 tons, piling, sewer contract 4, Queens, N. Y.; bids April 26.

300 tons, building, Swift Co., Port Newark, N. J.

290 tons, Del Rey-Pacific electric bridge, U. S. Engineer, Los Angeles; bids April 30, schedule 292.

290 tons, bridges, Broome and Jefferson counties, New York; bids April 27.

250 tons, addition, public school No. 226, Brooklyn; Skolnick Building Corp., New York, low.

250 tons, repairs to Bridge 1-C, for Pittsburgh & West Virginia railway, Pittsburgh.

250 tons, hospital building, Good Samaritan hospital, Suffern, N. Y.

250 tons, finishing building, Smith Paper Co., Lee, Mass.

250 tons, store, Twenty West Thirty-fourth street, New York.

250 tons, school, Endicott, New York.

240 tons, crane runway, Hayes Body Co., Grand Rapids, Mich.

230 tons, pure food building, for New York state industrial exhibit authority, Syracuse, N. Y.

220 tons, state highway underpass, Kenova, W. Va.

215 tons, five highway bridges, state of Missouri; bids May 1.

200 tons, boiler house, New Haven Pulp Board Co., New Haven.

200 tons, theatre, Hudson, N. Y.

170 tons, bridge, Oswego, Ill.

165 tons, state highway bridges, Oxford, Athol-Orange, Petersham and Sterling, Mass.; bids May 4, department of public works, G. H. Delano, chief engineer.

157 tons, sheet piling, bureau of reclamation, invitation A-42,226-A, Holtville, Calif.; bids opened.

155 tons, sheet piling, bureau of reclamation, invitation A-42,228-A, Calexico, Calif.; bids opened.

150 tons, bridge in Lincoln county, Colorado; bids April 27.

150 tons, airport, Harrisburg, Pa.; bids April 28.

130 tons, two timber deck I-beam bridges, Erie county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 30.

113 tons, five overhead traveling cranes, Metropolitan Water district, Los Angeles; Cyclops Iron Works, San Francisco, low.

100 tons, municipal airport hangar, Madison, Wis.; bids April 26.

100 tons, plant extension, Harrison Nut & Bolt Co., Harrison, N. J.

100 tons, sewage disposal plant, Hartford, Conn.

100 tons, Panama; Bethlehem Steel Export Co. low on April 21 bids.

Unstated, Tacoma, Wash., light department substation; bids April 26.

Reinforcing

Reinforcing Bar Prices, Page 95

Pittsburgh—Prices on concrete reinforcing bars are expected to hold at their present levels as a result of the announcements last week for third quarter. New billet material quoted by distributors is 2.55c, Pittsburgh, and rail steel, 2.40c, Pittsburgh. Pending business includes 1600 tons for the reclamation bureau at Pomona, Wash.

Cleveland — Some mills report deliveries can now be made on reinforcing bars within four weeks, the best that can be obtained on any steel product. Miscellaneous tonnage continues to dominate the market with no awards over 100 tons reported within the last three weeks. Prices are said to be firm, although no real test has been offered.

Boston — An increased number of small orders sustain reinforcing bar tonnage. New inquiry is gradually building up pending volume. At $524,000, Virginia Engineering Co., Newport News, Va., is low on a

Concrete Awards Compared

	Tons
Week ended April 24.....	4,430
Week ended April 17.....	6,694
Week ended April 10.....	4,727
This week, 1936	4,627
Weekly average, 1936.....	6,005
Weekly average, 1937.....	4,185
Weekly average, March....	5,402
Total to date, 1936.....	122,126
Total to date, 1937.....	71,142

Includes awards of 100 tons or more.

veteran's hospital, White River Junction, Vt. A fish pier Gloucester, Mass., highways, small bridges, sewers and other public work accounts for the bulk of requirements. Low bid on reinforcing steel in place for the Tabor overpass, Montpelier, Vt., was 4.48c.

Chicago—Reinforcing bar demand gradually is improving though activity in private building construction is increasing more slowly than anticipated. While public projects involve less tonnage than a year ago, a good volume of business is pending for state bridges and public build ings. Concrete bar prices are the firmest in several years.

New York—Inquiry for reinforcing steel is heavier than current awards. Bridges, sewers, highway and public works require larger tonnage. Partial requirements, Flushing river bridge, substructure, near 400 tons, have been placed. Contract for about 2000 tons of steel piles will be placed by a Newark, N. J., subcontractor, although part of this tonnage is understood to be in stock.

Philadelphia — Several fair-sized tonnages, including one private job involving 500 tons, have been placed with reinforcing bar sellers here recently. However, the market is far from brisk. School work and some institutional construction for the state of Pennsylvania appear most promising among prospective work. The local board of education has a program under contemplation involving eight elementary schools, two junior high schools and one vocational school. This program is not expected to become active until late this year, however.

Reinforcing Steel Awards

404 tons, depot supply building, government air depot, Sacramento, Calif., to Concrete Engineering Co., San Francisco.

400 tons, partial requirements, substructure, Flushing river bridge, department of plants and structures, New York, to Fireproof Products Co., New York; Corbetta Construction Co., New York, general contractor.

400 tons, building No. 10 and additions, Veterans Hospital, Kecoughton, Va. to Concrete Steel Co., Washington; Virginia Engineering Co., Newport News, Va., general contractor.

350 tons, building, Sears, Roebuck & Co., Lansing, Mich., to Truscon Steel Co., Youngstown, O.

350 tons, building, Hartford, Conn., electric light company, to Concrete Steel Co., New York.

300 tons, building, Mead, Johnson & Co., Evansville, Ind., to Bethlehem Steel Co., Bethlehem, Pa.

230 tons, building, Grand Rapids, Mich., for Wholesale Grocery Co., to Jones & Laughlin Steel Corp., Pittsburgh.

230 tons, building, for Continental Can Co., Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, store, Benson & Rixon Co., Chicago, to Inland Steel Co., Chicago.

175 tons, substructure fish pier, Gloucester, Mass., to Concrete Steel Co., New York; through Bay State Dredging & Contracting Co., Boston.

160 tons, water softening plant, Jamestown, N. Dak., to Cowin & Co., St. Paul, Minn.

155 tons, Seminary building, Darlington, N. J., to Truscon Steel Co., Youngstown, O.

150 tons Black Canyon, Ida., reclamation project, to unnamed interests; J. A. Terteling & Sons, Boise, Ida., general contractor also 60 tons shapes and gates.

150 tons, Odair, Wash., reclammation bureau, to Colorado Fuel & Iron Corp., Denver.

121 tons, courthouse, Las Cruces, New Mexico, to Truscon Steel Co., Youngstown, O.; through J. E. Morgan & Son, El Paso, Texas.

120 tons, WPA work, Des Moines, Ia., to Des Moines Steel Co., Des Moines.

115 tons, state bridge work, Lycoming, county, Pennsylvania, through R. C. Reitz, Lancaster, Pa., to Taylor-Davis Inc., Philadelphia.

110 tons, addition, St. Christopher hospital, Philadelphia, through the Turner Construction Co., that city, to the Bethlehem Steel Co., Bethlehem, Pa.

110 tons, state road work, Juniata county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Acute building No. 4, Veterans' Hospital, Northampton, Mass., to Truscon Steel Co., Youngstown, O., and New England Iron Works Inc., Hamden, Conn.; New England General Con-

tracting Co., New Haven, Conn., general contractor.

100 tons, bureau of reclamation, invitation 26,016-A, Boca, Calif., to unnamed interest.

Reinforcing Steel Pending

3400 tons, sewer, Flatbush avenue, Brooklyn; bids April 28.

1600 tons, reclamation bureau, Pomona, Wash., invitation 33500; bids soon.

800 tons, bridge, Topeka, Kans.

700 tons, filtration plant, Minneapolis.

550 tons, Bills Brook dam and appurtenant structures, Barkhamsted reservoir, East branch, Farmington river, Barkhamsted, Conn.; bids May 17, board of contract and supply, Metropolitan district, Hartford, Conn.

500 tons, sewerage treatment plant, Hempstead, New York.

395 tons, bureau of reclamation, invitation A-42,230-A, Calexico, Calif.; bids opened.

350 tons, addition, Williamsburg Housing project, New York; Starrett Bros & Eken, New York, low.

350 tons, building, J. W. Knapp department store, Lansing, Mich.

300 tons, Yakima Ridge canal, Roza project, Wash.; bids at Yakima, Wash., May 7; materials to be furnished by reclamation bureau.

300 tons, building, Northern States Power Co., St. Paul.

283 tons, bureau of reclamation, invitation A-24,551-A, Potholes, Calif.; bids opened.

250 tons, bridges, Worlds fair projects, New York; Faircroft Construction Co., New York, low.

250 tons, veterans hospital, White river junction, Vermont; Virginia Engineering Co., Newport News, low.

225 tons, sewage disposal plants, Raritan, Somerville and Borough of Middlesex, N. J.

225 tons, building, Bell Telephone Co., Detroit.

206 tons, building for Bigelow-Sanford Carpet Co., Emeryville, Calif.; bids opened.

200 tons, bridge, over Central railroad of New Jersey, Wilson avenue, Newark; Standard Bitulithic Co. Newark, low.

195 tons, Sacramento river bridge, Red Bluff, Calif.; bids May 5.

185 tons, mesh highway, Washington, D. C.; bids May 4.

175 tons, highway and bridge, Jacob Riis park, Queens, N. Y., contract 2; Woodcrest Construction Co., Inc., New York, low, April 20.

175 tons, warehouse for Blumauer-Frank Drug Co., Seattle; bids in.

150 tons, Washington state highway projects; bids in.

135 tons, high school, Crockett, Calif.; bids opened.

110 tons, state bridge, NSP37-1, Northern state parkway, Nassau county, New York; Andrew Weston Co. Inc., Woodmere, N. Y., low.

103 tons, bridge, Lincoln county, Colorado; bids soon.

Unstated tonnage, superstructure, public school Sixty-seventh street and Elmwood avenue, Philadelphia; bids opened June 5.

Unstated tonnage, superstructure, Central high school, North Philadelphia, Philedelphia; bids to be opened June 21.

Pig Iron

Pig Iron Prices, Page 96

Pittsburgh—In view of the current strong export situation and various other factors, the opinion was expressed in market circles here last week that it might be difficult to hold third-quarter pig iron prices at their present level. However, a number of sellers here are opposed to an increase and it is considered unlikely that any initial announcement would be made here. Approximately 60,000 tons for export have been booked in this district since the first of the year and offers of premiums for good-sized tonnages are frequent. The difficulty in this class of business, however, is to obtain ships, particularly to Japan. One large export order is reported to have been taken during the past week here. With some producers sold weeks ahead, little iron is available. Shipments are already exceeding the corresponding period last month. Advances in coke and iron ore prices and wages were only partially taken into account at the time of the last advance in pig iron.

Cleveland—Producers report shipments well above normal, exceeding expectations and comparing favorably with March. As anticipated, specifications have dropped off considerably within the last few weeks. Most foundries, with operations at capacity, are apparently well stocked. Inquiries for third quarter are unusually heavy but sellers claim no such tonnage has been booked.

Chicago—Pig iron producers are expected to announce prices soon for third quarter delivery. Second quarter capacity already is absorbed by previous orders and shipments are heavier than during the early part of first quarter. New buying consists principally of small lots, larger foundries already having covered practically all their second quarter needs. The market is firm at $24, furnace, for No. 2 foundry and malleable.

New York—Pig iron sellers have not opened books for third quarter and no price has been named. Most opinion at the moment is that prices may be extended. Melt is heavy but spot demand is light. The recently organized European raw material cartel has not yet established offices in this country.

Buffalo — Shipments of pig iron are running 30 to 50 per cent ahead of expectations and show no sign of major drop. A merchant stack here is down for six or seven weeks for relining, leaving 11 furnaces blowing.

Philadelphia — With prices on

most iron and steel products now being reaffirmed for third quarter, the possibility of a further advance in pig iron, such as was regarded as probable earlier this month, appears increasingly less imminent, according to local sellers. Eastern producers, so far as can be learned, have not formally opened books for third quarter, and may not do so for a while. Shipments continue heavy against contracts, with new buying spotty.

With estimated production of 6500 tons a month, Colonial Iron Co. will resume blast operations at its Riddlesburg, Pa., stack early in May. Foundry iron will first be produced to be followed by a considerable tonnage of basic to fill orders now on the books. Ore, coke, limestone and other raw material contracts have been executed. Hickman, Williams & Co., Philadelphia, will be exclusive selling agent. Officers of the Colonial Iron Co. are: George P. Pilling, Philadelphia, president and treasurer; W. D. Norman, New York, vice president and secretary, and W. C. McKee, general manager.

St. Louis — Current demand for pig iron has dwindled, but consumption and shipments are holding somewhat above the March high average. Sellers expected no new orders at this time, as coverage until third quarter was pretty thorough. However, they are kept busy getting forward tonnages to their customers.

Toronto, Ont.—Merchant pig iron sales were affected by labor troubles in the Oshawa plant of General Motors Corp. for the past week and dropped sharply below levels of the preceding weeks. Melters confined purchases to spot needs and awards ranged from a car to around 200 tons for spot delivery with total orders approximately 1500 tons. With the exception of plants associated with the automotive industry there was no curtailment in the daily melt. Scarcity of scrap, however, has tended to boost pig iron sales. Production of pig iron continues to hold at the high level for the year and prices are firm and unchanged.

Tin Plate

Tin Plate Prices, Page 94

Pittsburgh — Faced with heavy specifications, tin plate producers here continue operating at close to 100 per cent, with shipments steady and consumers exerting great pressure for delivery. On top of this strong domestic situation, which finds all mills loaded until Sept. 30, foreign inquiry continues active at advantageous prices.

Scrap

Scrap Prices, Page 98

Philadelphia—Scrap prices continue to ease, with most consumers marking time in expectation of still further reduction before the market begins to firm. Heavy melting steel and some cast grades are among the principal items to have undergone further decline at this time. Railroad specialties are showing the best resistance to downward trend.

Effective May 25, new railroad storage charges will be applied. Following free time for 10 days, a charge of 20 cents a net ton will be asked for six 5-day periods, 30 cents a ton for the next six 5-day periods, and 40 cents a ton for the following six 5-day periods. This schedule affects all ports from New York to New Orleans and follows action recently noted with respect to New England ports.

These new charges will become effective about the time scrap exporters begin moving tonnage against the large contract, noted in a recent issue as having been placed by the European buying cartel. Involving between 350,000 and 400,000 tons, this contract calls for deliveries beginning around the first of June and extending for a period of three months.

The cartel, it is understood, is paying $22.65, f.a.s., for the No. 1 steel involved in its recent contract, and $1 less for the No. 2 steel required.

Pittsburgh—No. 1 heavy melting steel has declined to $22.00-22.50 here in the prolonged absence of buying by mills. However, the inactivity was drawing to an end late last week and it was evident that clarification of the market position through a mill sale would be forthcoming. Although No. 1 heavy melting steel has fallen off about $2 in the last month, steelworks operations have shown little change from their high rate. Railroad specialties are notable for the strength they have commanded while other grades were weakening.

Cleveland—Buying of iron and steel scrap is still confined to small lots, largely of miscellaneous grades. Shipments continue fair to consumers. The softening tendency in prices developed from the recent lull in buying now has been translated into a general recession in steel grades of $1 a ton.

Chicago—Scrap prices continue easy and quotations are off 50 cents to $1 a ton. Heavy offerings find consumers uninterested in making new commitments and nominal prices prevail in a number of instances. Mills have turned down heavy melting steel at $20 and the market on this grade nominally is $19.50 to $20.

New York—Scrap brokers are paying $17 as their top price for No. 1 heavy melting steel and $16 for No. 2, dock delivery, which is 50 cents lower than recent bids. Stove plate is also down 50 cents for export.

Buffalo — Lower offers from principal melters and the prospect of heavy water receipts of scrap were factors in creating a nominal weakness during the past week. However, dealers were confining activities to shipments and were disposed to hold quotations, nominally at least, at former levels. It was pointed out the dock workers strike in Ontario would cut deeply into anticipated receipts of scrap if prolonged and that the present high rate of melt here also should be regarded as a strong undertone for the market.

Detroit—Scrap prices continue to decline with reductions of 50 cents to $1 in most classifications. Dealers, for the most part out of the market, believe much of the current pressure is artificial and will subside soon. Steel mills continue to operate at capacity, but foundries are slack, calling for little scrap. Publicity which scrap is receiving in newspapers and magazines is having an unfavorable effect and buyers are waiting for the bottom of the current dip.

St. Louis — The market for iron and steel scrap has yielded to congestion and other bearish factors and a number of important grades, including heavy melting steel, cast and rails have been marked down 50 cents per ton. The melt holds up well, despite labor troubles in several of the principal electrical manufacturing plants, and consumption is on a large scale.

Toronto, Ont. — Practically no change is reported in iron and steel scrap. Melters show keen interest and demand is well in excess of supplies for iron grades and new offerings continue light. Further improvement in offerings from rural districts is expected within the next few weeks as large quantities of old machinery in the farming districts are ready for breaking. Both machinery cast and stove plate are in limited supply and malleable scrap has practically disappeared.

Warehouse

Warehouse Prices, Page 97

Pittsburgh — Warehouse business continues at satisfactory rate, with plates, shapes, strip and sheets in particularly good demand. Inadequate stocks have proved troublesome to a few interests because of heavy demand and extended deliveries from mills.

Cincinnati—Demand from warehouses continues at high level. Sales of sheets and plates, due to mill situation, are especially heavy. A seasonal upturn in building materials has not been prominent. Prices are unchanged.

Cleveland — The general supply of warehouse steel here has materially decreased during the last six weeks, because mills have been inclined to take care of customers

first. Demand continues to hold up surprisingly well, in view of record shipments and sales during March. Considerable improvement has been noted in requirements for small structural material over last month.

Baltimore—Warehouse prices have been advanced on a number of items. Most of the increases are small but on hoops it is $7 per ton. Demand is still brisk although April total may be slightly under that of March.

Steel in Europe

Foreign Steel Prices, Page 97

London—(*By Cable*)—Most steelworks in Great Britain are operating practically at capacity. New bookings are restricted, owing to heavy backlogs on mill books and expectation of a price increase. Pig iron continues scarce, except in hematite, of which some has been sold to Italy. Shipments of Spanish iron ore from Bilbao are being held up by the blockade, interfering with supplies. Deliveries of semifinished steel from the Continent continue insufficient to meet needs, but some British products are available for export.

The Continent reports export demand active with premiums offered, especially on bars and plates.

Iron Ore

Iron Ore Prices, Page 98

Cleveland — With furnace and dock stocks of iron ore lower than at any time in many years, a large fleet of lake boats is fighting severe ice conditions in Lake Superior. April shipments, however, may break all records for the month. Some observers expect as much as 2,500,000 tons will be brought down this month. The Lake Superior Iron Ore association reports:

	Tons
Consumed in February	4,443,306
Consumed in March	5,142,496
Increase in March	699,190
Consumed in March 1936	2,897,697
On hand at furnaces, April 1	14,585,355
On Lake Erie docks, April 1	2,851,951
Total on hand at furnaces and Lake Erie docks April 1	17,437,306
Reserve total, April 1, 1936	22,933,433

According to M. A. Hanna Co., Cleveland, the total number of lake ore carriers available this season is 304, seventeen less than the 321 reported at this time last year. Capacity per trip for the 304 is 2,594,600 tons, based on 19 foot draft. The capacity per trip last year for the 321 vessels was 2,698,700 tons.

New York—Spot prices on South African low phosphorus ore have advanced to 17.00c per unit, alongside docks, eastern seaboard, on a recent cargo sale, which, in turn, followed closely a spot sale at 16.50c. Foreign manganiferous ore also is higher, holding nominally at 17.00c. Shortage of ships, with sharp advances in rates, is a dominant factor in the present high spot market.

Tungsten ore continues strong with prices nominally at around $23, duty paid, for spot, with little available. Ferrotungsten reflects this situation in ore. Prices are buoyant with $1.75, freight allowed, having been done on carlots, and higher having since been quoted.

Metallurgical Coke

Coke Prices, Page 95

During the past week the wage clause in blast furnace contracts was established at an average of around 35 cents a ton on beehive coke, retroactive to April 1, although in a few instances it was set at 31 and 32 cents per ton. On spot business the advance over the March level averages much higher, furnace coke commanding $4.75 to $4.90 per ton. Operations in the Connellsville, Pa.,

region continue at a high level. Several inquiries for coke for export have been reported recently, but operators were forced to decline the offers as they were unable to accumulate cargoes.

Cold Finished

Cold Finished Prices, Page 95

Pittsburgh — A leading interest is reaffirming current quotations on cold-finished carbon bars for third quarter. While buying has been light recently, an increase is considered likely in specifications from the automotive industry, to round out the requirements for 1937 models. Backlogs are still far from being exhausted and deliveries under six weeks are not easy to obtain. Jobbers are building up stocks and shipments to machinery manufacturers are well maintained.

Semifinished

Semifinished Prices, Page 95

Prices on rerolling billets, blooms, slabs, and sheet bars have been reaffirmed for third quarter at $37 per gross ton, Pittsburgh; forging blooms, billets, and slabs, $43, Pittsburgh; wire rods, $47 and $52, Pittsburgh; and skelp, 2.10c, Pittsburgh. Demand remains heavy and customers continue worried over obtaining early deliveries. Foreign inquiry for wire rods is unabated and nails also are widely sought. Chief difficulty in the path of exporting from the United States at present, however, is inability to obtain ships.

Mirrors of Motordom

(*Concluded from Page* 38)

the management, involving higher wage rates. At Oshawa, Ont., strikers yielded to Premier Hepburn and agreed to meet with company officials as representatives of workers and not as representatives of the UAW.

AUTO production for the week ending April 24, at 132,340, was at a new high mark since early in 1929, representing a daily output of 26,468. Gain over the week previous was 7370, largely accounted for by Chrysler divisions which are now back at prestrike operating levels. . . . Ratification by stockholders and approval by the SEC of Hupp's new financing program has finally been obtained, and new stock is listed on New York and Chicago exchanges. Thomas Bradley, president, states the plant is now being tooled up for production of a line of sixes and eights, with designs tentatively approved, the 1938 models being the thirtieth in the Hupmobile series since the company started in 1908. . . . Hudson has announced six new convertible models—two Hudson eights, two Hudson sixes and two Terraplanes.

Nonferrous Metals

Nonferrous Metal Prices, Page 96

New York—Major nonferrous metal markets displayed a firmer price tone toward the end of last week following extreme easiness earlier. Domestic markets reflected the sharp break in world commodity prices, especially those of metals on the London Metal Exchange. Support was found as bears covered and consumers bought at the more attractive levels.

Copper — Electrolytic copper dropped one full cent Tuesday to 14.50c, Connecticut. Copper and brass mill product, brass ingots, copper wire, and red metal scrap prices declined proportionately. Export

copper dropped to 14.00c, c.i.f., early in the week but rallied to 14.55c at the close.

Lead—Held firm at 5.85c, East St. Louis, in a quiet market. Refined stocks dropped to a new low since 1931 as shipments soared during March.

Zinc—Prime western eased $5 per ton to 6.75c, East St. Louis, despite the fact that spot supplies are still tight. Consumer buying interest failed to pick up at the lower level.

Tin—Straits spot prices fluctuated widely from a low of 56.37½c to a high of 59.37½c in line with changes in the London market. Consumers bought heavily at the lower levels.

Antimony—American spot antimony eased to 15.87½c, New York, but consumers continued to show little buying interest. Chinese spot held unchanged at 17.00c, duty paid New York.

Equipment

New York—Heavy buying of production machinery by steel and metal fabricating industry continues. Replacements and extensions in other industrial fields also is substantial. Brisk orders have prevented most machine builders from reducing backlogs and deliveries are further extended. An eastern grinding machine producer is now promising 14 weeks on regular line. Current orders for heavier equipment often cannot be shipped under eight months. General Electric Co. has bought substantially for its refrigeration department and will buy for turbine division. The Aluminum Co. of America is expected to place considerable business for its Edgewater, N. J. plant. Japan is expanding inquiry and orders here.

Cleveland — Machine tool and equipment inquiries and sales continue in fair volume with little change during past several weeks. Deliveries are unimproved being extended well into autumn in some instances. This and skilled labor shortage constitute major problems. Demand for used tools is brisk. National Rubber Machinery Co., Akron, O., is building 300 dual tire vulcanizers and molds and 72 inner tube vulcanizers and molds for Ford Motor Co.

Chicago—Machinery and equipment sales show little change from active rate of preceding 60 days. Machine tool inquiries are fairly numerous, having been affected only moderately by recent price advances which stimulated closing on business previously pending.

Seattle — Machinery and equipment are in good demand, particularly for mining, road work, logging and lumbering.

Construction and Enterprise

Ohio

BUCYRUS, O.—City is considering construction of sewage disposal plant at an estimated cost of $140,000. George M. Birk is mayor; P. A. Uhlman, 2083 Dayton street, Columbus, O., is consulting engineer.

COLUMBUS GROVE, O.—Village is considering construction of improvements to municipal electric light plant. Engineer will be selected soon to make survey. Earl Anderson is light plant superintendent.

FINDLAY, O.—City has made application to WPA to finance construction of extensions to sewage disposal plant at an estimated cost of $125,000. Improvements would include aeration tanks, final settling tanks, compressor and

pumps. Homer Dorsey is mayor; H. P. Jones & Co., Second National Bank building, Toledo, are consulting engineers.

GALION, O.—City is considering construction of improvements to sewage disposal plant at an estimated cost of $80,000. L. Cline is service director; P. A. Uhlman, 2083 Dayton street, Columbus, is consulting engineer.

GALION, O. — American Steel Abrasive Co. is constructing separate office building and an addition to the present plant, consisting of warehouse and mill building. New machinery will be installed in the mill building. Norman K. Kann is secretary and treasurer.

LOGAN, O.—Hocking Valley Coal & Storage Co., Columbus, recently incorporated by J. F. Baird and associates, is considering construction of coal tipple with elevators and storage facilities, at Pattonville, near here.

MANSFIELD, O.—City plans to erect elevated water tank and construct 16-inch main on Lexington avenue. Cost is estimated at $181,000. George B. Gascoigne, Leader building, Cleveland, is engineer making survey.

PAINESVILLE, O.—City will receive bids until April 28 for one 750-horsepower boiler and stoker unit. C. S. Fullerton is city manager; Ralph Hadlow, 700 Prospect avenue, Cleveland, is engineer.

SIDNEY, O.—City has plans completed for construction of improvements to waterworks system, including 500,000-gallon elevated steel tank and controls, diesel generator unit and gas stand. Floyd E. Browne, Marion building, Marion, O., is consulting engineer. Rolla Loughlin is mayor.

WARREN, O.—Republic Steel Corp., Cleveland, plans installation of electric heat treating furnaces in one of its plants here. C. C. Thayer, Republic building, Cleveland, is chief engineer.

WELLINGTON, O.—Village is considering installation of 1000-kilowatt turbine unit to replace present 500-kilowatt unit, at municipal light and water plant. Cost is estimated at $36,000 installed.

Pennsylvania

AMBLER, PA.—Keasbey & Mattison Co., Butler and Maple avenues, is considering construction of manufacturing plant at an estimated cost of $600,000. United Engineers & Constructors Inc., 1401 Arch street, Philadelphia, are engineers.

PHILADELPHIA—Publicker Commercial Alcohol Co., 260 South Broad street, has awarded contract for construction of warehouse building and boiler plant at Delaware avenue and Bigler street to S. H. Levin, 1619 Sansom street. Cost is estimated at about $88,000.

PITTSBURGH — Owens-Illinois Glass Co. will erect $42,000 maintenance building at its Clarion plant, here. Platt Construction Co., Erie, Pa., has general contract for the work.

New York

ALBANY, N. Y.—Hudson Scrap Iron & Metal Co. Inc. has been formed by Louis Lieberman, 82 State street, to deal in scrap metals and junk.

IRVINGTON, N. Y. — Celluweld Corp. of America, care board of trustees, has acquired factory building here and plans to alter and equip at an estimated cost of $40,000.

LITTLE FALLS, N. Y.—National Automotive Fibre Co. has completed plans for modernizing its factory here at an estimated cost of $150,000.

LOCKPORT, N. Y. — E. H. Ferree Co., manufacturer of leather specialties, plans $20,000 addition to factory building.

NEW YORK—Victor Welding & Mfg. Co. Inc. has been organized in Manhattan by David L. Reifer, 47 West Thirty-fourth street, New York.

NEW YORK—Strickland Foundry & Machine Works Inc., 516 West Thirty-sixth street, has leased from plans a one-story building to be erected at 581 and 583 Eleventh avenue by the Red Rock Realty Corp.

OLEAN, N. Y. — Corning Glass Works, Walnut street, Corning, N. Y., plans construction of factory here at an estimated cost of $55,000.

Illinois

BELLEVILLE, ILL.—Eagle Foundry Co., Fourteenth street and Illinois Central tracks, was damaged by gas explosion April 9.

CHICAGO—Cameron Can Machinery Co., 240 North Ashland avenue, has awarded contract for construction of $70,000 plant addition to H. F. Friestedt Co., 520 North Michigan avenue.

CHICAGO—Liberty Generator & Armature Corp., 11 South LaSalle street, has been organized by Joseph Lustfield and associates to manufacture, sell and distribute generators, armatures, etc.

CHICAGO, ILL. — Hales & Hunter, 4600 Cortland avenue, are receiving bids for construction of 3-story addition to kiln. Cost to exceed $40,000. Griesser & Son, 64 West Randolph street, Chicago, are architects.

Indiana

ANDERSON, IND.—Pierce Governor Co., Ohio avenue, manufacturer of engine governors, has let general contract for two-story building addition, 77 x 145 feet, to David Eshelman & Son, 518 West Fifth street. Cost, with equipment, will be over $50,000. E. R. Watkins, Anderson Bank building, is architect.

Louisiana

AMITE CITY, LA. — Town will expend $54,000 for water main replacements and extensions, requiring 30,000 feet of 6-inch cast iron mains. E. G. Freiler, box 901, Hammond, La., is engineer.

INDEPENDENCE, LA.—WPA regional office, Baton Rouge, is receiving bids for construction of sewage pumping station, here. Ed Freiter, Hammond, La., is preparing plans.

NEW ORLEANS — Continental Can Co., 521 North Scott street, plan to construct $250,000 addition to plant. Offices will be air conditioned. Favrot & Reed, Nola building, New Orleans, are architects.

NEW ORLEANS—Sewerage and water board will call for bids soon for construction of Panola street water pumping station. Cost is estimated at $215,000. Construction will include erection of 1-story brick building, installation of pumps, motors, valves, pipes and fittings. A. G. Moffat is secretary of the board.

SHREVEPORT, LA. — City has applied to PWA for grant of $179,470 for construction of waterworks and sewer system, estimated to cost $398,824. R. Allen is commissioner of public utilities.

SULPHUR, LA. — City plans construction of $80,000 sewage disposal system. Glen Overman and Lee Lacy are interested in the project.

North Carolina

BURLINGTON, N. C.—Burlington Mills Inc. plans to spend $210,000 for improvements and extensions to present plant; $950,000 for purchase of loom and spindle equipment.

FOUNTAIN, N. C.—Pitt and Green county membership co-operatives have been granted $60,000 by REA for construction 61 miles rural transmission lines.

MOUNT HOLLY, N. C.—American Yarn & Processing Co. will install machinery in new addition to its plant at Woodlawn, including spindles, cards and combers, to increase capacity 50 per cent.

WILMINGTON, N. C. — Tidewater Power Co. has plans maturing for construction of about 150 miles of transmission and distributing lines at an estimated cost of $170,000. Financing is being arranged through federal aid.

South Carolina

EASTOVER, S. C.—Two warehouses and store operated by J. A. Ammons were damaged by fire recently.

Tennessee

KNOXVILLE, TENN.—Knox Stove Works, 2016 Allor street, is negotiating for site for expansion.

KNOXVILLE, TENN. — Armour & Co., Chicago, will construct new packing plant, estimated cost $50,000.

NASHVILLE, TENN.—Tennessee Electric Power Co. will erect $2,000,000 steam electric plant, subject to approval of Tennessee railroad and public utility commission, to provide emergency power for Nashville and vicinity.

West Virginia

WHEELING, W. VA.—City plans to expend $203,000 to replace old water mains. H. A. Conrad is city engineer.

Virginia

BLACKSTONE, VA.—Town will purchase 800-horsepower diesel generator unit at an estimated cost of $60,000, to increase capacity of power plant.

COVINGTON, VA.—City plans construction of power plant. Application has been made to PWA for grant of $181,636 toward construction of the $403,636 project.

GRUNDY, VA. — City has plans completed by J. B. McCrary Co., 705 Rosenburg building, Roanoke, Va., for water system; probable cost $35,000.

PORTSMOUTH, VA. — City has preliminary plans for construction of municipal electric power plant and distribution system. Cost is estimated at $2,000,000. Federal financing will be applied for.

Missouri

ST. LOUIS—Liberty Machine Works, 1825 North Ninth street, plans erection of one-story machine shop.

ST. LOUIS — Owens-Illinois Can Co. plans to build $500,000 plant. Francisco & Jacobus, 511 Fifth avenue, New York, are preparing plans.

Texas

BRYAN, TEX.—Brazos County Rural

(*Please turn to Page* 118)

(*Concluded from Page* 116)

Corp. has plans completed for 300-mile rural electric line in Brazos county and will call for bids soon. R. G. Williams is manager; William G. Morrison, 204 Professional building, Waco, is rural electrification engineer.

CORPUS CHRISTI, TEX. — Crude Oil Terminal Co., Nixon building, plans installation of two 80,000-barrel oil storage tanks at an estimated cost of $40,000.

DEPORT, TEX. — City receives bids April 30 for construction of improvements to waterworks system. J. R. Hutchison is mayor; Hawley, Freese & Nichols, Capps building, Fort Worth, Tex., are engineers.

HEREFORD, TEX.—REA allotted $115,000 for construction of approximately 100 miles rural transmission lines in Deaf Smith county. William G. Morrison, 204 Professional building, Waco, is engineer.

KAUFMAN, TEX. — Rural Electric Co. has applied to REA for $250,000 loan for construction of approximately 250 miles power lines. Hawley, Freese & Nichols, Capps building, Fort Worth, are engineers.

STRAWN, TEX. — City will take bids until April 30 for construction of filtration plant improvements. J. M. Tucker is mayor; Hawley, Freese & Nichols, Capps building, Fort Worth, are engineers.

Wisconsin

MILWAUKEE — Wisconsin Gas & Electric Co., 4805 South Packard avenue, plans improvements to gas plant at Racine. Cost is estimated at about $400,000.

MILWAUKEE — City has accepted bid of Harnischfeger Corp., 4400 West National avenue, for one electric traveling crane for new water purification plant at $9960.

MILWAUKEE — Fulton Co., 1912 South Eighty-second street, maker of automotive accessories, is doubling its stock to finance further plant expansion and production facilities at an estimated investment of $100,000. Samuel A. Fulton is president.

MILWAUKEE — Amco Metal Inc., 3830 West Burnham street, maker of brass and bronze alloys, bearings, etc., will receive bids until April 28 for construction of 1-story factory addition, 80 x 200 feet. N. P. Backes, 3290 South New York avenue, is architect; Carl J. Zaiser is president.

RACINE, WIS. — J. I. Case Co., 700 State street, maker of tractors, threshing machines, etc., has purchased idle plant of Shower Bros. Furniture Co., Burlington, Iowa, and will re-equip 250,000 square feet of floor space for general manufacturing. H. H. Biggert is vice-president in charge.

RHINELANDER, WIS.—Robbins Flooring Co., main office here, will build flooring mill and dry kilns at Newberry, Mich. P. A. Abendroth is manager at Newberry.

WEST ALLIS, WIS. — Edgar T. Ward Sons Co., Pittsburgh, Pa., is completing negotiations for addition of about 22,000 square feet floor space at 1811 South Sixty-sixth street, to double facilities. Fred Odell is plant manager here.

Kansas

HORTON, KANS.—Brown-Atchison cooperative association has REA allotment of $100,000 for construction of 100 miles rural transmission lines in Brown, Atchison, and Nemaha counties. Joseph Nelson is president; O. R. Toman, 510 Barkley building, Lincoln, Nebr., is consulting engineer.

PAOLA, KANS.—Voters approved bond issue of $225,000 for construction of municipal light plant and distribution system. W. B. Rollins & Co., 339 Railway Exchange building, Kansas City, Mo., are consulting engineers; Linie Fuller is city clerk. (Noted March 22).

SOLOMON, KANS.—Dickinson county rural electric co-operative association has received REA allotment of $254,651 for construction of about 530 miles rural lines in Saline, Ottawa and Dickinson counties. Charles L. Taylor is secretary of the association.

North Dakota

FINLEY, N. DAK.—City will seek PWA funds to finance new waterworks and sewage system.

HILLSBORO, N. DAK.—City council is making survey and will apply to WPA for funds to construct sewage disposal plant, to cost about $30,000. R. W. Johnston is city auditor.

South Dakota

JEFFERSON CITY, S. DAK.—City has completed plans for filtration plant to cost $15,000 and have $9,091 PWA allotment approved. George Woelfel is city clerk and Buell & Winter Engineering Co., Sioux City, Iowa, engineers.

Iowa

ANAMOSA, IOWA—Maquoketa Valley rural electric co-operative has REA allotment of $305,000 for construction of 381 miles rural transmission lines in Jones and Jackson counties.

Nebraska

COLUMBUS, NEBR.—Voters approved $400,000 bond issue for construction of complete electric distribution system. (Noted March 29).

CORTLAND, NEBR.—Voters approved bond issue of $28,470 for construction of waterworks system.

FREMONT, NEBR.—City, board of public works, will take bids soon for construction of light and power building, metal-clad switchboard, five miles transmission lines and substation, to cost about $300,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

HAIGLER, NEBR.—City voted in favor of $37,665 bond issue to finance construction of municipal light and power plant. (Noted March 29).

ORD, NEBR.—North Loup public power and irrigation district rejected bids recently submitted and will readvertise soon for construction of dams, canals and two power plants. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers. E. H. Dunmire is manager.

TEKAMAH, NEBR.—Burt county rural public power district is taking bids until May 3 for construction of 250 miles rural transmission lines costing about $275,000. Roy Miller is secretary; H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, Nebr., is consulting engineer.

Wyoming

CODY, WYO. — Bureau of reclamation has called bids for May 3 for construction of laboratory and warehouse for Shoshone project.

Montana

CUT BANK, MONT.—City plans to build sewage system involving 19,000 feet 6 to 12-inch pipe. PWA aid asked.

LEWISTON, MONT.—City is seeking PWA funds to build sewage system to cost $65,000 or more. J. M. Schmitt is engineer.

Idaho

COEUR D'ALENE, IDAHO—Pending litigation will delay work on city power plant and distributing system to cost $295,000. Contract has been awarded to Fairbanks, Morse & Co.

LEWISTON, IDAHO — Plant of Gifford-Summit Warehouse Co. was severely damaged by fire recently.

TENSED, IDAHO — Benewah county rural electrification association has REA approval for construction of 245 miles rural lines, at an estimated cost of $270,000.

Pacific Coast

LOS ANGELES—General Electric Co., 5201 Santa Fe avenue, has acquired site at Banning and Vignes streets, for construction of six-story plant at an estimated cost of $700,000. S. E. Gates is manager.

DAYTON, WASH. — Superior Judge T. A. Paul has ordered city to proceed with construction of sewage disposal plant, work to begin within 90 days.

LOWELL, WASH. — Special election will be held soon to pass on proposed $80,000 water system improvement, to be built with WPA assistance. Plans are by Parker & Hill, Seattle.

NORTH BEND, WASH. — Mutual Power & Light Co. has called for bids May 4 for proposed rural electrification system, involving construction of 13 miles lines, expenditure of $13,000. George H. Whipple is association secretary.

PUYALLUP, WASH. — Washington Packers Inc. announces $75,000 expansion program, including construction of building additions and equipment for freezing fruits and vegetables. J. A. Forehand is secretary.

SEATTLE — Aircraft Plywood Co., 4000 Fifteenth avenue West, is preparing plant for installation of additional machinery.

SEATTLE — Seattle Ship Supply Co., 1114 American Bank building, has been incorporated by O. O. Hvatum and associates, with capital of $50,000, to deal in tools and machinery.

Canada

ST. CATHARINES, ONT.—McKinnon Industries Ltd., subsidiary of General Motors Corp., General Motors building, Detroit, will construct $1,000,000 foundry unit on Ontario street. Tope Construction Co., Hamilton, Ont., has general contract, work to be completed by Nov. 1. William A. Wecker is vice-president and general manager of the subsidiary.

Alaska

SEWARD, ALASKA — City has set June 7 as opening date for bids on construction of proposed $90,000 municipal diesel electric plant. First bids for hydroelectric plant rejected, exceeding estimates.