

# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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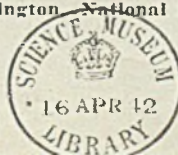


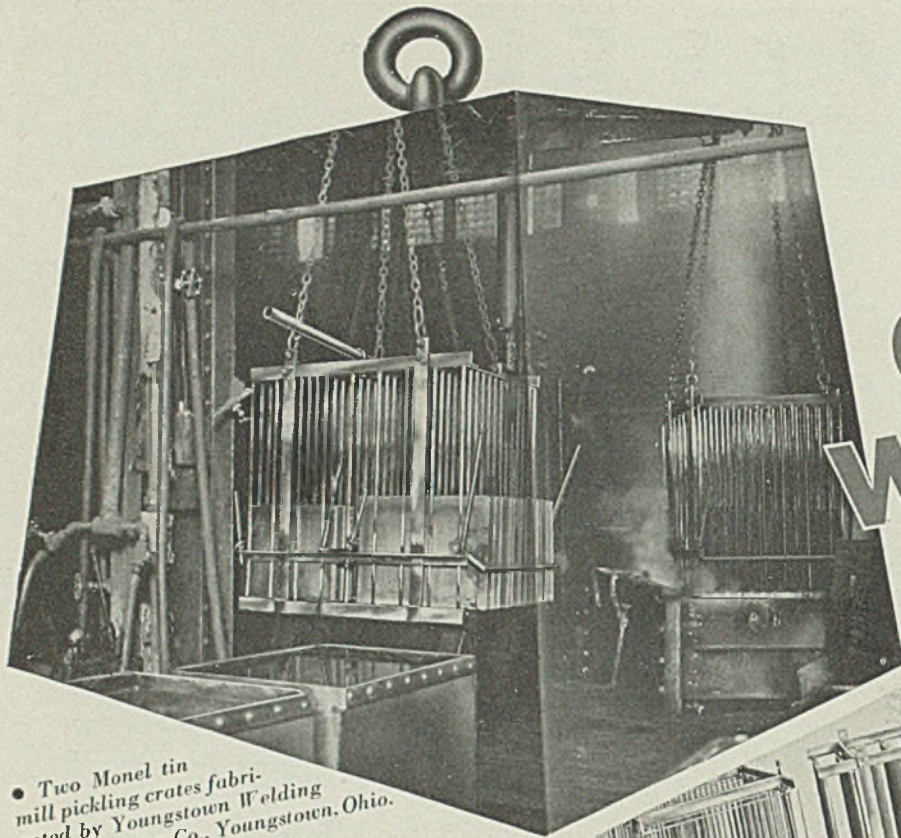
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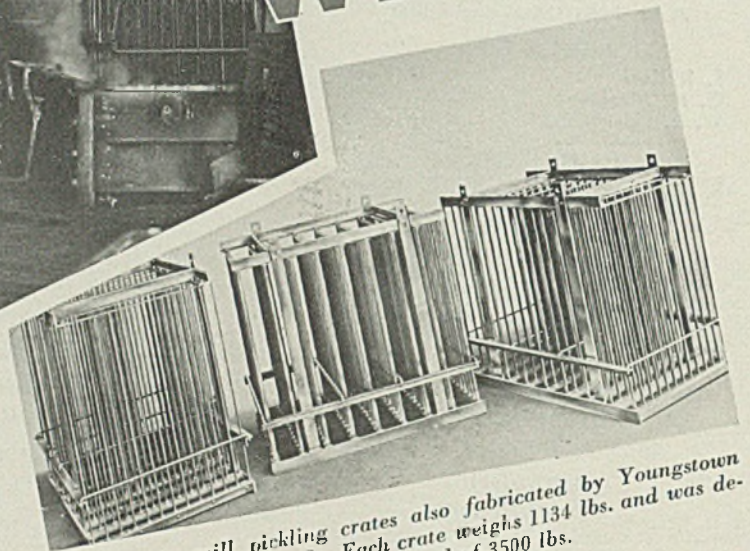
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*Cut down  
on*  
**CRATE  
WEIGHT.**



• Monel tin mill pickling crates also fabricated by Youngstown Welding & Engineering Co. Each crate weighs 1134 lbs. and was designed to carry a load of 3500 lbs.

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And the reasons: Monel is stronger and tougher than structural steel. Also, it's available in standard forms and sizes which are easily fabricated and welded. So you can get clean, smooth welded construction and use light weight design. Still more important: Sulphuric, hydrochloric, hydrofluoric acids have little effect on Monel Pickling Crates have seen as much as nineteen years' service. And in addition to resistance to corrosion Monel has a degree of ductility and toughness which enables it to take hard knocks aplenty. Where the average crate is often shot after a few years' service, the crate of Monel

is strong and serviceable. So in designing Pickling Crates of Monel you *do not* need to make them oversize to allow for weakening due to corrosion.

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## As the Editor Views the News

**H**ISTORY of far-reaching importance was written last Thursday when the senate, by a vote of 70 to 20, recommitted the Supreme Court bill to the judiciary committee. In thus ending the ill-advised attempt to make the highest court subservient to executive whim, the senate reaffirmed the principle of checks and balances assured by independent legislative, judiciary and executive branches of the government. In doing so, it vouchsafed to every citizen and to every private enterprise new hope that this proved system of checks and balances will be restored as a bulwark against unwarranted invasion of their rights.

• • •

Credit for this victory of common sense over power-drunk fanaticism can be shared equally by the anti-court-packing group of senators in both parties and by the millions of sober-minded American citizens whose protest made the fight of the senators possible. The force of public opinion in this instance, as in the recent issue between "little steel" and CIO, was on the side of fair play. It has demonstrated that it is definitely opposed to government policies which throw favors to minority groups to the detriment of the public. It is a warning against class legislation.

### Public Fed Up On Favoritism

In a broader sense, the victory can be construed as a national rebuke of unsound financial policy, of continued extravagant spending, of tacit encouragement of mob lawlessness, of unwarranted favoritism toward one brand of unionism and emnity against other brands and against employees who do not want to unionize, of studied but ill-concealed persecution of private industry, and of the administration practice of taking council from inexperienced and theoretical advisers without checking their proposals with the judgment and experience of competent experts. In short, the

### A Rebuke of Many Policies

public would like to see the new deal brought down to earth and harnessed to practical methods. A formula consisting of about one part of new deal idealism and nine parts of common sense of the John Nance Garner brand would fit the present needs of the nation admirably. It would work miracles almost immediately.

• • •

It would give heart to frightened tax payers. It would assure the public of federal support of law and order. It would assure employes the right to strike or the right to work, according to their free choice. It would release the controlling political party from the implied obligation to CIO in exchange for its \$500,000 campaign contribution. It would encourage private enterprise to plan ahead with greater confidence. It would help to restore the idea that thrift and self reliance are praiseworthy traits. It might even lead to the realization that training unemployed persons and helping them to find their place in private employment are preferable to maintaining them in habit-forming idleness at public expense.

### Formula Would Work Miracles

• • •

Establishing final price schedules for the fourth quarter may involve some delicate decisions of policy. The leading producer last Tuesday (p. 69) announced that present prices on bars, shapes, plates, strip, sheets, sheet piling, rails, track material and semifinished steel have been reaffirmed for fourth quarter delivery. On Friday it reaffirmed wire and wire products. At this writing no announcement on pig iron prices has been made (p. 85) and action on them may be deferred until Sept. 1. Tin plate prices have been extended into the fourth quarter by Carnegie-Illinois (p. 77), but not for the 1938 contracting season. Costs are up for all producers, but not uniformly. Will the leading sellers ultimately announce identical prices or will the present situation lead to differences in price policy just as recent events resulted in a divergence in labor policies?

### Prices Involve Nice Decisions

*E. L. Shaner*



# THE INLAND MEN WHO MAKE YOUR STEEL KNOW ITS ULTIMATE USE



It is common practice for Mill Management to know the various uses of the steel rolled.

But at Inland a further step is taken—

The men who actually make the steel are advised not only as to the specifications, but the exact purpose for which each heat and each rolling is to be used.

This knowledge backed by their many years of experience enables them to take care of each customer's special requirements with unequalled accuracy.

This close cooperation saves time and helps cut factory costs.

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

# INLAND STEEL CO.

# Business in 1939? Industries Make Big

## Preparations for Two World Fairs

**T**WO World fairs of 1939—one in New York, the other in San Francisco—are already attracting considerable attention in the steel and metalworking industries, for the amount of steel which will be used in their construction and the large exhibits which will be staged by some of the leading companies.

Approximately 100,000 tons of steel will be necessary for the New York fair which is taking form in Flushing Meadows in the northern Long Island section of the city, where only a few months ago a diminutive river wound its way through tall marsh grass.

On the West coast, the Golden Gate International exposition is growing up on a 400-acre man-made island in San Francisco bay. In the making of Treasure Island, as it is called, 20,000,000 cubic yards of earth fill has been dredged up from the bay, held in place by a 17,760-foot seawall. Five thousand tons of steel has been used in this construction work.

Among the first of the large exhibitors announced for the Golden Gate exposition is the Columbia Steel Co., West coast subsidiary of the United States Steel Corp. According to the exposition's announcements, this company has contracted for 10,830 square feet of space in the Hall of the Mineral Industry, at a rental estimated at \$86,640. Columbia's total exhibit appropriation is reported to be \$250,000.

The contours of Flushing Bay have been reshaped through the use of thousands of tons of steel sheet piling. The marsh lands have been filled in with millions of cubic yards of "fill," moved at a cost of \$2,200,000. Two sections of the river have been widened out into beautiful lakes.

The entire 1216-acre area which the fair will occupy now is being

landscaped and provided with water, gas and sewer lines. About 1200 tons of steel for water lines alone already has placed or is immediately pending. Along re-shaped Flushing Bay now winds Grand Central parkway which will provide ready access from the North and West by the way of the Triborough bridge.

Part of the steel also has been let for the Bronx-Whitestone bridge which will join the Bronx and Long Island at a point near the fair site. The projected East river tunnel, on which work already has started, may be completed in time to furnish a third major route.

### Plans Being Formulated

With April 30, 1939, opening date of the fair, still nearly two years off, many plans are largely in the embryonic stage. This applies particularly to those of exhibitors, only a few of which have signed up for

construction sites, or space in the 30 or more buildings which will be erected by Fair Corp.

According to fair officials, 28,500 tons of structural steel will be required for its buildings, exclusive of the amphitheater to be built by the state of New York and the buildings planned by a number of foreign countries. Twenty-two countries have decided to take an active part in the fair.

The central exhibit area comprises about 389 acres of land which now is being enclosed with three miles of fencing nine feet high. This area includes the new \$900,000 administration building, almost completed, into which the most of the fair officials will move from their present quarters in the Empire State building Aug. 15.

Bids went in recently on the shapes for two additional buildings, on which construction will be



*New York fair authorities are taking no chances on the materials which will go into many structures. The test building, with framework of steel, can reproduce all the twisting to which the buildings to be erected upon the filled-in Flushing Meadows, may be subjected*



Now nearing completion in the New York World's fair group is the administration building. Several hundred tons of steel were used in its construction

started shortly. These are a boat house and a field house. With the administration building and a \$1,000,000 building planned by New York city, they will be retained as permanent structures when the fair site later is converted into a park.

A particular tribute will be paid to steel in carrying out the theme of the exposition—"The World of Tomorrow"—through the erection of the trylon, a three-sided spire to rise 700 feet in the air, and a 200-foot perisphere. The two structures will form the dominant architectural group of the entire fair. Visitors will gain access to the perisphere by way of a 65-foot escalator, the world's largest, and may view "The World of Tomorrow" from a rotating platform capable of supporting 1500 persons at a time.

#### Individual Is Dominant

Unlike the usual run of world fairs, the New York spectacle will be carried out from the standpoint of the individual, under such general divisions as government, community interests, food, clothing and cosmetics, means of communication, means of distribution, means of production, means of business administration and means of transportation. It is declared that business and industry today possess most of the implements and materials necessary to fabricate a new "World of Tomorrow."

New and improved ways of using existing inventions and materials are said to be needed more than new inventions and new products in themselves, and it is felt that the fair offers an effective medium for developing these new ways.

Each division will have its individual theme built in turn around the central theme. Some companies may find it more advantageous to hold exhibits in several divisions for the proper portrayal of their stories to the public.

As reported in STEEL, July 12,

subsidiaries of the United States Steel Corp., New York, through the American Bridge Co., have signed up for a 51,166-square foot lot costing \$31,606. The corporation will erect its own building, plans for which now are being developed by its architects. Walter Dorwin Teague has been retained as consultant in molding its exhibits to the central theme.

#### Many To Erect Buildings

John A. Roeblings' Sons Co., Trenton, N. J., has contracted for 1575 feet of space at a cost of \$20,286 in one of the halls of production yet to be named. So far, these are the only companies associated with the steel industry signed up, according to fair officials, but every important interest is expected to take open space and construct its own building or occupy a section of one of the 30 or more buildings which will be erected by the fair.

It is reported that the Roebling company will spend close to \$100,000 on its exhibit. The company has been manufacturing wire rope and a large variety of other wire products since 1841. It also has pioneered in designing and erecting suspension bridges.

The first Roebling suspension bridge was erected across the Allegheny river at Pittsburgh in 1844. Its most recent accomplishment was the manufacture and erection of the cables for the Golden Gate bridge, San Francisco—the longest single span bridge ever constructed, with a main span of 4200 feet. Cables for the George Washington bridge, New York, the world's second longest span, of 3500 feet, also were manufactured and erected by the Roebling company. Its exhibit will feature these bridges, and products such as wire rope, insulated wire and cables, flat wires, wire screening, netting and welding wire.

The copper and brass fabricating industry is making plans for ex-

tensive displays but it has not been decided whether these will be presented as a group.

Following is a list of the companies and organizations which have contracted for open lots upon which their own buildings will be erected.

	Space in square feet	Cost of space
American Telephone & Telegraph Co. . . . .	139,400	\$48,790
American Gas Association . . . . .	122,008	42,971
Consolidated Edison Co. . . . .	75,183	35,338
Radio Corp. of America. . . . .	81,699	29,339
General Electric Co. . . . .	68,339	34,687
Y.M.C.A. of N. Y. . . . .	23,545	10,702

The Westinghouse Electric & Mfg. Co. has taken 10,922 feet in the electrical production building at a cost of \$152,903. Westinghouse will demonstrate the effect upon man's affairs of its intensive research and development work during the last 50 years and how these will contribute to his health, comfort and prosperity in the half century to come.

#### Other Companies Sign

The International Business Machines Corp., New York, will occupy 3653 square feet in the business administration building, while Metropolitan Life Insurance Co. of New York will take about the same amount of space in the same building.

A schedule of costs has been set up for open lots in the exhibit area. Twenty cents per square foot is charged for the first 20,000 square feet, 15 cents per foot for the next 30,000 and 10 cents for all over 40,000 feet. In addition 25 cents per foot frontage is charged on so-called "A" or main thoroughfares and 15 cents on "B" or cross streets. The exhibitor, of course, pays for the construction, maintenance and later the demolition of his building. The rate on floor area in buildings erected by the fair is \$14 per square foot.

Many companies have held off on contracting for space in advance, preferring to obtain a more visual picture of the fair site. Fair officials are encouraging early commitments by offering an 8 per cent discount on contracts executed during 1937 and 4 per cent on contracts made in the first three months of 1938. It also is recommended that foundations be placed in 1937 and not later than early 1938; exteriors by Aug. 15, 1938 to allow time for landscaping and interiors not later than March 1, 1939.

In view of the fact that most of the fair structures will be constructed upon comparatively new "fill" the organization has built a test building for determining the relative merits of various materials. Its steel frame is so constructed that it can be made to twist, heave, buckle or sag through the use of a series of steel rods.

Stucco on steel studding and on



*Model of the New York world's fair buildings. Near the center may be seen in miniature the 700-foot trylon and the 200-foot perisphere, among the dominant architectural features*

## Autos To Increase 50% in 23 Years, Says Kettering

**S**PEAKING on motor vehicles and highways of the future, Charles K. Kettering, vice president in charge of research, General Motors Corp., told members of the American Society of Civil Engineers, meeting in Detroit last week, that the car of 1937 will look just as antiquated in 1960 as the 1912 car does now, as a result of the motor industry's policy of constant improvement in its product.

Mr. Kettering based much of his address on answers to 18 questions submitted to a list of men identified with the automobile and allied industries, asking for opinions on such subjects as growth of automobile registration, future highway and parking problems and future automobile design changes that will affect road building problems. Some excerpts from his comment include:

"The automobile industry has never been able to predict what it will offer two years in advance.

"We will have to provide roads for 50 per cent more motor vehicles in the next 23 years.

"It is inconceivable that we shall long continue to park cars almost bumper to bumper along busy city streets and suffer the damage and inconvenience which results.

### Looks Ahead on Design

"The requirements of maneuverability and control of a car are closely tied up with road conditions. These items include steering, hill climbing, top speed, vision, lighting, riding quality and ease of manipulation.

"The automobile industry will offer better and better brake equipment as it learns more and more how to do the job. However, the coefficient of friction between road and tire always will be the limiting factor in stopping distances.

"A rear-engine car would provide better visibility with clear vision directly ahead. . . However, maneuverability, particularly cornering, requires an almost equal distribution of weight on the front and rear wheels. To accomplish this in a rear-engine car of reasonable wheelbase will require an engine of about half the weight of present units.

"The main reason why we do not have diesels in passenger cars is that we do not know how to build them. I have never seen a successful diesel engine in automobile cylinder sizes."

wood studding, stucco in different layers on paper-backed metal lathe and on thermax, a combination of wood, excelsior and magnesite binding; concrete stucco high in lime content and water-proof gypsum

plaster are among the materials being tried out for exterior walls. Sectional steel wallboard, ½-inch gypsum wallboard and thin asbestos cement boards are being tried out for interior walls.

## Air Conditioning Seen Creating Huge Demand for Related Equipment

**H**OW expansion in one modern industry is compelling a corresponding growth in related public facilities was pointed out last week by the marketing research division, bureau of foreign and domestic commerce, Washington.

As a result of the rapid increase in demand for air conditioning, a potential market has been built up, it says, "for millions of dollars worth of water works and sanitary works equipment, as well as building and other materials."

The report of its study on the adoption of air conditioning emphasizes two points: first, a remarkable ascendancy in such equipment, and second, "the obvious demand" that "will force cities to provide more capacity for water and sewerage facilities."

Installations of air-conditioning units have increased approximately 1400 per cent from 1933 to the end of 1936, the report states. Horsepower required increased from 168,880 at the end of 1932 to 432,796 at the close of 1936.

"Yet the trend of air conditioning sales continues upward more sharply than in any past year. . . . Consequently the need for water for this purpose is a matter of serious consideration to manufacturers and city water authorities alike."

Thirty-eight of 92 cities of 100,000

population or more reported to the department of commerce that steps had already been taken or were being considered to limit the use of water-using air-conditioning equipment.

Because of the limited sewerage capacity in the loop district of Chicago the installation of water-using air-conditioning plants which are not equipped with a cooling tower or otherwise equipped to obviate the necessity of discharging the cooling water into the sewerage system is being discouraged, it was stated by the bureau.

### Water Use Near Capacity

Many other large cities throughout the United States are now using from 75 to 90 per cent of available water capacity and could not readily furnish additional large quantities of water for purposes other than those now using water without arranging for increased capacity, it was pointed out.

The study was prompted by many requests for information on the subject, designed to furnish manufacturers of air-conditioning equipment with an effective indication of the market possibilities in each of the 92 cities and thus enable them to plan their sales activities, especially by types of equipment, to the best advantage.

# Congressional Study of Ore, Scrap Proposed; Hearings This Week

**A** CONGRESSIONAL committee "to conduct a comprehensive investigation and study of the natural resources of iron ore in the United States and of the domestic supplies of iron and steel scrap necessary for domestic use, with a view to conserving such natural resources and preserving such domestic supplies" was proposed last week in the senate.

Authors of the resolution are Senator H. Styles Bridges, republican, New Hampshire, and Senator George Berry, democrat, Tennessee.

It calls for a committee of three senators and three members of the house, authorized to employ experts if necessary, to hold hearings and to report results with recommendations for legislation not later than Feb. 1, 1938. It appropriates \$10,000 for the investigation.

When questioned concerning the resolution, Senator Bridges said that it was a non-partisan attempt to provide study and research on a subject of national importance.

"Our hope," he said, "is that by this resolution congress can get a clear picture of what is happening to American iron and steel scrap. Not only should domestic price fluctuations of scrap be investigated, but also the use to which the tre-

mendous quantities of scrap exported to foreign countries is put.

"The American users of iron and steel scrap, the collectors of iron and steel scrap, army and navy experts, should all be given a chance to be heard before congress considers an iron and steel scrap embargo.

## Used for War Materials?

"Our country wants peace and if the shiploads of scrap which we sell to foreign countries go for arms and other war materials abroad and at the same time deplete our domestic resources we should be intelligently advised of the fact.

"There are no facts before congress to indicate whether or not an embargo on iron and steel scrap is necessary in order to keep the domestic supply intact, keep the price within a fair range for the American iron and steel producer, and keep foreign nations from war."

Certain scrap interests interpreted the introduction of the resolution as meaning that no scrap embargo legislation will be adopted at this session of congress.

Representatives White and Lamneck, Ohio, introduced resolutions in the house, identical with the Bridges-Berry resolution.

Representative Koppelman, Con-

necticut, last week introduced a bill in the house stating: "There shall not be exported from the United States after the expiration of 60 days from the enactment of this act any scrap iron, scrap steel, pig iron, iron ore, and finished steel, except upon license issued by the national munitions control board."

It was announced that the subcommittee of the senate military affairs committee will begin hearings July 29 on scrap export prohibition bills, including the Schwel-lenbach bill, Senator Austin's amendment and the Bridges-Berry resolution. The subcommittee includes Senator Thomas, Utah, chairman; Senators Johnson, Colorado; Schwartz, Wyoming; Bridges, New Hampshire; and Lodge, Massachusetts.

## Foundry Equipment Buying Shows Decline in June

Orders for foundry equipment in June registered a slight decline from May but were much higher than in June, 1936, according to the Foundry Equipment Manufacturers' association. The net order index for June was 228.2, compared with 237.6 in May and with 141.4 in June, 1936. The shipment index was 232.1 in June, 226.2 in May and 153 in June, 1936. The unfilled order index was 372.8 in June, 376.8 in May and 130.8 in June, 1936. Indexes are based on averages of 1922-24 as 100 per cent.

## Institute Compares Steel Wages, Prices, Corporate Earnings

**A** MERICAN steel workers received an average of \$10 more in their weekly pay envelopes in April than the average for workers in all manufacturing industries, according to calculations by the American Iron and Steel institute based on department of labor figures.

The weekly pay envelopes received by steel workers contained an average of \$36.20, nearly 40 per cent more than the average of \$26.30 for all industrial wage earners.

Hourly earnings of steel's 530,000 wage earners in April were 85 cents an hour as against the general average of 63.8 cents.

The average weekly earnings of steel employes during April were exceeded by employes of only one other manufacturing industry, printing of newspapers and periodicals. The average weekly wage paid in that industry exceeded steel's average by only 50 cents per week.

As compared with the average of \$36.20 per week earned by steel employes in April, \$33.09 was earned

by automobile workers; \$32.37 by rubber tire workers; \$18.53 by garment workers; \$19.06 by soft coal miners and \$34.40 by anthracite.

The 40-hour week is standard in the steel industry and employes of many companies received time-and-a-half for overtime over eight hours a day or 40 hours a week. During April, steel employes worked an average of 42.6 hours per week compared with the average of 40.4 hours for all manufacturing industries.

## Rates Raised Five Times

Since 1935, the hourly wages of steel employes have been raised five times and are now at the highest level on record. Current payrolls are now at a rate well above \$1,000,000,000 a year.

Steel prices have lagged far behind the rise in the industry's wages since 1933, which marked the low point for steel prices during the depression. By contrast, the average hourly earnings of steel employes have increased 62 per cent since that

year. Total monthly payrolls of the industry have risen 175 per cent since 1933 while production has increased 173 per cent. The number employed in the industry in 1937 is nearly double the 1933 figure.

Labor's share of the steel industry's dollar in 1936 was substantially at the 1929 level despite the fact that both the volume and net earnings of the industry last year were well below the pre-depression figures.

The study shows that 38¼ cents out of each dollar of the industry's gross revenues last year went into the pay envelopes of its employes, compared with 38½ cents in 1929.

Dividend payments to steel stockholders amounted to 4½ cents out of each sales dollar received in 1936, while tax payments to federal, state and local tax collectors consumed another 4½ cents.

Depreciation of plants and machinery and depletion of raw material reserves accounted for 5¾ cents out of every steel sales dollar.



Interest payments on outstanding bonds represented 1½ cents.

Costs of raw materials purchased and all other expenses incurred by the companies during 1936 amounted to 43½ cents out of each dollar, leaving a balance of 2 cents to be added to the surplus of the industry.

Comparison of 1936 with 1929 revealed that although in both years substantially the same proportion of the steel dollar went into payrolls, stockholders' dividends in 1936 were only 65 per cent as much of the steel dollar as in 1929, when they amounted to 7 cents out of each dollar received by the industry.

Corporate earnings realized in 1936 by 32 large steel companies per employe on their payrolls were lower than in any of the seven years immediately preceding the depression, amounting to \$259 last year, compared with an average of \$490 for the period from 1923 through 1929, according to another study by the institute released last week.

The amount per worker which remained after payment of the expenses of the companies in 1936 was only 18 per cent of the average annual wage paid to employes during the year, as against 44½ per cent in 1929.

The sharp reduction realized by the industry per man employed was caused partly by the fact that the companies' profits for 1936 were generally lower than in the pre-depression years, and partly by a record-breaking increase in the number of men employed. In 1936 the industry employed about 10 per cent more men than in 1929.

#### LABOR BOARD HEARING IN REPUBLIC ISSUE ADJOURNED

Hearings were begun in Washington last week on the complaint of the national labor relations board against the Republic Steel Corp.

John L. Lewis and members of the board of the United Mine Workers attended the early sessions. Lee Pressman, counsel for the CIO, took part in the hearings. Republic was represented by Luther Day, T. F. Patton and T. F. Veach.

All of the testimony during the early part of the hearing was by Stanley W. Switter, chief of police, Massillon, O., and Richard B. Hardman, Massillon city solicitor.

Switter expressed the opinion that the steel strike riot at Massillon July 11, in which two persons were killed, could have been prevented if it had not been for continued pressure for appointment of special police.

Switter contended that he held out for employment of neutral men if any were named, and finally did

agree to the use of ten. Appointment of Republic employes on the special force was suggested by Gen. William Marlin, commander of the Ohio national guard in the strike area, and by the Law and Order league, he testified.

During cross examination of Switter, Mr. Day brought out the fact that many clubs had been taken from the arrested strikers, that Switter had seen many clubs and stones along the picket lines, that pickets had beaten "two or three" men, that leaders of the Law and Order league were citizens and business men and not connected with the steel company, and that apparently a considerable number of employes wanted to get back to work.

The hearing was adjourned Friday afternoon to Aug. 9, with the agreement that not later than Aug. 4 the board will announce where it is to be resumed. Attorneys for Republic had sought to have the hearing conducted in Cleveland. The board also announced that it would give the company until Aug. 4 to file an answer to its complaint.

In a statement for Republic, Mr. Day said that no testimony presented had substantiated the charges made in the complaint.

#### INLAND DEFENSE CITES CIO VIOLENCE, IRRESPONSIBILITY

Defense of Inland Steel Co. in its hearing before the national labor relations board against charges of unfair labor practices was started last week. The board completed its case the week before. Testimony given by the company asserted the violent methods used by the CIO and the irresponsibility of its leaders provided the basis for Inland's refusal to sign a contract with SWOC.

The company also maintained the union had never offered a contract for signature.

Chicago police were absolved last week in the killing of ten men in the Memorial day riot near the South Chicago plant of Republic Steel Corp. The coroner's jury, after hearing testimony from both sides, placed responsibility on the armed mob of strikers aligned with the CIO which was prevented from forcing its way into the Republic plant by the police lines.

#### VOTE AGAINST STRIKES IN TWO PLANTS; RALLY FAILS

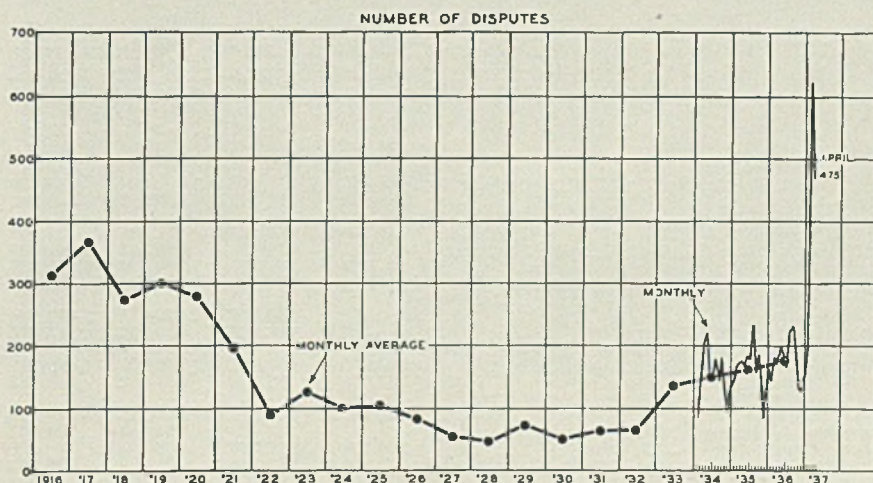
In Bath, Me., only 80 of 1800 Bath Iron Works employes attended a meeting called by American Federation of Labor organizers in an attempt to unionize the yards. Failure of the meeting was believed to have caused the organizers to abandon unionizing plans.

Union production employes of Granite City Steel Co. by a vote of 1398 to 399 rejected a proposal to strike in protest against the fact eight clerks who compute wage earnings are not members of the union. The company has 3314 employes, of which 2515 belong to the Amalgamated Association of Iron, Steel and Tin Workers.

Members of the Railway Equipment and Air Brake Workers' union, a CIO affiliate, last week voted against calling a strike at the Westinghouse Air Brake Co., Pittsburgh. Leaders of the union indicated that they would seek an election under supervision of the national labor relations board.

Metal trades employment at 22 leading cities declined slightly during June, the first decrease in 11 months, according to the National Metal Trades association.

### New High in Industrial Disputes Reached This Year



COMPILED by National Industrial Conference board, New York, from bureau of labor statistics. The number of disputes in March this year was far greater than the total in any single month during the past 20 years

# Financial

## SHARON SETS RECORD IN SECOND QUARTER

SHARON Steel Corp., Sharon, Pa., in the second quarter established a new record of earnings for any quarter in its history. Net profit is estimated at \$655,000, equal after charges to \$1.55 a common share. This compares with \$475,778 or \$1.13 a share in the first quarter, and a net of \$268,336 or 56 cents a share in the second quarter of 1936.

The company has recently registered with SEC 20,000 shares of \$5 cumulative convertible no par preferred stock and 57,143 shares of no par common stock, for redemption of convertible debentures and working capital.

## RELIANCE FINANCING EXPANSION PROGRAM

Reliance Steel Corp., Cleveland, through a group of well-known financial houses, has placed on the market 32,500 shares of \$1.50 cumulative convertible preference stock of \$25 par value, and 30,000 shares of common of \$2 par value. Proceeds from the sale of the preference shares are to be used to meet a portion of the cost of a \$550,000 program for acquiring new and enlarging present warehouse facilities.

Reliance has acquired outstanding stock of Friedman Bros. & Co. Inc., Cleveland; Modell-Friedman Steel Corp., Detroit and Toledo; Reliance Steel Corp., Detroit; Bancroft Steel Co. Inc., Worcester, Mass., and Mid-West Steel Co., Chicago, all of which have been under the same general control and management. As successor, Reliance's business will

be principally that of processing and distributing hot rolled and cold rolled steel strip and sheets, hot rolled pickled strip and sheets, galvanized sheets, plates and bars, and some seconds and scrap materials.

Consolidated balance sheet as of March 31, showed current assets of \$2,308,326 and total assets of \$2,662,434 against current liabilities of \$1,189,380.

## GENERAL ELECTRIC'S NET UP 58 PER CENT

General Electric Co., Schenectady, N. Y., reports profit available for dividends for the first half amounted to \$26,293,604, compared with \$16,592,324 for the first six months last year. This is equivalent to 91 cents a share of common stock, against 58 cents in the period last year. A dividend of 40 cents a share will be paid July 26 for the second quarter, making a total of 80 cents for the first half, compared with 50 cents for the period in 1936.

## CLIFFS IRON CO. TO REDEEM PORTION OF BONDS

Cleveland-Cliffs Iron Co., Cleveland, has issued notice of a call for redemption Sept. 1 of \$1,527,000 of its 4% per cent first mortgage bonds, due in 1950. Redemption price is 105 and accrued interest. The company's interim report shows net income of \$1,771,345 for second quarter, and \$1,872,363 for the first six months, compared with \$584,439 for the first half of 1936.

## REPUBLIC REDEEMS BONDS

Republic Steel Corp., Cleveland, has called for redemption by lot \$338,000 aggregate principal amount of general mortgage convertible 4½ per cent bonds, Series A, for the

sinking fund of Sept. 1 at 105. They are convertible for each \$1000 principal amount into 45 shares of common stock, if presented on or before Aug. 17.

## LAMSON & SESSIONS EARNS \$1.44 IN FIRST SIX MONTHS

Lamson & Sessions Co., Cleveland, reports first half profit of \$434,783 after all anticipated taxes. This amounts, after accrued preferred dividends for the period, to \$1.44 per common share, compared to 55 cents per common share for all of 1936. Volume of business during the first half of 1937 was more than 50 per cent greater in dollars than the first half of 1936. Company has reduced its \$750,000 RFC loan to \$600,000.

## DISTRIBUTION OF U. S. STEEL CORP. STOCK

United States Steel Corp. common stock outstanding as of June 30, amounted to 8,703,252 shares, while preferred totaled 3,602,811 shares.

Of the common stock outstanding, 2,204,571 shares, or 25.3 per cent, were in brokers' names, representing an increase of 45,277 shares over the 2,159,294 shares, or 24.8 per cent, held by brokers on March 31. Investors' common stock holdings were 6,498,681 shares, or 74.6 per cent, compared with 6,543,958 shares, or 75.19 per cent, March 31.

Of the preferred stock outstanding, 407,133 shares, or 11.30 per cent, were in brokers' names June 30, an increase of 4289 shares over the 402,844 shares, or 11.18 per cent, so held on March 31. Investors' holdings of preferred were 3,195,678 shares, or 88.7 per cent, compared with 3,199,967 shares, or 88.8 per cent on March 31.

Foreign holdings of common on June 30 totaled 727,879 shares, or 8.36 per cent of the issue, compared with 726,217 shares, or 8.34 per cent on March 31. Of the preferred 73,925 shares, or 2.05 per cent, were owned abroad on June 30, against 74,804 shares, or 2.08 per cent on March 31.

## Consumers' Net Earnings in First Half Up 62 Per Cent

AGGREGATE earnings of 20 identical companies among equipment manufacturers and other leading iron and steel consumers increased 62 per cent in the first half of 1937, compared with the same period in 1936.

	Second Quarter 1937	Second Quarter, 1936	First Half 1937	First Half, 1936
Edward G. Budd Mfg. Co., Philadelphia....	664,409	339,585	1,090,864	685,835
Budd Wheel Co., Philadelphia.....	259,253	310,087	520,960	518,692
Transue & Williams Steel Forging Corp., Alliance, O.....	49,085	38,455	111,435	69,971
Pittsburgh Screw & Bolt Corp., Pittsburgh	472,814	336,466	990,337	501,522
Eaton Mfg. Co., Cleveland.....	872,850	751,903	1,709,630	1,335,285
General Electric Co., Schenectady, N. Y. ....	14,667,196	9,505,494	26,293,604	16,592,324
American Brake Shoe & Foundry Co., New York.....	1,080,239	565,542	1,922,671	1,070,988
Mullins Mfg. Co., Salem, O.....	261,537	160,835	405,102	274,173
(Includes Youngstown Pressed Steel Co., from 5 1/37)				
Caterpillar Tractor Co., Peoria, Ill.....	1,209,050	807,621	6,302,875	4,481,091
U. S. Hoffman Machinery Corp., New York	283,003	231,592	464,082	312,238
National Malleable & Steel Casting Co., Cleveland.....	746,279	471,388	1,894,672	657,393
Lamson & Sessions Co., Cleveland.....	160,750	112,180	434,783	101,051
Clark Controller Co., Cleveland.....	325,005	281,335	309,121	164,698
Doehler Die Casting Co., Toledo, O.....	718,202	739,104	675,962	490,957
L. A. Young Spring & Wire Co., Detroit.....	477,627	188,572	1,201,565	1,166,352
Clark Equipment Co., Buchanan, Mich.....			788,439	242,826
Marion Steam Shovel Co., Marion, O.....			60,785	31,488
American Radiator & Standard Sanitary Corp., New York.....	2,080,785	1,116,411	3,729,409	1,524,025
Bridgeport Machine Co., Wichita, Kans.....	204,805	155,136	380,702	233,014
National Cash Register Co., Dayton, O.....	1,185,838	817,262	2,003,722	1,159,012

## Confirms Follansbee Reorganization Plan

Judge Robert M. Gibson in United States district court in Pittsburgh last week signed an order of final confirmation of the Follansbee Bros. Co., reorganization plan. The action was taken following hearing July 19 on the form of the order. No further objections were raised in court to the final confirmation.

The order directs that right to subscribe to the new securities be mailed Aug. 7 to unsecured creditors and stockholders of record Aug. 3 and that rights shall expire Aug. 30.

# Production

**C**LOSING of the plant of National Tube Co. at Lorain, O., for a two-week vacation brought down the operating rate in the Cleveland area, while Pittsburgh declined 5 points. These losses were balanced in part by better operations in eastern Pennsylvania, New England and Wheeling. The national average dropped 1 point to 81 per cent.

**Cleveland**—Down 28 points to 51 per cent of capacity by closing of 12 open hearths of National Tube Co. at Lorain, O., for vacation.

**Pittsburgh** — Off 5 points to 83 per cent of capacity. The leading interest is operating at about 85 per cent and the leading independent at about 80 per cent. One blast furnace has been taken off at Johnstown, Pa., leaving 47 active.

**Wheeling**—Up 1 point to 92 per cent of capacity.

**Chicago** — Unchanged at 84 per cent. Last week was the first full period of operation by all interests since labor trouble started, May 26. Blast furnace operations are steady, 32 of 39 stacks blowing.

**St. Louis**—Unchanged at 93 per cent, 29 out of 33 open hearths being active.

**Cincinnati**—Unchanged at 93 per cent of capacity.

**Detroit** — Off 2 points to 95 per cent, with one furnace down during week for repairs.

**Birmingham** — Unchanged at 96 per cent with 18 blast furnaces and 19 open hearths in production.

**Buffalo** — Unchanged at 88 per cent, which will be maintained this week.

**New England**—Up 12 points to 90 per cent, with all but two open hearths in operation. This rate is promised for this week, as well.

**Central eastern seaboard** — Advanced 2 points to 70 per cent. Activity has increased at two plants, partly offset by another which went down Thursday, to resume Tuesday.

**Youngstown**—Unchanged at 78 per cent, with same rate indicated for this week.

## Steel Center Reverses Trend, Moves Eastward

Geographic center of steel ingot capacity reversed its previous trend and moved 13 miles eastward in the past three years, the American Iron and Steel institute has calculated. At the close of 1936 the geographic center was about one mile north of Mansfield, O. In 1933 it was 13

## District Steel Rate

	Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts			
	Week ended		Change	Same week 1935
	July 24	1936		
Pittsburgh ..	83	—5	67	41
Chicago .....	84	none	70	49
Eastern Pa. . .	70	+2	50½	29
Youngstown . .	78	none	78	49
Wheeling .....	92	+1	89	73
Cleveland .....	51	—28	85	48
Buffalo .....	88	none	84	37
Blrmingham . .	96	none	58	31½
New England . .	90	+12	78	32
Detroit .....	95	—2	100	94
Cincinnati . . .	93	none	76	†
St. Louis .....	93	none	†	†
Average ..	81	—1	70½	45

†Not reported.

miles farther west and about one mile north.

Net increases in capacity east of

## Steel Index Is Ready

*The index to Volume 100 of STEEL, for the first six months of 1937, now is ready for distribution. Copies will be sent to all subscribers requesting them.*

the present center and abandonment since 1933 of some steel capacity in the West, which more than offset recent increases, explains the eastward shift.

Between 1874 and 1933 the center

moved westward at a rate of about six miles a year. In 1874 it was in Juniata county in Pennsylvania. The westward movement closely resembled a similar but slower shift in the center of population which moved 190 miles westward between 1870 and 1930 to a point in southwestern Indiana.

## New York Code Permits Structural Steel Welding

Structural steel welding in the erection of high buildings is permitted in New York's new building code, approved last week by the board of aldermen. Greater restrictions are placed on wood-frame construction. The code also provides for a new type of housing employing steel mesh, expected to stimulate use of this material.

More extensive use of steel reinforced concrete as result of the new code is anticipated, although revisions in requirements for piling may cut down steel for this purpose.

## Cargo Steamers Sold

Maritime commission, Washington, has accepted the bid of States Steamship Co., Portland, Oreg., for PACIFIC HEMLOCK and PACIFIC PINE, at \$71,675 and \$73,175, respectively. These are steel cargo vessels from the commission's reserve fleet at Lake Union, Seattle. Details of bidding are told on page 32.

## Steel Pipe Line Laid in Swampland



**O**NE of the largest industrial pipe line jobs in recent years has just been completed for the Southern Kraft Corp.'s Georgetown, S. C., paper mill. Three miles of the 9½-mile water line was laid through heavy cypress swamp. Blocked at the ends with wood, each 49-foot section of pipe, weighing 3000 pounds, was lowered into the watery trench, and floated into position. The blocks were removed at the time flexible couplings were installed. The pipe was spiral welded, 24-inch inside diameter, manufactured by American Rolling Mill Co.

# Men of Industry

**R**L. MORRISON has been appointed general manager, Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, subsidiary of Westinghouse Air Brake Co. and of Bendix Aviation Corp. His appointment fills the vacancy caused by the death of Robert M. Heinrichs. Mr. Morrison previously served as district manager for the Bendix-Westinghouse Co., with offices in Detroit, and before that served in the Detroit district as inspector, representative and district sales manager.

Mr. Morrison joined Westing-



R. L. Morrison

house Air Brake Co. at Wilmerding in 1915. He is a member of the Society of Automotive Engineers.

Phillip K. McCullough, associated with Mercury Mfg. Co., Chicago, since 1933, has been appointed advertising manager.

William F. Fischer, 1241 Thirty-second street, Sacramento, Calif., has been appointed representative of Lincoln Electric Co., Cleveland, for arc welding equipment.

R. R. Weddell, manager of small tool division, Ingersoll Milling Machine Co., Rockford, Ill., is in Europe on a short business and pleasure trip.

H. E. Van Petten, advertising manager, mechanical rubber goods division, B. F. Goodrich Co., Akron, O., was recently elected president of the Cleveland Industrial Marketers association.

Edward H. Patterson, director, has become vice president, Fort Pitt Bridge Works, Pittsburgh. He succeeds H. R. Blickle, who was elected

president of the company, following the resignation of Theodore A. Straub on account of ill health.

Frank Putnam, formerly with Lowe Bros., Dayton, O., as assistant to the manager of industrial sales, has been appointed to the newly created position of assistant merchandising manager, Renown Stove Co., Owosso, Mich.

Maurice Mayer, 49 Pearl street, Hartford, Conn., has been appointed direct factory representative by High Speed Hammer Co. Inc., Rochester, N. Y., for its full line of cold riveting machinery and precision drilling machines.

M. J. Kearins, president, Whitman & Barnes, Detroit, sailed from New York July 17 for an extended European trip. He will contact distributors in England and continental Europe, returning to America late in August.

Frank Hicks has been placed in charge of the new publicity service recently inaugurated by Crane Co., Chicago. He joins the Crane organization with 17 years experience in newspaper, trade magazine and general publicity work.

Ralph K. Clifford, formerly general superintendent, Continental Steel Corp., Kokomo, Ind., has been appointed works manager. Julian L. Schueler, formerly superintendent of the steel and wire division, has been named general superintendent.

G. W. Hoskins, recently with Lincoln Electric Co., Cleveland, has joined the Harnischfeger Corp., Milwaukee, as sales engineer for Smootharc welders and weld rods in the Philadelphia territory. Mr. Hoskins has had extensive practical experience with welding operations.

David P. Andrews has been appointed district sales manager at Indianapolis for Great Lakes Steel Corp., Ecorse, Mich., division of National Steel Corp. Mr. Andrews was formerly associated with Carnegie-Illinois Steel Corp. at Pittsburgh, Cincinnati and Indianapolis.

Richard J. Lund has been appointed editor of the *Mining Congress Journal*, Washington. He succeeds Mrs. E. R. Coombes, who has resigned to undertake private work. A graduate of the University of Wisconsin, Mr. Lund has a broad background of experience in the

mineral industries. He has been employed in engineering and geological work, in connection with both coal and metal mining operations, and is the author of various chapters in the 1937 "Minerals Yearbook".

Gustavus A. Magee has resigned as general manager of plant No. 1, Two Rivers, Wis., of the Aluminum Goods Mfg. Co., Manitowoc, Wis., because of ill health. Herman C. Wentoorf, manager of plant No. 4 at Two Rivers, has also been placed in charge of No. 1 plant.

William J. Davidson, technical director under R. H. Grant, vice president in charge of sales, General Motors Corp., Detroit, has been appointed general sales manager of Winton Engine Corp., Cleveland. He joined the engineering department



William J. Davidson

of Cadillac in 1914, and has been chief engineer of the Canadian products division, technical director of General Motors of Canada, executive secretary of the general technical committee and new devices committee. In 1930 he was business director of the corporation's research laboratories.

Joseph E. Mayl, assistant sales manager, Goodyear Tire & Rubber Co., Akron, O., has been appointed vice president of California Goodyear Co. W. A. Hazlett, sales manager western division, Los Angeles, will become director of the Goodyear plant in Wolverhampton, England.

Harold F. Ingram, Roman J. Myer and Leon Stephens are being transferred from the Gary sheet and tin mills of Carnegie-Illinois Steel Corp. to the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Mr. Ingram, who will go to Birmingham in charge of the order department of the tin plate division of the Tennessee company, in August, has been associated with United

States Steel Corp. subsidiaries since 1923. Mr. Myer went to the Gary tin mills in January, 1927. In Birmingham he will serve as roughing mill slab yard foreman for the 42-inch hot strip mill. Mr. Stephens, who has been employed in Steel corporation plants since November, 1926, has been appointed superintendent of the hot strip mill of the Tennessee company.

R. E. Zimmerman, vice president in charge of metallurgy and research, United States Steel Corp., New York, returned July 22 from a trip to Germany, France and England, where he studied recent developments in the technology of processes for the production and treatment of various grades of iron and steel.

Spaulding F. Glass has joined United Drill & Tool Corp., with offices at 100 South Jefferson street, Detroit, as assistant treasurer. He recently resigned as senior technical adviser of the technical staff under the commissioner of internal revenue, Washington. He is an attorney and a certified public accountant and prior to 1933 was jointly engaged in the practice of law and public accounting in Washington and Kansas City, Mo.

Howard C. Kaeff, formerly turn foreman of the 42-inch hot strip mills at the Gary sheet and tin mills of Carnegie-Illinois Steel Corp., has been appointed superintendent of cold reduction mills of Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Mr. Kaeff was first employed at Gary sheet mill in 1916 as assistant order clerk, a position he held until 1926, when he left the corporation. He was re-employed two years later as cutting-up shear foreman; in 1935 was transferred to the cold



Howard C. Kaeff

reduction department; a year later was transferred to the 42-inch hot strip mills as turn foreman and held that position until his recent promotion.

## Died:

HOMER C. GERWIG, 50, assistant general manager of sales, National Tube Co., Pittsburgh, in Pittsburgh, July 21. He was graduated from Lehigh university in 1910 and shortly thereafter entered the general engineering department of National Tube at Pittsburgh, where he served five years. In 1915 he was transferred to the general sales department, and in 1931 was made assistant general manager of sales.

Harry C. Whitaker, 66, director of Wheeling Steel Corp., Wheeling, W. Va., July 17, in Wheeling.

John Eggers, 78, founder and treasurer, Eggers Iron Co., Chicago, July 17.

Henry C. Faas, who retired after 52 years' service with Carnegie Steel Co., July 13, in Pittsburgh.

George F. Pfeil, 72, former general superintendent of works, Union Switch & Signal Co., Pittsburgh, in Pittsburgh, July 16.

William S. Walker, 66, for six years president of the American Silica Sand Co., Chicago, in that city, July 15.

Kenneth Ketchum, 42, Pittsburgh advertising and sales promotion man, associated with Ketchum Inc., at Pittsburgh, July 17.

Joseph B. Eck, 50, president, Globe Mfg. Co., Sheboygan, Wis., maker of tools, dies and stampings, in that city July 14.

Dr. John W. Hallock, former

member of the faculty of University of Pittsburgh and an authority on industrial engineering, at Pittsburgh, July 17.

J. B. Orr, director of Townsend Co., Braeburn Alloy Steel Corp., Boiler Tube Co. of America, and Keystone Portland Cement Co., at his summer home in Great Barrington, Mass., July 16.

Dr. Mell F. Jackson, 57, manager of the farm products department, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., at Mentone Springs, Ala., July 17. He had been head of this division since 1924.

Charles L. Schlater, 78, well known hardware salesman, at his home in Philadelphia, June 29. Active in business for 62 years, he had been a salesman for the woven wire fabrics division of John A. Roebling's Sons Co. since 1909.

Edgar L. Newhouse, 72, former chairman of the board of American Smelting & Refining Co., in New York, July 13. He retired in 1930 after 45 years with the Guggenheim interests, rising from an engineer to vice president and subsequently to chairman. He held the latter post 15 years.

## 30 Million Steel Drums Produced During 1936

Thirty million steel barrels, drums and packages were produced last year as containers for oils, chemicals, paints and a wide variety of other commodities, according to estimates received by the American Iron and Steel institute. That total is in addition to the more than 17,000,000,000 sanitary cans made from tin plate produced by the steel industry during 1936.

More than 287,000 gross tons of steel sheets were consumed in producing that number of barrels and drums, it is estimated.

About 60 per cent of that tonnage of steel was used to produce the standard 55-gallon drum widely used as a container for oil and kerosene. A total of 7,300,000 drums of this type were produced during the year, while 3,700,000 steel drums and barrels of other sizes were produced, accounting for about 25 per cent of the tonnage of steel going into containers other than sanitary cans.

The remaining 15 per cent of the tonnage was consumed in producing between 18 and 20 million smaller "steel packages," ranging from one to 12 gallons in capacity. These were used as containers for paints, putty, printing inks, alcohol, oils, lacquers, etc. Steel packages are generally made of thinner steel than are barrels and drums.



Henry R. Hortenstine

Recently elected president of Hunter Steel Co., Pittsburgh, as noted in STEEL, June 28, page 24. Associated with the company and its predecessor 21 years, he formerly was vice president and chief engineer

# National Steel Triples Capacity, Rising To Fifth Place, in Eight Years

**N**ATIONAL STEEL CORP., Pittsburgh, will have forced into fifth place among leading steel producers before the end of this year when extensive additions are completed at the plant of its subsidiary, Great Lakes Steel Corp., Detroit, Ernest T. Weir, chairman, stated last week.

The expansion will increase National Steel's annual ingot capacity to 3,400,000 tons, almost three times the 1,200,000 tons capacity it had when organized in 1929.

National's record is considered by steel analysts as one of the most spectacular achievements in industrial history because:

1. It was accomplished during the greatest depression ever experienced in the United States.
2. The company has multiplied its original capacity by three, and has financed much of its growth out of earnings.
3. It has earned a profit in every month since its organization.
4. It has never failed to pay a dividend.

## Expands Finishing Capacity

Expansion of finishing equipment, raw material resources and transportation facilities has paralleled the increase in primary steel capacity; and the whole development has been accomplished by a virtually continuous program of additions and improvements at Great Lakes Steel, the Weirton Steel Co. and other National operations.

Although noted as the largest independent producer of tin plate and also as a producer of sheets, strip and other light steels, National makes a wide range of products that covers almost every staple need of steel consumers. The only major commodities not produced are pipe and wire and the company states that it can enter these markets with but slight rearrangement of facilities any time such a step is required to maintain National's competitive position.

The present program at Great Lakes is one of the most extensive undertaken by the company and will be completed at a cost of more than \$25,000,000. Some of individual projects now being constructed include a new blast furnace, which will be among the largest in the world, coke ovens, open-hearth furnaces, annealing furnaces, a slabbing mill, gas mains and a gas holder, an ore bridge, and extension of the present ore docks.

The new blast furnace will have a

capacity of 1000 tons of pig iron per day. It will be 100 feet high and will have a 25-foot hearth and 28-foot bosh. The furnace has been designed to permit enlargement when desired and auxiliary facilities have been arranged so that two additional furnaces of the same size may be included in the installation at some future time. Two furnaces of smaller size comprise the present blast furnace department.

The four 200-ton open-hearths now being constructed will represent a 33 1/3 per cent increase in Great Lakes open-hearth capacity. The new furnaces are being built so that they may be increased to duplicate the present 12-furnace installation. The 130 coke ovens under construction will have a capacity of 2550 tons of total coke every 24 hours.

The slabbing mill reduces ingots to slabs for the 96-inch continuous hot and cold strip-sheet mill that went into operation at Great Lakes last year and was reported as the first mill in the world which could roll sheets and strip up to 90 inches in width. The slabbing mill is being built in line with the 96-inch mill and is so arranged that sheets, strip, or plate may be rolled direct from the ingot without reheating.

New annealing furnaces are being built which will increase annealing capacity by 50 per cent. This addition requires extension of the present annealing furnace building.

The installation for the utilization of gas includes a holder which will be 170 feet high and 118 feet in diameter and a 42-inch main almost 2 miles long. The coke ovens will be fired with gas from the blast furnaces. Excess blast furnace gas and the coke oven gas will be delivered through the mains to be used throughout the Great Lakes operations including slab and billet reheating, and open hearth, box annealing, and normalizing furnace heating. The gas production will be approximately 83,000,000 cubic feet per day.

## Steel's Life More Than Doubled in 50 Years

Steel now made in the United States has an average life of 33 1/2 years, according to the American Iron and Steel institute. Long life results from progress in the steel and allied industries in various phases of manufacture, fabrication and preservation and by the develop-

ment of new uses for steel such as skyscrapers, pipe lines and others, which last for many years.

Fifty years ago the life of steel, before rust or obsolescence ended its usefulness, is said to have been not more than 15 years. In 1886 2,500,000 tons was produced, principally rails, which required replacement in a relatively short time, due to hard use.

From 1886 to 1915 the average life of steel in the United States increased about eight years, at a nearly constant rate. During the war a heavy tonnage was exported and thus was lost to this country. Since the war substantial progress has been made in the manufacture and use of steel, which has increased its average life more than ten years.

## Meetings

**A** WIDE range of economic and industry problems will be discussed at the annual convention of the American Mining congress in Salt Lake City, Utah, Sept. 7-10. Members of congress, government officials and executives of the metal mining industry will take part.

Among economic topics scheduled are: Labor legislation, with particular reference to collective bargaining; responsibility of labor; federal regulation of hours and wages; mine taxation; undistributed earnings tax; tariffs and foreign trade; effect of reciprocal trade agreements; gold and silver prices; and mineral land withdrawals.

Industry problems will include: Ventilation, dust elimination and air conditioning in mines and mills; accident prevention and safety methods; occupational disease legislation; stream pollution; reducing cost of workmen's compensation; and improvements in ore concentration.

An exposition of metal mining machinery, equipment and supplies, in which over 75 manufacturers will participate, will be held in connection with the convention under auspices of the Western division of the Mining Congress.

## Steel Corporation's Output

In the table on page 30 in the July 19 issue of STEEL, captioned "U. S. Steel Corp. Share of Ingot Output Declines" there were several typographical errors in the percentage column. The corporation's actual percentage in 1934 was 34 per cent; in 1935, 33 per cent, and in 1936, 36 per cent. As noted in the table, the corporation's portion of total ingot output in the United States declined from 66 per cent in 1902 to 35 per cent in 1933.

# Activities of Steel Users and Makers

UNFILLED orders of Mesta Machine Co., Pittsburgh, at the start of July reached a new high point at more than \$24,000,000, against \$18,000,000 at the beginning of 1937 and \$10,500,000 in mid-summer 1936. The spurt in new orders was helped considerably by the contract from Carnegie-Illinois Steel Corp. for the hot mill at Irvin works. During the past year 20 per cent has been added to capacity through an expansion program, and additional expansion will require expenditure of \$1,000,000. The company is working three turns. About 15 months will be required to complete the business now on the books.

General Plastics Inc., Tonawanda, N. Y., has opened a Detroit office at 518 New Center building. J. S. Miller is in charge, with P. D. Carvalho assisting him.

Illinois Watch Co. will dispose of machinery, equipment and raw materials, valued at \$200,000, at public auction at Springfield, Ill., July 28-29. The sale follows acquisition of

manufacturer's rights of Illinois Watch Co. by the Hamilton Watch Co., Lancaster, Pa.

Monmouth Products Co., Cleveland, manufacturer of motor car parts and home humidifiers, has leased a plant at 1931 East Sixty-first street.

Iron & Steel Products Inc., Chicago, has moved its general offices to East 135th street and Chicago, South Shore and South Bend railroad.

Carboloy Co. Inc., Detroit, has acquired the assets and interests of the Union Wire Die Corp., manufacturer of Widia cemented carbide drawing and extrusion dies. W. G. Robbins is president of Carboloy.

Otis Steel Co., Cleveland, has awarded a contract to the Rust Furnace Co., Pittsburgh, for a single hole soaking pit 10 x 16 feet with a capacity of ten 24 x 48-inch ingots. It will operate on either blast furnace or natural gas.

Rust Engineering Co., Pittsburgh, has been awarded a contract for two reinforced concrete bins for Mathieson Alkali Works Inc., Lake Charles, La. The bins will have an inside diameter of 40 feet with a

height of 75 feet, and each will have capacity for 6,000,000 pounds.

Urlick Foundry Co., Erie, Pa., recently added to its operating capacity and can now melt 500 tons of gray iron castings per month. New equipment recently installed includes two pouring cranes, weight control cupola blower, mold drying oven, and conveyor equipment. R. W. Britton and E. J. Hedlund are owners of the company.

Carrier Corp., Newark, N. J., has purchased the former plant of the Franklin Automobile Co. at Syracuse, N. Y., and will concentrate 80 per cent of its administrative and productive operations there. The Syracuse chamber of commerce raised a fund of \$250,000 to apply to moving expenses and plant improvements.

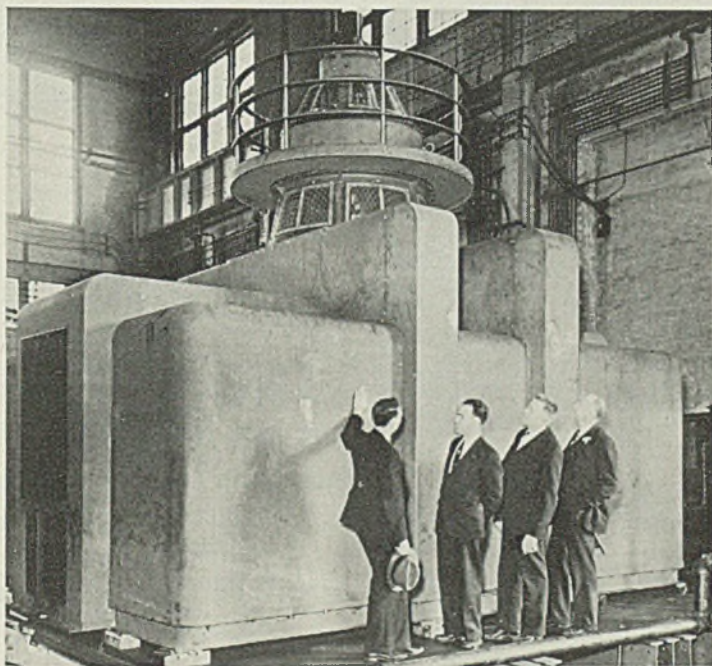
Aluminum Ore Co., subsidiary of Aluminum Co. of America, has selected Mobile, Ala., as the site of a large works. Upon a 75-acre plot on the Mobile river a plant will be erected which will be used for the first step in the manufacture of aluminum. Another similar plant of Aluminum Ore Co. is located at East St. Louis, Ill.

Harnischfeger Corp., Milwaukee, has recently remodeled its Hercules Steel Castings plant into one of the most modern welding electrode factories in the country. Electrode research laboratories have been set up and practically the entire plant will be devoted to the manufacture and improvement of Smootharc welding wire. Welding electrodes previously were manufactured in the National avenue plant.

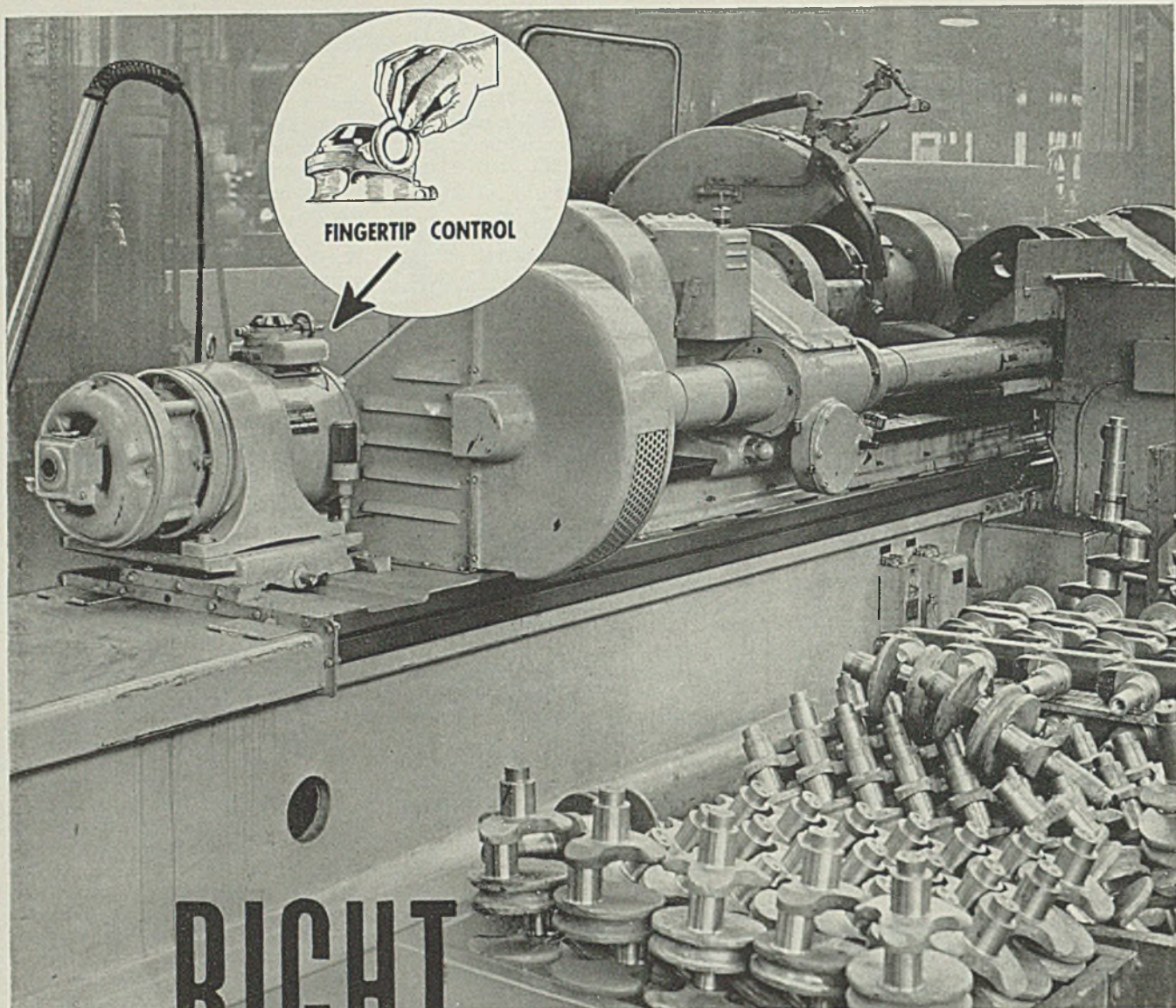
Hugh A. Galt, president of Southern Alkali Corp., announced last week that contracts have been let for construction of a chlorine plant at Corpus Christi, Tex., and it is expected production will start about Jan. 1, 1938. Southern Alkali owns and operates a large alkali plant at Corpus Christi and this addition will round out its operations. The Southern Alkali Corp. is jointly owned by Pittsburgh Plate Glass Co. and American Cyanamid Corp.

National Tool Co., Cleveland, last week announced a reorganization, and a new firm of the same name has been incorporated under the Ohio laws. A. J. Brandt is president of the new company and associated with him are E. J. Lees, formerly of the Lees-Bradner Co., who has been made vice president and chief engineer; L. M. Prosser, formerly with General Motors Corp., who has been named vice president and treasurer, and S. J. Kornhauser, secretary and general counsel.

## To Pump Water Over Mountains



**FIRST** of six large slow-speed motors for the metropolitan water district of Southern California recently passed its factory test at General Electric Co.'s Schenectady plant. These motors, rated 9000 horsepower, 0.95 power factor, 400 revolutions per minute, 6900 volts, 60 cycles, will be a part of the equipment to operate pumps on the water district aqueduct. Five pumping plants are required to raise the aqueduct water over the mountain barriers that stand between the Colorado river and the district



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Precision work will not tolerate approximate methods. Whatever speeds happen to be available just won't do for fine grinding. This Norton Crankshaft Grinder is used by Caterpillar Tractor Co., and is equipped with Transitorq to do away with approximation— for Transitorq gives *infinite* speed control—

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New Departure, Division General Motors Corporation, Bristol, Connecticut. Chicago, Detroit, San Francisco and London, England.

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*Variable Speed*  
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# MIRRORS OF MOTORDOM

DETROIT

**A**S THE 1937 production season slows down, interest here is veering again to developments in the ranks of labor, both organized and unorganized. During the past week the UAW took a couple of right hooks to the chin which set the union cause back on its heels.

One of the blows was delivered by Walter L. Fry, outspoken president of Fry Products, seat cover manufacturer, who closed his plant last Monday and told his employees:

"I don't intend to run a plant where the UAW is boss or even part boss. There can be only one boss in a company. He is responsible for its success or failure.

"If I must accept that responsibility then I must have the right to be the final word in the operation of this plant. The union, perhaps not alone in our particular plant, but by wildcat strikes in plants of our customers (General Motors), has directly caused a loss of \$22,500 to the Fry company in the first six months of this year. In addition to this we have lost more than a quarter million dollars worth of business.

"Congress can pass laws and the national labor board can hold all the hearings it wants to. They can fine me and even put me in jail if they wish, but all the laws in the world can't make me operate this company at a loss just to employ you."

## Employees Oust UAW Organizer

Fighting words those, probably echoing the sentiments of a thousand employers throughout the nation. Fry made it plain he held no brief for his employees joining any union, but would not deal with the UAW as it is now constituted. Upshot of the situation was that after first voting in favor of a UAW organizer participating in conferences between management and employees, the latter next day reversed their stand, escorted Herbert Brown, UAW organizer, from the plant and then approved resumption of work.

Agreement now provides for no signed contract with the UAW, representation of employees by a com-

BY A. H. ALLEN  
Detroit Editor, STEEL

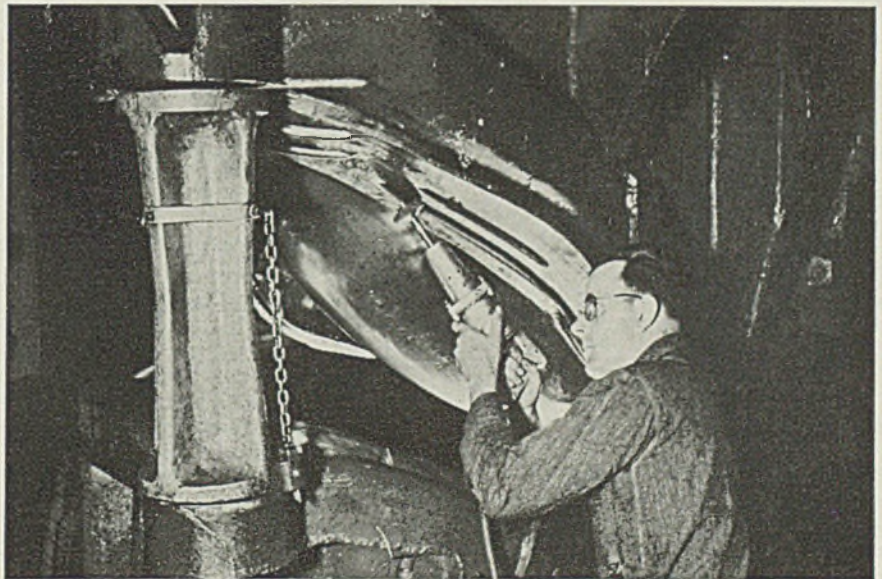
mittee from the plant only, maintenance of seniority rights and wage rates, and no discrimination between union and nonunion men. Parting shot of Edward Ayres, another UAW organizer, was, "As far as the international union is concerned, as long as we have five loyal men or women in Fry's plant we can close it down anytime we want to do so." A chorus of boos from employees greeted his remark.

Meanwhile, W. S. Knudsen, president of General Motors, dispatched another letter to Homer Martin, president of the UAW, suggesting

as a necessary stipulation covering the responsibility for interruptions to production in any further agreement with the union the following:

"It is the responsibility of the management to maintain discipline in its shop, and the right of the employer to hire, fire and discipline employees for cause is expressly recognized. Until after all the steps set forth in the grievance procedure set up in this agreement have been complied with, no strike shall be called, and there shall be no refusal to work or stoppage of production in whole or in part due to the union, its officials or members, and for a violation of this provision, the company shall forthwith discharge the employe or employes guilty thereof, and the union shall take suitable disciplinary action against the parties responsible. For failure on the part of

## Magnesium Jack Promotes Safety



**S**AFETY plug or jack of magnesium alloy (dowmetal), shown at the left, provides triple check against injury to workman repairing the die on this heavy fender press in the Chevrolet plant. When the jack is removed from the storage shelf the electrical plug on the chain disconnects power to the press. The plug is easily lifted because of its light weight and, thirdly, has ample strength to hold jaws of the press open while die work is in process



## MIRRORS OF MOTORDOM

the union to take such action, or to prevent strikes and stoppages to production, as herein provided for, the company shall have the right to terminate the agreement."

Little action can be expected from the UAW until after its convention next month in Milwaukee when elections for officers will be held. Two opposing factions have developed within the UAW, one the so-called conservative group headed by Martin, and the other favoring "demonstration" of authority, headed by Wyndham Mortimer, first vice president and allied with the Flint UAW group which has been the hotbed of the "wildcat" strikes in recent months. Union officials deny any such rift in their organization, but it is generally recognized a divergence of opinion exists.

Sizing up the matter as it now stands, the Martin group probably will retain its power and the conservative element in the UAW, if any, will direct policies to come.

Hearing being conducted by the NLRB on the UAW complaint against Ford has now filled upward of 2600 pages of testimony, with the board attorneys calling nearly 100 witnesses before they rested their case last Wednesday. Ford attorneys then summoned their witnesses and the interminable testimony began to pile up again.

Splashed over the front page of a recent "Ford edition" of the weekly paper issued by the UAW was a picture of two labor board attorneys, with the following significant caption, "Frank Bowen, regional director of the NLRB, and Larry Knapp, counsel, U. S. government officials who have Ford up a tree."

**A**SSEMBLY lines at Packard rolled to a stop over a week ago and a large number of the working force was released until production on the new model is resumed, which will probably be around Aug. 15, although delays occasioned chiefly by concern over the labor situation may defer this date two weeks or more. At the moment maintenance crews and engineers are busy rearranging equipment and getting schedules set for starting the 1938 jobs.

Packard was the first of the ma-

### Automobile Production

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

	1935	1936	1937
Jan.....	300,335	377,244	399,634
Feb.....	350,346	300,810	383,698
March....	447,894	438,943	518,977
April.....	477,059	527,625	553,415
May.....	381,809	480,518	540,357
5 Mos. ...	1,957,443	2,125,140	2,396,081
June ....	372,085	469,368	†477,200
July.....	35,297	451,206	.....
Aug.....	245,075	275,934	.....
Sept.....	92,728	139,820	.....
Oct.....	280,316	230,049	.....
Nov.....	408,550	405,799	.....
Dec.....	418,317	519,121	.....
Year ....	4,119,811	4,616,437	.....

Estimated by *Ward's Automotive Reports*

Week ended:	
June 26 .....	121,032
July 3 .....	122,890
July 10 .....	100,981
July 17 .....	115,380
July 24 .....	88,055

	Week ending	
	July 24	July 17
General Motors .....	50,040	49,840
Ford .....	655	26,655
Chrysler .....	26,550	26,300
All others .....	10,810	12,585

†Estimated.

car producers to close for the changeover and may be the first to have new models ready for display. It would not surprise some observers if the new Packards, in addition to their steel tops and slightly altered body lines, would offer some form of automatic gearshift as standard or perhaps only optional equipment.

Studebaker likewise virtually has completed production of 1937 models, although scattered assemblies will continue for a few weeks to clean up parts on hand. Truck output will not be affected by the changeover to new models which probably will be ready some time early in September. Indications are that Studebaker production for the 1937 season will approximate 62,500, about 25 per cent ahead of the preceding year.

Sales of Studebaker trucks and commercial cars zoomed this year to an 84.3 per cent increase over last, which probably explains why truck production is not being slowed. Truck exports likewise rose to new heights. June ship-

ments, for example, quadrupled shipments abroad in June, 1936.

Expansion throughout Studebaker's parts division is now in process, first step being a new parts depot at Denver, to be followed by additional outlets to supplement present 16 distributing centers.

Chevrolet shows no slackening in production of current models, and assembly plants are moving about 28,000 cars into the field weekly. Bodies on next year's models will be about 3 inches wider between wheel housings, it is understood, but in general will carry out the style of the 1937 line, continuing the streamline crease across the cowl and front door. Originally, it was proposed to eliminate this decorative touch, because of some reported dissatisfaction with the appearance in the field, but cost of new body dies plus the losses incurred from strikes early in the year are said to have swayed the management to postponing changes in body lines.

Talk is heard of a new type of pressed alloy steel clutch plate to be adopted by Chevrolet next year. The new design is reputed to involve a spring steel plate with radial slots cut from a central hole outward to smaller holes near the edge. This design produces a series of segments which provide improved cushioning action.

**A** CONTINUAL switch from castings to pressed steel, and from pressed steel to castings, for auto parts is in process. For example, Buick is reported to be experimenting with a pressed steel housing for flywheel and clutch assembly instead of the present cast housing.

On the other hand, several producers are studying the feasibility of changing to cast crankshafts and camshafts instead of the present forged steel shafts. Buick, Olds and Pontiac divisions of General Motors are looking over the matter of setting up suitable foundry facilities to supply cast shafts for these three models, although it is not likely any change will be made soon.

Chevrolet has just announced a new taxicab model. Built on a 127-inch wheelbase, it has a turning radius of 22 feet, overall length of 202 inches, removable straight partition between driver's and passenger's compartments, and all other standard features of the regular line. A special universal joint is installed behind the transmission, securely mounted to the frame cross member and providing extra strength for the driving mechanism.

Fisher Body has issued initial parts releases for Cadillac, Olds and

(Please turn to Page 87)



# WINDOWS OF WASHINGTON

WASHINGTON

**T**HE President has entirely tabooed the use of the term "must" legislation by the press. Last week he used a new word at his press conference—"desirable." Asked what he considered desirable legislation for the remainder of the present session of congress, aside from the court reform bill, he mentioned hours and wages, housing, tax loophole, farm legislation, and the government reorganization bill. If he should insist on this lineup, the next session of congress will probably be going on before this one has adjourned.

There has been much talk here recently that the south is heartily opposed to the hours and wages legislation and there is a general feeling in many well informed circles that this will not become law during the present session.

The caucus last week for the democratic leadership of the senate might be captioned "Bilbo's Revenge," for it was no other than Senator Bilbo, Mississippi, who cast the deciding vote against his colleague, Senator Harrison.

There was a tie vote in the caucus, 37-37, between Barkley, Kentucky, and Harrison. It was up to Bilbo to vote and he voted for Barkley thereby settling an old score with Harrison against whom Bilbo campaigned when he came up for re-election the last time. The fight is of long duration and while it is said here that Harrison did not want the leadership it is a foregone conclusion that he would rather have been beaten in almost any other way.

## ALL IDENTICAL BIDS TO BE PROBED AS "COLLUSIVE"

The question of collusive bidding, which has been up many times here during the past couple of years, due chiefly to complaints made by Secretary of the Interior Ickes, on what he alleged were collusive steel bids, again came to the fore last week when the secretary of the treasury ordered that all identical bids re-

BY L. M. LAMM  
*Washington Editor, STEEL*

ceived should be deemed to be collusive and sent to the department of justice.

Following the receipt of an opinion of the attorney general, requested by the treasury on the subject, the secretary of the treasury has given the following instructions to the director of the procurement division of the treasury department:

"Hereafter, all cases in which there is evidence that bids, otherwise acceptable, are the result of collusion, should, before any bid is accepted, be referred through the usual channels to the department of justice for determination whether a finding of collusion by the director of the procurement division would be supported by evidence so clear and convincing as to lead a man of ordinary judgment and prudence definitely to that conclusion.

"All cases of identical bids would, in the absence of satisfactory affirmative evidence that no collusion was present, fall within the foregoing instruction."

## SAYS TECHNOLOGY DRIVES FARMERS INTO INDUSTRY

Technology seems to have taken Washington by storm recently. Bills have been introduced in congress on the subject and now the science committee of the national resources committee has transmitted to the President, through Secretary Ickes, a report in which it states that in no other country have so many drastic changes taken place within a comparatively short time as in the United States, "changes that have required the readjustment of hundreds of millions of people, largely as the result of a shift from an agricultural to an industrial nation, according to a survey of technological developments in the field of agriculture."

While the committee suggests that the introduction of machinery has,

on the whole, benefited and had a uniform effect on the body of industrial workers, the advance of technology in agriculture has tended to widen the gap in general wellbeing between farmers who are able to embrace it and those who are unable to utilize the fruits of science and invention. "This gap," the committee says, "is certain to widen. The hoe has not been relegated to the museum. The man with the hoe and the man with the tractor are not competitive equals where they are engaged in the same type of farming."

The effect of this competition between large numbers of agricultural people, if it is not restrained, the committee holds, will lead toward greater concentration of commercial production on fewer farms with an increase in the average size of these farms and fewer commercial farmers. This would mean, it is contended, that a large number of farmers with relatively small commercial production would be compelled to migrate to industrial centers to compete for employment opportunities.

In the same report the committee shows by a comparison of the average annual income, available power and the value of farm mechanical equipment by states, that the annual income of the agricultural worker tends strongly to increase as the power and machinery available for his use increases. For instance, it was found that Alabama has the lowest gross income per worker of \$492, with 1.5 horsepower available and \$142 invested in machinery; Montana shows the greatest horsepower per worker, 22.5 with \$953 invested in machinery.

## NO WAR IN CHINA YET TO INVOKE NEUTRALITY MOVE

While the Sino-Japanese situation, seems much better, it is evident that the President has no desire to affect our Far East trade with the two countries involved unless it is absolutely necessary.

At a press conference last week, Mr. Roosevelt was asked when and if

he intended to invoke the neutrality law. Under the new law no provision is made for the President to invoke the law until after war is declared but he is to act when he finds a state of war exists.

Those who are familiar with the Far East situation understand perfectly that invoking the neutrality law in this case would militate against the Chinese and there is considerable sympathy for that country.

Some government officials familiar with this situation called attention to the fact that the United States has recently loaned China money with which to purchase a number of locomotives in this country. Also a loan is pending with the government import-export bank for the purchase of further railway and other equipment and machinery. It is the belief of this official that part of the present action by Japan was taken as the result of these loans. This is based on the fact that Japan a year ago notified the world that no further loans were to be made to China without Japan's consent. This official is of the opinion that the present situation may be a result, in part at least, of the loans about to be made by the United States to China.

Although the \$750,000 credit recently extended by the United States export-import bank is insignificant in comparison with the huge sums already advanced by Great Britain, Germany, France, Belgium and Czechoslovakia, it may be the entering wedge, says Dr. Chen Hang-seng in a publication of the Institute of Pacific Relations, a non-governmental body.

He states that "the boom in Chinese railway construction which set in about four years ago bids fair to rival that which the United States experienced in the last decades of the nineteenth century. Foreign powers have competed keenly for a share in this great market, frequently extending long term credits on very favorable terms for the purchase of railway materials."

#### **WOULD INCREASE RUSSIAN BUYING BY TRADE PACT**

Negotiations are still under way between the United States and the Russian government for renewal of the special trade agreement which expired this month. Under that agreement Russia agreed to spend \$30,000,000 in the United States during the year. Government officials here contend that Russia did better than that. Certain concessions were granted Russia by which she obtained the same treatment accorded other nations. It is reported the government is making an effort to raise this \$30,000,000 provision to a much larger amount.

It is stated here the Hull organization now is considering a number

of trade agreements with other countries and it is known that the administration is anxious to conclude a trade agreement with England if possible. Apparently there are a good many obstacles in the way of this latter agreement but the effort is under way.

#### **STEEL PRODUCTION GAIN AIDS GENERAL RECOVERY**

In a report last week to Secretary of the Interior Ickes, in which it shows that the mineral industries are contributing their part to the general recovery movement, the bureau of mines calls attention to the fact that "in 1936 the American iron and steel industry increased its annual output for the fourth successive year. The increase in domestic output of pig iron in 1936 over 1935 was greater than the total production in 1932," says the bureau.

"The higher rate of operation," the report continues, "reacted to the benefit of producers of such mineral products as iron ore, manganiferous iron ores, fluorspar, fluxing stone and coke, which depend on iron and steel producers for their chief market."

"In the first four or five months of this year increases are indicated in the average monthly production of important metals. Steel shows an average monthly increase of 42 per cent.

"Prices, likewise, show substantial improvement."

#### **BROOKINGS FAVORS CIVIL SERVICE AND CAREERS**

In connection with the proposed reorganization of government departments which the President believes should become law before congress adjourns the Brookings institution, a non-governmental organization, asked by the senate select committee on federal government reorganization to make a survey, has made public a chapter dealing with government personnel.

The institution recommends "that in the interests of economy and efficiency the merit system be extended to the bulk of the employes not now under it," and asserts that "no effort is made to repeat the familiar arguments in favor of the merit system and the career service as opposed to the spoils system and rotation in office."

#### **MEXICAN STEEL INDUSTRY GROWING; SCRAP IS SCARCE**

Due to increased building activity and the local public works program, production activities of Mexican iron and steel mills were considerably larger during 1936 with indications that the output for 1937 will register still further gain, according to Assistant American Trade Commissioner Miles Hammond, Mexico City, in a report to

the bureau of foreign and domestic commerce.

Demand for rails by the Mexican railways has been stimulated and the largest steel producing plant in the country is now said to be engaged in turning out extensive orders.

The national demand for black sheets and tin plate is enlarging to a considerable extent. The former is used in the manufacture of galvanized sheets to meet demand of building activities and the latter to fill large orders from Mexican canning enterprises.

Although Mexico has iron deposits sufficient to take care of its national demand for centuries, difficulty is said to be experienced in gathering sufficient scrap, which continues to be imported from the United States in important volume.

#### **TAKES BIDS ON SHIPS**

The United States maritime commission last week opened bids for purchase of four steel cargo vessels in its reserve fleet in Lake Union, Seattle.

The bidders were: States Steamship Co., Portland, Oreg., which bid \$216,525 for the three ships as follows: PACIFIC HEMLOCK, \$71,675; PACIFIC SPRUCE, \$71,675; PACIFIC PINE, \$73,175. The company informed the commission that it desired these ships, which have an aggregate tonnage of 25,675 tons, for operation in intercoastal trade, via the Panama canal. No tender was made on the PACIFIC REDWOOD, a vessel of 8682 tons.

The Pacific-American Fisheries Inc., of South Bellingham, Wash., bid \$37,500 each for two ships, the PACIFIC SPRUCE and the PACIFIC PINE, conditioned upon waiver by the commission of its restriction against operation in foreign trade.

#### **CIO OFFICES LUXURIOUS**

CIO Lewis and his United Mine Workers are lifting the face of the University club here, which they purchased sometime ago for \$275,000, and are spending \$136,000 more to modernize the building to make it a permanent headquarters.

According to present plans almost the entire club building will be wrecked. Nothing will be left standing but the walls and the floors. Some of the larger club rooms are being partitioned into offices, a completely new and modern heating system is being installed and when it is completed, some months from now, it will be a rebuilt and completely modernized office building.

#### **FIND NO GERMAN DUMPING**

Customs service of the treasury department has failed to find any dumping of German horseshoes on the American market and this case, which has been pending for two years or more, has been closed.

# Editorial

## Predicting and Planning for Technological Progress

INDUSTRIALISTS will find much of interest in the 450,000-word report of the President's national resources committee on "Technological Trends and National Policy, Including the Social Implications of New Inventions."

The committee stresses the importance of studying in advance the likely trends of progress in science and technology and suggests that the nation create a permanent "planning body" which would keep abreast of technological changes and attempt to forecast imminent transitions that might affect national life. The function of this board would be that of a "technological telescope"—to peer into the future of scientific advances.

Listed as subjects for immediate study and planning are the mechanical cotton picker, air-conditioning equipment, plastics, the photoelectric cell, artificial cotton and woolen-like fibers made from cellulose, synthetic rubber, prefabricated houses, television, facsimile transmission, the automobile trailer, gasoline produced from coal, steep-flight aircraft planes and tray agriculture.

### Six New Industries of Twentieth Century Offered As Examples for Forward Planning Profitably

Professor William F. Ogburn, director of research for the report, gives a hint as to how forecasting and planning might work in this statement in the opening chapter: "If the legislators, governors and presidents since the beginning of the century could have foreseen the development of six industries, based on the telephone, the automobile, the airplane, the motion picture, rayon and the radio, and could have anticipated their influence on society and the changes they precipitated, they would have been in a much better position for directing the policies of the state."

Amplifying this statement, Professor Ogburn adds that "in hundreds of ways the governments, industries and individuals could have planned more soundly had they foreseen the development of these six industries. . . . Highways are too narrow. The metropolitan areas could have been planned better; much crime could have been prevented. Industries could have been located to greater advantage.

\* \* \*

All thoughtful persons will agree that it is desirable to perfect methods of easing the hardships of the

inevitable adjustment of national life to changes wrought by invention and scientific and technological progress. The report will serve a useful purpose in focusing attention upon this long neglected problem.

Nevertheless, we should not be too optimistic over the prospect of predicting accurately the outcome of new developments. We doubt very much whether any board of experts—no matter how eminently qualified they may be—can forecast what the status of the photoelectric cell, television, prefabricated houses or air conditioning will be 20 years from now. Even if such forecasts could be made now, they would be of little value in planning unless the experts also could foresee the complete economic and social picture of 20 years hence.

### Retrospect Fails To Suggest How Procedure Would Have Changed Development from Present Status

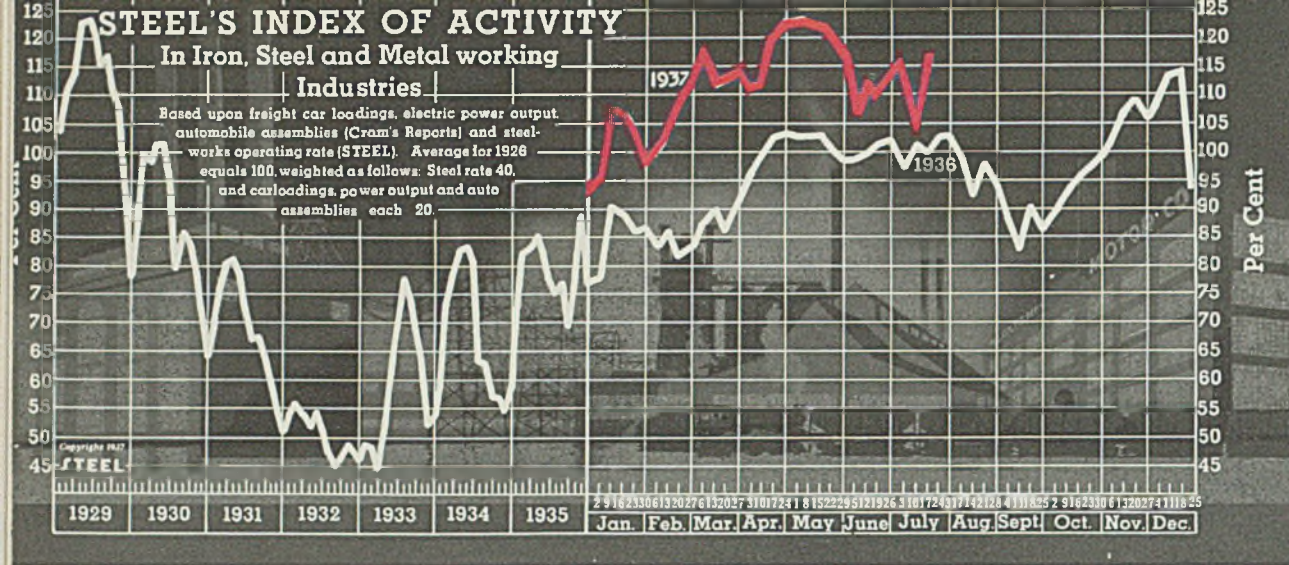
Assume that in 1900 the responsible heads of government and industry had known for a certainty that by 1937 more than 25,000,000 automobiles would be in use in the United States. To what extent would that knowledge have changed the development of the automobile industry, the adjustment of other industries to the requirements of automobile manufacturers, the planning and construction of highways, the layout of cities and towns, etc?

Probably not as much as the President's committee would have us think. Such knowledge probably would not have prevented the high mortality among early automobile manufacturers. Nor would it have changed materially the location of early automobile plants or the subsequent shift toward Michigan. It might have helped somewhat in the development of highways, yet here we suspect that we would have overbuilt in some sections and underbuilt in others.

Civilization advances by experience. Each generation is prone to discount the lessons of the past and to learn by its own mistakes. Someone has said that history teaches that man never profits from the lessons of history.

This is a factor to be taken into account in planning for the future. The citizen who pays the cost of government and the industrial executive who must make a profit for his stockholders are intensely practical. They will be governed by something more tangible than a forecast of events a decade or more in the future. Moreover, before committing themselves to the advice of a federal planning board, they will want some definite proof of the capacity of that board to plan wisely.

The broad idea of the committee's report is praiseworthy. It will stimulate constructive thinking. But it must be reduced to practical working limits before it will impress responsible individuals.



The

STEEL'S index of activity gained 11.8 points to 115.6 in the week ending July 17:

Weed ending	1937	1936	1935	1934	1933	1932	1931	1930
May 22	122.2	100.4	82.8	81.9	66.1	55.1	78.3	102.3
May 29	115.6	98.6	71.9	75.7	65.3	54.2	75.7	94.9
June 5	105.1	98.8	79.3	82.3	69.9	51.0	73.5	97.9
June 12	111.4	99.4	80.0	83.6	72.1	51.1	73.2	96.2
June 19	110.3	101.0	77.3	81.8	73.9	51.8	70.9	95.0
June 26	112.8	101.9	78.4	79.4	77.0	51.6	70.6	94.0
July 3	115.3	97.5	64.1	52.3	71.4	49.2	64.1	75.0
July 10	103.8†	100.9	76.5	67.8	79.1	41.7	69.4	86.9
July 17	115.6*	99.9	79.8	68.1	79.4	46.9	70.0	79.1

\*Preliminary. †Revised.

## Summer Letdown Will Be Less Drastic Than Expected

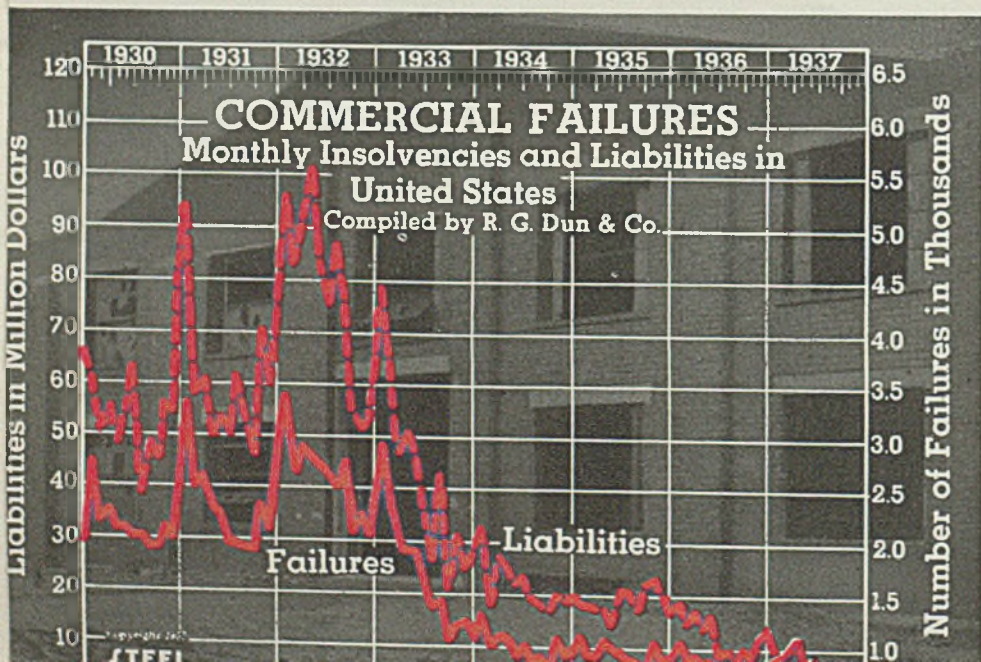
**T**HUS far in July business has performed in a manner which has taken the edge off the fears of observers who predicted that a sharp seasonal recession would occur during the summer months. Business in general has slackened somewhat, but the rebound which occurred shortly after the July 4 holiday, and which concurrently marked the end of serious labor trouble, has been encouraging enough to breed

restrained optimism in places where pessimism was firmly entrenched in June.

Comparisons of July activity with that in spring months of 1937 are faulty because the prolonged period of strikes distorted second-quarter figures. As a matter of fact, labor trouble was responsible for cutting down activity in late May and in June and for throwing part of the normal activity of that period into the third quarter.

This accounts in part for the absence of a sharp recession in July and it also may be advanced later as an explanation for a better-than-expected August.

Current figures are distinctly cheerful. STEEL'S index of activity in the iron, steel and metalworking industries stands at 115.6 for the week ending July



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

# BUSINESS TREND

17, a gain of 11.8 points over the preceding week. The index more than made up for its holiday losses and is at the highest level since the strike began in the last week of May.

## Where Business Stands

Monthly Averages, 1936=100

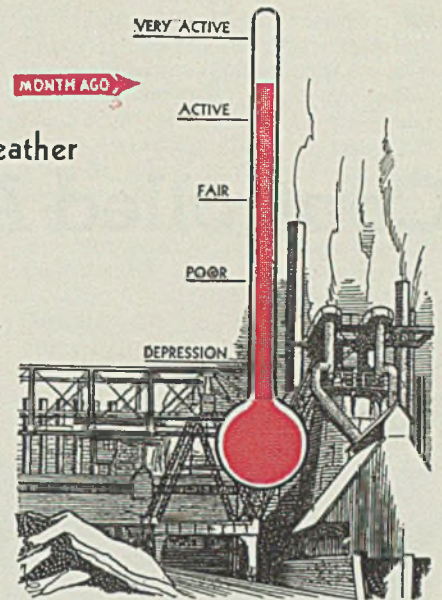
	May, 1937	April, 1937	May, 1936
Steel Ingot Output .....	131.8	129.7	103.5
Pig Iron Output .....	136.4	135.3	102.3
Freight Movement .....	112.4	106.5	96.7
Building Construction .....	118.0	141.7	106.5
Automobile Production .....	140.4	143.9	124.9
Wholesale Prices .....	114.1	117.0	96.4

The gain was accounted for by a sharp upturn of from 74 to 82 per cent of capacity in the steelworks operating rate, a moderate increase in automobile out-

## Industrial Weather

TREND:

Steady



put, a sharp advance in revenue freight car loadings and a rise in electric power output to 2,298,005,000 kilowatt-hours—a new all-time record.

The rebound from labor difficulties and the holiday carries the index to a point about 7 per cent below the plateau of greatest activity in the second quarter. In other words, activity now is only 7 per cent below the average maintained from mid-April to the last week of May.

This does not indicate a serious let-down for the summer months.

## The Barometer of Business

### Industrial Indicators

	June, 1937	May, 1937	June, 1936
Pig Iron output (Daily average, tons) .....	103,822	114,328	86,551
Machine Tool Index .....	227.6	234.2	124.5
Finished Steel Shipments .....	1,268,550	1,304,039	886,065
Ingot output (Daily average, tons) .....	160,914	198,213	153,263
Dodge Bldg., awards in 37 states (sq. ft.) .....	46,393,100	40,287,900	36,881,400
Automobile output .....	*477,200	540,357	469,355
Coal output, tons .....	31,560,000	29,980,000	29,300,000
Business failures; number .....	670	834	773
Business failures; liabilities .....	\$8,191,000	\$8,364,000	\$9,177,000
Cement production, bbls. ....	11,634,000	11,634,000	11,273,000
Cotton consumption, bales .....	681,000	669,000	556,000
Car loadings (weekly average) .....	744,131	779,541	696,753

\*Estimated.

### Foreign Trade

	June, 1937	May, 1937	June, 1936
Exports .....	\$288,924,000	\$185,693,000	
Imports .....	\$285,038,000	\$191,077,000	
Gold exports .....	\$4,000	\$77,000	
Gold imports .....	\$155,366,000	\$277,851,000	

### Financial Indicators

	June, 1937	May, 1937	June, 1936
25 Industrial stocks .....	\$207.41	\$210.16	\$201.52
25 Rail stocks .....	\$41.74	\$46.12	\$36.83
40 Bonds .....	\$83.91	\$85.35	\$87.07
Bank clearings (000 omitted) .....		\$23,951,000	\$26,148,000
Commercial paper rate (N. Y., per cent) .....	1	1	¾
*Commercial loans (000 omitted) .....	\$9,760,000	\$9,529,000	\$8,396,000
Federal Reserve ratio, per cent .....	79.5	79.7	78.7
Railroad earnings .....	\$43,662,959	\$47,807,447	\$41,797,047
Stock sales, N. Y. stock exchange .....	16,443,293	18,564,979	21,428,377
Bond sales, par value .....	\$178,640,400	\$178,891,200	\$221,879,500

\*Leading member banks Federal Reserve System.

### Commodity Prices

	June, 1937	May, 1937	June, 1936
STEEL'S composite average of 25 iron and steel prices .....	\$39.82	\$40.06	\$32.79
Bradstreet's Index .....	\$11.33	\$11.51	\$9.73
Wheat, cash (bushel) .....	\$1.41	\$1.47	\$1.13
Corn, cash (bushel) .....	\$1.36	\$1.47	81c

# Controlled Atmospheres for Copper

Applying the principle of controlled atmospheres

to the annealing of copper and its alloys makes

possible finished surface direct from the furnace

**P**RESENT demands for deep drawing characteristics, quick and easy soldering, maximum ductility or strength make it essential that copper producers control the characteristics of their product in a way previously seldom necessary. It is of course well understood that after each ordinary drawing or rolling operation the metal becomes hard probably due to twinning of the crystals of which the metal is composed with the result that further working is impractical until the metal has been annealed. The annealing operation involves the heating of the metal to a sufficiently high temperature to reform the crystals and at the necessary temperatures considerable modification of the metal itself, and particularly of the surface, is possible unless the atmosphere around the metal is carefully

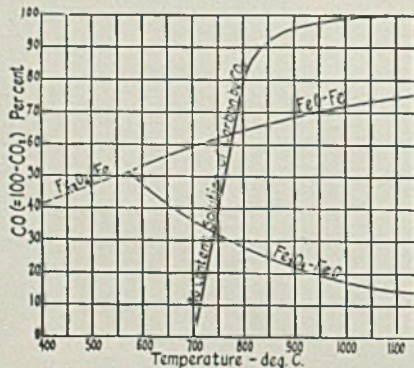


FIG. 1—Equilibrium of iron at various temperatures in contact with atmosphere consisting principally of carbon monoxide and carbon dioxide

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controlled. In many cases the metal is shipped immediately after annealing without further finishing or treatment and the surface appearance in the final anneal is, therefore, a subject of vital importance.

The above brief statement will summarize the considerations which force a careful study of annealing conditions and atmospheres. There are many factors which have an important effect on the quality of the resultant product. Some of these factors are due to the composition or character of the metal itself, some are due to outside conditions such as surface conditions and the like and a third group of factors resides in the composition and balancing of the atmosphere itself.

Commercial electrolytic copper is

**T**HE accompanying article was presented by Mr. Darrah in the form of a paper before the national conference on industrial gas sales conducted in Chicago, June 8 and 9 by the industrial gas section of the American Gas association and the Midwest Industrial Gas sales council

one of the purest metals available in large quantities today. Copper, like all other metals, is formed from grains closely interlocked and most of the impurities present in copper are located at the grain boundaries. Such impurities as silver, commonly found in natural or lake copper, usually concentrate principally in the grain boundaries. Copper oxides similarly ordinarily collect at grain surfaces as well as some of the less frequent additions.

Any study, therefore, of the effect of annealing or furnace atmospheres

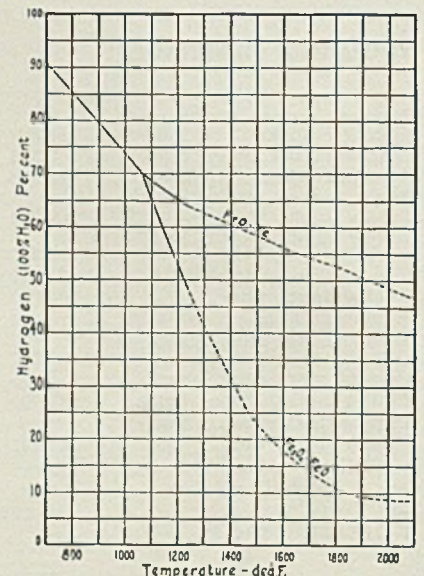


FIG. 2—Equilibrium of iron at various temperatures in contact with gases consisting principally of water vapor and hydrogen



must give careful consideration to the penetration of furnace atmospheres into the material forming the grain boundaries. Much has been written regarding "hydrogen embrittlement" and there is probably some little divergence of opinion today on that subject. It seems to have been established, however, that hydrogen embrittlement is a reaction occurring as a result of the penetration of strongly reducing hydrogen into the grain boundaries when an excess of copper oxides is present at these same grain boundaries.

In other words, careful investigation appears to indicate that so-called oxygen free copper is not subject to hydrogen embrittlement even under conditions which might be expected to emphasize this difficulty.

#### No Embrittlement Noticed

The writer has heated metallic copper known to be oxygen free to temperatures around 2100 degrees Fahr. for several hours in a pure hydrogen atmosphere without any noticeable hydrogen embrittlement even though the copper was carefully tested for this condition. Copper so heated forms extremely large crystals and may be made to form spangles closely resembling those produced by zinc on iron sheets.

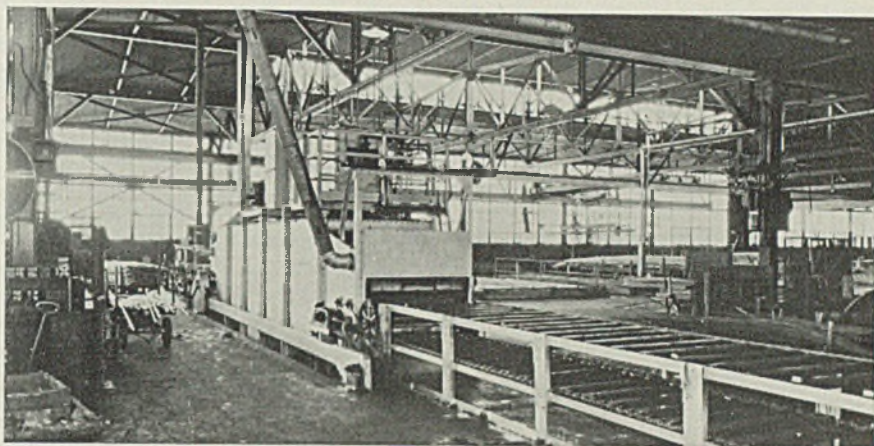
On the other hand copper containing commercial amounts of copper oxide when heated for long periods at high temperatures in an atmosphere containing considerable amounts of hydrogen may show a decided brittleness which may be due to the reduction of some of the oxide at the grain boundaries, leaving a minute gap or space which results in decided weakening of the metal and a tendency for checking or cracking under strains. Water vapor appears to be produced in most cases where careful tests have been made and the so-called hydrogen em-

brittlement has been noted in oxide bearing copper.

This brief discussion of the effect of hydrogen embrittlement is offered in the hope that it may clarify this subject. It is the writer's opinion that the effect of the atmosphere is frequently quite largely dependent on the nature of the metal being heated as well as the composition of the surrounding furnace atmosphere.

In passing it is of interest to note that slight impurities such as the presence of silver in lake copper have a pronounced effect on the re-

quired annealing temperature. This impurity has the peculiar effect that the annealing temperature is considerably increased when the metal has been subjected to relatively slight working before annealing whereas when the metal has been considerably reduced, as by heavy rolling or drawing, a lower annealing temperature will give satisfactory results. Thus lake copper may require a variable annealing temperature differing by 200 or 300 degrees Fahr. from the annealing temperature of electrolytic copper. In general lake copper may be readily



**FIG. 3**—Copper may be clean annealed in a furnace of type shown, in an atmosphere consisting entirely of products of combustion

**FIG. 4**—Where a clean, bright, shiny surface suitable for immediate shipment without pickling is desired best results are obtained by annealing in atmosphere generated in equipment such as shown in this view

handled with the same atmospheres as those employed in connection with electrolytic coppers but lake copper is somewhat more sensitive to atmosphere variations and discoloration.

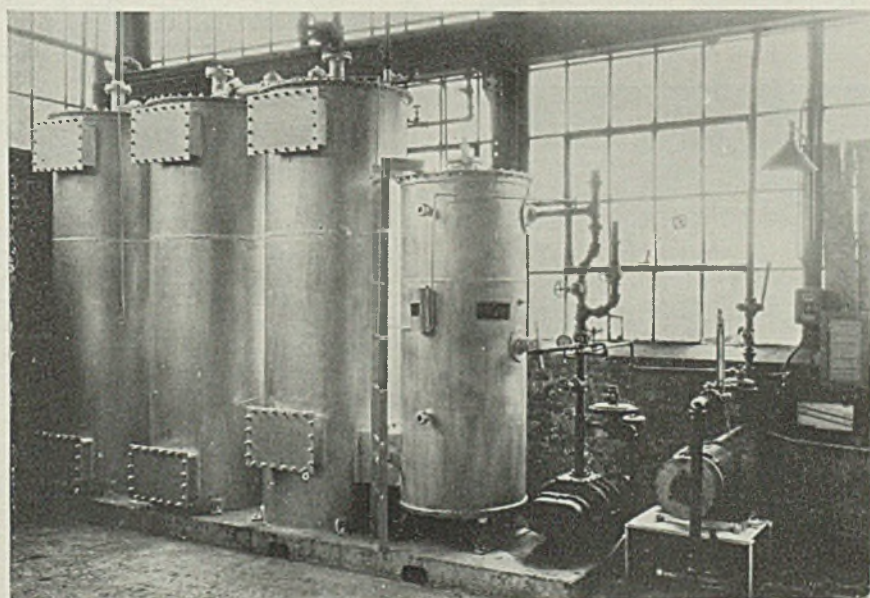
Commercial copper is one of the easiest metals to anneal and still maintain a clean bright surface. Copper, of course, will readily oxidize

### Color Changes of Copper When Heated in Air

Color	Temperature of Formation, degrees Cent.
Orange blue	200
Rose red	250
Violet	300
Steel blue	350
Brass yellow	400
Red (cuprous oxide)	450
Greenish gray	500
Gray	550
Black (cupric oxide)	600

at elevated temperatures and form two well known series of oxides, the so-called cuprous and cupric oxides. Cuprous oxide is reddish or rose color and cupric oxide is jet black. As copper is heated in air it goes through a series of color changes indicated approximately by the accompanying table. By keeping these colors in mind it is possible to tell quite accurately the temperature where oxidation forms.

Oxidation of copper in common



with steel, nickel and many other common metals is a reversible reaction which may proceed in either direction depending on the temperature of the metal and the composition of the atmosphere surrounding the metal. Thus at 1000 degrees Fahr. copper may be almost instantaneously oxidized or deoxidized on its surface, which explains the well known "running colors" observed when copper is heated in the air. In an atmosphere of air free steam, copper will remain unchanged. Clean copper will also remain unchanged when heated in an atmosphere of pure hydrogen or of carbon dioxide. In bright annealing it is desirable to have a small trace of carbon monoxide which serves to reduce copper oxide which may be present or to compensate for any traces of oxygen which may cling to the surface of metal or find its way into the heating chamber. Theoretically the atmosphere used for bright annealing copper may, if desired, be very rich in carbon monoxide or in hydrogen. Practically it is not customary to have atmospheres any richer than necessary in order to avoid having the cost higher.

#### Rich Atmosphere Embrittles

Another objection to the use of an extremely rich atmosphere in bright annealing copper is the hazard of so-called "hydrogen embrittlement" which, as pointed out above, is probably due to the reduction of minute quantities of copper oxides at the grain boundaries. This does not occur unless the atmosphere is quite rich; 2 or 3 per cent carbon monoxide in an atmosphere containing 8 to 10 per cent carbon dioxide and some water vapor is entirely harmless, but it is advisable if possible to operate with around  $\frac{1}{2}$  of 1 per cent of carbon monoxide or possibly slightly less. Rich atmospheres under certain conditions also involve explosive hazards while lean atmospheres do not.

One of the principal objections to

the use of a highly reducing atmosphere in connection with the bright annealing of copper comes from a source which might ordinarily be hardly suspected. In working copper, whether in rolling, drawing or extruding, it is naturally necessary to provide ample lubrication. Oils and greases are commonly provided for this purpose and almost no commercial oil or grease is free from sulphur. Copper is a metal which combines with sulphur with great ease and when heated with an atmosphere containing minute traces of sulphur the formation of copper sulphides will proceed very readily. So active is copper in combining with sulphur that ordinarily chemical tests for the presence of sulphur apparently are no more sensitive than the simple test of heating copper in the suspected atmosphere. This condition indicates that any atmosphere offered for bright annealing copper must be chemically free from traces of sulphur. It also follows that sulphur must not be present in any dirt or foreign materials carried into the annealing chamber. Therefore, roll oil and all lubricants must be entirely free from traces of sulphur.

It is a peculiar fact that sulphur in roll oil does not appear to be active in combining with or discoloring copper until the vapor of the roll oil has been heated to a sufficiently high temperature to crack the vapor, setting free hydrogen sulphide. Therefore the peculiar phenomena frequently is observed that when tightly coiled copper strip, containing considerable amounts of roll oil are heated to high temperatures the spaces between the turns of the coil are frequently clean and bright, even though the copper at this point is in contact with the

maximum amount of roll oil. On the other hand, the outer and inner edges of the coiled strip which are exposed to the vapors of the roll oil are considerably discolored. The explanation of this fact apparently lies in the cracking of the roll oil outside the coil setting free sulphur compounds which can discolor the copper, whereas the roll oil between the turns of the coiled strip vaporizes off without cracking and the sulphur compounds contained therein are not in a form to produce copper sulphide.

Copper sulphide stains may be recognized by the sickly greenish purple color and by the fact that the surface is not quickly cleaned with dilute sulphuric acid. Copper sulphide stains are immediately removed by passing the copper surface through dilute sodium cyanide so that these two solvents form a ready means of distinguishing a sulphide stain from an oxide stain.

#### No Alkali Allowable

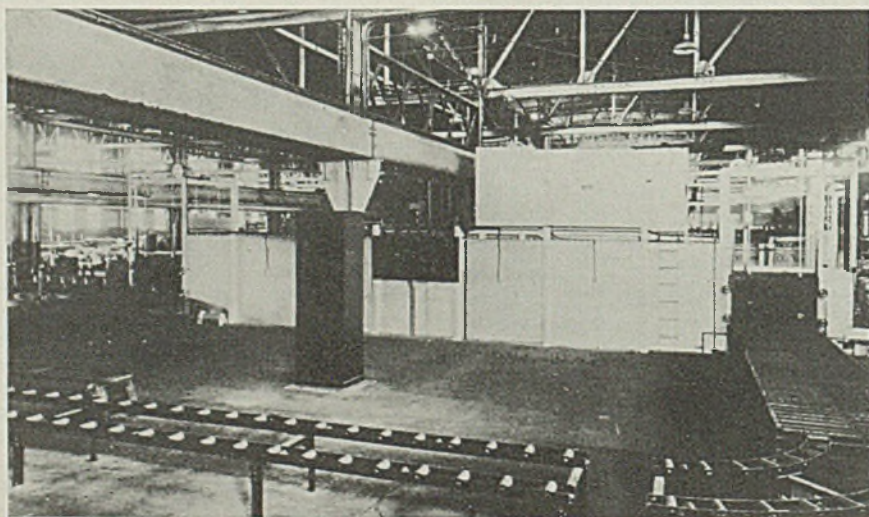
It is extremely important that the roll oil or any other lubricant contains no appreciable amount of fixed alkali as, for example, lubricating soaps. Such alkali is likely to be set free at the higher temperatures and cause considerable etching of the surface. This is more pronounced in the case of brass than in copper, but fixed alkali soaps should be avoided in annealing any of the nonferrous metals.

Modern industry has found such a widespread application of copper alloys that the mere listing of the various groups and their properties would occupy a lengthy paper. For the purposes of this discussion the characteristics of a few of the more commonly used copper alloys will be considered.

In the case of all of the copper alloys the nature of the surrounding gas must be much more accurately controlled than in the case of commercially pure copper. All of the interactions between the gas and the metal are not reversible which adds to the chemical complications. Simplest, most commonly used, copper alloy is brass, consisting principally of copper and zinc with portions of lead and other metals. Introduction of zinc into the metal immediately involves a number of complications. Unlike copper, which has an extremely low vapor pressure and is substantially non volatile at annealing temperatures, zinc has a high and ever increasing vapor pressure and is extremely volatile at the temperatures employed to anneal brass. Incidentally for complete reforming of the crystal structure, full annealing, much higher temperatures are required in the case of brass than in the case of copper. This accentuates the difficulties caused by the high vapor pressures of the zinc.

The percentage of zinc in the brass

**FIG. 5**—A typical furnace for bright annealing copper in a controlled atmosphere; products of combustion and air are prevented from entering annealing chamber



is an important factor. The so called "high brasses" containing more zinc are quite susceptible to the effect of evaporation while the low brasses are considerably more stable and approach copper in their reaction. When brass containing 25 to 35 per cent zinc is heated to annealing temperatures of around 1100 degrees Fahr. which ordinarily gives a complete reformation of the structure, very appreciable amounts of zinc will boil out of the surface. The natural result of this condition is the formation of a surface layer slightly lower in zinc than the interior. This, under ordinary conditions, is a very thin layer and may actually benefit the brass for some purposes. Careful observers have noted that absolutely clean brass, or copper, even when well lubricated is somewhat difficult to draw. Many instances are known where shipments of metals have been rejected by the purchasers because of difficulty in drawing. The metal may drag, tear or deform. Occasionally much mystery has surrounded this condition as measurements of grain size and composition have indicated that the metal was normal in all measurable ways.

#### Surface Condition Important

A great deal of data collected in practice has indicated that a rather obscure surface condition has a very marked effect on the performance of the metal in drawing or forming. Following up the line of reasoning outlined above it is the author's opinion that this surface condition is the result of at least two factors resulting from the annealing operation. One factor is the slight reduction of the zinc content of the outer surface of the metal and another factor is the formation of a lubricating layer of oxide, perhaps microscopically thin, on the surface of the metal.

An analysis of these conditions indicates that it is possible to produce a metal surface which may be too free from oxide and too clean. Fortunately such a condition is not easy to obtain. A thin skin of copper rich metal on the surface of a brass sheet may considerably increase the ductility of the surface and therefore the ability to deep draw the sheet. Minute hard cracks visible only under the microscope are, of course, the first indication of breaking or tearing of the surface during drawing and if these hard cracks can be prevented the depth of draw can be very greatly increased.

Naturally, when zinc evaporates from the surface of the brass in contact with any atmosphere containing water vapor or carbon dioxide or oxygen, zinc oxides are immediately formed. Zinc oxide is not readily reduced back to metallic zinc at the

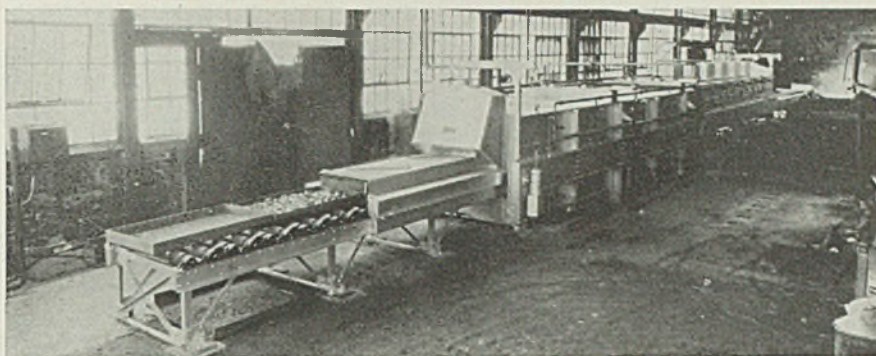


FIG. 6—A typical continuous furnace for bright annealing copper and various copper alloys

temperatures ordinarily encountered in annealing brass. Therefore, unless special precautions are taken any zinc oxide once formed will remain as a thin white powder on the surface of the metal. Experience indicates that active hydrogen, or hydrogen produced by a catalyst, will reduce zinc oxide at around 1100 to 1200 degrees Fahr. There appear to be certain materials which may be added to the atmosphere to assist this condition. The addition of refined kerosene, free from sulphur, appears to protect the surface of brass from excessive loss of zinc and permits the formation of a fairly clean bright surface. The cracking of the kerosene vapor in contact with the zinc oxide is probably the cause of this condition. Formaldehyde, alcohol and, at higher temperatures, methane and ethane will give similar results, the principle being apparently that a sufficiently high temperature must be provided to crack the protecting vapor.

As might be expected, the amount of evaporation of zinc is roughly proportional to the time that the metal is maintained at any given temperature. This indicates that best surfaces and least zinc loss will result from the quickest anneal. This factor alone would naturally lead to the suggestion of annealing brass with the maximum temperature head in order to shorten the required time. Unfortunately, the solution is not quite as simple as this because the vapor pressure of zinc rises very rapidly and much faster than the rate of heat transfer. Best results are, therefore, obtained in annealing with a thermal head ranging between 100 to 200 degrees Fahr.

In those cases in which it is only desired to relieve strains or slightly anneal metal and operating at temperatures between 600 and 900 degrees Fahr. zinc losses may be maintained quite low by careful control of atmosphere and heat distribution. Within this temperature range clean, practically unstained,

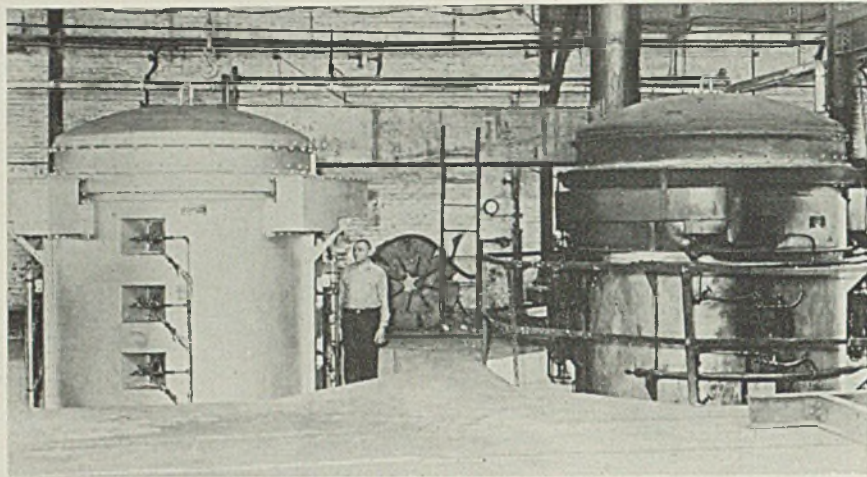
brass may be produced using an atmosphere low in water vapor and containing around 3 to 4 per cent carbon monoxide. The ratio of carbon dioxide to carbon monoxide is a vital factor and in order to obtain the best surface at temperatures of 1100 degrees or over this ratio should preferably be around 1 to 2 or 1 to 3 assuming water vapor is low.

Another factor of considerable importance in obtaining clean, unstained, brass surface is the presence of lubricating oils or greases as from rolls or drawing dies. Zinc oxide has a very marked "cracking" or catalytic action on many greases. Those containing heavier hydrocarbons or long carbon chains are likely to deposit tar or carbon when heated in the presence of zinc oxide. This accounts for the frequently observed "scallop" along the edges of coiled strip. The more readily the vapor of the roll oil or lubricants is permitted to leave the brass being annealed the less pronounced will be the formation of carbon stains.

#### Controlled Water Vapor

The surrounding atmosphere will reduce the formation of carbon stain when conditions make it possible to dilute the concentration of roll oil vapor and when the furnace atmosphere contains appreciable amounts of water vapor. Since, however, the water vapor which tends to reduce the amount of carbon stain will also tend to cause zinc oxide it is apparent that this factor must be carefully controlled and in brass the necessary adjustments are so close that water vapor ordinarily is reduced to a minimum. Carbon dioxide will operate in the same way as water vapor tending to reduce carbon stain on brass and tending to induce zinc oxide on the surface. Carbon dioxide is less active and, therefore, more readily controlled.

It might be assumed from the above statement that a rapidly circulating atmosphere would be of assistance in obtaining bright brass. If the atmosphere is carefully proportioned and maintained in accurate balance this is true, but it must be noted that if the atmosphere is not maintained at the optimum composi-



**FIG. 7**—Group of batch type furnaces used for bright annealing copper and copper alloys

tion rapid circulation will tend to increase the surface discoloration rather than to decrease it.

Considering briefly nickel bearing alloys such as copper nickel, German silver or nickel silver it may briefly be mentioned that those consisting of copper and nickel only are slightly easier to handle than brass, while those containing copper, nickel and zinc as, for example, German silver are about as troublesome as brass.

Nickel oxide will form on the surface of these alloys when heated to annealing temperatures, 1100 to 1300 degrees Fahr., unless the atmosphere is carefully balanced. The curve shown on Fig. 1 indicates the temperature range under which nickel is stable. The oxidation of nickel is a reversible reaction closely paralleling in temperatures and gas conditions the oxidation of iron. The curve shown in Fig. 2 shows the equilibrium of iron at various temperatures in contact with gases consisting principally of water vapor and hydrogen while the curve shown in Fig. 1 gives similar data on an atmosphere consisting principally of carbon monoxide and carbon dioxide. Copper is readily reduced to metallic form in the presence of any ratio which will prevent the formation of oxides in nickel; therefore, any atmosphere which will give bright nickel will permit obtaining a bright surface on copper nickel alloys.

#### Atmospheres Vary

Controlled atmospheres may be produced with many different types of equipment depending of course on the results which are desired. For bright annealing clean copper an atmosphere of pure steam will give fairly satisfactory results. If the copper is cooled down to a safe temperature, about 140 degrees Fahr. a steam atmosphere is likely to cause condensation and water stains. Copper may be clean annealed in an atmosphere consisting entirely of products of complete combustion. A furnace similar to that

shown in Fig. 3 may be used commercially for clean annealing, using only products of combustion and excluding all excess air. The surface of commercial copper heated in such a furnace will be clean and free from oxide. It will not ordinarily be polished or brilliant but it will be smooth or mat finished and in excellent condition for soldering. Such a finish is favored by roofers and metalworkers because of the ease with which cutting marks may be seen on this surface.

Where a clean, bright, shiny surface suitable for immediate shipment without pickling is desired, careful control of the atmosphere is desirable and best results are obtained by using a generator such as is indicated in Fig. 4. In this case the metal is passed through a furnace of a type similar to that shown in Fig. 5, in which the products of combustion and air are prevented from entering. The interior of the furnace is kept filled with a controlled atmosphere produced by the equipment in Fig. 4. This type of generator consists of a cracking chamber in which some form of gaseous fuel, preferably natural gas or manufactured gas, is burned with a deficiency of air.

In the case of natural gas about 8 cubic feet of air are added to 1 foot of natural gas with a corresponding amount in the case of lower B.t.u. manufactured gas. During the burning operation sufficiently high temperatures are reached to destroy or crack the so-called organic sulphur compounds such as the mercaptans. The resultant cracked gases and products of combustion are passed through scrubbing towers where they are cooled and washed and then through desulphurizing towers where sulphur dioxide is completely removed. By careful control of the size and shape of the combustion chamber and the

subsequent scrubbing and absorption, oxides of nitrogen also are removed giving a gas which is absolutely inert in connection with copper. Commercial installations prove that a generator of this type may be operated automatically to give a protective atmosphere such that the surface of copper is absolutely unchanged by the annealing operation.

Units of this type may be protected against gas and electric failures by automatic cutouts and automatic lighting equipment. They must be provided with proportional mixers in order to hold the ratio of air and gas constant over any operating range. A catalyst within the combustion chamber is of considerable advantage in reducing the size of the unit and the constancy of the resultant product. The catalyst must, however, be selected with care as otherwise a considerable amount of oxides of nitrogen may be produced.

Many types of equipment are utilized for clean annealing copper and nonferrous alloys. In general the equipment may be divided into continuous furnaces and batch type furnaces, and the nature of the material being handled, the tonnage requirements and operating conditions ordinarily will determine which type should be employed. The continuous type of furnace has the advantage in that ordinarily material is available for fabrication or shipment sooner than in the case of the batch type equipment. Fig. 6 shows a typical continuous furnace for bright annealing copper and various alloys while Fig. 7 shows a group of batch type furnaces for the same purpose. Continuous furnaces may be provided with wire mesh or roller hearth conveyors. Walking beams, drag chains and other types are also frequently employed.

#### Cooling in the Furnace

It will be apparent that in order to obtain a clean surface in the finished metal, the material must be cooled within the furnace before being exposed to the air. Cooling is best accomplished by rapidly circulating the furnace atmosphere through cooling devices and around the material being heated. Special water cooled radiators have been developed for this purpose and have proved highly satisfactory. With the proper equipment cooling may be accomplished in approximately twice the time for heating. Some of the less efficient cooling devices require greater time intervals up to two and one-half or three times the heating period.

Furnaces for clean annealing may be divided into two general classes from the standpoint of atmosphere application. The type quite frequently used consists of a tightly closed chamber filled with special inert atmosphere generated in an

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external gas unit as shown in Fig. 4. With this type of equipment it is possible absolutely to control the composition of the atmosphere within the furnace at all times if proper sealing means are provided for the doors. A furnace of this type ordinarily employs either an entering and leaving vestibule with interlocked doors at each side or a thermal trap so arranged that the point of entrance is well below the level of the hot gases within the furnace. This type of equipment, example of which is shown in Fig. 6, gives close control of furnace atmosphere and to this extent is highly satisfactory. Unless careful provision is made, however, roll oil and other impurities are likely to accumulate within the heating or cooling chamber in the form of vapors and considerable discoloration to the outer copper surface may be experienced. Proper venting of the atmosphere will do much to overcome this difficulty.

The other type of clean annealing furnace which is of particular advantage for copper or copper nickel alloys depends on control of the combustion equipment for the generation of an inert atmosphere. When applied to sheets or strips this furnace is very successful in giving a clean bright surface free from marking and in condition for ready absorption of solder. Sheets of this kind may also be further drawn, rolled or shaped without cleaning or pickling.

Furnaces of this type have the advantage that the end of the fur-

nace may be kept open for loading and unloading as the outgoing products of combustion will serve to prevent the entrance of an excessive amount of room air to oxidize the metal. Furnaces of this type, in which the outgoing metal is cooled with a water spray, are very economical and quite rapid in operation. The surface of copper articles passed through such a furnace may be quite accurately controlled to give any desired finish.

Batch type furnaces for clean and bright annealing have a wide application largely because they are economical in both fuel and controlled atmospheres and are really low in first cost. Fig. 7 shows a group of pot type bright annealing furnaces each having capacity for 10,000 pounds of coiled copper strip and producing bright metal at a rate of around 3000 pounds per hour. Furnaces of this type are quite economical in first cost and ordinarily will give cleaner brighter surfaces than many of the conveyor furnaces owing to the tendency for sulphur compounds to accumulate in the conveyor type furnace.

The pot type or batch type bright annealing furnace is not more extensively used largely because of the slow cooling rate of the metal within the pot. This may be accelerated by forced cooling from the outside of the pot or by a cooling

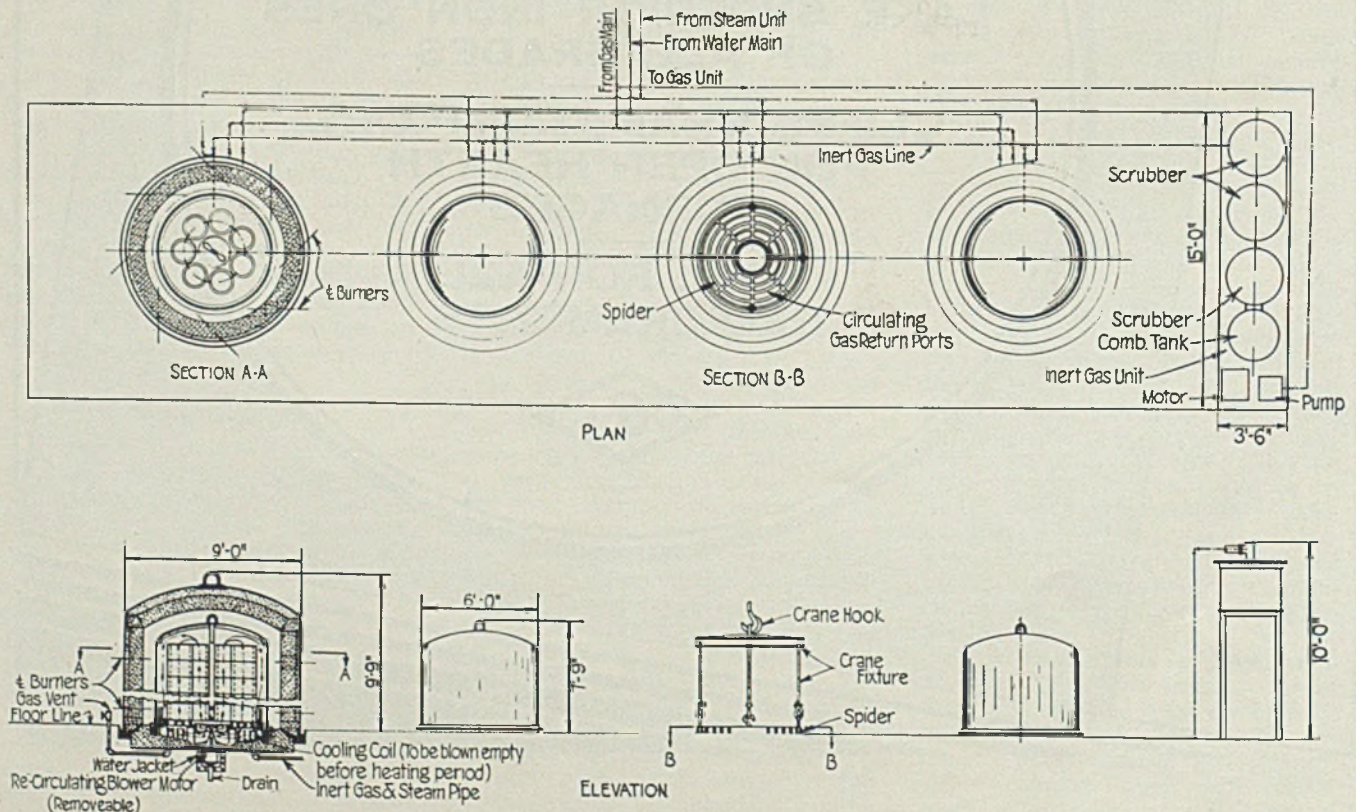
fan system located in the base of the pot. Fig. 8 shows a diagram of a typical pot furnace of this type.

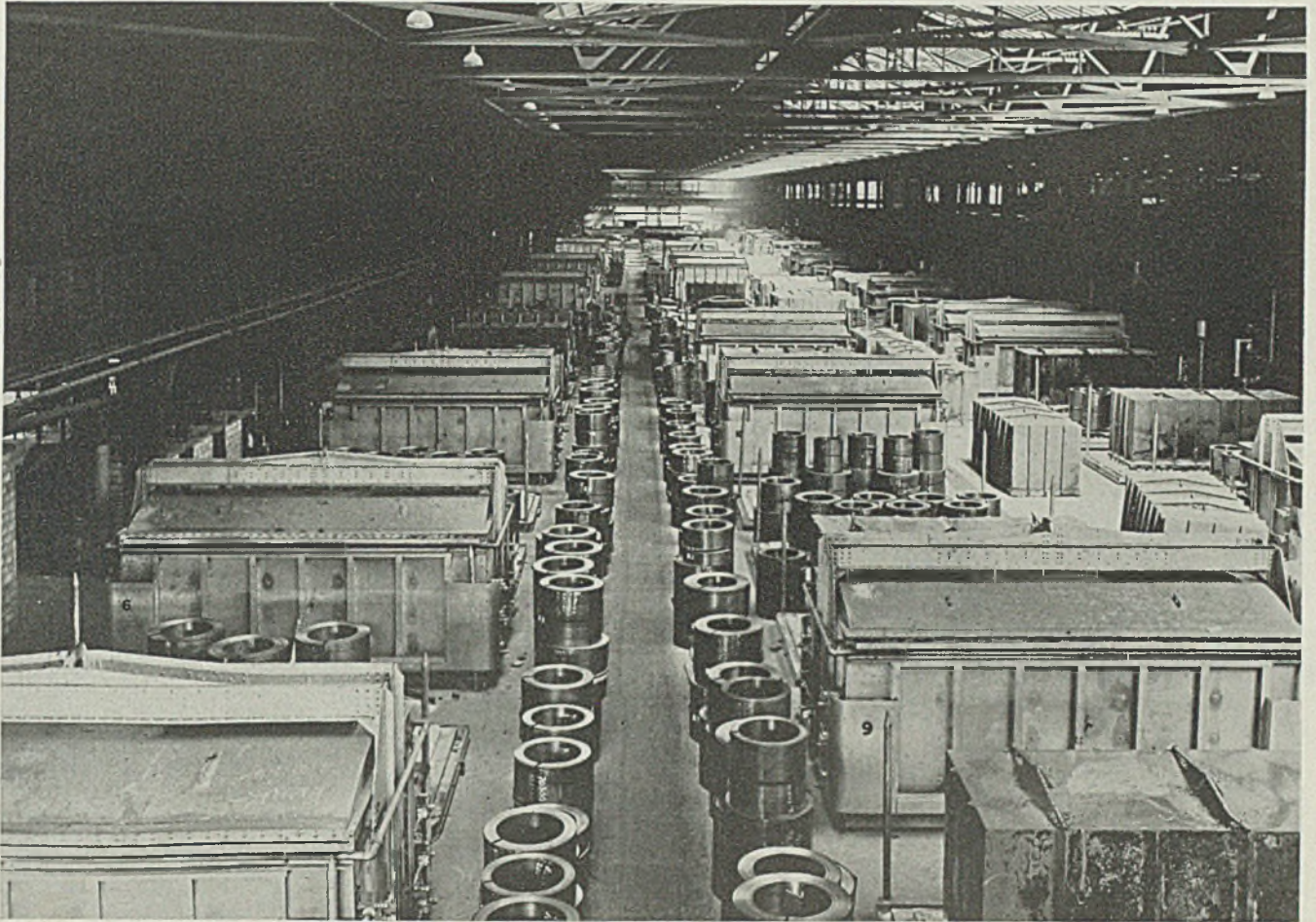
## Presents Data on Hot Blast Stove Construction

How a greater heating capacity of blast furnace stoves may be obtained at a decreased cost is outlined in an eight-page bulletin recently issued by the William M. Bailey Co., Magee building, Pittsburgh. Discussion includes brick designed for different zones in a stove such as the inlet, top, straight and ribbed checker brick. A plan view of a welded stove shell shows the various type checker brick and incorporates the weight of brick shapes, square foot of heating surface per cubic foot of volume and the weight of brick per square foot of heating surface.

Cross-sectional views of various shapes as laid in a 24-foot stove and an illustration of four types of checkers stacked in the order in which they would be placed in a stove, depict how low labor cost is obtained, channeling eliminated and maximum heating surface secured. General factors involved in lining hot blast stoves also are considered. A section of a steel bottom of a blast furnace hot blast stove of the side-combustion type shows how from 30 to 35 tons of standard rolled steel products may be used instead of brick.

FIG. 8—Diagram of the typical pot or batch type bright annealing furnace





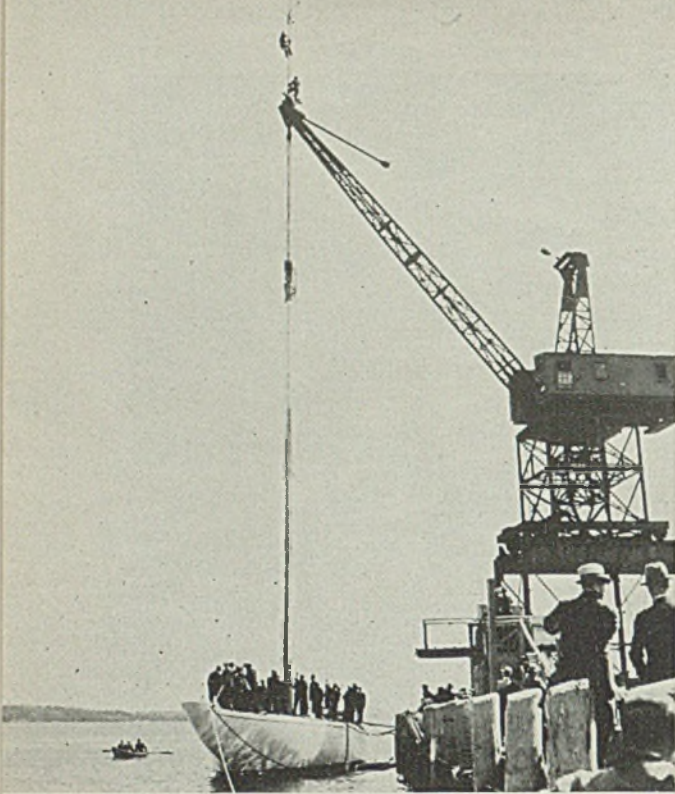
*Battery of Swindell Furnaces in large midwestern Strip Mill*

# SWINDELL

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PITTSBURGH, PA.

# Racing Yacht Uses Arc Welded Steel Construction



**FIG. 1**—"Stepping" the 165-foot duralumin mast of the America's cup defender RANGER. Fittings for the mast were arc welded

**L**ATEST advanced principles of yacht design and construction, including all-steel fabrication and extensive use of arc welding, are embodied in the racing yacht RANGER, just selected to defend the America's cup against the British contender in competition starting July 31. Built for Harold S. Vanderbilt by the Bath Iron Works, Bath, Me., the yacht was designed by W. Starling Burgess, designer of last year's cup winner RAINBOW, as well as the previous ENTERPRISE. Mr. Burgess' father, before him, designed three America's cup winners.

RANGER, shown in Fig. 1, is 135 feet 5 1/4 inches long overall, 87 feet at the waterline, 21 feet maximum beam and 15 feet draft. Her mast, 165 feet tall, 22 x 14 inches at the base and 11 x 7 inches at the top, will carry between 6000 and 7000 square feet of main sail. Minimum weight and strength to withstand the heavy stresses of this tremen-

dous sail area were obtained by fabricating the mast of duralumin and arc welding its fittings.

To counterbalance draw of the sails, the yacht has a lead keel weighing 110 tons, heaviest ever used on an America's cup boat. This weight is held in place by a flat keel plate of arc welded steel to give the required strength without extra weight. The stresses to which the mast and keel plate are subjected when the RANGER is underway with all sails drawing are terrific. The

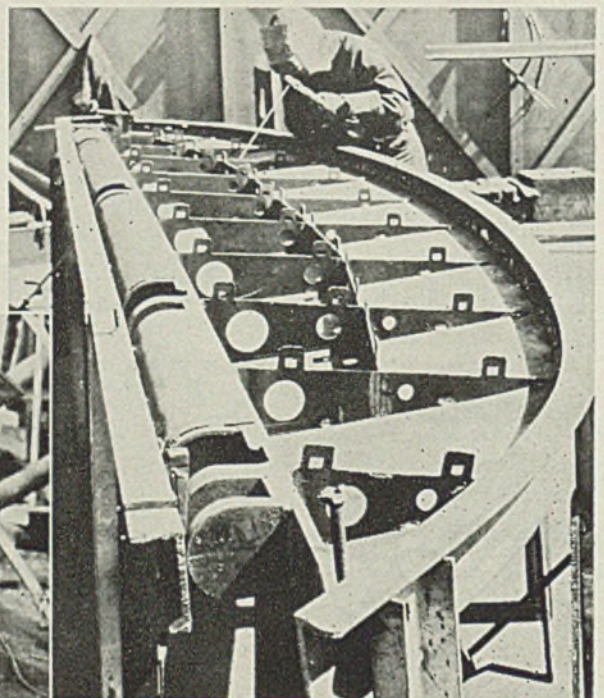
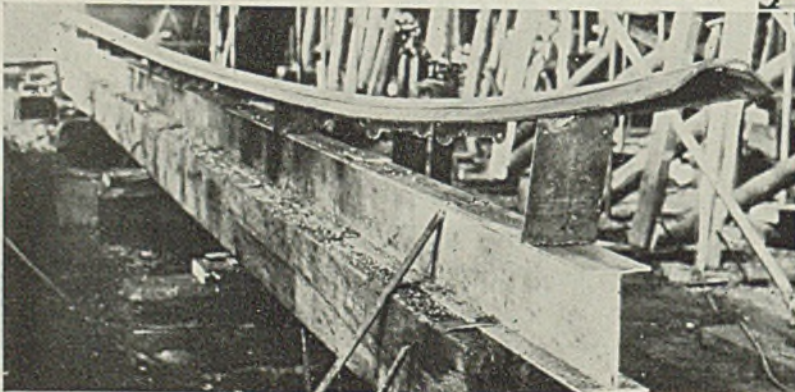
force applied by wind against the sails pushes the mast one way; the 110-ton keel, pulled downward by gravity, pushes the opposite way.

In addition to mast fittings and keel plate, RANGER's stem, rudder and stern frame are arc welded for greatest strength per pound weight. The stem, Fig. 2, is fabricated of three plates, 48 feet long, 4 1/4 inches wide and 5/8-inch thick. Use of welding made it possible to fabricate the stem to conform exactly to lines of the hull.

The rudder, another part of the structure which must resist extreme stresses, is entirely weld fabricated. It is 13 feet long and has a 4-foot maximum width. Construction is evident from Fig. 3. It consists of various steel shapes and plate cut to conform to designed size and form, then fused into a single unit by the electric arc. The stern frame was fabricated entirely from flat steel plates welded together.

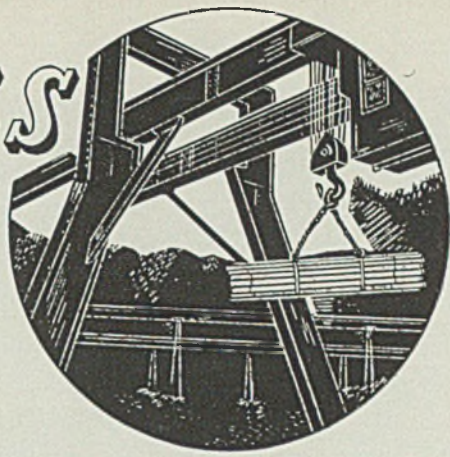
Welding was performed with the shielded arc process of the Lincoln Electric Co., Cleveland.

**FIG. 2 (below)**—The stem was fabricated by arc welding together three steel plates. Fig. 3 (right)—The rudder is of welded construction for maximum strength and minimum weight. Photos courtesy Lincoln Electric Co.





# MATERIALS HANDLING



## Small Parts Handled in Large Lots

**A**LTHOUGH individual items manufactured in the plant of Edward Katzinger Co., Chicago, are light, in most cases weighing only a few ounces, the large quantities in which the work is produced makes desirable the handling of the parts in fairly large containers. This plant is engaged in the manufacture of bakers' pans and kitchenware from tinfoil; miscellaneous kitchen tools, such as egg-beaters, strainers, can openers and knife sharpeners; other items of tinfoil, wire and heavier gage

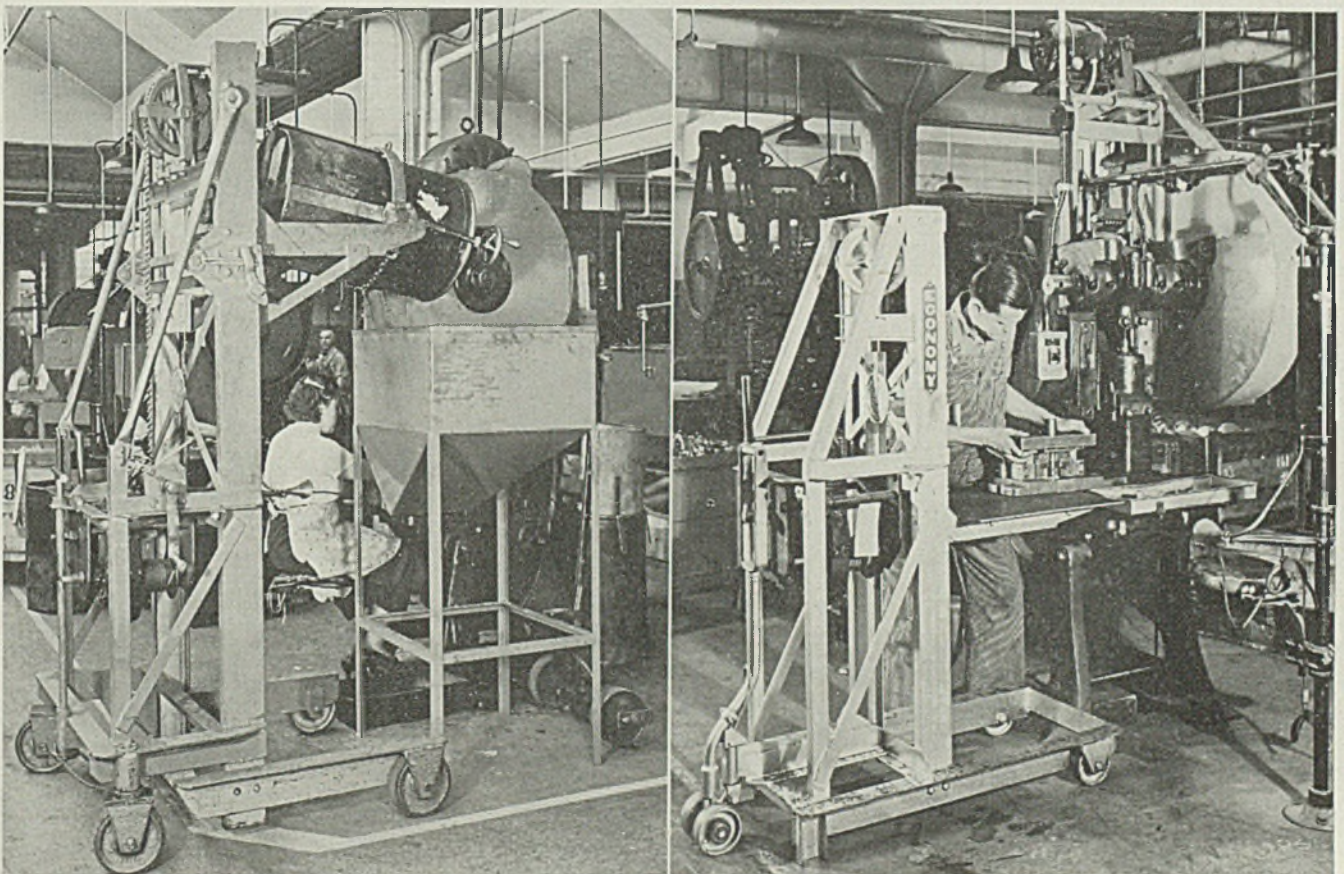
sheets; and a line of kitchen cutlery for mail order houses and variety stores.

Kitchen and bakers ware of tinfoil, such as pie, cake, bread and muffin pans, nest instead of bulking up as processed. As a result, the loads become extremely heavy. In

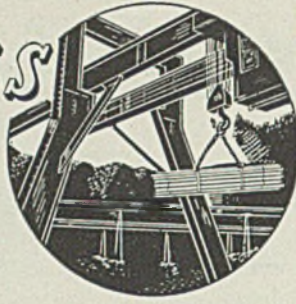
the case of rectangular pans which are nested, a pile is almost solid.

The practice, however, is to process complete or as nearly complete as possible in a single operation or in machines set in sequence and in some cases tied together to operate automatically and in synchronism.

**T**HE hand-operated tier lifter or portable elevator, shown at the left, is adapted to dumping steel barrels containing parts into work hoppers at presses and other machines in the kitchen-ware manufacturing plant. Illustration at the right shows the hand-operated tier lifter used for handling dies between storage and presses. The table can be adjusted accurately to pressed level. Photos courtesy Economy Engineering Co., Chicago



# MATERIALS HANDLING



large box trucks supported on casters. Usually the distance traveled is short and the truck is pushed to its destination. Similar trucks are utilized to receive the finished items for transfer to storage. For long distances of travel these box trucks may be handled on the electric fork trucks.

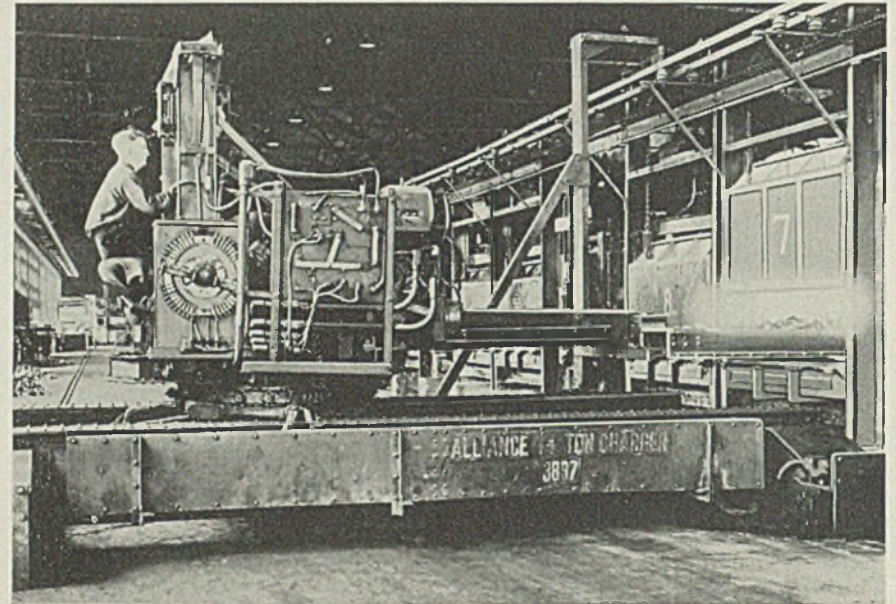
Heavy wire parts and processed pieces of heavy-gage steel are han-

OPERATED by the man in the control seat, the machine shown here picks up heavy trays of Dodge truck parts and places them in the heat treating furnaces. The steel arm at the right is inserting a tray of parts in one of the furnaces. Moving quietly back and forth in performing its daily duties, the machine appears almost human. Similar in many respects to the well-known open-hearth charging machine used in steel plants, the unit was built by Alliance Machine Co., Alliance, O.

This decreases the amount of rehandling so that in some cases the total handling consists in taking the tinplate to the machines and carrying away the scrap and finished, sometimes also wrapped, products.

## Coiled Stock Preferred

Incoming tinplate in bundles or boxes as well as wire and steel strip in coils, are received at the plant in freight cars. This material is unloaded by electric tiering trucks equipped with forks and trans-



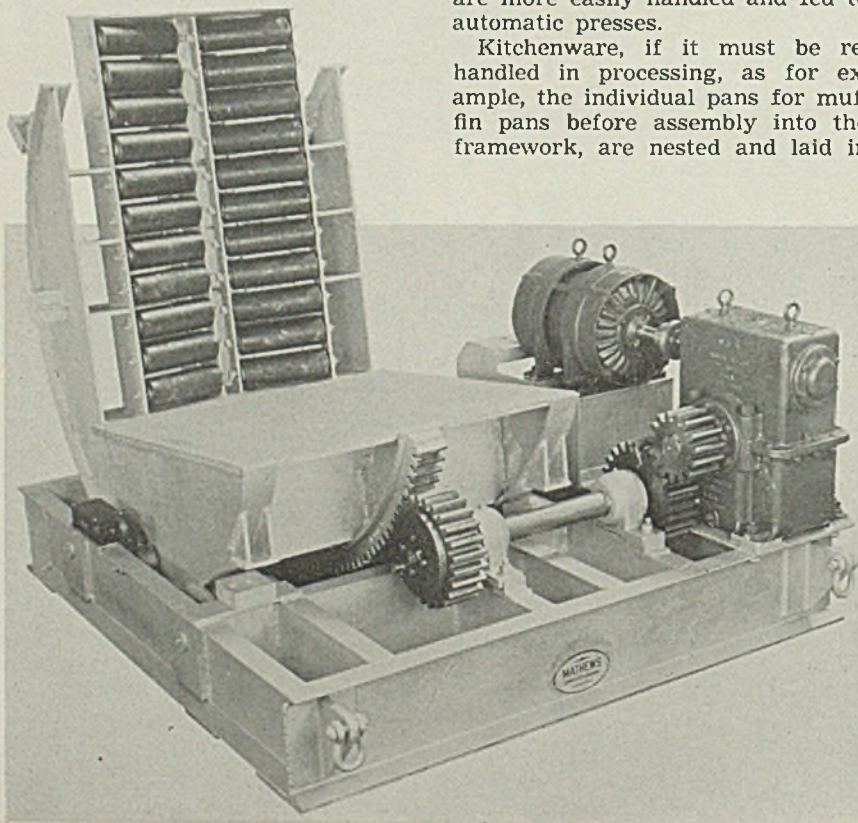
ported and piled in the warehouse. These trucks also deliver this same material as needed to the machines. As much of the material as possible is purchased in coil form since coils are more easily handled and fed to automatic presses.

Kitchenware, if it must be rehandled in processing, as for example, the individual pans for muffin pans before assembly into the framework, are nested and laid in

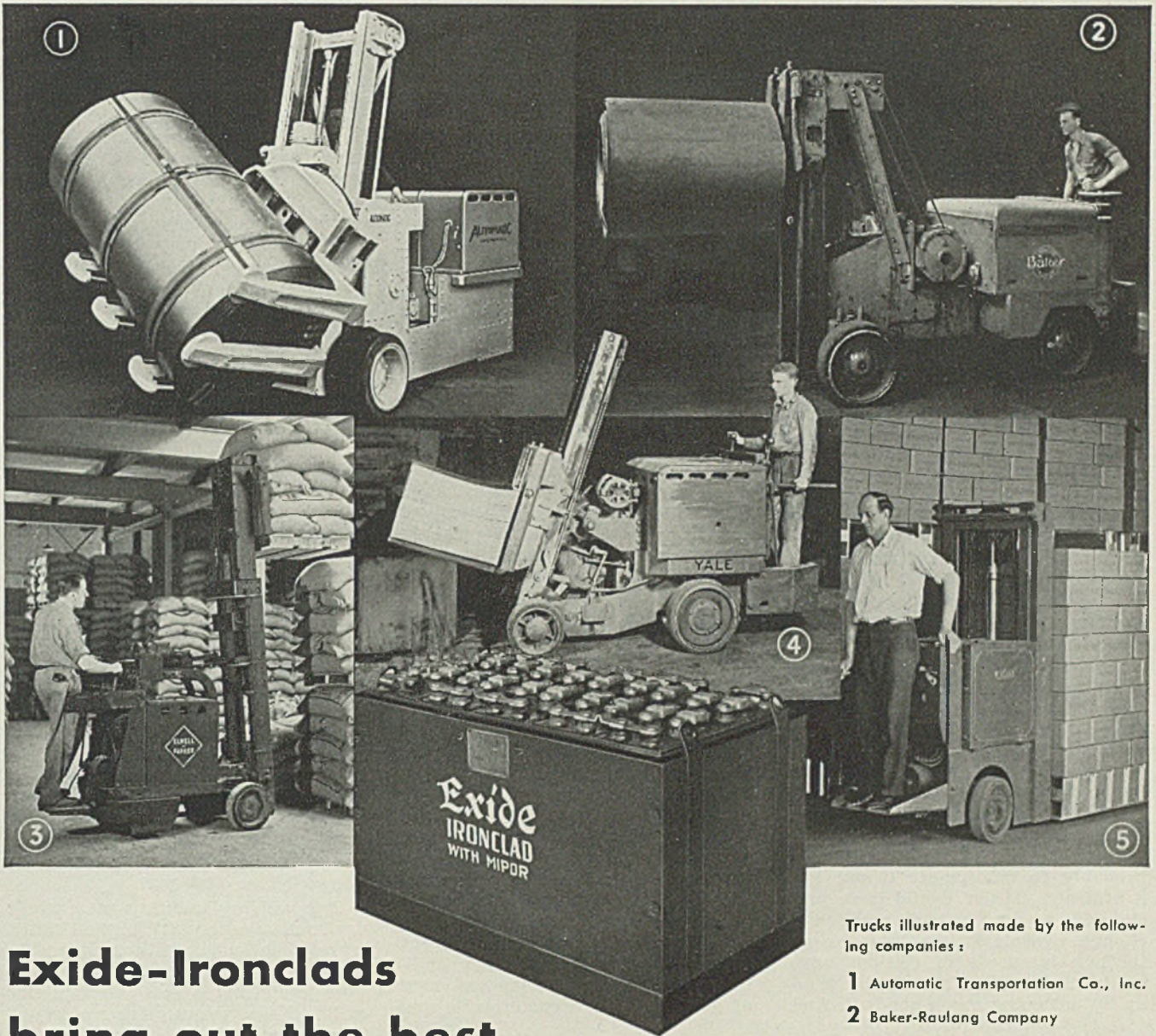
dled in steel barrels which hold several hundred pounds of parts thus permitting long runs between changes. These barrels are handled by a special tier-lift or portable elevator, shown in an accompanying illustration, which lifts the barrel and dumps its contents into special hopper benches at the riveters and other machines where assembly or other operations are performed.

## Portable Lifter Used

This portable lifter, which is of welded construction, has a capacity of 1000 pounds with a lift of 5 feet. The overall height is 8 feet, but the top is hinged to permit passage of (Please turn to Page 68)



RECENTLY developed is the portable coil upender for use in one of the steel mills in the Chicago district. This unit, shown in this illustration, is designed to receive coils from a crane, upend them and discharge them in such position that they may be picked up by the mandrel of a ram truck. The coils handled weigh 7000 pounds and are 38 inches in diameter. The receiving section of the upender is a 1-inch flat steel plate, while the discharge section is a section of troughed roller conveyor. Power is supplied by a 7½-horsepower motor coupled to wormgear speed reducer, eight seconds being required to upend a coil and to return to the receive position. The unit is equipped with lift shackles so it may be handled by a crane. Photo courtesy Mathews Conveyor Co.



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- 2 Baker-Raulang Company
- 3 The Elwell-Parker Electric Company
- 4 The Yale & Towne Manufacturing Co.
- 5 Mercury Manufacturing Company

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assures productive speeds every hour of the day.

Exide-Ironclads not only speed up production—they cut costs. This is because of their long life, proved by the experience of hundreds of plants working to the limit of capacity. And economy is further increased by the low cost of battery maintenance. Let Exide-Ironclads speed up your material handling service and cut costs. Write for new free booklet, "Material Handling Systems and Equipment."

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# WELDING, ETC.

BY ROBERT E. KINKEAD

## Current Commentary

**T**ITLE at the head of this column indicates that welding is the principal subject of it but the Etc. covers a good deal of territory which may be commented on in the best traditions of column conducting.

Whether it is the result of the chicken dinner, the beer or hot weather, it seems to us that the state of the country's security is pretty high in this summer of 1937. It cost too many lives of course for John Lewis to find out what old Sam Gompers knew 30 years ago, namely, that the one big union scheme won't work. But eventually it would have cost many more lives if our government had been sufficiently lawful and military to have slapped him down before he had a chance to try it.

By labeling the President's attempts at judicial reform "packing the court" an opportunity was presented to get public and Congressional reactions to the scheme and probably to emasculate if not kill it entirely. Hitler would have proclaimed a decree and made the change overnight; we have to go through hundreds of editions with big black headlines and finally wind up by not doing much about it. And

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**I**N 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.

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there seems to be no alternative to this blundering inefficient way of doing things if we are to preserve the liberty and freedom of action that are our most treasured traditions. The law is less of a restraint in our country than in any major country in the world and therein seems to lie our stability and security. Seriously restrained and suppressed people are always dangerous.

Job insurance and old age pensions are in for a trial on a national scale and at least something will be gained although certainly not as much as might be hoped. The economic royalists have been properly scolded but we still need competent men to operate large enterprises. Perhaps the net result will be to inhibit some of their sins without losing the national use of their abilities. With our traditions and kind of government we compromise and

do the best we can under the circumstances.

The immediate likelihood of war is very remote. Eventually we will find ourselves in another war; probably grossly unprepared, but full of enthusiasm and strength. No one seems to have a sensible idea as to how it can be avoided but the wildest crackpot on the subject of no more war is doing his country a service by expounding his views, whatever they may be.

Our national security is high because individually and collectively we are fairly free to try any kind of a scheme to better ourselves. It is the round-about, inefficient and blundering way, but, in looking the situation over, it has proven to be the safest.

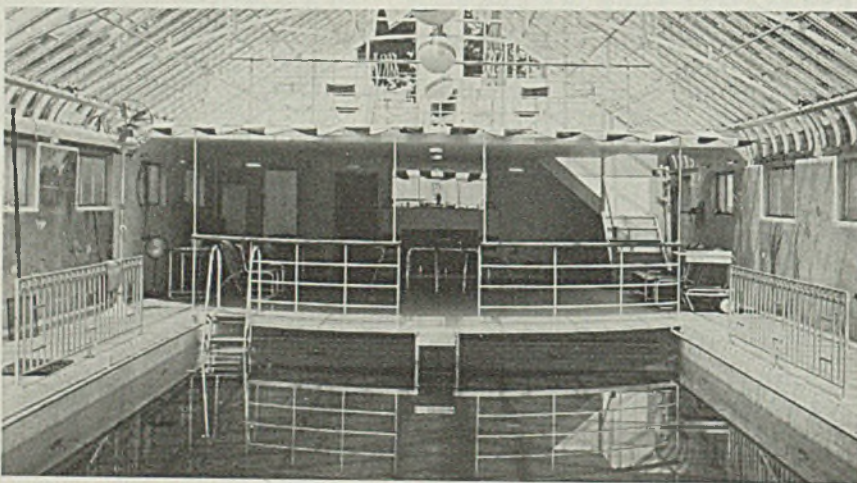
## Design of Welded Piping

**A** TEXT book of the above title which has recently been published by The Linde Air Products Company, is authoritative and complete. The book is suitable for use by engineers and craftsmen who deal with welded pipe as well as schools which teach the subject of pipe welding. While the text deals only with the oxyacetylene welding process, since it is published by manufacturers of such equipment and compressed gases, it is a credit to the industry and the publisher in that it presents readily usable information on every phase of the subject of pipe welding with the oxyacetylene blow pipe.

The welding industry as a whole leads the country in the publication of information as distinguished from competitive claims. Its great success is due in no small part to this policy. Each manufacturer of standing accepts it as a duty to publish as much information as possible about what his equipment and process may be used for and precisely how successful results may be obtained. It is more than a coincidence that the conspicuously successful companies are those which supply the most information on the processes they sell. Such competition is deadly to the fellow who shouts the merits of his equipment from the housetops and "knocks" the equipment of other manufacturers in the same field.

It has long been a source of wonder to many business men why the "God's sakers" in Washington who are continually trying to save the country from "cut-throat" competition do not spend some of their time tabulating the results of competition as practiced by the outstandingly successful companies and the kind practiced by the chiselers. If the financial facts were published, there would probably be no need for laws on the subject.

## Steel Pool Is Arc Welded



**T**HIS Floridian paradise is an all arc welded steel swimming pool in an Ohio city. The pool itself is 30 x 40 feet and there are also three dressing rooms, a shower room, upper deck and roof garden. An all-welded steel boiler keeps the pool at the desired temperature during the winter



“Fur,” *said the Deacon,*  
“’t’s mighty plain

thut the weakes’ place  
mus’ stan’ the strain..”

*That strengthening of vital parts  
is the job U·S·S Carilloy Alloy Steels are  
designed to do*

HE was born 200 years too soon—that delightful deacon who built the famous one-hoss shay—for he was an engineer at heart. With his penchant for making each part “uz strong uz the rest” he was doing just the job that automotive engineers are accomplishing today with such outstanding success.

And the parallel does not stop there.

When the deacon “inquired of the village folk” he was going to headquarters for help and cooperation in finding better and stronger materials, just as automotive engineers are when they call in alloy specialists from the metallurgical laboratories of Carnegie-Illinois.

When he selected “crossbars of ash from the straightest trees” and “steel of the finest, bright and blue” he was exercising the same painstaking selection of materials as automotive engineers when they specify carefully developed grades of U·S·S Carilloy Alloy Steels to strengthen vital parts.

Their new 1938 models will be no less outstanding than the deacon’s masterpiece, because today’s conception of fine performance includes both long life and that smooth, trouble-free joy of driving which makes a hesitant prospect decide to trade.

We salute these ingenious automotive engineers—the modern prototype of Holmes’ ingenious Deacon.

We take pride in supplying them with the finest alloy steels it is now possible to make, for strengthening the vital parts in their designs. We take pleasure in working with them, to develop even finer alloy steels to achieve new heights in smooth performance.

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*Pittsburgh and Chicago*

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**S T A T E S                      S T E E L**



# *SURFACE TREATMENT AND FINISHING OF METALS*

## Finishing Operations Account for Almost Half of Plow Production Cost

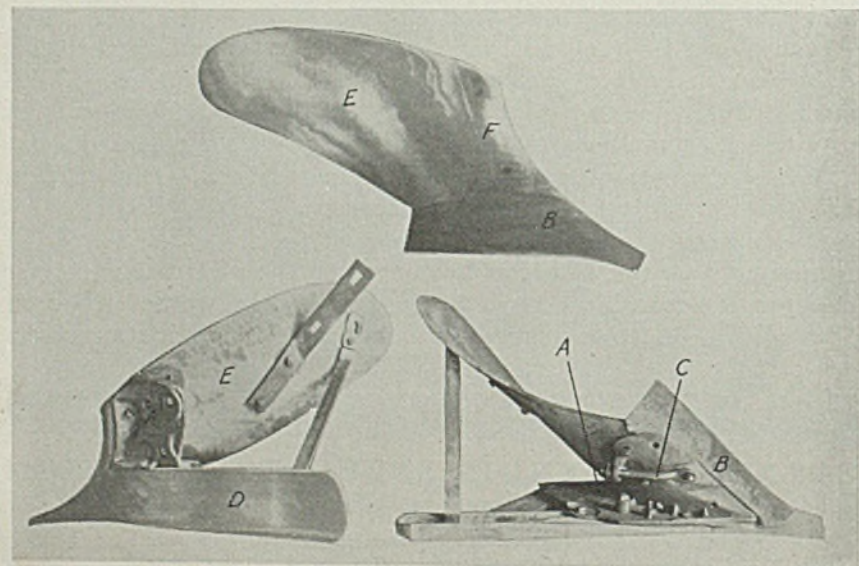
**P**LOW manufacturers are confronted with three major problems—they must design plows for turning effectively all types of soil; they must make a reliable product at a price which will command sales in a highly competitive market; and their product must be finished attractively. Not the least of these three problems is that of finishing. To state that the average agriculturist admires artistically finished implements may seem overdrawn, but the fact remains that he will not buy a plow which does not have an expensive finish.

Grinding and polishing operations predominate in finishing the several components which are assembled into the plow base. These parts are

shown in an accompanying illustration as manufactured by Syracuse Chilled Plow Co., Inc., Syracuse, N. Y., a subsidiary of Deere & Co., Moline, Ill. Referring to this illustration, A is the frog to which the other parts are joined. This part is made from high quality malleable iron and the accuracy of its angles and curvatures is assured by dropping it in dies.

At B is shown the plowshare, bolted to the frog. It is a chilled iron casting of special composition. It must be exceedingly hard and at the same time tough enough to withstand severe usage. In this particular design the point is held in place with a simple and ingenious device. Referring to the illustration,

it is shown that the eyebolt C hooks over a projection on the point and when the nut is set up the point is



**T**HE large number of polishing wheels used in plow finishing necessitates a special department in which wheels are set up by skilled operators

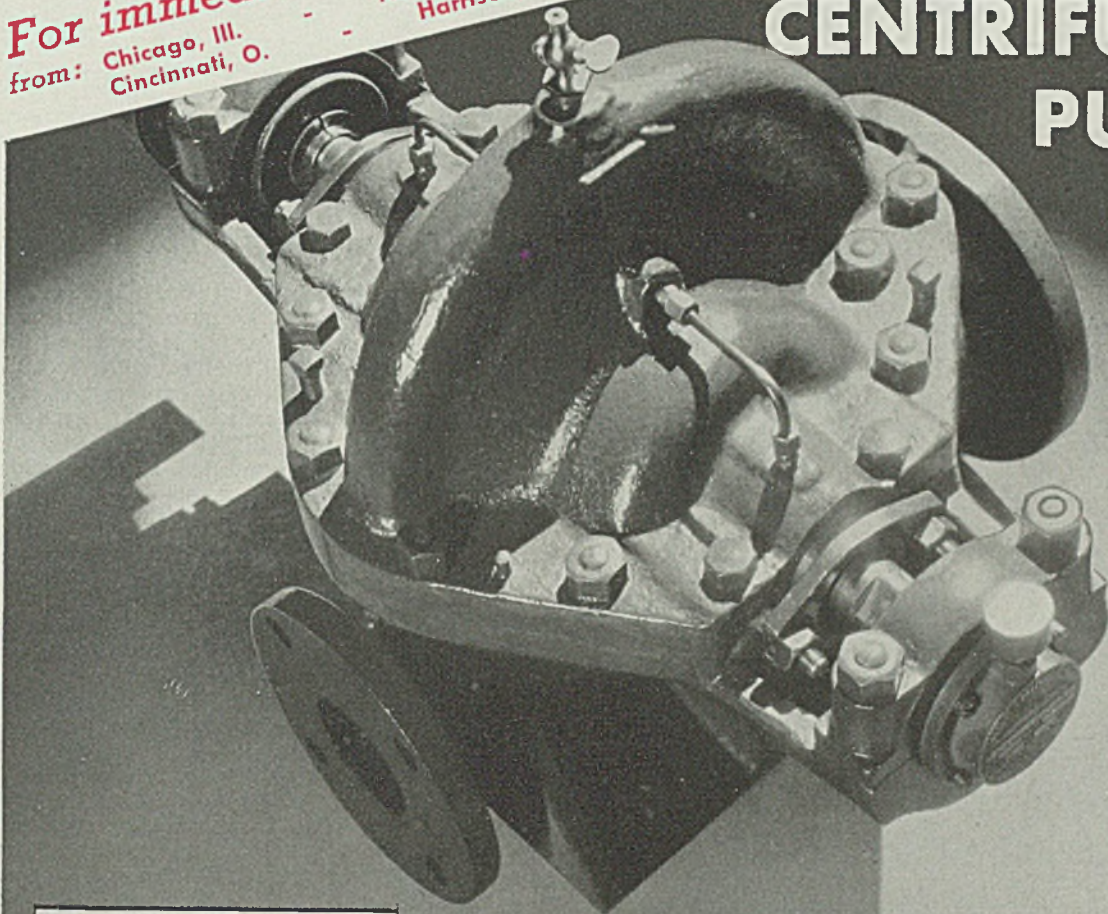
**I**LLUSTRATED here is a modern plow and the manner in which its component parts are assembled

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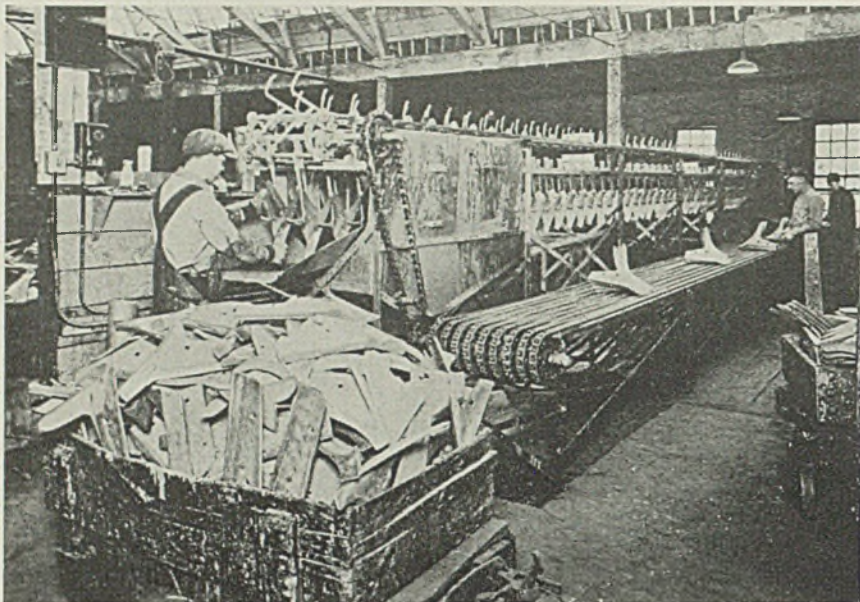
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drawn back securely in place. At D is shown the landslide. This part also is chilled iron and is called the landslide because it works against the straight side of the furrow. The moldboard is shown at E. This unit turns the furrow over. Moldboards are chilled iron or special plow steel, depending on the variety of soil to be plowed. The moldboard is bolted to the frog. The part shown at F is called a shin piece and is not found on all plows. In reality it is an auxiliary to the point as it cuts the furrow before the moldboard turns it over. The piece also is chilled iron and is bolted to the frog. The entire plow base is fastened to the plow beam which can be wood, cast iron, or high grade carbon steel.

#### Castings Inspected Rigidly

Finishing operations on plow parts begin directly after the castings are shaken out of the sand. From the foundry the castings go to the mill room where they are rattled in tumbling barrels to clean them thoroughly from sand. Then follows the first inspection. Defective castings are discarded while those that pass inspection are sent to the trimming room. Here the moldboards, points, shin pieces and landslides are ground to fit templates and gages which insure accuracy of assembly. The work of fitting is of utmost importance since many of the units are sold as repair parts.

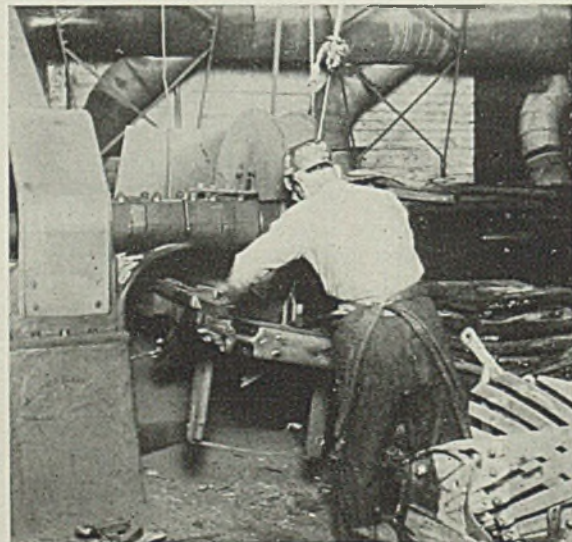
Plow surfacing is divided into two general operations, the finishing of completed plow bases and the surfacing of the units separately when they are to be sold as repair parts. Views of surfacing operations are shown in accompanying illustrations. Operators locate the work on cradles which are free to be passed under the wheel. This is called the American method and was devel-

oped over fifty years ago by the Safety Emery Wheel Co., now called the Safety Grinding Wheel and Machine Co. The plow grinders are substantial units, carrying grinding wheels 30 inches in diameter, 3-inch face, 24 grit, P grade, universal scale. These wheels operate normally at a surface speed of 5000 feet per minute and an adequate exhaust system is provided to carry away the abrasive dust. While the operation appears to be simple, in reality considerable practice is necessary to turn out first class work since the grinder is working on curved surfaces.

Both repair parts and complete plow bases must be highly polished to bring out an attractive finish and to insure that the plow will work satisfactorily with a minimum draft.

The setup for polishing does not materially differ from that followed in grinding as the same type of machines are used and the holding

**METHOD** of grinding plow parts shown here is known as the "American method". Considerable skill is required to manipulate the cradle under the wheel and produce a smooth curved surface



**A**LUMINUM paint is applied to repair parts in this automatic paint spraying machine. Painted parts are discharged at right where operator stencils them with company's name, part number and designation

devices are the same. A plow polisher at work is shown in an accompanying illustration. The polishing wheels are made of heavy canvas stitched sections which are riveted together to form a wheel of desired width. These wheels are designed especially for plow work. When the wheel is worn down to one annular row of rivets they are removed and operations continued. The wheels are 24 inches in diameter and have a 3-inch face. Two grits are used. Parts are first polished with No. 24 material and then finished with No. 60 grit. The abrasive used is alumina.

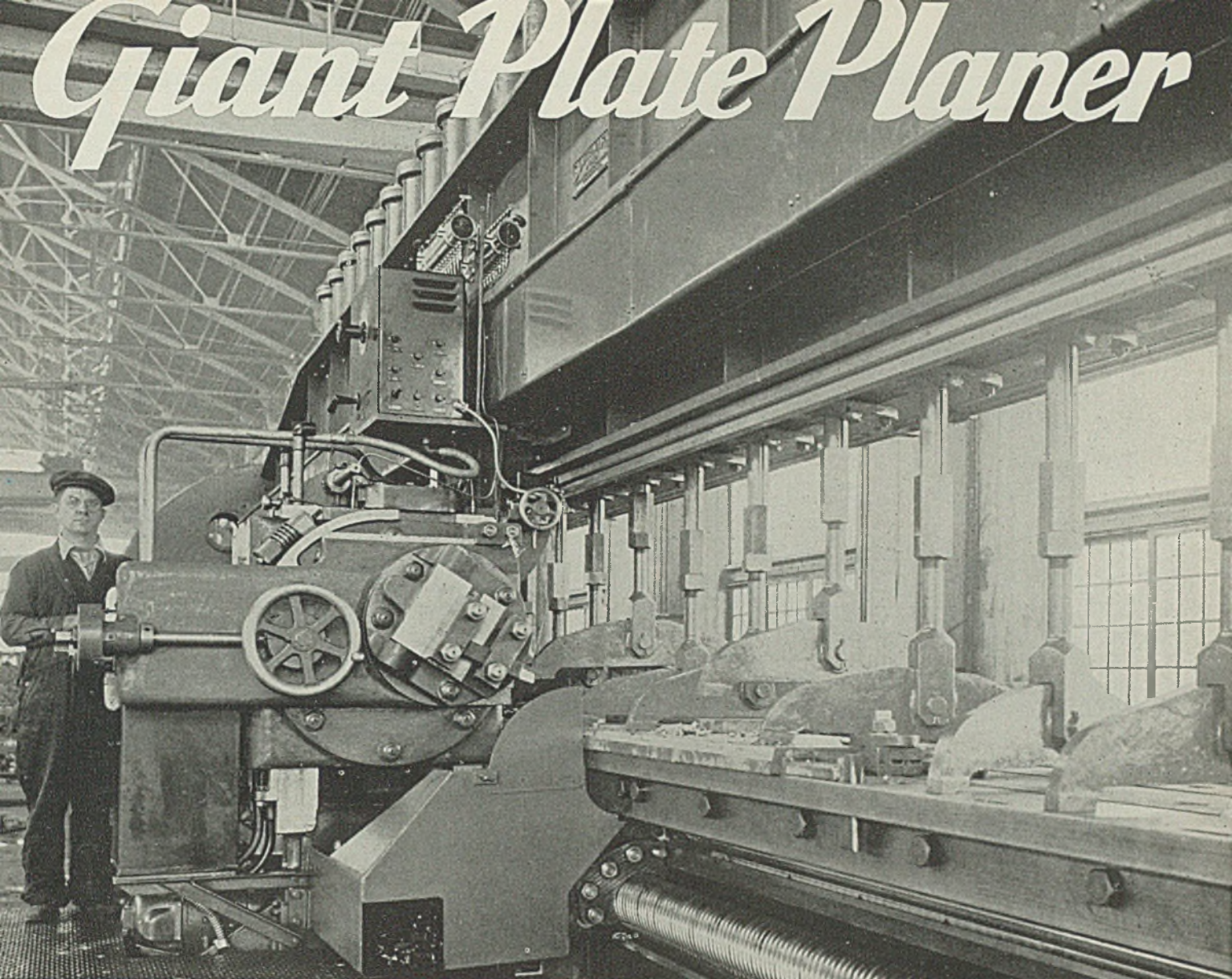
Mention should be made of an operation technically termed plow-point grinding. It consists of grinding the front edge of the share to a fairly sharp edge so it will cut the soil freely. If the point is dull, either when new or through continued use, excessive draft is necessary to pull the plow and an inferior furrow also results. This operation is a simple hand grinding job done on a silicon carbide wheel, 18 inches in diameter, 2-inch face. This wheel is operated at a surface speed of 5000 feet per minute and is adequately guarded. Grinders and polishers throughout the plant are required to wear goggles of the latest approved type.

Final finishing operation is painting. Parts to be painted are hung on hooks, dipped in tanks, the tops of which are level with the floor, removed and run aside on overhead trolleys to dry. In general these parts receive a flat color followed by a dip coat of varnish. Red and

*(Please turn to page 64)*



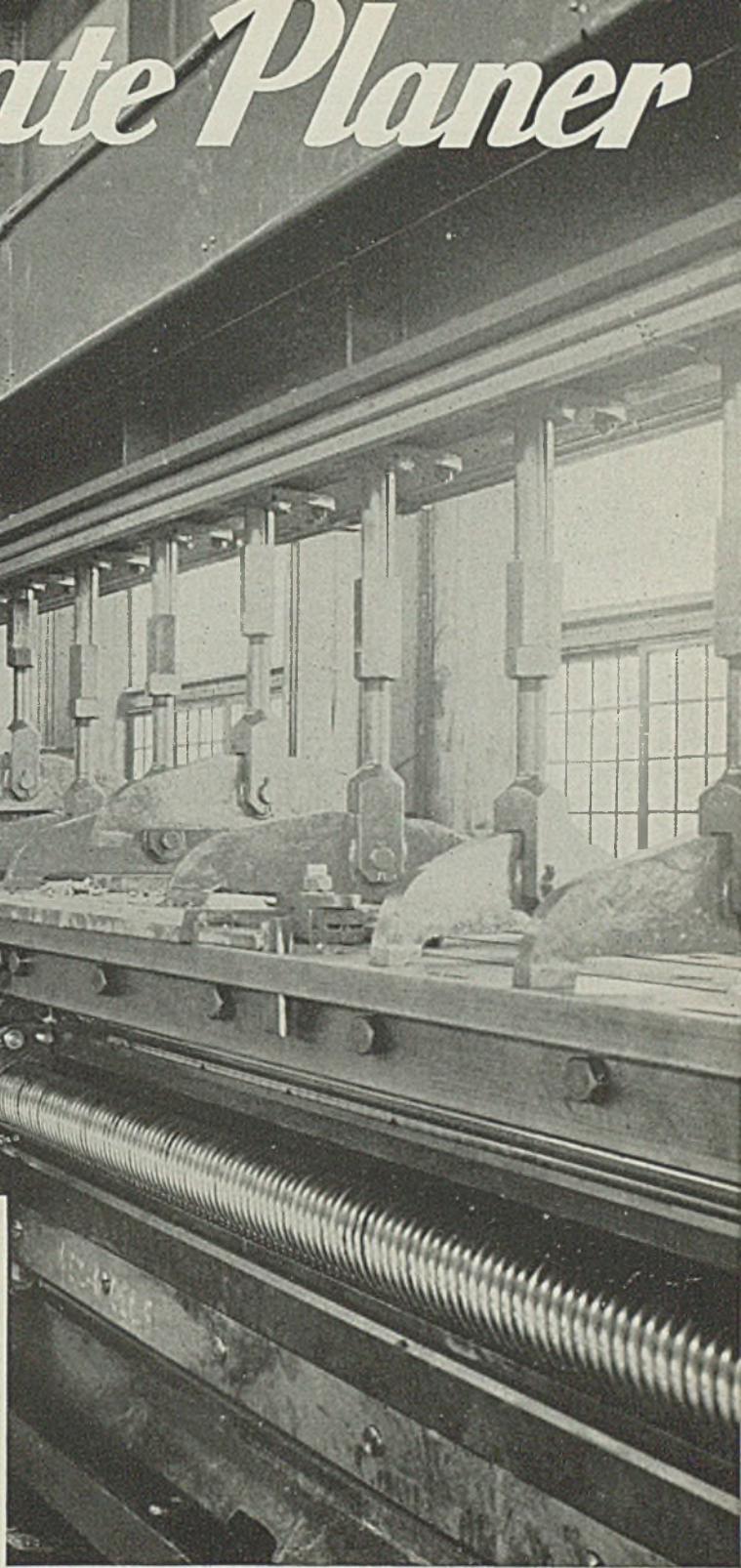
# Giant Plate Planer



This is one of a pair of 36' plate planers recently built by Southwark. It takes plates up to 5" thick by 36' long . . . takes cuts up to 1/4" deep by 1" wide . . . planes, scarfs or bevels, cuts keyways or locking joints . . . at cutting speeds up to 45 feet per minute . . . and holds accuracy within 0.001" limits.

Pneumatic hold-downs, 7" dia. by 59' long quintuple thread drive screw and 50 h. p. carriage drive with automatic electric feed are features of these enormous planers . . . this being the first time automatic electrical feed has been utilized in a plate planer.

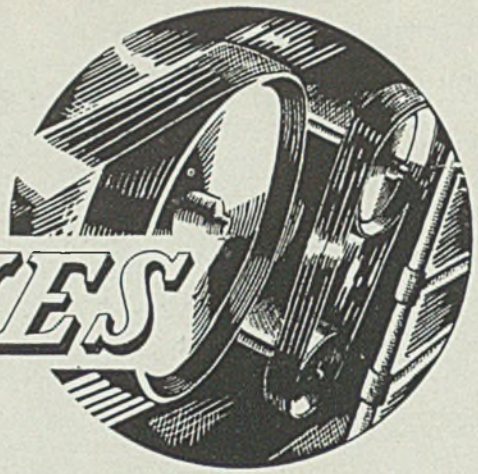
For the design and construction of large or special-purpose equipment Southwark offers the services and facilities of a century-old organization with proved ability to match problems with machines—economically.



**BALDWIN-SOUTHWARK CORPORATION**  
SOUTHWARK DIVISION, PHILADELPHIA

Pacific Coast Representative: THE PELTON WATER WHEEL CO., San Francisco

# POWER DRIVES



## Modernization of Drives and Layout Results in Increased Production

**M**ODERNIZATION of a plant necessitates special attention to the type and method of driving the various machines to fit into the flow of work. To obtain the best flow of work with minimum handling and rehandling often requires a layout of machines which makes them impractical to drive by other than individual motors.

This problem faced Allis-Chalmers

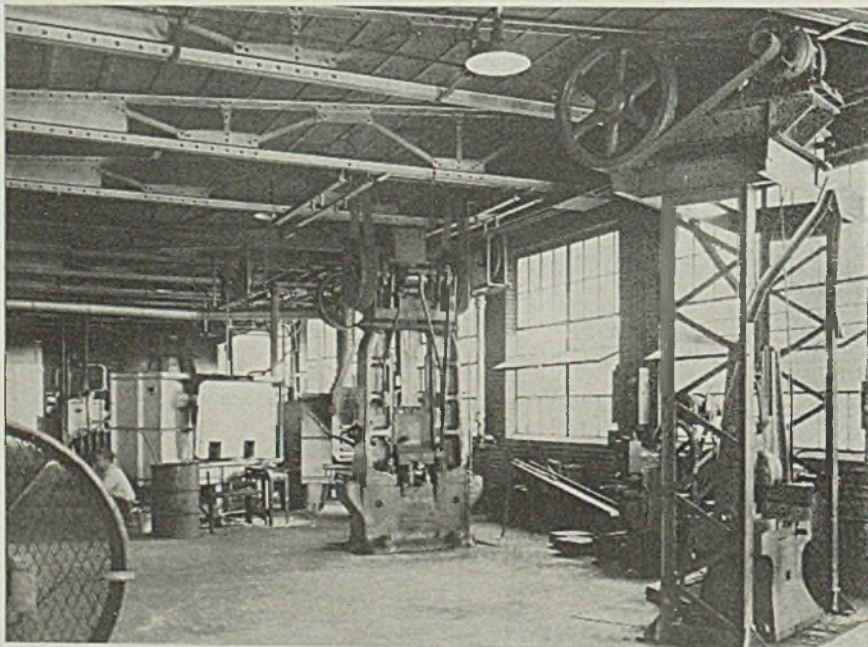
Mfg. Co., when it acquired the La Crosse Plow Works, at La Crosse Wis. a few years ago for the manufacture of farm implements. Increased production requirements at their La Crosse plant required the building of a new blacksmith and forge shop there. Many new machines, all with individual drives, were also purchased, and an entire modernization program for the old

existing machines was carried out.

This change involved about 100 machine tools, all of which now have individual drives with but a few exceptions. Several Bradley hammers, which are regulated by the tightening and loosening of a flat-belt drive and which cannot be driven any other way, are in use, but even these have their jackshafts driven by motors through multiple v-belt drives. A few belt-driven grinders and drill presses remain but these are slated for change at an early date.

This gave the engineers an opportunity to plan layout and drives without considering the existing installation. This is a good policy to follow in any case particularly with an installation several years old as the drive should always fit the production requirements and not subordinate these to fit the drive.

To obtain the proper setting of the machines for the most efficient flow of work, best lighting and economy of floor space it was necessary to place each at a definite spot in the shop rather than to line them up in a straight line, as had been necessary on the lineshaft drive. Thus some groups of machines working together were set at

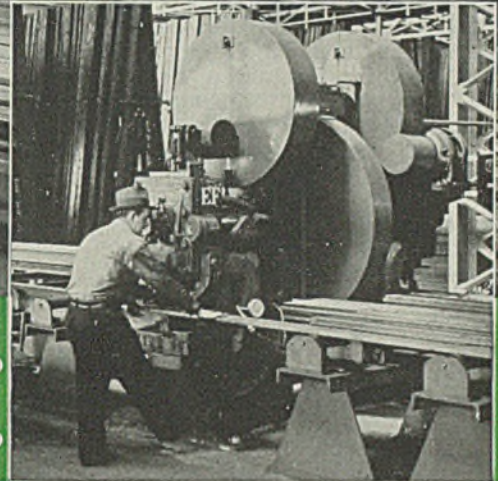
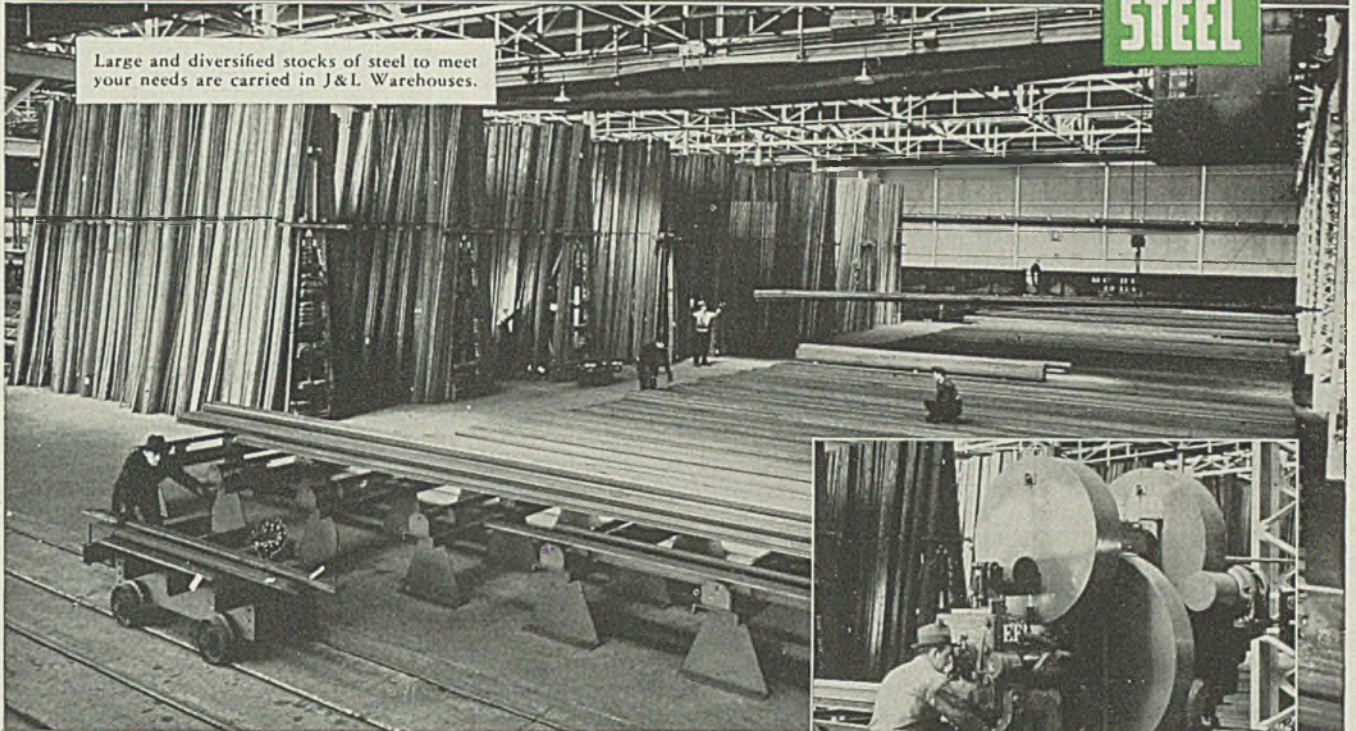


**F**IG. 1 — Machines with individual drives are laid out so as to obtain as many operations as possible with one heat

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LOUISVILLE—Magnolia 1693 Stock of Bars for Concrete Reinforcement and Bar Fabricating Yard  
MEMPHIS—5-1825 Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products Reinforcing Bar Warehouse and Fabricating Shop  
\* (Long Island City) — Operated by National Bridge Works Division of Jones & Laughlin Steel Service, Inc.

angles with the wall and with each other. In some cases they were set so that the work traveled over a semicircular path to facilitate passing on from one operator to the next. This was especially necessary with hammers and trimmers.

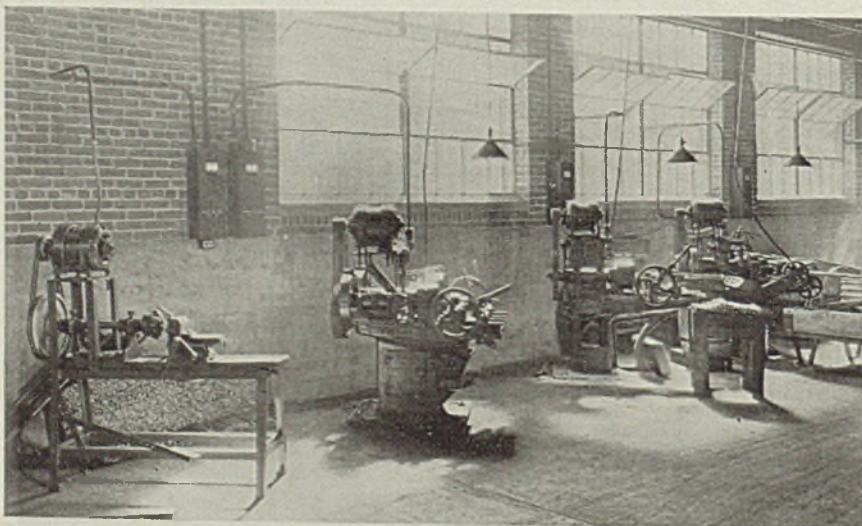
Some of the machines operate entirely independently and so were located in the most convenient and accessible space as it was not necessary to bunch them together. Other machines, also individually driven, were arranged to accomplish their sequence of operations with the least possible effort as brought out in later paragraphs.

#### Use Special Mountings

In most cases mounting had to be adapted to machines to suit the individual motors. In all but a few instances special mountings were constructed for the motor so the motor and machine became a unit. This will permit easy shifting of a machine if the spacing or location should be found incorrect for best production or for changes in production. Adapting a drive for changing conditions is a necessary consideration often overlooked.

No motors were floor mounted and in only a few instances were motors mounted on the ceiling trusses. One of these ceiling mountings is shown in the background in Fig. 1, where two motors are installed on a board drop hammer. On the crank drop hammer in the foreground a special framework of welded angles and channels mounts the motor directly over the hammer but in no way interferes with its operation. This mounting relieves the motor of the direct shock and vibration of the dropping hammer head and was necessary to

**FIG. 2**—Special short center V-belt drive motor mountings permitted arranging these machines to secure best natural light and to take long work without projecting into the aisle



support the drop-operating mechanism of the hammer. Control equipment with a stop button at the press is close by on the wall.

The flow of work in the operations performed on equipment shown in Fig. 1 indicates the advantage of careful layout and the disadvantage of driving as a group. The machines shown are set in such a way as to obtain as many operations as possible with one heat. They are so arranged that the distance between them represents the shortest convenient traveling distance of the work in hand.

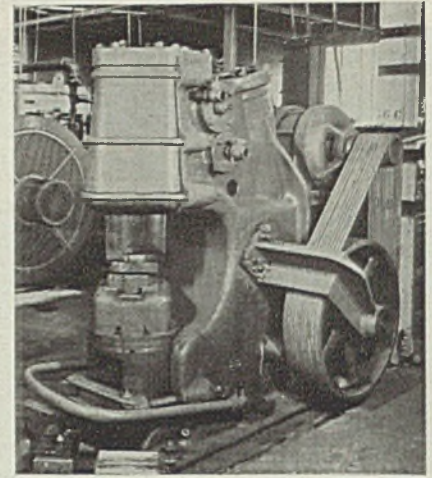
The blank is heated in the forge at the left, passes directly to the board drop hammer operator who drops and passes on to the slide at his left. The operator of the cutoff shear at the window trims the forging and passes on to the crank drop hammer in the foreground for straightening.

#### Aisles Kept Clear

The machines shown in Fig. 2 were set at an angle to take care of good light, but primarily were set this way so that trucks passing down the aisles would not interfere with operations when long work was cut off or threaded. If machines were set at right angles to the wall long work would extend into the aisle.

This installation consists of one pointing machine, two double-head bolt-cutting machines and one threading machine. The motor mountings are of special design to adapt them to the machine. Each motor receives power from a drop conduit with a section of flexible conduit at the motor to prevent breaking loose from vibration. Control equipment is wall mounted with start and stop buttons at the machine, except on the pointing machine.

In revamping the drives V-belts replaced other types of drives in practically all cases. On the ham-



**FIG. 3**—To adapt this hammer to individual motor drive, a welded outboard bearing brace was applied to the driving sheave

mer shown in Fig. 3, operation was improved by the addition of a special brace or outboard bearing to the large drive sheave on the hammer because of the long overhanging bearing. This brace was welded from steel plates and bolted to the frame of the press.

#### Production Is Increased

Advantages reported as resulting from this installation are: Monthly expense for purchased power was decreased with an increase in production of more than 25 per cent. Lathes, bolt cutters, threading machines and similar units produced not only more but better work or finish due to the more positive drive and elimination of backlash and vibration. The more positive drive resulted in better performance of punch presses, drop hammers, large shears and other similar units because of the decreased losses at peak loads. At least one millwright was released for production work because of decreased maintenance and servicing required.

This modernization program, according to the results obtained to date, indicates that the decreased maintenance and other costs together with the increased production, will amount to many thousands of dollars annually. All V-belt drives and sheaves were provided by the Texrope department of Allis-Chalmers Mfg. Co., Milwaukee. In most cases the flywheel on the machine was grooved for the V-belts.

A close spirit of co-operation existing between the various members of the maintenance force so that they will call each other's attention to signs of impending trouble, where the work does not come under the individual's own responsibility, tends toward greater harmony and better operation.

# METAL SHOW ISSUE

OCTOBER 11, 1937

## Information

### GENERAL

The National Metal Congress and Exposition, sponsored by the American Society for Metals, will be held at the Atlantic City Auditorium, Atlantic City, N. J., October 18-22. The following technical societies, will participate:

American Society for Metals  
American Welding Society  
Iron & Steel Division, A.I.M.E.  
Iron & Steel Division, A.S.M.E.  
Institute of Metals Division, A.I.M.E.  
Machine Shop Practice Division, A.S.M.E.  
Wire Association

STEEL, with its interests so closely interwoven with those of the participating societies, is co-operating wholeheartedly in order that the Nineteenth Annual National Metal Congress may reach a new high in achievement. The October 11 issue will carry complete advance details of the convention and exposition, and will be in the hands of readers just a week before the convention opens—ample time to make plans.

In addition to the usual valuable pre-convention data, plus values will be found in a well illustrated portion devoted to heat treatment, welding, metals and alloys. Various articles will be written by well known leaders in their respective fields. They will be informative, authoritative and comprehensive.

This issue will serve to bring the Exposition to those who cannot attend.

### PUBLICATION

A feature of the October 11 issue of STEEL will be a combined editorial and advertising section devoted to the same interests as the National Metal Congress.

Those advertisers desirous of appealing to these same interests will find unusual value in being properly represented in the special section of this issue.

Additional advertising values are afforded by the articles on heat treatment, welding and metals written by various authorities. Advertisements in this section will be placed effectively before the right people.

This interest value is not confined to the readers of STEEL who attend the Exposition, but extends in even larger measure to those similarly interested who do not attend, thereby depending more largely upon STEEL to bring the Exposition to them.

#### COLOR

Two colors will be used—red and black—printed on India tint coated stock.

#### RATE

Including color and insert position—\$175 a page for regular advertisers—\$200 per page one time.

#### BLEED-OFF

\$25.00 additional for one page.  
\$40.00 additional for a two page spread.  
(Bleed-off plates, 8 $\frac{3}{4}$  x 11 $\frac{7}{8}$  inches.)

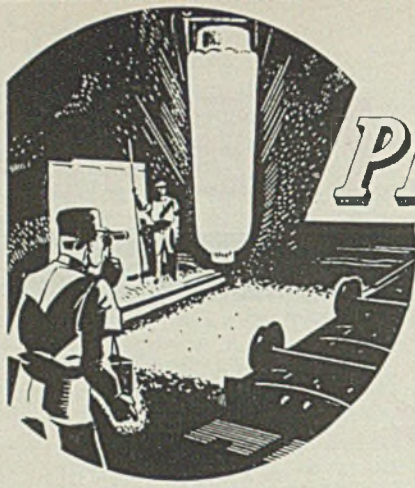
#### CLOSING DATES

Final forms will close Thursday, September 30. Reservation and copy requiring composition should be in Cleveland not later than Wednesday, September 15.

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# PROGRESS IN STEELMAKING

## Enlarged Electric Heat Treating Facilities Bring Advanced Practice

**U**TILIZATION of electric furnaces in heat treating alloy and high-carbon steel bars, as instituted by the Bethlehem Steel Co. eight years ago when it erected a modern heat treating shop at its Bethlehem, Pa., plant, has proved so advantageous the shop's facilities are now being enlarged, both in the interests of increased output and greater efficiency. The new equipment, all electrically heated, includes a warm-up oven and four bell-type carbottom furnaces. In conjunction with the original installations which were described by the writer in *STEEL* for Nov. 21, 1930, the new furnaces will increase capacity by an estimated 840 tons per month.

Fully as significant as this enlargement of capacity, necessitated by steadily increasing demand, is the further refinement of heat treating practice which the new equipment facilitates. With treatments ranging through normalizing and quenching followed by tempering, it is not unusual for a single job to be routed through eight different treatments, and frequently a hundred or more different treatments are done in a day, varying according to size of

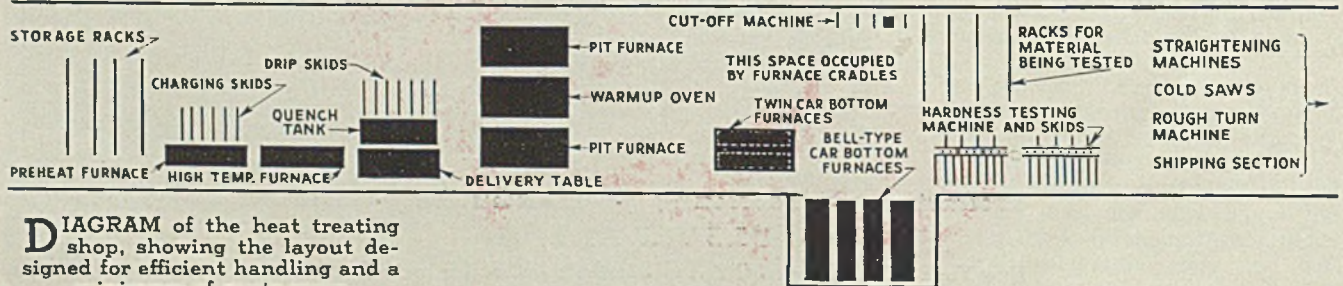
section, analysis and the use the steel is to serve. The new equipment will facilitate all the treatment work and in some instances will make possible improved or more dependable physicals. Higher alloy contents in steels, calling for more accurately controlled practices as well as more varied practices, are probably the most important developments within the industry these improved facilities are designed to meet.

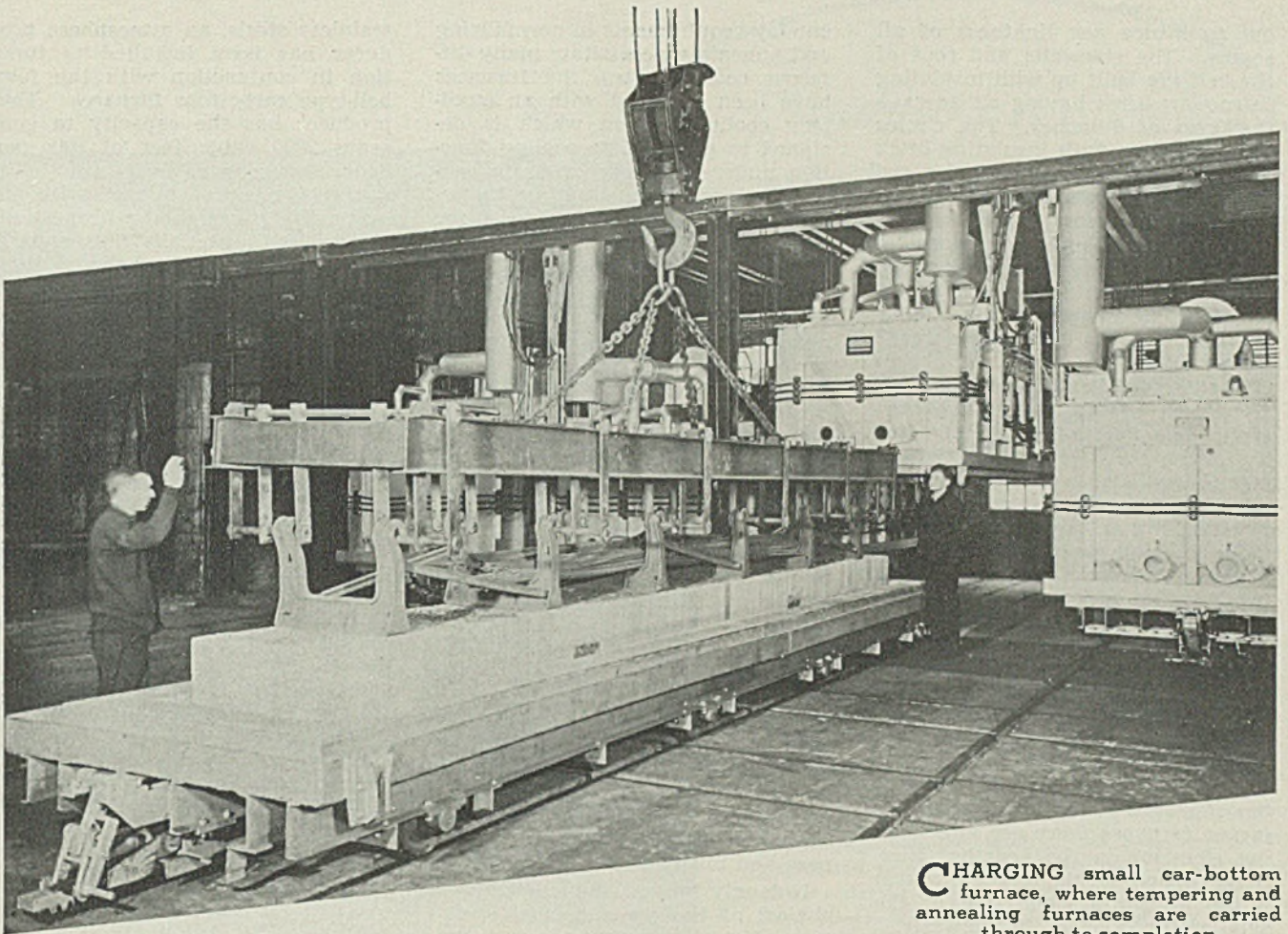
The new warm-up oven, which in its general design resembles a pit furnace, is of interest in its supplementary relationship, both to existing equipment and to the new bell-type carbottom furnaces. All quenched bars are placed in this warm-up oven immediately after they have been removed from the quenching bath, whether oil or water. The furnace then is held at the desired temperature until the hardened bars have been thoroughly soaked through when they are removed and at some later time are tempered to meet the specifications set by the customer.

This "warm-up" or partial tempering tends to eliminate quenching

strains and also makes it possible to place the hardened bars in a tempering furnace maintained at the correct tempering temperature without danger of cracks developing, caused by too rapid cooling.

The warm-up oven is located between the two pit annealing furnaces as indicated in the accompanying diagram. It has inside clearance dimensions of 7 feet wide by 7 feet 2 inches long and a capacity for 50,000 pounds of bars each 24 hours. Its cover comprises two members split lengthwise, and each half of the cover has four wheels with machined treads and ball bearing journals which permit easy and rapid opening in putting in or taking out charges of bars. The oven is heated by passing a 3-phase, 25-cycle, alternating current through standard nickel-chromium resistance units which are located along the sides of the oven. Electrical capacity is 135 kilowatts and the temperature is controlled by one automatic indicating controller, while a separate four-point record of four different internal locations is furnished by another automatic recorder. Prior to installation of the





**C**HARGING small car-bottom furnace, where tempering and annealing furnaces are carried through to completion

warm-up oven it was necessary at times to devote one of the twin-car-bottom furnaces, included in the original equipment (see diagram) to this phase of heat treating. The warm-up furnace releases the twin-carbottom furnaces for uninterrupted service in tempering, and also makes possible the routing of all work to be tempered through this phase.

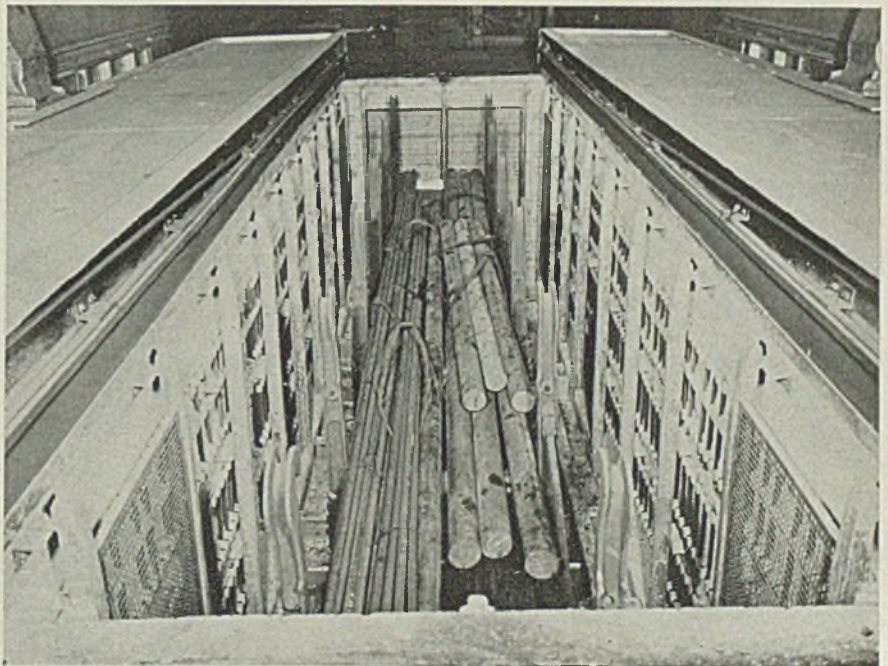
As has been said, the chief significance of the warm-up oven is in a supplementary relationship to other equipment. In the new bell-type carbottom furnaces, on the other hand, tempering or annealing operations are carried through to completion and certain features are embodied in their design which are considered to be essential to meet consistently current requirements in heat treatment. Among these features is the provision made to assure the same degree of uniformity in cooling and the same accuracy in controlling the rate of cooling which are provided for in the heat of the charge. This feature has its principal application when the furnaces are employed for annealing or normalizing. In order to reduce scaling to a minimum, the furnaces are designed to employ controlled gas atmospheres.

Two of these furnaces have inside

dimensions of 5 feet 8 inches wide by 5 feet from top of car to center of arch by 27 feet long, while two

**V**IEW of the warm-up oven with the cover off. This unit has a capacity of 50,000 pounds of bars per 24 hours

have inside dimensions of 4 feet 4 inches wide by 3 feet 11 inches from top of car to center of arch by 27 feet long. The bells consist of an outer shell fabricated from  $\frac{1}{4}$ -inch plate thoroughly braced with structural members and welded through-



out to insure gas tightness of all seams. The sidewalls and roof of the bell are built up with insulating refractory brick having an average thickness of 9 inches. The circles are backed up with insulating brick suitable for high temperatures and controlled atmosphere conditions. All bushings to accommodate heating unit terminals and thermocouples are of high-temperature electrical insulating material as well as being designed to prevent air infiltration and for gas atmosphere conditions.

Cars are of heavy steel construction, each equipped with two complete seals, both sand and oil. Just as in the bell, all construction inside the oil seal is welded to insure gas tightness. Each furnace is provided with a suitable vent pipe and valve to be operated at the beginning of the lifting cycle and at the end of the lowering cycle.

To insure uniform heating of the charge, the heating units in the furnace bell are divided into three temperature control zones and each of these zones is controlled automatically and independently. Both the larger and smaller furnaces are equipped with heating elements in the sidewalls and ends, and in the larger furnaces there are also heating elements in the hearths. Electrical capacity of the larger furnaces is 390 kilowatts while that of the smaller furnaces is 240 kilowatts.

Each of these four furnaces will be used primarily for tempering hardened steel bars. There have been and will continue to be times when one or all of these furnaces will be used for the annealing or normalizing of bars. Therefore, the furnaces have been designed for a maximum temperature of 2000 degrees Fahr. and realizing that pres-

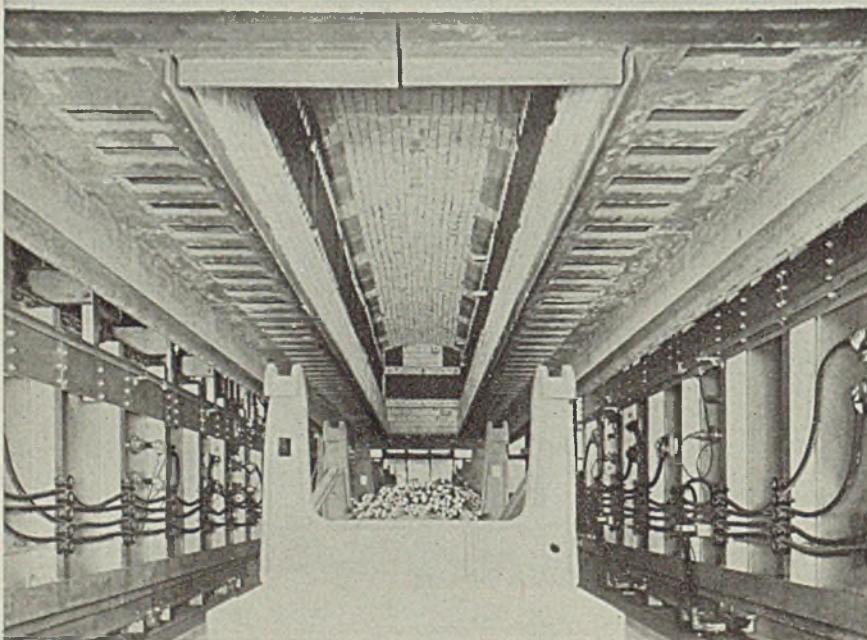
ent-day requirements in normalizing and annealing necessitate many different cooling rates, the furnaces have been equipped with an auxiliary cooling system which is designed to perform its cooling function under the same accurate control and with same uniformity incorporated in the provisions for heating.

Each zone in the furnace is equipped with a motor-driven blower which will force air at shop temperature through nickel-chrome alloy coolers in the furnace walls, both sides and ends. Regulation of the rate of cooling is controlled by dampers in the line whereby either the heated air in the coolers can be recirculated or all cold air can be blown through the coolers. The total area of the coolers is equal to the total area of the heating units and accordingly the cold dispersion rate is equal to the heat dispersion rate.

This cooling system is used only when the furnace is being used on an annealing operation where the natural cooling rate of the furnace is too slow to give the desired results. Several batches of material cooled at a rate of 40 degrees per hour from 1550 degrees Fahr. have shown uniform brinell hardness and microstructures.

Not only have customers become critical of the hardness and structure of steel bars, but they are today more concerned with surface conditions such as scale, decarburization and the like. To eliminate scale and decarburization when annealing or normalizing alloy, high-carbon, high-speed or any of the

**I**NTERIOR view of one of the small carbottom furnaces, which is 27 feet long



stainless steels, an atmosphere producer has been installed to function in conjunction with the four bell-type carbottom furnaces. This producer has the capacity to generate 2000 cubic feet of gas per hour, and operates as follows: City gas properly proportioned with air by passing through the proportioning valves is partially burned in a cracking chamber to the desired composition. Leaving the cracking chamber, the products pass through a heat exchanger, water separator and trap where the moisture is removed. The gases next enter an iron oxide scrubber where the last particles of sulphur are removed. After leaving the iron oxide tower the desulphurized gas passes upward through another tower where it is brought into intimate contact with a patented chemical solution which can be adjusted to absorb any desired quantity of the carbon dioxide. The gas finally passes through an alumina tower where the moisture is reduced to the equivalent of moisture content at -40 degrees Fahr.

## Finishing Accounts for Almost Half of Plow Cost

*(Concluded from Page 56)*

green are the predominating colors. Handles are sometimes finished in natural wood and plow bases with plain varnish. Repair parts are often finished in varnish pigmented with Prussian blue while a few intended for special purposes are finished in black.

Plow points intended for repair parts are finished by a different method. Shown in an accompanying illustration is a mechanical paint spraying device. Operator at left loads points on a conveyor chain which carries them through a battery of spray nozzles. Aluminum paint is used and the machine is so arranged that all superfluous material flows back into the supply tank and is recirculated to the spray nozzles. By the time the parts reach the rear of the machine they are completely dry. Here they unload automatically and fall into a chute which discharges them on a conveyor belt. As each part is discharged the operator on the right stencils it in red paint with the company's name, part number and designation. The belt then conveys the parts to the front of the machine where they are wired in bundles of six.

Thus finishing operations enter largely into plow manufacture and account for almost half the entire manufacturing cost. However, finish is necessary to satisfy the natural tendency to judge quality by external appearance which is an old habit with the average buyer.



*"Industry is  
mind using Nature  
to make human  
life more free"*

—HENRY FORD

## OVERHEAD AT THE ROUGE

To thousands of visitors at the Ford plant in Dearborn, the 132 miles of overhead conveyor system is a matter for comment and question—a symbol of Ford production technique.

Even the casual observer sees that the back-break and strain of old-time industrial work have been transferred from tiring muscle to tireless metal. Application of the conveyor system has been carried a long way in Ford plants. It is one of many labor-serving devices developed there. Each of them multiplies the men's usefulness many times—and multiplies, too, the demand for the product they make.

It is reasonable to think of the whole Ford plant—with 7,250,000 square feet of floor space—as one gigantic conveyor system. Iron ore becomes finished product moving uninterruptedly from ore boat to blast furnace, foundry, open hearth, rolling mill and on into automobiles.

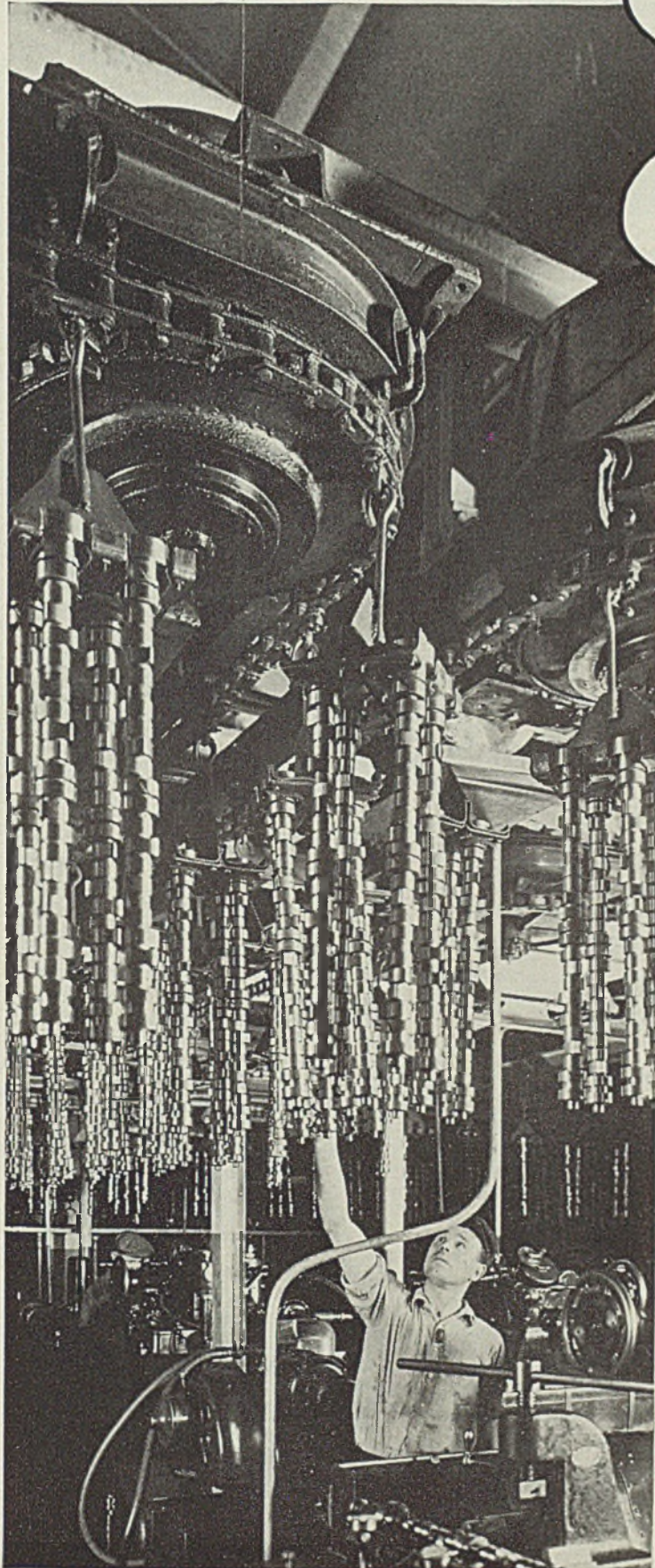
In ordinary metal handling, costs mount as iron or steel are reheated after they have cooled. At the Ford Rouge plant, metal handling is so swift and efficient that a minimum of heat is lost. From the time it runs out of blast furnaces, metal is kept hot, nursed and carried toward the next process without pause or delay.

It costs a lot to keep great stores of parts and materials on hand. So Ford keeps them at the smallest practical level. Raw materials arrive as needed. Production of parts and cars follows current needs closely. Ford plants are manufacturing—not storage—plants.

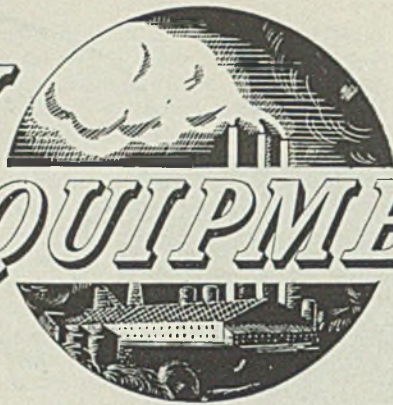
From Dearborn, parts and assemblies go to Ford branch plants without delay. Their journey is charted to the hour and the minute. They are billed to arrive not just "next week," but "Tuesday morning at 8:53," no later. At the branches, the conveyor system carries on. Time and money still are conserved.

Reasonably enough, at the receiving end of this great Ford conveyor system is the Ford V-8 owner. To him go the benefits of production skill and economy—the quality car in the low-price field.

F O R D M O T O R  
C O M P A N Y

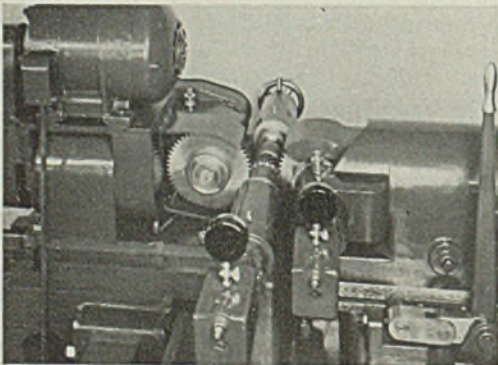


# NEW EQUIPMENT



## Gear Lapping Machine—

Michigan Tool Co., Detroit, has announced a new crossed-axes gear lapping machine designed for maximum flexibility where a variety of gears are to be lapped. This machine will lap gears from 1½ to 20 inches in diameter, and clusters up to 30 inches in length. Change-over time for gears of the same pitch and helix angle is about five minutes; about 20 minutes is ample time for changing over for gears of entirely different characteristics—involving a change of laps. Machine is a duplex type, with two laps which may be used either for lapping front and back side of gear teeth at the same time, with the machine running in one direction only, or may be set to lap two separate gears, as on a cluster, simultaneously. The unit comes equipped with an automatic cycle control mechanism adjustable to permit setting the lapping cycle at anywhere from 5 seconds to 20 minutes in both directions, the machine running first in one direction, then reversing, running the same length of time in the other direction and then stopping for reloading. The two laps are located at either side of the work. The lap at the back is the driving member, being driven through a 3-horsepower motor at 1140 revolutions per minute. Work is mounted either between centers or on an arbor. Centers are mounted on a reciprocating table, stroke of

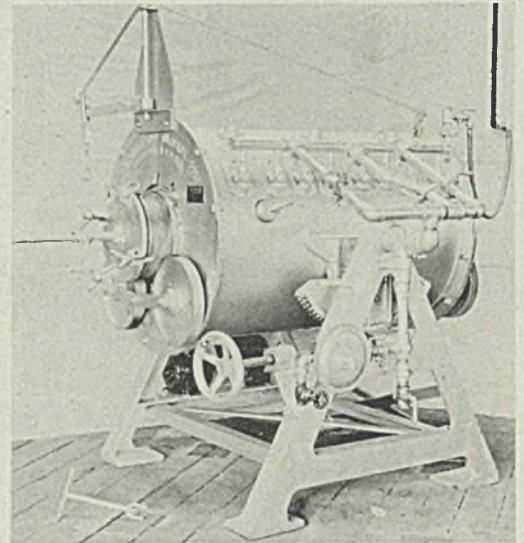


Michigan machine laps both back and front sides of gear teeth at same time

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Improved rotary carburizer of 600 pound capacity has uniform heating at all points

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which can be set anywhere up to 5 inches. Table is driven through a second 3-horsepower motor at 1140 revolutions per minute.

## Rotary Carburizer—

American Gas Furnace Co., Elizabeth, N. J., has announced its newly improved, 600-pound capacity rotary carburizer, now known as the No. 2-B'37 and having lower gas consumption due to use of a lining of insulating refractory backed by block insulation. Burners are of

heat-resisting alloy and fire into special high temperature refractory burner tunnels. Flame sweeps entirely around the retort with uniform heating at all points since burners fire from one side of the machine only. Burners are served by a single valve control set using air at 1 pound per square inch and gas at 4 to 6-inch water column, although machine can also be supplied for high pressure gas. Cover, handled by a simple and efficient crane, is of improved design with insulation extending from outer cover to the inner, heat-resisting alloy, spacing disk.

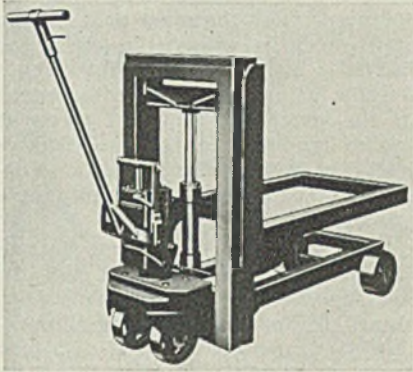
## Cable Terminators—

Delta-Star Electric Co., 2400 block, Fulton street, Chicago, is manufacturing an improved type of interchangeable-bushing cable terminators with spring diaphragm stud connectors. These terminators, made for voltages from 7.5 to 30 kilovolt-amperes, are designed to insure vacuum tightness under extreme conditions. The stud connectors are made from hexagon, hard drawn, copper rod and seating shoulders

built up of laminated, spring bronze, slotted washers engage recesses in hexagon portion. When the cap nut is tightened, the laminations flex and press the hood nut gasket, compensating for temperature changes and gasket aging.

#### Lift Truck—

Lyon Iron Works, Greene, N. Y., is manufacturing a new adaption of the standard Lyon hydraulic lift

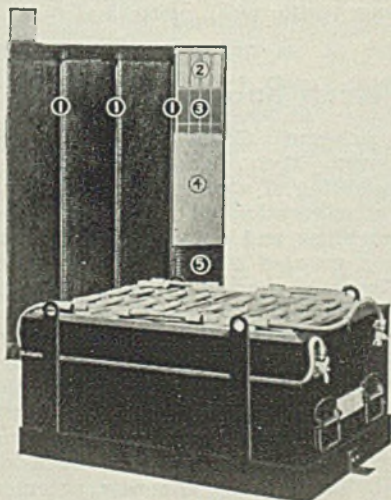


Lyon special lift truck is shown at elevated height of 19 inches

truck. The new unit was designed for a special handling problem in which a 10-inch elevation was necessary instead of the usual standard 3-inch elevation. The special truck has a cantilever type elevating frame with a lowered height of 9-inches and an elevated height of 19 inches. Carrying platform is 24 inches wide and 42 inches long, while rated capacity of the truck is 3500 pounds.

#### Storage Battery—

USL Battery Corp., Niagara Falls, N. Y., has announced a new battery known as the USL Durapak for use



USL Durapak battery has many constructional features

in industrial trucks, electric locomotives, battery-propelled street trucks, railroad car lighting and air conditioning service. Major feature is a new positive plate having patented sectional construction to withstand expansion and contraction stresses, heavy one-piece interlocking plate grid for greater mechanical strength and conductivity, machine-pasted plates for greater plate uniformity, glass fiber retainer to prevent loss of plate material and unique plate shielding to hold glass fiber retainer pads firmly against the plate surface and permanently shield entire plate. Other constructional features include Permatex all-rubber separators, to balance the long service life of the positive plates, and improved

negative plates with tapered tops and insulated edges for extra protection against short circuits.

#### Clam Shell Bucket—

Hayward Co., 50 Church street, New York City, recently began manufacture of a new grab bucket for coal, coke, and similar bulk materials. This new Class E-15 clam shell is built to carry approximately a pound of material to every pound of its own weight. Light weight alloy construction is claimed to have made the increase in capacity possible and at the same time give increased strength and longer service.



## 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

**Circuit Breakers**—General Electric Co., Schenectady, N. Y. Bulletin describing the type FKO-227 outdoor oil-blast circuit breakers.

**Cupola Charger**—Whiting Corporation, Harvey, Ill. Pamphlet No. 221, describing the new Whiting Tiger skip-hoist cupola charger.

**Clam Shell Bucket**—Hayward Co., 50 Church street, New York City. Bulletin describing the new Hayward clam shell bucket, class E-15.

**Alloys and Overlay Metals**—Colmonoy Inc., Los Nietos, Calif. General circular covering the Colmonoy line of alloys and overlay metals.

**Steels**—Bethlehem Steel Co., Bethlehem, Pa. Two folders, one dealing with "Mayari Staybolt Steel," and the other with "Bethlehem Silico Manganese Steel."

**Safety Slings**—Murray Safety Sling Co., 33 Water street, Pittsburgh. Bulletin illustrating the numerous Murray safety plaited wire rope slings.

**Floor Plate**—Inland Steel Co., 38 South Dearborn street, Chicago. Booklet covering Inland 4-way safety plates for flooring applications.

**Welding**—Lincoln Electric Co., Cleveland. Bulletin entitled "Welding in Construction Work", illustrating a great variety of applications of arc welding in the structural field.

**Grinding Machines**—Brown &

Sharpe Mfg. Co., Providence, R. I. Bulletin illustrating and describing the Brown & Sharpe No. 5 plain grinding machines in the 3 x 12-inch and the 3 x 18-inch sizes.

**Ground Shafting**—Bliss & Laughlin Inc., Harvey, Ill. Folder showing the production of B & L turned, ground and polished shafting and small diameter drawn, ground and polished bars.

**Refractory Cement**—Refractory & Insulation Corp., 381 Fourth avenue, New York City. Bulletin No. R-31, dealing with R & I No. 3000 refractory cement and its applications.

**Hoses**—Electric Hose & Rubber Co., Wilmington, Del. Catalog of 64 pages covering its complete line of molded and braided hose. Jobbers' net prices and resale net prices of both hose and couplings are sections included.

**V-Belts**—Rockwood Mfg. Co., 1801-2001 English avenue, Indianapolis, Ind. Book No. 795 entitled "V-belt Replacements", a complete listing and price chart of all Rockwood V-belts used for replacements.

**Large Direct-Current Motors**—Allis-Chalmers Mfg. Co., Milwaukee. Bulletin No. 1157, illustrating installations and describing in detail the construction and "frog-leg" armature winding of large direct-current motors for steel mills and mines.

## MATERIALS HANDLING



### Small Parts Handled In Large Quantities

(Concluded from Page 48)

the unit through doorways. The machine is hand operated, both in the elevating of the barrel in the ver-

tical position and its up-ending, which is accomplished by a separate hand crank on one side. The barrel is held in position at whatever angle it is turned. Four rubber-tired wheels with automobile-type steering provide stability and ease of movement in the narrow aisles.

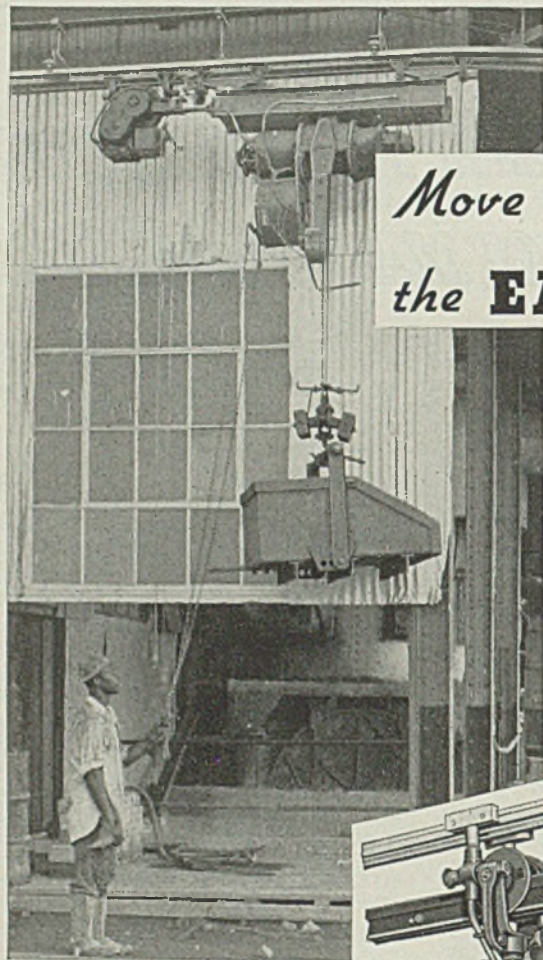
The hopper benches with which certain machines are equipped make it possible to maintain large supplies of parts so that the operators can make long runs between re-fillings. As many of the operations are maintained for weeks, and some

are continuous throughout the year, handling in large quantities is considerably more economical than handling small lots at shorter intervals. Hoppers are so designed as to feed parts down by gravity to the flat working end within reach of the operator. The hoppers are constructed of welded sheet steel supported on welded angle-iron frames.

In some cases where parts would crush or become bent by the weight of a heavy pile resting on them special handling is provided or the complete unit is assembled as manufactured. For the most part, where strip stock is utilized in coils, the punched coil is cut up into short lengths of scrap by an attachment at the machine. The cut scrap is easier handled and disposed of than if the material were recoiled. Furthermore, the cutter occupies less space than a recoiler.

Dies are handled between storage and presses on a 500-pound capacity hand-operated tier lifter. This unit, shown in an accompanying illustration, has an overall height of 5 feet and a platform lift of 4 feet 2 inches. The platform is 2 feet square. For diesetting, the lifter is hand operated with a crank-up and crank-down hoisting unit which enables the operator to adjust the platform to the exact height of the bed of the press being served.

Because of the heavy production in this plant and the large containers which are employed, aisles have been encroached upon for temporary parts and materials storage at the machines. Rather than make a new layout on the plant, which would necessitate additional floor space and moving a large proportion of the machines, a system of "one-way traffic" has been established where movement of material is heaviest. This system operates satisfactorily. The traffic and piling limits on aisles are marked carefully. Aisles are surfaced with a special rubberized compound to reduce traffic wear, noise and dust.

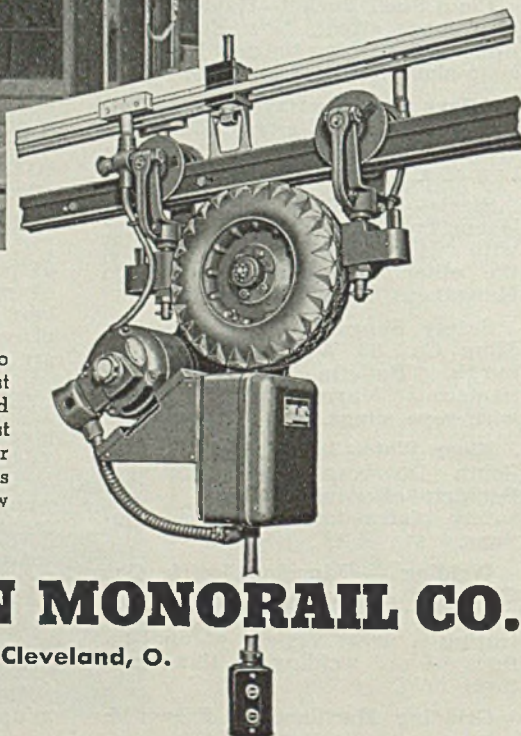


American MonoTractor reduces cost of handling heavy castings.

This rubber drive wheel, geared to an electric motor, is inflated against the bottom of the rail. The increased tractive contact of rubber against steel creates tremendous draw-bar pull. Many interesting applications are described in a new book now available. Write for a copy.

## Move Heavy Loads the **EASY WAY**

No pulling—no fatigue but precision spotting of heavy loads from push-button, rope or completely automatic control. Loads up to 4 tons travel smoothly along monorail tracks with American MonoTractor drive.



# AMERICAN MONORAIL CO.

13102 Athens Ave., Cleveland, O.

### Patents Rubber Lubricant

Acheson Colloids Corp., Port Huron, Mich., has announced the patenting of a composition designed for lubrication of rubber parts on machines and automobiles. Patent was granted to George F. Willson, Cleveland representative of Acheson Colloids Corp., and assigned to that company. Lubrication of rubber parts on automobiles and other mechanism has presented a troublesome problem because of the softening action of the usual lubricating agents and compositions, such as oil, on rubber. The new patented lubricant, however, is claimed to give effective and lasting lubrication of rubber parts.

# Unchanged Fourth Quarter Prices Give Stability

## Scrap Rises Further; Auto Output Tapers; Production Steady

**A** NNOUNCEMENT of prices for fourth quarter delivery on principal rolled steel products by a leading producer at the level prevailing for third quarter has met the expectations of market observers and will steady the market by eliminating tendency toward overbuying or speculation.

The statement by Carnegie-Illinois Steel Corp. that prices would be continued includes bars and small shapes, structural shapes, plates, tin plate and other tin mill products, strip, sheets, sheet piling, standard and light rails and accessories, car and locomotive axles, solid wrought steel wheels and semifinished products. Galvanized sheets, tubular goods and pig iron are not included. American Steel & Wire Co. has reaffirmed prices on wire and wire products for fourth quarter.

Pig iron prices probably will be announced about Sept. 1. Producers are faced with the question of production costs, the course of scrap prices and with export inquiry and are not ready to commit themselves. In galvanized sheets the price of zinc is an important factor and this is being studied for the present.

No apprehension exists among steelmakers in view of the slower rate of buying, compared with earlier months. The present rate is excellent for the time of year and a steady flow of business is better than the rush for tonnage that prevailed in the spring. With much business yet to be cleared from books current orders serve to maintain operations at a high rate and renewed fall placements are relied on to continue near-capacity production.

Sheet deliveries, which have been extended further than in other products, are being bettered as backlogs are reduced in face of lighter buying. However, considerable delay is still encountered, hot-rolled being obtainable in about 16 weeks, hot-rolled annealed in about 18, galvanized in 18 to 19 and cold-rolled in 10 to 11 weeks. Some automotive buying for 1938 models is being felt.

Closing of the National Tube Co. plant at Lorain, O., for vacation cut the operating rate in the Cleveland district sharply and the Pittsburgh area also receded 5 points. These were offset in part by increased activity in Eastern Pennsylvania, New England and

### MARKET IN TABLOID

**DEMAND** . . . . Lighter but at satisfactory rate.

**PRICES** . . . . Steady, reaffirmed for fourth quarter on most rolled steel products.

**PRODUCTION** . . Operations down 1 point to 81 because of vacation shut downs.

**SHIPMENTS** . . . . At high rate to shorten delivery delay.

the Wheeling district. The national rate was lowered 1 point by these changes, to 81 per cent of capacity. Eastern Pennsylvania rose 2 points to 70 per cent, Wheeling 1 point to 92 and New England 12 points to 90. Cleveland dropped 28 points to 51 per cent, Pittsburgh 5 points to 83 and Detroit 2 points to 95. There was no change at Chicago at 84 per cent, Youngstown at 78, Buffalo at 88, Birmingham at 96 and Cincinnati and St. Louis at 93 each.

Largely due to practical shutdown by Ford Motor Co. automobile production last week dropped to 88,055 cars. General Motors held its rate with 50,040 and Chrysler with 26,550, while Ford made only 655. All others made a total of 10,810, compared with 12,585 the previous week.

In spite of iron ore shipments as high as the entire fleet can bring to lower lake ports ore on hand at ports and furnaces July 1 was only 2,450,000 tons larger than at the corresponding period in 1936. With consumption in June, this year, 876,000 tons greater than in the same month last year this excess reserve is not imposing when prospects for steel production through the winter promise new records. Remaining months of navigation are relied on to increase the spread much further.

Strength continues in scrap. At Pittsburgh and Chicago quotations rose 50 cents further on renewed buying, but at eastern points no further advance was made. Export demand is having an effect as far west as Chicago and is being felt in the Birmingham, Ala., area, which has been free from this competition in the past.

Because of increases in steelmaking grades the composite price of scrap rose last week 25 cents, to \$19., which is level with early May. Stronger scrap prices: lifted the iron and steel composite 7 cents, to \$40.11. The finished steel composite is unchanged at \$61.70.

## COMPOSITE MARKET AVERAGES

	July 24	July 17	July 10	One Month Ago June, 1937	Three Months Ago Apr., 1937	One Year Ago July, 1936	Five Years Ago July, 1932
Iron and Steel . . . .	\$40.11	\$40.04	\$39.91	\$39.82	\$40.39	\$33.49	\$28.87
Finished Steel . . . .	61.70	61.70	61.70	61.70	61.45	53.40	47.71
Steelworks Scrap . . .	19.00	18.75	17.75	17.15	21.67	12.89	6.06

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

	July 24, 1937	June 1937	April 1937	July 1936
Steel bars, Pittsburgh . . . . .	2.45c	2.45c	2.45c	1.95c
Steel bars, Chicago . . . . .	2.50	2.50	2.50	2.00
Steel bars, Philadelphia . . . . .	2.74	2.74	2.74	2.26
Iron bars, Terre Haute, Ind. . . . .	2.35	2.35	2.35	1.85
Shapes, Pittsburgh . . . . .	2.25	2.25	2.25	1.90
Shapes, Philadelphia . . . . .	2.45 ½	2.45 ½	2.45 ½	2.11 ½
Shapes, Chicago . . . . .	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh . . . . .	2.25	2.25	2.25	1.90
Tank plates, Philadelphia . . . . .	2.43 ½	2.43 ½	2.43 ½	2.09
Tank plates, Chicago . . . . .	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts. . . . .	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts. . . . .	3.15	3.15	3.15	2.50
Sheets, No. 24, galv., Pitts. . . . .	3.80	3.80	3.80	3.20
Sheets, No. 10, hot rolled, Gary. . . . .	2.50	2.50	2.50	2.05
Sheets, No. 24, hot anneal., Gary. . . . .	3.25	3.25	3.25	2.60
Sheets, No. 24, galvan., Gary. . . . .	3.90	3.90	3.90	3.30
Plain wire, Pittsburgh . . . . .	2.90	2.90	2.90	2.40
Tin plate, per base box, Pitts. . . . .	\$5.35	5.35	5.25	5.25
Wire nails, Pittsburgh . . . . .	2.75	2.75	2.75	2.10

### Semifinished Material

Sheet bars, open-hearth. Youngs. . . . .	\$37.00	\$37.00	\$37.00	\$30.00
Sheet bars, open-hearth, Pitts. . . . .	37.00	37.00	37.00	30.00
Billets, open-hearth, Pittsburgh . . . . .	37.00	37.00	37.00	30.00
Wire rods, No. 5 to ½-inch, Pitts. . . . .	47.00	47.00	47.00	38.00

### Pig Iron

	July 24, 1937	June 1937	April 1937	July 1936
Bessemer, del. Pittsburgh . . . . .	\$25.26	\$25.26	\$25.26	\$20.81
Basic, Valley . . . . .	23.50	23.50	23.50	19.00
Basic, eastern del. East Pa. . . . .	25.26	25.26	25.26	20.81
No. 2 fdy., del. Pittsburgh . . . . .	25.21	25.21	25.21	20.31
No. 2 fdy., Chicago . . . . .	24.00	24.00	24.00	19.50
Southern No. 2, Birmingham . . . . .	20.38	20.38	20.38	15.50
Southern No. 2, del. Cincinnati . . . . .	23.69	23.69	23.69	20.2007
No. 2X eastern, del. Phila. . . . .	26.135	26.135	26.135	21.68
Malleable, Valley . . . . .	24.00	24.00	24.00	19.50
Malleable, Chicago . . . . .	24.00	24.00	24.00	19.50
Lake Sup., charcoal, del. Chicago . . . . .	30.04	30.04	30.04	25.2528
Gray forge, del. Pittsburgh . . . . .	24.17	24.17	24.17	19.67
Ferromanganese, del. Pittsburgh . . . . .	107.29	107.29	99.79	80.13

### Scrap

Heavy melting steel, Pittsburgh . . . . .	\$20.25	\$18.40	\$22.75	\$14.15
Heavy melt. steel, No. 2, East Pa. . . . .	16.75	15.25	19.06	11.50
Heavy melting steel, Chicago . . . . .	18.25	16.00	20.75	13.25
Rail for rolling, Chicago . . . . .	20.75	19.50	23.35	14.00
Railroad steel specialties, Chicago . . . . .	20.75	19.50	23.75	14.75

### Coke

Connellsville, furnace, ovens . . . . .	\$4.50	\$4.65	\$4.50	\$3.45
Connellsville, foundry, ovens . . . . .	5.30	5.30	5.05	4.25
Chicago, by-product foundry, del. . . . .	11.00	11.00	11.00	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, del. . . . .	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 . . . . .	3.73c

### 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. . . . .	2.43 ½ c
Boston, delivered . . . . .	2.65c
Buffalo, delivered . . . . .	2.50c
Chicago or Gary . . . . .	2.30c
Cleveland, del. . . . .	2.44 ½ c
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. . . . .	2.45 ½ c
New York, del. . . . .	2.50 ½ c
Boston, delivered . . . . .	2.63 ½ c
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
Birmingham . . . . .	2.45c

**Iron**

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

**Reinforcing**

New billet, straight lengths, quoted by distributors	
Pittsburgh .....	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.60c
Gulf ports .....	2.65c
Pacific coast ports, f.o.b. car docks .....	
Philadelphia, del. ....	2.84c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh .....	2.40c
Chicago, Buffalo, Cleve- land, 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.) ...	
Single loop bale ties, (base column, c. l.) ...	63.00

**To Manufacturing Trade**

Plain wire, 6-9 ga. ....	2.90c
Anderson, Ind. (merchant prod- ucts 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 deduc-  
tions and extras. List dated  
Aug. 26, 1935; revised Oct. 1,  
1936.

**Alloy Steel Bars (Hot)**

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chi- cago, Massillon, Can- ton, Bethlehem .....	3.00c
Alloy	
S.A.E. Diff. S.A.E. Diff.	
2000 .....	0.35 3100.....0.70
2100 .....	0.75 3200.....1.35
2300 .....	1.55 3300.....3.80
2500 .....	2.25 3400.....3.20
4100 0.15 to 0.25 Mo. ....	0.55
4600 0.20 to 0.30 Mo. 1.50- 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. N., Van .....	1.50
Carbon Van. ....	0.85
9200 spring flats .....	0.15
9200 spring rounds, squares	0.40

**Piling**

Pittsburgh .....	2.60c
Chicago, Buffalo .....	2.70c

**Strip and Hoops**

(Base, hot rolled, 25-1ton)	
(Base, cold-rolled, 25-3 tons)	
Hot strip to 23 $\frac{1}{2}$ -in.	
Pittsburgh .....	2.40c
Chicago or Gary .....	2.50c
Birmingham base .....	2.55c
Detroit, del. ....	2.60c
Philadelphia, del. ....	2.69c
New York, del. ....	2.73c
Cooperage hoop,	
Pittsburgh .....	2.50c
Chicago .....	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh,	
Cleveland .....	3.20c
Detroit, del. ....	3.40c
Worcester, Mass. ....	3.40c
Cleve. Worces- Pitts. ter, Mass.	
Carbon 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, Bir- mingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:	
Carriage and Machine	
$\frac{1}{2}$ x 6 and smaller....	65-5 off
Do. larger, to 1-in. ....	60-10 off
Do. 1 $\frac{1}{2}$ and 1 $\frac{1}{4}$ -in. ....	60-5 off
Tire bolts .....	50 off
Plow Bolts	
All sizes .....	65-5 off
Stove Bolts	
In packages with nuts at- tached 72 $\frac{1}{2}$ off; in packages with nuts separate 72 $\frac{1}{2}$ -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.:	
$\frac{1}{2}$ to $\frac{7}{8}$ -inch .....	60-10 off
Do. 9/16 to 1-inch .....	60-5 off
Do., over 1-inch .....	60 off

**Hexagon Cap Screws**

Milled .....	50-10 off
Upset, 1-in., smaller .....	60 off
Square Head Set Screws	
Upset, 1-in., smaller .....	75 off
Headless set screws .....	75 off

**Rivets, Wrought Washers**

Structural, Pittsburgh, Cleveland .....	3.60c
Structural, Chicago .....	3.70c
$\frac{7}{8}$ -inch and smaller, Pitts., Chl., Cleve. ....	
65-5 off	
Wrought washers, Pitts., Chl., 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 dis- count on any extras. .	\$3.90
Do., under 5 kegs no disc. on any extras. .	\$4.05

**Welded Iron, Steel Pipe**

Base discounts on steel pipe,  
Pitts., Lorain, O., to consumers  
in carloads. Gary, Ind., 2 points  
less. Chicago, del. 2 $\frac{1}{2}$  less.  
Wrought pipe, Pittsburgh.

**Butt Weld Steel**

In.	Blk.	Galv.
$\frac{1}{2}$ .....	59 $\frac{1}{2}$	49
$\frac{3}{4}$ .....	62 $\frac{1}{2}$	53
1-3 .....	64 $\frac{1}{2}$	55 $\frac{1}{2}$
Iron		
$\frac{1}{2}$ .....	26	8
1-1 $\frac{1}{2}$ .....	30	14
1 $\frac{1}{2}$ .....	34	16 $\frac{1}{2}$
2 .....	33 $\frac{1}{2}$	16

**Lap Weld Steel**

2 .....	57	47 $\frac{1}{2}$
2 $\frac{1}{2}$ -3 .....	60	50 $\frac{1}{2}$
3 $\frac{1}{2}$ -6 .....	62	52 $\frac{1}{2}$
7 and 8 .....	61	50 $\frac{1}{2}$
9 and 10 .....	60 $\frac{1}{2}$	50

**Iron**

2 .....	26 $\frac{1}{2}$	10
2 $\frac{1}{2}$ -3 $\frac{1}{2}$ .....	27 $\frac{1}{2}$	12 $\frac{1}{2}$
4 .....	29 $\frac{1}{2}$	16
4 $\frac{1}{2}$ -8 .....	28 $\frac{1}{2}$	15
9-12 .....	24 $\frac{1}{2}$	10

**Line Pipe Steel**

1 to 3, butt weld .....	63 $\frac{1}{2}$
2, lap weld .....	56
2 $\frac{1}{2}$ to 3, lap weld .....	59
3 $\frac{1}{2}$ to 6, lap weld .....	61
7 and 8, lap weld .....	60
10-inch, lap weld .....	59 $\frac{1}{2}$
12-inch, lap weld .....	58 $\frac{1}{2}$

**Butt Weld Iron**

	Blk.	Galv.
$\frac{1}{2}$ .....	25	7
1 and 1 $\frac{1}{2}$ .....	29	13
1 $\frac{1}{2}$ .....	33	15 $\frac{1}{2}$
2 .....	32 $\frac{1}{2}$	15

**Lap Weld**

1 $\frac{1}{2}$ .....	23 $\frac{1}{2}$	7
2 .....	25 $\frac{1}{2}$	9
2 $\frac{1}{2}$ to 3 $\frac{1}{2}$ .....	26 $\frac{1}{2}$	11 $\frac{1}{2}$
4 .....	28 $\frac{1}{2}$	15
4 $\frac{1}{2}$ to 8 .....	27 $\frac{1}{2}$	14
9 to 12 .....	23 $\frac{1}{2}$	9

**Boiler Tubes**

Carloads minimum wall seam-  
less steel boiler tubes, cut  
lengths 4 to 24 feet, f.o.b. Pitts-  
burgh, base price per 100 feet  
subject to usual extras.

**Lap Weld**

Sizes	Steel	Char- coal Iron
1 $\frac{1}{2}$ " OD x 13 Ga. ....	\$10.45	\$23.71
1 $\frac{3}{4}$ " OD x 13 Ga. ....	11.89	22.93
2" OD x 13 Ga. ....	13.31	19.35
2" OD x 11 Ga. ....	15.49	23.36
2 $\frac{1}{2}$ " OD x 13 Ga. ....	14.82	21.68
2 $\frac{1}{2}$ " OD x 11 Ga. ....	17.38	26.02
2 $\frac{1}{2}$ " OD x 12 Ga. ....	17.82	26.57
2 $\frac{3}{4}$ " OD x 12 Ga. ....	18.86	29.00
3" OD x 12 Ga. ....	19.73	31.36
3 $\frac{1}{2}$ " OD x 11 Ga. ....	24.89	39.81
4" OD x 10 Ga. ....	30.81	49.90
5" OD x 9 Ga. ....	47.57	73.93
6" OD x 7 Ga. ....	73.25	.....

**Seamless**

	Hot Rolled	Cold Drawn
1" OD x 13 Ga. ....	\$ 8.41	\$ 9.46
1 $\frac{1}{4}$ " OD x 13 Ga. ....	9.96	11.21
1 $\frac{1}{2}$ " OD x 13 Ga. ....	11.00	12.38
1 $\frac{3}{4}$ " OD x 13 Ga. ....	12.51	14.09
2" OD x 13 Ga. ....	14.02	15.78
2 $\frac{1}{2}$ " OD x 13 Ga. ....	15.63	17.60

2 $\frac{1}{2}$ " OD x 12 Ga. ....	17.21	19.37
2 $\frac{3}{4}$ " OD x 12 Ga. ....	18.85	21.22
2 $\frac{1}{2}$ " OD x 12 Ga. ....	19.98	22.49
3" OD x 12 Ga. ....	20.97	23.60
4 $\frac{1}{2}$ " OD x 10 Ga. ....	40.15	45.19
3 $\frac{1}{2}$ " OD x 11 Ga. ....	26.47	29.79
4" OD x 10 Ga. ....	32.83	36.96
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	
Std. fltgs., Birm., base.	\$100.00

**Semifinished Steel**

Billets and Blooms

4 x 4-inch base; gross ton	
Pitts., Chl., Cleve., Buf- falo, Young, Bham. ....	\$37.00
Philadelphia .....	42.30
Duluth .....	39.00

Forging Billets

6 x 6 to 9 x 9-in. base	
Pitts., Chicago, Buffalo. ....	43.00
Forging, Duluth .....	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point .....	37.00
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Slabs

Pitts., Chicago, Cleve- land, Youngstown .....	37.00
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Wire Rods

Pitts., Cleve., No. 5 to $\frac{1}{2}$ -inch incl. ....	47.00
Do., over $\frac{3}{8}$ to $\frac{1}{2}$ -inch incl. ....	52.00
Chicago up \$1; Worcester up \$2.	

Skelp

Pitts., Chl., Young, Buff., Coatesville, Sparrows Pt. ....	2.10c
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**Coke**

Price Per Net Ton

Beehive Ovens	
Connellsville, fur. ....	\$4.40- 4.60
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
Chl., 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 xylo. ....	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 bbis. to job- bers .....	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia. ....	\$28.50

## Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

**Basing Points:**

	No. 2 Malle- Fdry. able	Basic	Besse- mer
Bethlehem, Pa. ....	\$25.00	\$25.50	\$26.00
Birdsboro, Pa. ....	25.00	25.50	26.00
Birmingham, Ala.†	20.38	19.38	25.00
Buffalo .....	24.00	24.50	25.00
Chicago .....	24.00	24.00	23.50
Cleveland .....	24.00	24.00	23.50
Detroit .....	24.00	24.00	23.50
Duluth .....	24.50	24.50	25.00
Erie, Pa. ....	24.00	24.50	23.50
Everett, Mass. ....	25.75	26.25	26.75
Hamilton, O. ....	24.00	24.00	23.50
Neville Island, Pa. ....	24.00	24.00	23.50
Provo, Utah .....	22.00	.....	.....
Sharpville, Pa. ....	24.00	24.00	23.50
Sparrows Point, Md. ....	25.00	.....	24.50
Swedeland, Pa. ....	25.00	25.50	26.00
Toledo, O. ....	24.00	24.00	23.50
Youngstown, O. ....	24.00	24.00	23.50

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

**Delivered from Basing Points:**

	25.26	25.26	24.76	25.76
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	.....

	No. 2 Malle- Fdry. able	Basic	Besse- mer
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**

Valley furnace .....	\$23.50	Charcoal	Lake Superior fur. ....	\$27.00
Pitts. dist. fur. ....	23.50	do., del. Chicago .....	do., del. Chicago .....	30.04
		Lyles, Tenn. ....	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 Ferrosilicont**

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 ferrosilicont, 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	
<i>Super Quality</i>	
Pa., Mo., Ky. ....	\$64.60
<i>First Quality</i>	
Pa., Ill., Md., Mo., Ky....	51.30
Alabama, Georgia .....	51.30
New Jersey .....	56.00
<i>Second Quality</i>	
Pa., Ill., Ky., Md., Mo....	46.55
Georgia, Alabama .....	41.80
New Jersey .....	51.00
<i>Ohio</i>	
First quality .....	43.70
Intermediate .....	39.90
Second quality .....	35.15
<b>Malleable Bung Brick</b>	
All bases .....	\$59.85
<b>Silica Brick</b>	
Pennsylvania .....	\$51.30
Joliet, E. Chicago .....	59.85
Birmingham, Ala. ....	51.30
<b>Ladle Brick</b>	
(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
<b>Base Brick</b>	
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 .....	\$20.00
Do., for barge .....	\$21.50

## Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd....	\$102.50
Do., Baltimore, base..	102.50
Do., del. Pittsburgh...	107.29
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot..	33.00
Do., New Orleans .....	33.00
Do., 26-28%, Palmer- ton .....	39.00
Ferrosilicont, 50% freight allowed, c.i. ....	69.50
Do., less carload .....	77.00
Do., 75 per cent .....	126-130.00
Spot, \$5 a ton higher.	
Silicomane, 2½ carbon..	106.50
2% carbon 111.50; 1%, 121.50	
Ferrochrome, 66-70 chrom- ium, 4-6 carbon, cts. lb. del. ....	10.50
Ferrotungsten, stand., lb. con. del. cars .....	1.80-1.85
Ferrovandium, 35 to 40% lb., cont. ....	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots .....	145.00
Spot, ton lots .....	150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage .....	63.50
Ferrophosphorus, electro- lytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb. ....	0.95
Molybdate, lb. cont....	0.80
†Carloads. Quan. diff. apply	

## Nonferrous

**METAL PRICES OF THE WEEK**

Spot unless otherwise specified. Cents per pound

Copper			Stralts Tin		Lead	Lead	Zinc	Alumi- num	Antimony	Nickel		
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	New York	East St. L.	St. L.	99%	American Spot, N. Y.	Cath- odes		
July 17	14.00	14.12½	13.75	60.00	59.37½	6.00	5.85	7.00	20.00	14.75	35.00	
July 19	14.00	14.12½	13.75	59.87½	59.25	6.00	5.85	7.00	20.00	15.00	35.00	
July 20	14.00	14.12½	13.75	60.25	59.50	6.00	5.85	7.00	20.00	15.00	35.00	
July 21	14.00	14.12½	13.75	59.87½	59.12½	6.00	5.85	7.00	20.00	15.00	35.00	
July 22	14.00	14.12½	13.75	59.50	58.75	6.00	5.85	7.00	20.00	15.25	35.00	
July 23	14.00	14.12½	13.75	59.12½	59.37½	6.00	5.85	7.00	20.00	15.25	35.00	
<b>MILL PRODUCTS</b>												
F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper												
<b>Sheets</b>												
Yellow brass (high).... 19.75												
Copper, hot rolled..... 21.87½												
Lead, cut to jobbers.... 9.50												
Zinc, 100-lb. base.. 12.00-13.00												
<b>Tubes</b>												
High yellow brass..... 22.50												
Seamless copper .....												22.62½
<b>Rods</b>												
High yellow brass .....												16.25
Copper, hot rolled.....												18.62½
<b>Anodes</b>												
Copper, untrimmed.....												19.12½
<b>Wire</b>												
Yellow brass (high)....												20.00
<b>OLD METALS</b>												
Nom. Deal, buying prices												
<b>No. 1 Composition Red Brass</b>												
New York .....												8.75-9.00
Cleveland .....												9.25-9.50
Chicago .....												9.25-9.50
St. Louis .....												8.75-9.00
<b>Heavy Copper and Wire</b>												
*New York, No. 1 .....												11.00-11.50
Cleveland, No. 1 .....												11.00-11.25
Chicago, No. 1 .....												11.00-11.25
St. Louis, No. 1 .....												10.75-11.00
<b>Composition Brass Borings</b>												
New York .....												8.00-8.25
<b>Light Copper</b>												
New York .....												9.25-9.50
Cleveland .....												9.00-9.25
Chicago .....												9.25-9.50
*St. Louis .....												8.75-9.00
<b>Light Brass</b>												
Cleveland .....												5.25-5.50
Chicago .....												5.75-6.25
*St. Louis .....												5.25-5.50
<b>Lead</b>												
New York .....												5.00
Cleveland .....												4.50-4.75
Chicago .....												5.00-5.12½
St. Louis .....												4.50-4.75
<b>Zinc</b>												
New York .....												3.00-3.25
Cleveland .....												3.00-3.25
*St. Louis .....												3.00-3.25
<b>Aluminum</b>												
*Borings, Cleveland 9.75-10.00												
Mixed cast, Cleve.. 12.75-13.00												
Clips, soft, Cleve.. 14.75-15.00												
*Mixed cast, St. L.. 12.50-12.75												
<b>SECONDARY METALS</b>												
Brass, ingot 85-5-5-5, 1cl, 14.00												
Stand. No. 12 alum. 18.50-19.00												



# Warehouse Iron and Steel Prices

*Cents per pound for delivery within metropolitan districts of cities specified*

### STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.10c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York† (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

### IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York† (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

### REINFORCING BARS

Buffalo	2.60c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

### SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.35c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York† (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

### PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.47c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ¼-in. and over	3.86c
Detroit	3.95c
Detroit, ½-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York† (d)	4.00c
Philadelphia	3.90c

Phila. floor	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	4.16c
Chicago	3.85c
Cincinnati	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York† (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

### NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	3.35c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Houston	4.66c
Cleveland	4.68½c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York† (d)	4.82c
Philadelphia	4.65c
Pitts.* (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

### NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	4.10c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York† (d)	5.47c
Philadelphia	5.30c
Pitts.* (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

### BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	3.52c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ½-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York† (d)	4.32c

Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

### HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	3.52c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York† (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

### COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	3.70c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c

New York† (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

### COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.39c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York† (d)	3.92c
St. Louis	4.54c

### TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

Base	
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening 12½c	
Uniform extras apply.	

### BOLTS AND NUTS

(100 pounds or over)	
Discount	
Chicago (a)	.55 to .60
Cleveland	.60-5-5
Detroit	.70-10
Milwaukee	.60 to .65

New Orleans	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 classf. (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 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, July 22

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports	Continental Channel or North Sea ports, metric tons	
		Quoted in dollars at current value	**Quoted in gold pounds sterling
<b>PIG IRON</b>			
Foundry, 2.50-3.00 Silicon	\$29.88 6 0 0	\$30.00	3 19 0
Basic bessemer	19.55 3 18 6*	28.84	3 12 0
Hematite, Phos. .03-.05	21.79 4 7 6		
<b>SEMIFINISHED STEEL</b>			
Billets	\$39.22 7 17 6	\$35.04	4 7 6
Wire rods, No. 5 gage	53.91 10 16 6	52.06	6 10 0
<b>FINISHED STEEL</b>			
Standard rails	\$50.42 10 2 0	\$48.07	6 0 0
Merchant bars	2.44c 11 0 6	2.17c to 2.25c	6 0 0 to 6 5 0
Structural shapes	2.36c 10 12 6	1.94c	5 7 6
Plates, 1½ in. or 5 mm.	2.57c 11 11 6	2.58c	7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.33c 15 0 0	3.16c	8 15 0
Sheets, galv., 24 gage, corr.	4.16c 18 15 0	4.16c	11 10 0
Bands and strips	3.05c 13 15 0	2.35c	6 10 0
Plain wire, base	3.22c 14 10 0	2.53c	7 0 0
Galvanized wire, base	3.77c 17 0 0	3.17c	8 15 0
Wire nails, base	3.10c 14 0 0	2.90c	8 0 0
Tin plate, box 108 lbs.	\$ 6.22 1 5 0		

British ferromanganese \$102.50 delivered Atlantic seaboard, duty-paid.

### Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, Si. 2.5	\$25.15 5 1 0(a)	\$17.23 462	\$27.80 825	\$25.38 63
Basic bessemer pig iron	24.90 5 0 0(a)	10.26 275	14.66 435	27.99 (b) 69.50
Furnace coke	8.72 1 15 0	5.89 158	6.23 185	7.65 19
Billets	39.22 7 17 6	24.43 655	32.25 960	38.87 96.50
Standard rails	2.25c 10 2 6	1.66c 975	1.80c 1,200	2.38c 132
Merchant bars	2.54c 11 9 0	1.50c 885	1.65c 1,100	1.98c 110
Structural shapes	2.45c 11 0 6	1.46c 860	1.65c 1,100	1.93c 107
Plates, 1½ in. or 5 mm.	2.60c 11 14 3	1.88c 1,105	2.06c 1,375	2.29c 127
Sheets, black	3.50c 15 15 0§	2.47c 1,450†	2.36c 1,575†	2.59c 144
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.33c 19 10 0	3.66c 2,150	2.85c 1,900	6.66c 370
Plain wire	3.22c 14 10 0	2.31c 1,360	2.48c 1,650	3.11c 173
Bands and strips	2.71c 12 4 0	1.70c 1,000	2.33c 1,550	2.29c 127

\*Basic. †British ship-plates. Continental, bridge plates. §24 ga. † 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 64.50 per cent over paper sterling.

# Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

## HEAVY MELTING STEEL

Birmingham†, No. 1	15.00-16.00
Birmingham†, No. 2	14.00-15.00
Bos. dock No. 1, exp.	16.50-16.75
N. Eng. del. No. 1	15.25-15.75
Buffalo, No. 1	19.00-20.00
Buffalo, No. 2	17.00-17.50
Chicago, No. 1	18.00-18.50
Cleveland, No. 1	19.00-19.50
Cleveland, No. 2	17.50-18.00
Detroit, No. 1	15.75-16.25
Eastern Pa., No. 1	19.00-19.50
Eastern Pa., No. 2	16.50-17.00
Federal, Ill.	15.00-15.50
Granite City, R.R.	16.25-16.75
Granite City, No. 2	15.00-15.50
New York, No. 1	15.50-16.00
N.Y. dock, No. 1 exp.	15.50-16.00
Pitts., No. 1 (R. R.)	21.00-21.50
Pitts., No. 1 (dir.)	20.00-20.50
Pittsburgh, No. 2	17.50-18.00
St. Louis, R.R.	16.25-16.75
St. Louis, No. 2	15.00-15.50
Toronto, Mrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	20.00-20.50

## COMPRESSED SHEETS

Buffalo, dealers	17.00-17.50
Chicago, factory	17.00-17.50
Chicago, dealer	16.50-17.00
Cleveland	18.50-19.00
Detroit	17.25-17.75
E. Pa., new mat.	18.50-19.00
E. Pa., old mat.	15.50
Pittsburgh	20.00-20.50
St. Louis	13.00-13.50
Valleys	19.50-20.00

## BUNDLED SHEETS

Buffalo	13.50-14.00
Cincinnati, del.	13.50-14.00
Cleveland	14.00-14.50
Pittsburgh	18.00-18.50
St. Louis	11.00-11.50
Toronto, dealers	8.00

## SHEET CLIPPINGS, LOOSE

Chicago	12.50-13.00
Cincinnati	12.50-13.00
Detroit	11.75-12.25
St. Louis	10.50-11.00

## STEEL RAILS, SHORT

Birmingham	17.00-18.00
Buffalo	23.00-24.00
Chicago (3 ft.)	21.00-21.50
Chicago (2 ft.)	21.50-22.00
Cincinnati, del.	21.75-22.25
Detroit	20.00-20.50
Pitts., 3 ft. and less	25.00-25.50
St. Louis, 2 ft. & less	19.50-20.00

## STEEL RAILS, SCRAP

Boston district	†14.25-14.50
Buffalo	19.50-20.00
Chicago	18.00-18.50
Cleveland	21.00-21.50
Pittsburgh	21.50-22.00
St. Louis	18.50-19.00

## STOVE PLATE

Birmingham	10.00-10.50
Boston district	10.50-10.75
Buffalo	14.50-15.00
Chicago	11.00-11.50
Cincinnati, dealers	10.50-11.00
Detroit, net	11.75-12.25
Eastern Pa.	15.50-16.00
New York, fdy.	†11.50-12.00
St. Louis	12.25-12.75
Toronto, deal'rs, net	9.50-10.00

## SPRINGS

Buffalo	22.00-22.50
Chicago, leaf	21.50-22.00
Chicago, coil	22.50-23.00
Eastern Pa.	24.00-24.50
Pittsburgh	25.00-25.50
St. Louis	20.50-21.00

## ANGLE BARS—STEEL

Chicago	20.50-21.00
St. Louis	19.00-19.50

## RAILROAD SPECIALTIES

Chicago	20.50-21.00
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## LOW PHOSPHORUS

Buffalo, billet and bloom crops	22.50-23.50
Cleveland, billet, bloom crops	24.50-25.00
Eastern Pa., crops	24.00-24.50
Pittsburgh, billet, bloom crops	25.50-26.00
Pittsburgh, sheet bar crops	25.00-25.50

## FROGS, SWITCHES

Chicago	18.00-18.50
St. Louis, cut	17.50-18.00

## SHOVELING STEEL

Chicago	18.00-18.50
Federal, Ill.	15.00-15.50
Granite City, Ill.	15.00-15.50
Toronto, dealers	9.00-9.50

## RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district	†10.00-10.25
Buffalo, No. 1	17.00-17.50
Buffalo, No. 2	19.00-20.00
Chicago, No. 1 net	15.50-16.00
Chicago, No. 2	18.00-18.50
Cincinnati, No. 2	16.00-16.50
Eastern Pa., No. 1	19.50-20.00
St. Louis, No. 1	15.00-15.50
St. Louis, No. 2	16.25-16.75
Toronto, No. 1 dir.	15.00

## SPECIFICATION PIPE

Eastern Pa.	16.50-17.00
New York	†12.50-13.00

## BUSHELING

Buffalo, No. 1	17.00-17.50
Chicago, No. 1	16.50-17.00
Cincln., No. 1, deal.	15.00-15.50
Cincinnati, No. 2	9.00-9.50
Cleveland, No. 2	13.50-14.00
Detroit, No. 1 new	15.25-15.75
Valleys, new, No. 1	18.50-19.00
Toronto, dealers	9.00

## MACHINE TURNINGS

Birmingham	6.00-7.00
Buffalo	11.50-12.00
Chicago	10.00-10.50
Cincinnati, dealers	10.50-11.00
Cleveland	13.00-13.50
Detroit	11.50-12.00
Eastern Pa.	13.00-13.50
New York	†9.25-9.75
Pittsburgh	14.50-15.00
St. Louis	8.50-9.00
Toronto, dealers	8.00-8.50
Valleys	15.50-16.00

## BORINGS AND TURNINGS

Boston district	†8.30-8.80
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For Blast Furnace Use

Buffalo	12.75-13.25
Cincinnati, dealers	10.00-10.50
Cleveland	13.50-14.00
Detroit	12.50-13.00
Eastern Pa.	12.50-13.00
New York	†9.00-9.50
Pittsburgh	14.75-15.25
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	†9.00-9.25
Buffalo	12.75-13.25
Chicago	11.50-12.00
Cincinnati, dealers	10.00-10.50
Cleveland	13.50-14.00
Detroit	12.50-13.00
E. Pa., chemical	14.50-15.00
New York	†9.00-9.50
St. Louis	8.00-8.50
Toronto, dealers	9.00

## PIPE AND FLUES

Cincinnati, dealers	12.00-12.50
Chicago, net	13.50-14.00

## RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	12.50-13.00
Cincinnati	11.00-11.50
Eastern Pa.	15.50-16.00
New York	†11.50-12.00
St. Louis	12.00-12.50

## FORGE FLASHINGS

Boston district	†11.75-12.00
Buffalo	16.50-17.50
Cleveland	17.50-18.00
Detroit	14.50-15.00
Pittsburgh	17.50-18.00

## FORGE SCRAP

Boston district	†8.00-8.50
Chicago, heavy	21.00-21.50
Eastern Pa.	16.00-16.50

## ARCH BARS, TRANSOMS

St. Louis	19.00-19.50
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## AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	16.00-16.50
Chicago, elec. fur.	16.50-17.00
Eastern Pa.	17.00-17.50
St. Louis	13.50-14.00
Toronto	9.50

## STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	22.00-22.50
Boston district	†20.00
Chicago, net	24.00-24.50
Eastern Pa.	25.00-26.00
St. Louis	22.00-22.50

## SHAFTING

Boston district	†18.50-18.75
New York	†19.00-19.50
Eastern Pa.	24.00-24.50
St. Louis	17.50-18.00

## CAR WHEELS

Birmingham	18.00-19.00
Boston dist., iron	†15.00-15.25
Buffalo, iron	18.50-19.50
Buffalo, steel	22.50-23.00
Chicago, iron	19.00-19.50
Chicago, rolled steel	21.00-21.50

Cincinnati, iron	18.50-19.00
Eastern Pa., iron	19.50-20.00
Eastern Pa., steel	24.00-24.50
Pittsburgh, iron	21.00-21.50
Pittsburgh, steel	25.00-25.50
St. Louis, iron	18.00-18.50
St. Louis, steel	20.00-20.50

## NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.	†14.50
N. Eng. del. No. 2	16.50
N. Eng. del. textile	18.50
Buffalo, cupola	18.00-18.50
Buffalo, mach.	18.00-18.50
Chicago, agri. net.	13.00-13.50
Chicago, auto	14.00-14.50
Chicago, mach. net.	15.00-15.50
Chicago, rail'd net.	14.00-14.50
Cincln., mach. cup.	15.50-16.00
Cleveland, mach.	19.00-19.50
Eastern Pa., cupola	19.50-20.00
E. Pa., mixed yard	18.00
Pittsburgh, cupola	19.50-20.00
San Francisco, del.	13.50-14.00
Seattle	12.00-13.00
St. Louis, No. 1	14.50-15.00
St. L., No. 1, mach.	15.00-15.50
Toronto, No. 1, mach., net	16.00-17.00

## HEAVY CAST

Boston dist. break	†14.00-14.50
N. Eng. del.	15.00-15.25
Buffalo, break	15.00-15.50
Cleveland, break	13.50-14.00
Detroit, break	14.00-14.50
Detroit, auto net.	15.00-15.50
Eastern Pa.	19.00-19.50
New York, break	†15.00-15.50
Pittsburgh	17.00-17.50

## MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	20.00
Buffalo	20.00-21.00
Chicago, R. R.	20.00-20.50
Cincln., agri. del.	16.50-17.00
Cleveland, rail	20.50-21.00
Detroit, auto	15.50-16.00
Eastern Pa., R. R.	19.00-20.00
Pittsburgh, rail	20.50-21.00
St. Louis, R. R.	19.50-20.00

## RAILS FOR ROLLING

5 feet and over

Birmingham	19.00-20.00
Boston	†17.50-18.00
Buffalo	19.50-20.00
Chicago	20.50-21.00
Eastern Pa., R. R.	21.00-21.50
New York	†17.00-17.50
St. Louis	19.00-19.50

## LOCOMOTIVE TIRES

Chicago (cut)	22.00-22.50
St. Louis, No. 1	18.00-18.50

## LOW PHOS. PUNCHINGS

Buffalo	22.50-23.50
Chicago	21.00-21.50
Eastern Pa.	24.00-24.50
Pittsburgh (heavy)	23.00-23.50
Pittsburgh (light)	22.50-23.00

## 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	
Foreign manganiferous ore, 45.5% iron, 6-10% man.	*17.00

No. Afr. low phos.	17.50
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	*16.00
Tungsten, Nov.-Dec. sh. ton, unit, duty pd.	\$22.00 to \$23.00; spot non.
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	\$23.50-26.50
*Nominal asking price for spot.	

## Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52%	non. 52.00 to 53.00
So. African, 50-52%	non. 52.00 to 53.00
Indian, 50-52%	Nominal

# Sheets

Sheet Prices, Page 70

**Pittsburgh** — Speculation over prices to be paid for sheets on mills' books for shipment during fourth quarter has been cleared to a great extent by recent announcement reaffirming current quotations until Dec. 31. Galvanized sheets, however, have not been reaffirmed and an announcement concerning this grade will be made later. As a result of the recent slackening in incoming business, delivery promises have improved considerably, with hot-rolled now ranging around 16 weeks; hot-rolled annealed around 18; galvanized, 18 to 19; and cold-rolled, 10 to 11. Some automotive builders have given notice that tonnages they planned to receive in early August will not be needed until later, presumably indicating delay in getting the 1938 assembly program underway. Production continues at a high rate and pressure for earlier shipment is still being exerted by consumers.

**Philadelphia**—A leading eastern automobile body builder is reported to have placed a substantial portion of its flat rolled steel requirements for 1938 automobile frames with an eastern and a Pittsburgh mill. It is understood additional tonnage will be distributed in conjunction with cold-finished auto body sheets. It is estimated this interest will require 75,000 to 100,000 tons of steel for frames alone. General demand for sheets continues to recede seasonally, although requirements for new model radios and sporadic buying of stovemakers constitute a bright spot. Deliveries have improved further with two to three weeks available in some cases. Galvanized is available in three to four weeks though makers with plants further west are unable to do as well.

State of Pennsylvania took bids July 23 on culverts requiring 6000 tons of galvanized corrugated sheets. No award has been made.

**Cleveland** — Sheet steel buying continues to lag with most mills making considerable headway against backlogs, particularly on cold-rolled material. However, operations in most departments show no signs of easing as bookings on certain finishes, such as galvanized and annealed are expected to maintain active operations through the summer. Recent announcement by Carnegie-Illinois Steel Corp. extending present prices into fourth quarter on most steel products, is expected to have a stabilizing effect.

**Chicago**—Sheet shipments exceed

# MODERN STEEL PLANTS SPEED PRODUCTION *in* SOAKING PITTS



**I**NCREASED production in steel plants throughout the country calls for insulation that will assure maximum operating efficiency of soaking pits, furnaces, and other heated equipment. Supervisors of leading plants have found that Armstrong's Insulating Fire Brick successfully meet these requirements. These efficient brick reduce fuel costs, help assure accurate temperature control, and speed up production.

Armstrong's Insulating Fire Brick offer the advantages of low thermal conductivity, high crushing strength, freedom from

shrinkage, uniformity, and refractoriness. Armstrong's Brick are available in five types, covering a complete range of temperatures and uses. Armstrong's qualified high temperature insulation engineers will gladly assist you, without charge or obligation, in the selection of proper materials and their application. For samples and descriptive literature, write Armstrong Cork Products Company, Building Materials Division, 985 Concord Street, Lancaster, Penna.



## Armstrong's HIGH TEMPERATURE INSULATION

new business, but heavy backlogs prevent early decline in output. Deliveries vary, being less extended on cold-rolled material as a result of reduced automotive needs. Announcement of an extension of sheet prices, except on galvanized, into fourth quarter clears the way for automotive contracting for new models. Consumption by farm equipment builders continues heavy.

**Boston**—Sheet buying continues to slacken gradually, practically all finishes being affected, blue annealed holding slightly better than

others. Specifications by heating equipment consumers are holding well, notably stove and electric range builders. Spot buying of alloy, culvert and special finishes is moderately active in small lots. Shipments to shipyards are steady.

**New York**—With most mills sold far ahead, well into autumn in some cases, and deliveries ranging up to 22 weeks on various finishes, the current decline in new sheet buying is welcomed by producers. Nevertheless, there has been considerable improvement in delivery on some

finishes, notably cold-finished, several mills being able to ship in about four weeks. Shipments are heavy and requirements widely diversified. New demand for corrugated galvanized sheets for culvert pipe is heavy.

**Cincinnati**—Buying of sheets continues, as in recent weeks, in volume less than mill capacity and backlogs are being reduced. Considerable tonnage is being placed for new automobile models and by jobbers.

**St. Louis**—Producers and distributors of sheets report a further tapering in ordering, though specifications and shipments hold around recent high levels. Relatively greatest interest continues in the lighter gages of blue annealed and in galvanized and tin plate.

**Birmingham**—Some improvement in specifications for sheets is reported during the past two weeks, but this condition is viewed rather as a result of delayed orders in several instances. No particular pressure is being exerted in behalf of deliveries, and fairly good backlogs assure continued operations.

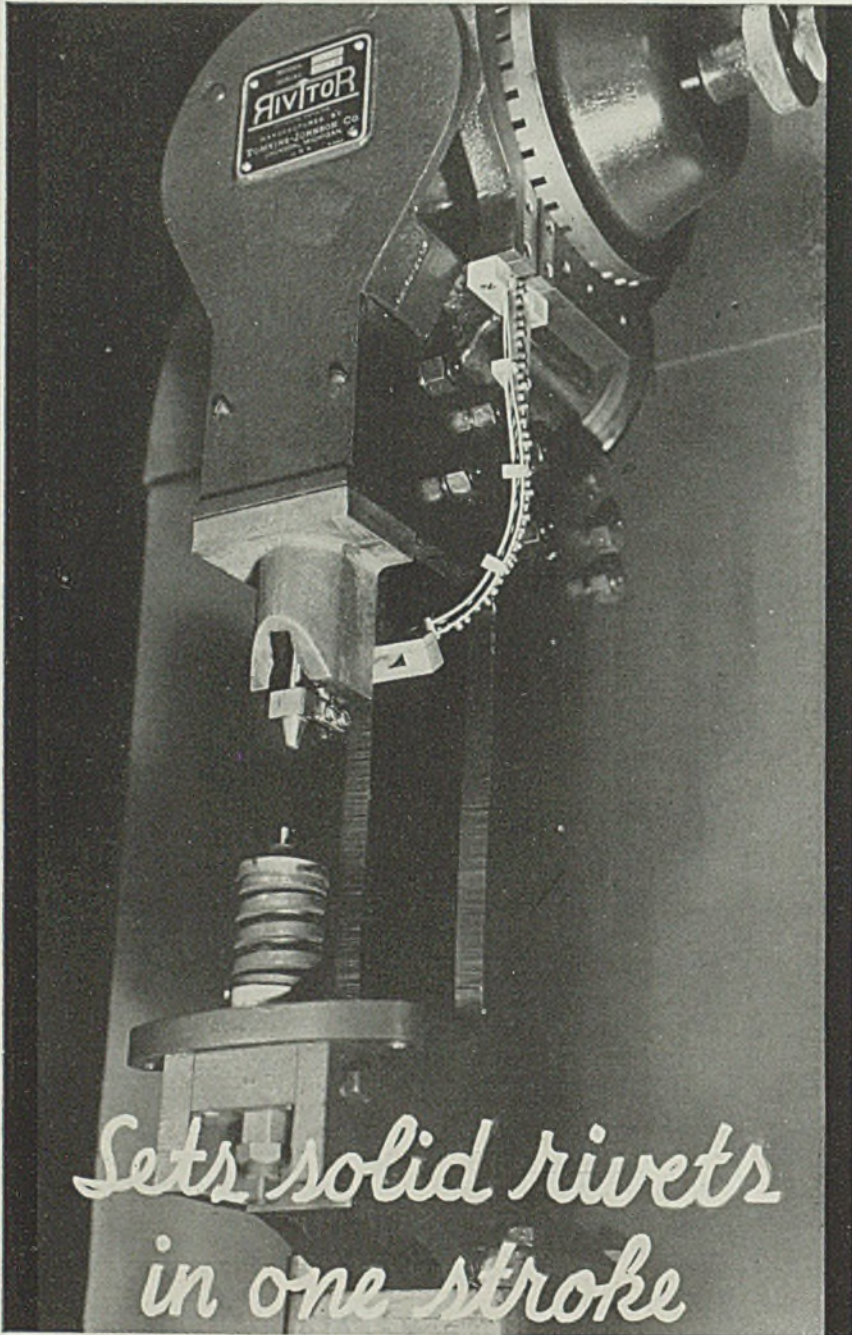
## Strip

Strip Prices, Page 71

**Pittsburgh** — Carrying over of present strip prices for deliveries during fourth quarter generally had been anticipated, although many persons had not looked for an announcement this early. While specifications have been less than shipments since July 1, in the case of one or two producers here they are only about 35 per cent under deliveries. Backlogs are two to three weeks on hot-rolled and four to six weeks on cold-rolled. Automotive specifications have been light and it appears now that around three weeks may elapse before much of a gain in activity from this source can be expected.

**Cleveland**—Specifications for hot and cold-rolled steel strip from miscellaneous sources has shown little change. Mills have made considerable headway against backlogs, which are now approximately two weeks on hot-rolled and three to four on cold-rolled material. Most consumers have ample stocks and are in no hurry to order ahead. Little improvement is expected until the automotive industry resumes normal operations.

**Chicago**—New strip business is quiet in comparison with shipments. July is expected to mark the low month in orders, with an early increase in automotive buying in prospect. Deliveries are improv-



**THE RIVITOR** automatically feeds and sets solid rivets with speed and precision, and it pays for itself by enabling you to substitute solid rivets for other types of rivets. Write us for specifications.

**THE TOMKINS-JOHNSON CO., 611 N. Mechanic St., Jackson, Michigan**  
European Office—Gaston E. Marbaix, Ltd., Vincent House, Vincent Square, London, S. W. 1, England

ing, but backlogs still are sufficient to support good operations. The rate is particularly favorable for this period.

Superior Steel Corp. and Washburn Wire Co., New York, divided 475 tons of narrow cold strip for the Rock Island, Ill., arsenal, bids under schedule 754. The former bid 8.4c, delivered on 0.038 x 1.7 inch and Washburn Wire Co. 10.05c on 0.024 x 1.187 inch.

**Boston**—While current consumption of narrow cold strip has declined slightly, incoming business is estimated at 65 to 70 per cent of fairly well sustained shipments. Drop in cold strip buying has been a trifle more pronounced than in wire, although some automotive parts producers are beginning to purchase moderately against requirements for new models. Backlogs are lower and operations continue high. Demand is well spread.

**New York**—Buying of cold strip is steady, but incoming volume continues considerably below shipments. Indications of an early upturn in specifications are evident as consumer stocks are generally lower following steady consumption. Deliveries on most lines are about normal and mills are seeking tonnage more actively as backlogs are reduced. Some buying for new automotive models through parts-makers has started, although not yet of large proportions.

**Philadelphia**—More interest has developed from radio trade but otherwise strip demand continues to lag seasonally. Relatively quick delivery is available on both hot and cold-rolled grades with the former averaging two weeks and less.

## Tin Plate

Tin Plate Prices, Page 70

**Pittsburgh**—Tin plate, at \$5.35 per base box, Pittsburgh, and other tin mill products, have been reaffirmed for fourth quarter by Carnegie-Illinois Steel Corp. The \$5.35 price does not apply on contracts for 1938, and an announcement of next year's contract price will be made later. The present \$5.35 price, which went into effect in April and was the first advance since December, 1933, has been nominal for the most part, and resulted in customers' utilizing their \$4.85 contracts to the fullest extent. Reaffirmation for the fourth quarter had generally been expected, despite increased costs of labor, tin and other materials. In the case of tin plate producers who were hampered for more than a month by strikes, it is expected the only solution to their problem of fulfilling \$4.85 contracts will be to continue shipping at the old price after Oct.

1 until this business is cleared, as apparently it would be impossible to complete these shipments before Oct. 1. Operations last week on the national scale were 96 per cent, with the Pittsburgh district average slightly higher. Producers in the Pittsburgh district continue to operate as high as 18 turns per week.

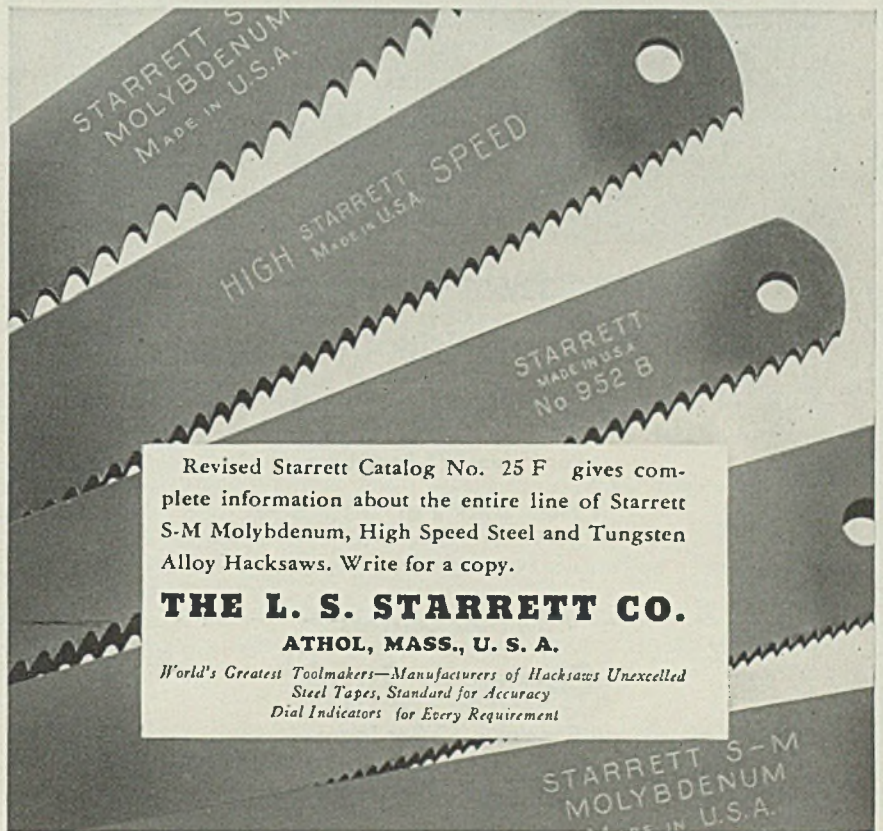
Detroit Rex Products Co., Detroit, manufacturer of Detrex degreasing machines, has opened a new branch office at 812 Huron road, Cleveland.

## Plates

Plate Prices, Page 70

**New York**—A factor operating against plate buying involves much tonnage under contract, released for shipment, but still undelivered. While a few mills are able to ship universal plates in five weeks, much tonnage cannot be promised before eight or 10. Until this material is received and worked off, most fabricating consumers are not in the

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market for additional steel. More open spots are appearing in rolling schedules, however, and deliveries are slowly improving. Railroads have released little tonnage against third quarter contracts. Shipyards have a large volume of work, repairs and new construction figured, but the slow recovery from the recent strike is operating against releases of plates. There has been a decided spurt in buying for eastern navy yards for other ships.

**Pittsburgh**—Plate producers con-

tinue active against previous bookings, backlogs in some cases ranging around eight to ten weeks. The present price of 2.25c, base, Pittsburgh, has been reaffirmed for fourth quarter. Barge orders continue light. Bids on three towboats, involving 200 tons of plates each will be taken August 18 by Inland Waterways, New Orleans.

**Cleveland**—Most plate mills report deliveries of 10 to 12 weeks, with a slight improvement since the first of the month, in contrast to the marked reduction in most other steel

products. Recent awards are confined to small lots for structural projects. Lima Locomotive Works, Lima, O., last week booked two locomotives for the Newburgh & South Shore railroad, Cleveland.

**Chicago**—While plate buying is relatively quiet, heavy shipments are in prospect through the quarter. Railroad equipment inquiries are light and little plate buying is in sight from that direction. Car-building and tank fabricating shops continue busy.

**Boston**—Plate buying has slackened with tonnages to shipyards holding well. Most buying is for miscellaneous needs with fabricators slightly less active. Deliveries with some mills are around eight weeks with others able to do materially better.

**Philadelphia**—Users are exerting pressure for deliveries but new orders continue to taper and are largely of miscellaneous character. Current tonnage from ship, locomotive and car builders is light with little pickup seen for next several weeks.

**Birmingham**—Orders for plates have climbed during the past few days but there is no immediate indication of sustained demand at the moment. Output is well booked for the third quarter.

**Seattle**—Demand for plates has declined and no important projects are up for figures. Jobbers report a fair turnover in small tonnages. Pasco, Wash. proposes water system extensions, including a large tank. Marine construction and repair jobs call for normal quantities of plates of various gages.

### Plate Contracts Placed

120 tons, gas-holder, Northern Indiana Public Service Co., Wabash, Ind., to Chicago Bridge & Iron Works, Chicago.

### Plate Contracts Pending

1800 tons, pipe line, Colorado Fuel & Iron Co., Minnequa, Colo.

600 tons, three towboats, for Inland Waterways, New Orleans, bids Aug. 18.

### Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Bolt, nut and rivet specifications are fairly steady, only moderately below the peak early in the year. Consumption is holding better than usual in the farm implement and tractor industries. Requirements of railroads and freight car builders are relatively heavy but only a small amount of new business for equipment building purposes is in early prospect. Jobbers are specifying in light volume, still working against stocks in some instances. Prices

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July 26, 1937

are fairly steady, with an extension of current levels into the fourth quarter probable.

## Bars

Bar Prices, Page 70

**Pittsburgh**—Hot-rolled bars will remain at 2.45c, base, Pittsburgh, during fourth quarter. Reaffirmation of this and other prices last week created little surprise in market circles as it had been expected. Current specifications continue below shipments and bookings for the month are around 30 per cent below the comparable period in June. In some sizes some producers have backlogs of three to five weeks. The automobile industry's slackening of assemblies, lighter requirements of railroad car shops and miscellaneous consumers, who at this season prefer to confine their orders closer to actual needs, are among the factors largely responsible for the present condition. In view of the reaffirmation for fourth quarter, buying may be expected to be steadier from now on. Schedules of farm equipment manufacturers are well maintained.

**Cleveland**—Requirements for commercial and cold-drawn alloy steel bars from machine tool builders, bolt and nut and farm equipment manufacturers are encouraging despite seasonal influences. However, the absence of automotive specifications is reflected in prompt deliveries on both hot and cold-rolled material.

**Chicago**—Paced by heavy needs of implement and tractor companies, bar consumption is showing resistance to seasonal influences. New business is quieter and less active than shipments, but deliveries hold around 30 days. Soft steel bars will continue 2.50c, Chicago or Gary, through the fourth quarter, other producers following the lead of Carnegie-Illinois Steel Corp. in announcing extension of present prices.

**New York**—Commercial steel bar buying is sluggish, substantially below shipments, with deliveries practically normal. Specifications by bolt and nut consumers are fairly steady, but demand from most sources has dropped.

**Philadelphia**—Buying of merchant bars by railroads, the jobbing trade and other principal outlets continues to lag as indicated by reduction of mill order books. Two weeks or earlier can be done in some instances.

**Boston**—Outstanding in bar demand is heavy buying for navy yards and large inquiry for man-

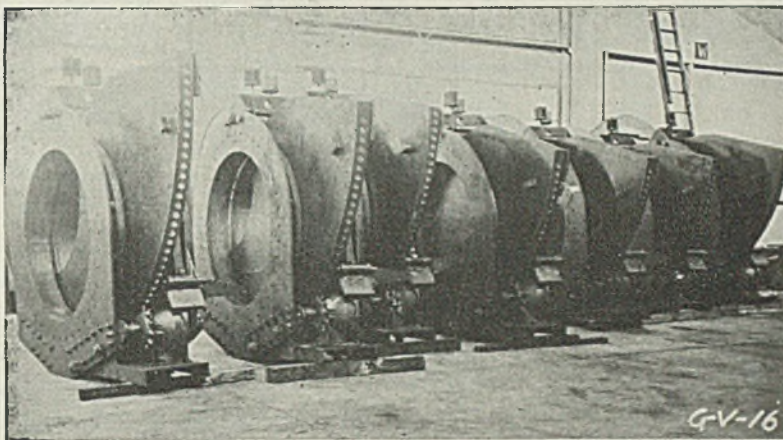
ganese acid steel, hot and cold-drawn bars for the Springfield, Mass., armory. On a substantial tonnage for the Portsmouth, N. H., navy yard, bid July 13, Jones & Laughlin Steel Corp., Pittsburgh, appears low. Most quotations were practically uniform.

**Birmingham**—Output of bars is booked at least for the first half of the third quarter, or possibly better. Some new tonnage has been specified during the last week with indications that July tonnage might be slightly higher than that of June.

## Pipe

Pipe Prices, Page 71

**Pittsburgh**—New business has declined in tubular goods but mills have fair backlogs, some ranging around six to eight weeks, which may not be quickly reduced. A 650-mile gasoline line from Grandfield, Okla., to a site on the Mississippi river in Iowa is planned by Bell Oil & Gas Co., Cushing Refining & Gasoline Co., Rock Island Re-



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fining Co., and Anderson Pritchard Oil Corp. This would require approximately 32,500 tons.

**Cleveland**—Most jobbers have had an opportunity to rebuild their stocks as decline in specifications from miscellaneous sources becomes more apparent. Many expect July to fall considerably behind June in total volume. Awards for the steel and cast pipe for the Industrial Rayon Co's plant, Painesville, O., is expected soon. J. B. Clow & Son Co., Cleveland, was awarded 150 tons of 16-20 inch cast pipe and fittings for

a grade elimination at Akron, O.

**Boston**—Steel pipe buying is light, lack of commercial building depressing demand for butt weld. Stocks held by resellers are ample, although not heavy as a rule. Some confusion prevails in prices. Wrought pipe buying is dull. Cast activity is largely for fill-in lots, with inquiry light.

**New York**—Purchase of 3900 tons of cast pipe by the Federal Water Service Corp., Brooklyn, features a slightly more active demand, with small lot inquiry and buying sus-

tained. For Newark, N. J., Warren Foundry & Pipe Co. is low on 1500 feet, 12-inch, a procurement division, treasury department requirement. Requisitions for additional heavy purchases by New York city have been approved and bids are expected on several thousand tons shortly.

**Birmingham**—Small orders, mostly from scattered sections, are reported by pipe plants here to maintain a fairly steady operating rate, although one large plant has been on a four-day schedule.

## Cast Pipe Placed

3900 tons, 6, 8, 12 and 16-inch, Federal Water Service Corp., Brooklyn, N. Y., for delivery at Flatbush and Woodhaven, divided between R. D. Wood & Co., Florence, N. J., and United States Pipe & Foundry Co., Burlington, N. J.

150 tons, 16 and 20-inch, grade elimination, Akron, O., to J. B. Clow & Son Co., Cleveland.

## Cast Pipe Pending

3700 tons, mostly 20-inch cement lined, New York city; bids Aug. 2.

3600 tons, 20-inch and under, cement-lined, New York city; bids asked in about 10 days.

165 ton, 6-inch, Simsbury, Conn.

# Transportation

Track Material Prices, Page 71

Railroad equipment markets are the quietest so far this year. Car builders still have fair backlogs which would prevent their accepting much new business for delivery before the fall peak in traffic arrives and carriers are in no hurry to make additional commitments. Rail mill backlogs continue to decline steadily as new buying remains light. While rail producers look for some additional orders to fill out track laying programs, tonnages are expected to be moderate. American Car & Foundry Co. expects to open its Madison, Ill., plant about Aug. 1, employing 1000 men on a Union Pacific order.

The Wabash has been given court permission to buy 6500 tons of 112-pound rails and sufficient fastenings, to replace 80-pound rails. General repairs to 665 box cars and 293 hopper cars were also authorized.

Western Maryland has ordered 1000 tons of rails from Carnegie-Illinois Steel Corp., Pittsburgh, and 1000 tons from Bethlehem Steel Co., Bethlehem, Pa.

Railroad equipment makers assert that for the carriers to obtain new

## Behind the Scenes with STEEL

### Fairs Please

IN THE year of our Lord 1939 will occur two giant fairs, as practically everyone in this country now knows. New York, home of press agents and publicity, has been beefing and blasting for some time about the event of '39 on its Flushing meadows, while out on the other half of the land, San Francisco, home of the famous California weather, publicity and press agents, has been busily building a 400-acre island to house its international fair which will also occur in 1939. Impartially entering both are the iron, steel and metalworking industries, which are ably covered each week by that paragon of business papers, STEEL. On page 15 our vice president in charge of fairs, expositions and staff meetings has written the first of what will eventually be a complete job of reporting on parts played by the industry in both these fairs.

handed a second epistle from a progressive gentleman who wanted to reassure us that although his subscription had yet several months to run, he would renew it in plenty of time so as not to miss a single issue.

### Names

INAMES, it is alleged, make news. Names, 1882 of them, representing all the known makes of American automobiles since the beginning of time were sent to us this week by Eaton Mfg. Co. We lamented at length that the industry has become so efficient as to drive out the producers of such fine cars as the Bugmobile and the Poppy Car. Seems that all the interesting names have gone the way of all things and only the prosaic ones are left. Can you imagine anything more romantic than rolling along in a Peter Pan convertible?

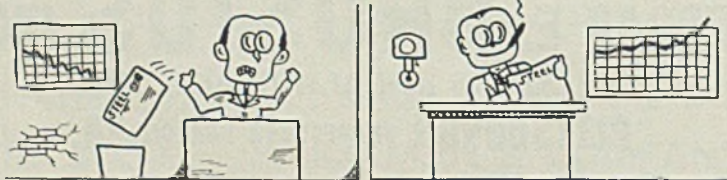
### Ardent

WE ARE by nature reticent and quite backward about mentioning such things as reader loyalty and such, but two letters which came in the mail bag left us limp with wonder that people could be so different. The first gave us a terrible let-down. The writer said he was wasting three cents to tell us he never wanted to see a copy of our magazine again. Said he threw it into the wastebasket in its original envelope. While we were sitting around in the dumps, feeling sorry for the misguided creature who could not use what most all executives in the iron, steel and metalworking industries relied on each week, we were

### Whiskery

IRON and steel, according to the American Iron & Steel Institute, is growing older every year in this country. Fifty years ago a piece of iron had reached the end of its natural life and was ready for a renaissance via the scrap heap at the end of fifteen years. Now, however, the same materials are still hale and hearty after thirty years, reaching a ripe old age shortly after 33 winters. We know one heap of iron now only three years old which feels quite decrepit on the open highway.

—SHIRDLU





cars in time for use late this year, buying will have to be done soon.

Rail and track material prices have been reaffirmed for fourth quarter, including standard rails at \$42.50; light rails, \$43; angle bars, 2.80c; and tie plates at \$46 per ton.

## Rail Orders Placed

Tennessee valley authority, 165 tons track and guide rails for Pickwick Landing dam spillway gate openings, to Carnegie-Illinois Steel Corp., Pittsburgh.

Western Maryland, 2000 tons, divided as follows: 1000 tons to Carnegie-Illinois Steel Corp., Pittsburgh, and 1000 tons to Bethlehem Steel Co., Bethlehem, Pa.

## Rail Orders Pending

Wabash railroad, 6500 tons 112-pound rails.

## Car Orders Placed

Godfrey L. Cabot Inc., Boston, 20 steel-covered hoppers to American Car & Foundry Co., New York.

Hercules Powder Co., four tank cars to General American Transportation Co., Chicago.

New York Central, four baggage-mail cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York Central, six light weight alloy dining cars to Pullman-Standard Car Mfg. Co., Chicago.

Southern Pacific, two tavern and two coffeshop style cars to Pullman-Standard Car Mfg. Co., Chicago.

## Locomotives Placed

Newburgh & South Shore railroad, Cleveland, two locomotives, to Lima Locomotive Works, Lima, O.

## Wire

Wire Prices, Page 71

Cleveland—American Steel & Wire Co. late Friday announced prices on wire and wire products are reaffirmed for fourth quarter delivery.

Wire mills remain at practical capacity in most departments, despite continued recession in specifications for merchant products and manufacturing wire. However, the latter have held better than merchant products, exceeding expectations of most sellers. Producers do not look for any general improvement until their automotive sources once more become active.

Pittsburgh — Reaffirmation of semifinished steel prices for fourth quarter is likely to have some effect on wire prices, announcement of which is expected soon. Meanwhile, demand continues light in most lines, with manufacturers buying somewhat better than merchants. Export inquiry has improved, especially in barbed wire, where a large tonnage for shipment

to Europe was being negotiated last week. Prices are steady.

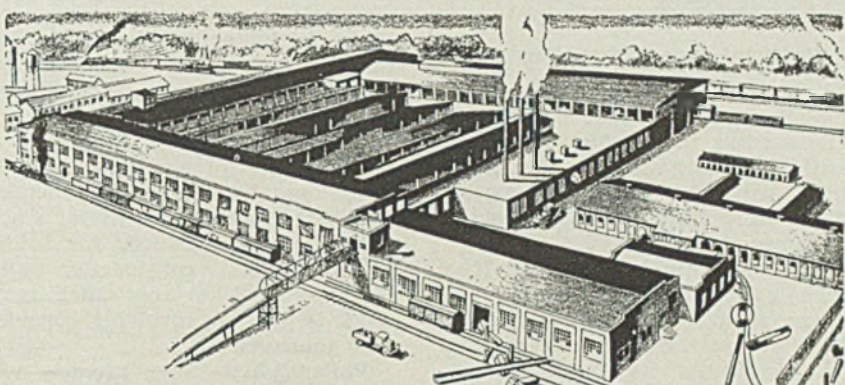
Chicago—Steel wire demand still is affected by the season, and a gain in consumption is not expected until August or early September. Favorable outlook for farm income points to sustained buying of fence, barbed wire, etc., for an indefinite period.

Bureau of reclamation, Denver, will take bids July 27 on 208 tons of steel core bare copper wire.

Boston—Buying for new automotive model needs through partmakers has gained momentum, starting sooner than expected. Specifications

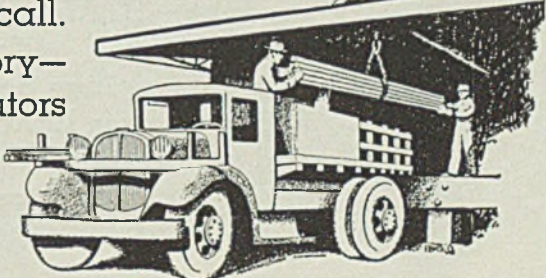
from this source had not been expected until early next month. There has been a slight increase in buying of some specialty wire products, but most standard lines are quiet with manufacturers' wire steady. One producer reports new bookings slightly above last month. Finishing mill operations continue high with more open spots appearing in production schedules as backlogs are gradually reduced.

New York—Incoming business is steady, but slightly lower than earlier in the month, notably in manufacturers' wire, although spec-



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ifications this month are above June. Most mills have good backlogs on heavier wire products with new orders down slightly. Demand for specialty goods, covering a broad list, is generally maintained at the recently lower level. Spotty improvement in merchant wire products, including nails, is noted as jobbers fill in depleted lines.

**Birmingham**—Wire products continue in slow demand. Renewal of agricultural buying early in the fall is expected to stabilize the market.

## Shapes

Structural Shape Prices, Page 70

**New York** — Structural projects being figured are fewer. A substantial increase in volume looms just ahead, including a subway extension to the world's fair site, Queens; another deck, Henry Hudson bridge, and tunnel approaches.

The new building code for New York city, to be signed by the mayor, is not expected to materially affect the use of steel in the immediate future. Outstanding, however, is a provision which allows structural steel welding in the erection

of high buildings. This, if widely adopted, would materially affect the volume of structural rivets. The use of steel building mesh in larger volume, however, is expected to increase.

**Boston**—Structural contracts for small state bridges are more numerous, going mostly to outside shops. Considerable of this tonnage has been held up by labor troubles. About 500 tons of new Vermont bridges has been bid. Deliveries on plain material average about six weeks or slightly better.

**Pittsburgh**—The 2.25c, Pittsburgh, structural shape price will be carried through fourth quarter unchanged. Awards and inquiries continue fairly well maintained. Approximately 800 tons will be needed for a store building in Upper Darby, Pa.

**Buffalo** — Industrial building is heading upward and there will be early purchases of considerable fabricated material for projects now being figured. Awards for bridge and industrial construction total close to \$500,000 and much more work is pending involving considerable tonnages.

**Philadelphia**—There are few jobs before the trade, although a number of projects requiring less than

100 tons individually are noted. Bids go in Aug. 10 on a swing bridge over Savannah river, Allendale, S. C., requiring 300 tons.

**Cleveland**—Local structural fabricators are well occupied with small jobs. For some time at least one fabricator has been unable to bid on many of these because his delivery promises were too extended. A slight improvement is noted in deliveries from mills. The only important pending project is the Lorain avenue bridge, Cleveland, about 600 tons; bids July 27.

**Chicago** — Inquiries and awards are lighter, and few major projects are pending. Bridge inquiries continue well below the volume a year ago though several small ones are pending in Illinois and Indiana. A local fabricator has booked 1200 tons for TVA work.

**St. Louis**—New projects are few and mainly small but fabricators are busy getting out structurals held up during the recent strike.

**Birmingham**—Some new business has been placed but most specifications are for the smaller shapes handled by jobbers. Operations in fabricating plants are approximately 70 per cent.

## Shape Contracts Placed

9000 tons, main building, Charity hospital, New Orleans, to Bethlehem Steel Co., Bethlehem, Pa.

3000 tons, river tunnels and shafts, Queens midtown tunnel, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Walsh Construction Co., Long Island City, N. Y., bids May 25, New York city tunnel authority.

2750 tons, William Cullen Bryant high school, Queens, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa., \$262,540, steel direct, fabricating and erecting, bids July 9, board of education, New York.

1550 tons, bridges and underpasses, Ascension parish, Louisiana, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

1400 tons, building, Federated Metals Corp., Whiting, Ind., to Austin Co., Cleveland.

1300 tons, operating bridge, for Chickamauga and Guntersville dams, Tennessee Valley Authority, Knoxville, Tenn., to Duffin Iron Co., Chicago.

1250 tons, building, Corning Glass Works, Corning, N. Y., to International Steel Co., Evansville, Ind.

## Shape Awards Compared

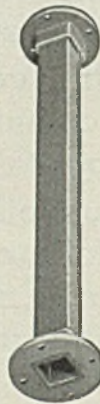
	Tons
Week ended July 24.....	29,463
Week ended July 17.....	15,390
Week ended July 10.....	13,900
This week, 1936.....	17,577
Weekly average, 1936.....	16,332
Weekly average, 1937.....	26,821
Weekly average, June.....	32,510
Total to date, 1936.....	665,443
Total to date, 1937.....	804,622

Includes awards of 100 tons or more

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800 tons, building, National Container Corp., Jacksonville, Fla., to Jones & Laughlin Steel Corp., Pittsburgh.

700 tons, bridge, Delaware & Hudson railroad, Cobleskill, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

475 tons, bridge No. 1560, Shelby county, Indiana, to Central States Bridge & Structural Co., Indianapolis, Ind.

475 tons, bridge WPGS-498-A, Cimarron county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

400 tons, galvanized switch yards structures, Pickwick Landing dam, to International Derrick & Equipment Co., Columbus, O.

360 tons, press and warehouse buildings, St. Joseph, Mich., to R. C. Mahon Co., Detroit.

350 tons, building, Landers, Frary & Clark, New Britain, Conn., to Berlin Construction Co., Berlin, Conn.; A. F. Peaslee Inc., Hartford, Conn., general contractor.

335 tons, 400-foot radio tower, Alpine, N. J., to American Bridge Co., Pittsburgh.

325 tons, bridge WPGM 507, Jefferson county, Kentucky, to American Bridge Co., Pittsburgh.

301 tons, overpass, Creek county, Oklahoma, to Capitol Steel & Iron Co., Oklahoma City, Okla.; G. G. Toler, Ada, Okla., general contractor.

300 tons, 75-foot lift span, Chicago, Milwaukee, St. Paul & Pacific railroad, Portage, Wis., to Worden-Allen Co., Milwaukee.

300 tons, office building, Sharon, Pa., for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

270 tons, addition, public school 197, Brooklyn, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.; \$25,500, steel direct, fabricating and erecting, bids July 9, board of education, New York.

270 tons, addition, public school 86, Bronx, New York, to Schact Steel Construction Co., New York; \$24,790, steel direct, fabricating and erecting, bids July 9, board of education, New York.

265 tons, furnace building, Libbey-Owens-Ford Glass Co., Ottawa, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

260 tons, store building, 721 Fifth Avenue Corp., New Rochelle, N. Y., to Bethlehem Fabricators, Bethlehem, Pa.

240 tons, grinding and packing building addition, E. I. du Pont de Nemours & Co., Edge Moor, Pa., to Belmont Iron Works, Eddystone, Pa.

225 tons, sludge disposal plant, Buffalo, N. Y., to R. C. McMannus Steel Construction Co., Buffalo.

220 tons, bleachers, Chicago National League ball club, Chicago, to Midland Structural Steel Co., Cicero, Ill.

200 tons, mill building, American Smelting & Refining Co., Perth Amboy, N. J., to Belmont Iron Works, Eddystone, Pa.

190 tons, gas producer building, Libbey-Owens-Ford Glass Co., Ottawa, Ill., to Wisconsin Bridge Co., Milwaukee.

175 tons, nine transmission towers, Corinth, Miss., for Tennessee Valley Authority, Knoxville, to Nashville Bridge Co., Nashville, Tenn.

170 tons, building, International Silver Co., Meriden, Conn., to New England Iron Works Inc., New Haven, Conn.

165 tons, garage, Eastern Massachusetts Street Railway Co., Brockton, Mass., to New England Structural Co., Everett, Mass.

155 tons, Bernhelm bottling plant, Louisville, Ky., to Joseph T. Ryerson & Son Inc., Chicago.

150 tons, state highway bridge RC 3892, Howes Cave-Cobleskill, Schoharie county, New York, to Pan-American Bridge Co., New Castle, Ind.; Richard Hopkins Co., Albany, N. Y., general contractor, bids July 8.

150 tons, building addition, St. Clare's hospital, West Fifty-first street, New York, to Dreier Structural Steel Co., New York.

130 tons, building addition, Atlas Steel Barrel Co., Bayonne, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa.; Austin Company, general contractor.

125 tons or more, beaching gears for Pan-American Airways, to Barde Steel Co., Seattle; Kenworth Motor Truck Corp., Seattle, general contractor.

115 tons, building addition, American Optical Co., Southbridge, Mass., to Bethlehem Fabricators Inc., Bethlehem, Pa.; H. U. Bail Sons Inc., Southbridge, general contractor.

110 tons, plate girder span, Western Maryland railroad, Cherry Run, W. Va., to American Bridge Co., Pittsburgh.

107 tons, steel stringer bridge and approaches No. WPF 69, Fitchburg, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Wachusett Engineering Co. Inc., Fitchburg, general contractor.

100 tons, shapes and bars, state bridge, Uxbridge, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Richard White Sons Inc., West Newton, Mass., general contractor, bids June 22.

100 tons, shapes and bars, grade crossing, Delaware & Hudson railroad, Corinth, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; S. A. Scullen Inc., Cohoes, N. Y., general contractor.

100 tons, shapes and bars, Newbury, N. H., to American Bridge Co., Pittsburgh, and Truseon Steel Co., Youngstown, O.; Dominic M. Bernardi Inc., Wellesley, Mass., general contractor.

100 tons, repairs to plant of Seattle Gas Co., to Pacific Car & Foundry Co., Seattle.

Unstated tonnage, guide rail supports and sills, spillway gates, Pickwick Landing dam, Tennessee Valley Authority, to Bethlehem Fabricators Inc., Bethlehem, Pa., \$47,851, f.o.b. plant.

## Shape Contracts Pending

10,000 tons, annex building 3, government printing office, Washington; Great Lakes Construction Co., Chicago, low, bids July 16. Otis Elevator Co., Washington, low on elevator plant, \$414,900.

6000 tons, court house, Kansas City, Mo.; bids Aug. 31.

3500 tons, Beach Channel drive, Queens, N. Y.; A. M. Hazel Inc., New York, low; bids July 19.

3000 tons, marine hospital, St. Louis; bids Sept. 3.

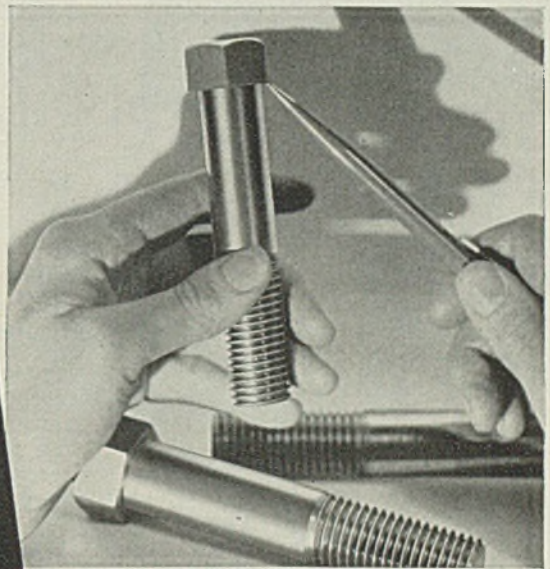
2500 tons, upper deck, Henry Hudson bridge, New York; bids soon.

2000 tons, anchorages, Bronx-Whitestone bridge, New York; Corbetta Construction Co., New York, low, bids July 21, Triborough Bridge authority, New York.

1050 tons, five underpasses, Pennsylvania railroad, New Brunswick, N. J.

1000 tons, gates, hoists, stoplogs and other items for Bonneville dam; bids by U. S. engineers, Bonneville, Oreg., Aug. 6, 13 and 17.

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**VANO**—moderate volumes (1,500-3,000 C. F. M.) at high velocities (4300 F. P. M.)



Write for Bulletin 164-2.

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- 800 tons, store building, Lit Bros., Upper Darby, Pa.
- 800 tons, bridge, Bartelso, Ill.
- 750 tons, addition to bank building, Nashville, Tenn.
- 700 tons, boiler room, Southern Indiana Gas & Electric Co., Evansville, Ind.
- 600 tons, office building, Equitable Life Insurance Co., Washington.
- 500 tons, coaling station, Frankfort, Ind.
- 475 tons, foundry addition, American Locomotive Co., Schenectady, N. Y.
- 460 tons, two bridges, New Brunswick, N. J., for Pennsylvania railroad.
- 450 tons, manufacturing building and boiler house, Lady Esther, Clearing, Chicago.
- 450 tons, factory and office, Engineer & Research Corp., Riverdale, Md.
- 300 tons, reconstruction pier No. 12, Baltimore & Ohio railroad, Philadelphia.
- 270 tons, extension to mill building, Chicago Bridge & Iron Works, Greenville, Pa.
- 250 tons, alterations to stock yard buildings, for New York Central railroad, New York.
- 250 tons, factory building, for Lincoln Associates, Flushing, N. Y.
- 250 tons, building, for Emauel Ornstein, New York.
- 250 tons, building, Cluett-Peabody & Co., Leominster, Mass.
- 168 tons, highway project and bridge F.A.P. 223, Stockbridge, Vt.; E. H. Lewis, Andover, Mass., low, \$178,-894.20, bids July 16.
- 167 tons, three-span I-beam state bridge, 84-foot span, Norwich, Vt.; Hagan-Thibodeau Construction Co., Wolfeboro, N. H., low, \$38,465, bids July 16.
- 164 tons, 153-foot span deck truss bridge with two 69-foot approach beam spans, Dummerston-Newfane, Vt., Williams-ville branch, West river; bids July 30, H. E. Sargent, commissioner of highways, Montpelier, Vt.
- 105 tons, piling, navy delivery, Sewalls Point, Va., Dravo Corp., Pittsburgh, low.
- Unstated, 221 foot bureau of roads span, Linn county, Oreg., Joplin & Elder, Portland, low.

# Reinforcing

Reinforcing Bar Prices, Page 71

**Pittsburgh**—The continuance of present prices through fourth quarter may result in less haste to close projects. Prices in some districts at present are spotty. New projects are lighter than last year.

**Cleveland** — Reinforcing steel requirements continue relatively inactive with mills in position to make deliveries almost overnight. Prices continue spotty with little improvement expected.

**Chicago**—Less activity in building restricts concrete bar inquiries. Awards are swelled by placing of 1900 tons for the local postoffice garage with Inland Steel Co. Prices are somewhat steadier though all irregularity has not disappeared.

**New York**—Reinforcing tonnage is heavier. New buying and inquiry for highway mesh, while down slightly, is still active. Contractor-buyers continue to press for conces-

sions on reinforcing bars, with some success.

**Buffalo** — Two bridge and two warehouse jobs in Western New York are expected to require more than 1000 tons of reinforcing bars. Pending projects include a locomotive round house at Niagara Falls and several bridge jobs.

**Philadelphia**—Coath & Goss Inc., Chicago, is low on experimental basin for navy department, Carderock, Md., requiring 2900 tons. Otherwise market is devoid of important jobs with most buying in small lots for alteration and additions.

**Seattle**—New business is not promising, consisting mostly of small tonnages. Increasing costs have halted construction and this is reflected in concrete bar demand.

## Reinforcing Placed

- 1900 tons, postoffice garage, Chicago, to Inland Steel Co., Chicago.
- 1400 tons, river tunnels and shafts, Queens midtown tunnel, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Walsh Construction Co., Long Island City, N. Y., general contractor; bids May 25, New York city tunnel authority.
- 950 tons, court house building, Philadelphia, to Sweets Steel Co., Williamsport, Pa.
- 700 tons, U. S. veterans hospital, Detroit, to Hausman Steel Co., Toledo, O.
- 620 tons, overpass, South Norfolk, Va., over Norfolk & Western and Norfolk Southern railroads, to Truscon Steel Co., Youngstown, O.
- 325 tons, mesh highway, Cherry Valley-Sharon Springs highway, Otsego and Schoharie counties, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through Thomas A. Brogan, Yonkers, N. Y., general contractor.
- 300 tons, plant, Federated Metals Corp., Whiting, Ind., to Inland Steel Co., Chicago.
- 250 tons, two exploratory caissons, Lackawack dam, Warwaring, Ulster county, New York, to Concrete Steel Co., New York; Triest Construction Co., New York, general contractor; bids June 2, Board of Water Supply, New York.
- 250 tons, grade elimination, Kentucky & Indiana Terminal railroad, Louisville, Ky., to Laclade Steel Co., St. Louis.
- 225 tons, substructure, bridge, Fetterman, W. Va., to Hall-Hodges Co., Norfolk, Va.; T. A. Loving, Goldsboro, N. C., general contractor.
- 200 tons, state highway bridge, Quema-

## Concrete Awards Compared

	Tons
Week ended July 24 .....	8,026
Week ended July 17 .....	2,843
Week ended July 10 .....	7,083
This week, 1936 .....	15,431
Weekly average, 1936 .....	6,005
Weekly average, 1936 .....	5,765
Weekly average, June .....	9,596
Total to date, 1936 .....	218,282
Total to date, 1937 .....	172,964

Includes awards of 100 tons or more.

honing Shade and Stony Creek townships, Somerset county, Pennsylvania, to National Building & Supply Co.

150 tons, state highway projects, Albany and Fulton counties, New York, through Sheehan Contracting Co., Albany, to Albany Steel & Iron Co. and Strope Steel Co., both Albany, N. Y.

150 tons, housing development, Brentwood Village Corp., Washington, to Rosslyn Steel & Cement Co., Washington.

150 tons, highway project, Bennington, Vt., to Northern Steel Co., Boston.

132 tons, substructure, state bridge, Boston & Maine railroad crossing, North Kennebunkport, Me., to Baneroff & Martin Rolling Mills Co., Portland, Me.; Concrete Construction Co. and Cerall Contracting Co., Chelsea, Mass., joint contractors. Project also includes 130 tons, steel piling.

124 tons, mesh highway, Orleans county, New York, to Wickwire Spencer Steel Co., New York.

100 tons, overpass, Creek county, Oklahoma, to Capitol Steel & Iron Co., Oklahoma City, Okla.; G. G. Toler, Ada, Okla., general contractor.

100 tons, army engineer, San Francisco, to Gunn, Carle & Co., San Francisco.

## Reinforcing Pending

5500 tons, naval experimental model basin, bureau of yards and docks, navy department, Carderock, Md.; Coath & Goss Inc., Chicago, low, bids July 21.

1325 tons, bullion depository, West Point; Boudin Contracting Corp., New York, low.

1000 tons, factory building, Phillip Morris & Co., Richmond, Va.

810 tons, sewer contract 1, project 1, Queens, N. Y., Luang Construction Co., New York, low.

700 tons, store building, Sears, Roebuck & Co., Detroit.

550 tons, reservoir, East Orange, N. J.; taking new bids.

525 tons, mesh, Merrit highway, near Greenwich, Conn.; bids Aug. 3.

510 tons, building, museum of modern art, New York.

500 tons, mesh highway, Jefferson county, New York; bids July 27.

500 tons, building, school of architecture, Massachusetts Institute of Technology, Cambridge, Mass.

480 tons, anchorages, Bronx-White-stone bridge, New York, contract WB-4; Corbetta Construction Co. low; bids July 21, Triborough Bridge Authority, New York.

390 tons, filtration building, Minneapolis-St. Paul.

300 tons, malt house, Albert Schwill & Co., Chicago.

238 tons, sewer, avenue M, Brooklyn, N. Y.; Charles Bennett Improvement Co., Brooklyn, low.

200 tons, reservoir, Orange, N. J.

155 tons, 105 tons fabricated bars and 50 tons plain steel bars, pony truss bridge, Centre county, Pennsylvania; L. M. Hutchinson, Mt. Union, Pa., low at \$99,668.11 on Schedule 1, and \$112,999.06 on Schedule 2.

114 tons, bridge, route 28, Annandale, N. J., Yeo Construction Co., Philadelphia, low.

100 tons, warehouse addition, for Gazzola Drug & Chemical Co., Chicago.

100 tons, warehouse, Libbey Glass Co., Toledo, O.

100 tons, building, Landers, Frary & Clark, New Britain, Conn.

Unstated, warehouse for Hood River Ap-

ple Growers association, Hood River, Oreg.; L. H. Hoffman, Portland, general contractor.

# Pig Iron

Pig Iron Prices, Page 72

**Pittsburgh**—No announcement has been made on pig iron prices for fourth quarter, most producers believing it inadvisable now, with numerous questions unsettled, such as production costs, volume of domestic and foreign demand, and course of scrap prices. However, reaffirmation of steel prices may have considerable effect toward bringing about a continuance of present pig iron quotations into fourth quarter, provided scrap does not exceed its March peak. Already, as a result of recent scrap price use, a few melters have indicated they might use more pig iron.

**Cleveland**—General feeling is that sellers will wait until Sept. 1 before opening books for fourth quarter, to more closely estimate costs and watch future developments in the recent upward trend of the scrap. Farm implement manufacturers, foundries are comparatively inac-

tive. Most melters have sufficient stocks and are hesitant to contract ahead until fourth quarter prices are determined.

**Chicago**—Pig iron producers do not expect to announce fourth quarter prices until Sept. 1 when a better picture of factors affecting quotations will be available. The market currently is firm at \$24, furnace, for No. 2 foundry and malleable. Shipments continue ahead of the June rate, a gain of 10 to 15 per cent being indicated. Consumption is declining among some jobbing plants, but foundry operations as a whole show only a small decrease since a month ago. Farm equipment foundries continue heavy schedules.

**Boston**—Pig iron buying for domestic consumption is light, but contract shipments are steady and include numerous calls for small-lot deliveries. Foundry melt is down slightly. Export inquiry continues active. Some sellers are unable to meet exact analysis requirements, but most buyers take the closest available.

**New York**—Pig iron sales are in small lots for current shipment, generally from consumers operating with light stocks. Shipments against

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contracts are steady and in good volume, most melters having covered through the current quarter.

**Buffalo**—Demand for pig iron is improving slowly but there has been no improvement in releases on third quarter orders. Producers believe consumers will reduce inventories to minimum before taking shipments. New strength in scrap markets will be an added factor in causing consumers to use all available hot iron in open-hearth mixtures.

**Philadelphia**—Pig iron buyers are showing more interest in fourth quarter requirements and several substantial purchases are reported in the offing. These melters are working down supplies bought earlier. Talk still is heard of a fourth quarter increase, but even if announced consumers undoubtedly will be covered for this period at current prices. Russia is reported short on iron, which is lending strength to world markets.

**Cincinnati** — Pig iron is feeling seasonal influences and some effect from carryover. Some foundries are contracting conservatively but many jobbing foundries, now without backlogs, again are purchasing in small lots. Scrap price rises and renewed talk of a possible fourth quarter price advance in iron has failed to drive in new business in volume.

**St. Louis**—Contrary to seasonal precedent, shipments of pig iron so far this month have exceeded the like interval in June and there is every indication the July total will compare favorably with that of any month this year.

**Birmingham** — Pig iron buying continues spotty with most buyers pressing for immediate delivery, and a noticeable absence of contract buying at the moment. Accumulation is not sufficient to cause apprehension.

**Toronto, Ont.**—Business continues at steady level although sales are confined to small lots for spot delivery. Melters are interested in current needs only and melt has been reduced owing to vacations. Sales have dropped to around 1000 tons per week. Those covered for third quarter are taking schedule delivery but making no additional bookings.

## Scrap

Scrap Prices, Page 74

**Pittsburgh** — Scrap showed increased strength last week. No. 1 heavy melting steel rising 50 cents to \$20 to \$20.50 per ton. Dealers found it increasingly difficult to obtain good material, and at the close of the week \$20.50 per ton was being paid for lots of three to five carloads. Some of this material was being applied on lower priced orders. Railroad specialties and some of the other grades were stronger also. Dealers are cautious on accepting new business at the current quotations. Mill buying is light.

**Chicago**—Scrap prices continue to soar. Heavy melting steel has been bought by a mill at \$18.50, or \$2.50 above the June low, but brokers are bidding \$19 and \$19.50. Railroad lists have brought better than

\$20.50 for heavy melting, this figure having been boosted partly by competition from exporters' bids.

**Boston**—Scrap prices continue to develop strength, although buying, except for export, is not heavy. Since the advance of 50 cents in melting steel grades for dock delivery, brokers have slightly raised bids on these grades for domestic shipment to Pennsylvania. Boat loading continues active. Stove plate and several cast grades are up 50 cents and even more has been paid for the former.

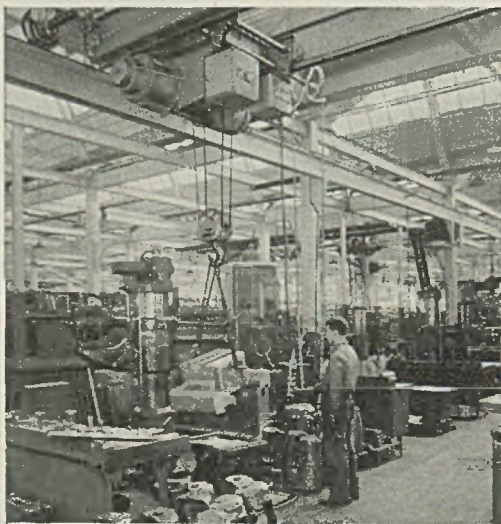
**New York**—Heavy melting steel for export dock delivery has advanced 50 cents. No. 2 cast is also 50 cents higher. For domestic shipment stronger prices are bid for borings and turnings, grate bars, No. 1 heavy melting steel and stove plate. Shipments to mills are steady but not heavy, although buying is light. Tonnage of heavy melting steel moving to Buffalo by water is slightly heavier, though below that of last year. Buying for export is maintained with shipments against orders active.

**Philadelphia** — The market for steel and iron scrap has leveled off after the recent rapid rise, with a few advances to adjust individual items. An additional sale of No. 1 heavy melting steel is noted at \$19.50 for delivery at a nearby Philadelphia mill. This consumer is now reported fairly well covered on requirements although additional purchases are expected soon. Export demand is slow here as this market is out of line with other seaboard areas. Cast grades are in better demand.

**Buffalo**—No. 1 steel, which has been much stronger than No. 2 recently, is held by dealers for as much as \$20 a ton. The usual differentials between the two grades no longer exist here, due to the strength of the one and the comparative weakness of the other.

**Detroit**—Tightening up of supplies as a result of slowing automobile production, and some speculative buying, have carried prices to higher ground. Borings and turnings are up another 50 cents per ton, sheet bundles 25 cents, and plate scrap and short rails have been raised 50 cents and \$1 respectively. The latter increase is occasioned by improved demand from foundries which are buying in anticipation of higher prices or as a result of recent new business on automotive accounts. Blast furnace scrap continues in good demand, mostly for water shipment.

**Cincinnati**—Heavy melting steel is leading the way in a scrap price advance, rising \$1 to \$16.50. Dealers find material scarce at this figure. The increase for other grades was



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smaller. Dealer activity in obtaining material so far is not matched by mill purchasing interest.

**St. Louis**—The past week or ten days have witnessed a sharp advance in iron and steel scrap prices, the extent of which nearly wipes out the severe losses recorded during May and June. Latest advances range from 25 cents per ton to \$3.50 per ton, the extreme advance being on shafting. Other grades affected by the rise include rails, heavy melting steel, malleable, car wheels, borings and turnings and railroad specialties.

**Birmingham**—The feature of the week was the phenomenal jump in scrap, sending most items up \$1 a ton. Entry of Republic Steel Corp. into the market, with widespread demand, some of it foreign, is responsible. A considerable tonnage of scrap is moving from Mobile, Ala., for foreign consignment, and dealers report some difficulty in obtaining desired specifications.

## Warehouse

Warehouse Prices, Page 73

**Pittsburgh**—Warehouse business has been irregular during past week, with some interests reporting sales slightly better than in the previous period and others noting continuance of the downward trend.

**Cleveland**—Warehouse distributor's report no change in the declining trend in orders since the first of the month. All products have been affected seasonally with the possible exception of certain grades of sheets and heavy plates, on which mill deliveries remain well extended.

**Chicago**—Sales are fairly steady and only moderately below the rate a month ago. Demand reflects some seasonal decrease in consumption and warehouses expect trend to continue into August. Extension of present prices on warehouse products through fourth quarter is in prospect.

**New York**—Steel buying from warehouses is quiet and July volume with most distributors will be considerably below last month. Practically all lines of steel products are slower, although some sellers report cold-finished sales to the machine shop trade are moderate.

**Philadelphia**—Steel sales out of warehouse continue to taper with no particular product outstanding in current lighter buying. No change in prices is anticipated in view of reaffirmation of fourth quarter mill prices.

**Detroit**—Warehouse trade, while holding at a fair level, is not showing the increase experienced last

year, chief reason being the lack of important changes in new automobile models. In industry outside automotive field, demand holds well, and sales are encouraging. A number of new industrial plants are under construction, but warehouses report this is not reflected in their business.

**Cincinnati**—Volume of warehouses has dropped abruptly since early July. Better mill deliveries sapped tonnage which had been screening the customary seasonal lull. Individual sales of structurals are small but account for considerable business.

## Cold-Finished

Cold Finished Prices, Page 71

**Pittsburgh**—Cold-finished shipments are comparable to last month by reason of backlogs, but new business is off considerably, as much as 35 per cent in some cases. Activity last week was enlivened by a few orders from jobbers who, after stocking heavily, had run out of certain sizes. Otherwise, specifications have been so light that it has been hard to pick out the lines which have been more active than others. Orders direct from the automotive industry are expected in two or three weeks for delivery around Sept. 1. Some material already has been ordered for 1938, however, by certain divisions such as those making body hardware. Reaffirmation of hot-rolled bar prices is expected to be reflected in cold-finished items.

## Iron Ore

Iron Ore Prices, Page 74

**Cleveland**—All of the 312 American lake ore carriers were in commission July 15. This compares with 247 out of a possible 318 on July 15, 1936, according to the M. A. Hanna Co., Cleveland. The 312 carriers are being used in the ore trade.

Stocks of iron ore at the lower lakes ports and furnaces July 1 were approximately 2,450,000 tons more than on the comparable date last year, due to the marked improvement in shipments from upper lake ports. The Lake Superior Iron Ore association reports:

	Tons
Consumed in May .....	5,339,925
Consumed in June .....	4,639,733
Decrease in June .....	700,192
Consumed in June, 1936 .....	3,763,289
On hand at furnaces July 1 .....	21,065,726
On Lake Erie docks July 1 .....	3,329,253
Total on hand at furnaces and Lake Erie docks July 1 .....	24,394,979
Reserves, total July 1, 1936 .....	21,953,825

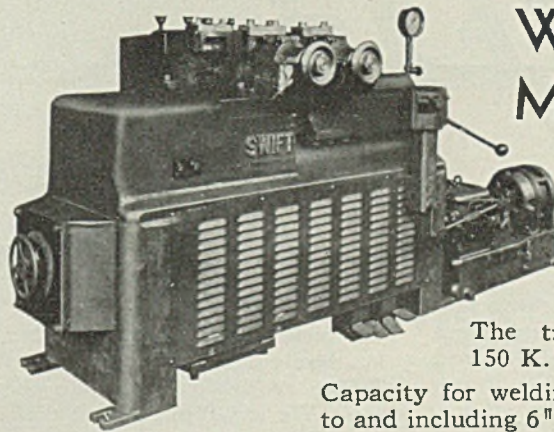
## Mirrors of Motordom

(Concluded from page 28)

LaSalle to a number of suppliers. Order instructions call for shipments to start the week of Aug. 2.

Reports from the East advise of considerable speculation over possibility of production being started in the old Cunningham plant on a new type of three-wheel automobile. The design is understood to be one shown around Detroit about

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three years ago and which created unusual interest at the time, but lack of capital prevented any progress toward actual production.

Twelve additional bell-type annealing furnaces have been purchased by Ford from Westinghouse for annealing coils of body stock. Each furnace will accommodate two coils, or 32,000 pounds of steel. The new units bring the total number of such furnaces at Ford to 38.

Contract for a fourth slab heating furnace at the hot strip mill of the Rouge plant has been awarded to Rust Engineering Co., Pittsburgh. The furnace will be 45 feet in length, 17 feet in inside width, with capacity of 30 gross tons of slabs per hour. It will operate on oil with coke oven gas for stand-by.

Modernization of Ford showrooms at 1710 Broadway into a permanent year-round exhibit of Ford products has been announced. Work on alterations to the five-story building will be completed by Oct. 15, in time for the annual Ford show held concurrently with the national automobile show.

Last Wednesday, visitors were formally admitted to view the "Roads of the World" display on the grounds of the Ford rotunda in Dearborn. Comprising a half-mile stretch of roadway made up of sections reproduced from 18 historic world highways, the project was dedicated by consular officials and representatives from road and highway associations. The exhibit includes representations of virtually every type of road surface

used since highways first were constructed.

## Nonferrous Metals

Nonferrous Metal Prices, Page 72

**New York**—A sudden spurt in copper buying accompanied by advancing prices abroad featured nonferrous metal market developments last week. While other metals tended lower abroad, zinc and lead firmed here while tin declined.

**Copper**—Domestic sales jumped to 5336 tons Thursday, lifting the July average to 1773 tons per market day, the highest rate since February. Export copper closed at 14.20c to 14.25c, c.i.f., with sales reported as high as 14.35c. Electrolytic held firm at 14.00c, Connecticut.

**Lead**—A tighter supply situation developed in lead with refined stocks reported 2437 tons lower at the end of June at only 113,370. Sales for the week were moderate at the unchanged basis of 5.85c, East St. Louis.

**Zinc**—Buying pressure was lifted but prices remained very firm due to scarcity of nearby supplies. Prime western held at 7.00c, East St. Louis.

**Tin**—Straits spot prices slumped to around 59.12½ compared with 60.00c earlier in the week. Consumers bought more actively at the lower levels.

**Antimony**—The market was active pricewise with spot advancing to 15.25c, New York. Threats of war in the Far East were responsible.

## Steel In Europe

Foreign Steel Prices, Page 73

**London** — (By Cable) — Demand for steel and iron in Great Britain continues strong in spite of the vacation season now beginning in Scotland. South Durham Steel & Iron Co. Ltd. is starting an additional blast furnace stack. Supplies of steel and steelmaking iron are improving generally, including deliveries from the Continent but still are insufficient to meet current requirements.

The United reports export trade is more active. South America is resuming buying. Export prices on products included in the steel cartel have been increased to include premiums, which now are discarded.

## Semifinished

Semifinished Prices, Page 71

For delivery over fourth quarter in the United States, semifinished prices will remain at their present levels, \$37 per gross ton, Pittsburgh, for billets and blooms, sheet bars and slabs; \$43 for forging billets; \$47 and \$52 for wire rods, and 2.10c for skelp. Aggregate demand is slightly reduced, but still strong, and production continues high, with mills replenishing stocks whenever possible after satisfying requirements of finishing departments. Sheet bars and skelp remain scarce under the continued heavy demand from tin plate producers.

## Metallurgical Coke

Coke Prices, Page 71

Activity in the Connellsville beehive coke region is well maintained, considering all circumstances, but is, of course, reduced compared to the spring peak. Prices are fairly steady.

The two Republic Steel Corp. mines which were opened about ten days ago in the face of the strike by the United Mine Workers of America have continued to operate without undue interference.

## Equipment

**Boston**—New orders for machinery and equipment are down slightly, but a heavy volume of business already figured, still unplaced pends. Such volume now considered active covers a broad range. Shops have large backlogs; operations are high and somewhat limited by available



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skilled mechanics. Shipments are heavy, but deliveries show little improvement. Frick Co. Inc., Waynesboro, Pa., at \$207,186, is low on equipment for the stores and cold storage building, Gloucester, Mass., fish pier.

**Pittsburgh**—Large awards for steel mill equipment for Pittsburgh district have featured the equipment market. Machine tool builders continue active against previous orders, although inquiry is light. Demand is expected to become increasingly strong soon.

**Chicago**—Machine tool and plant equipment sales lack the snap prevailing earlier in the year, but the

summer letdown so far has been small. Extended deliveries still provide some stimulus to early closing on inquiries, but the price situation is less of a factor than during the first half. Despite heavy demand so far this year, machine tool sellers see a large volume of potential business for later months. Only occasional small inquiries are coming from railroads.

**Seattle**—Volume is fair although seasonal recession is noted. Lumber and logging firms are making usual replacements. Road machinery is in normal demand while pumping equipment and electrical items are strong.

of 2000 gallons-per-minute capacity for the Sandyville levee.

## Connecticut

**HARTFORD, CONN.**—Elias Glass Co., Corbin avenue, New Britain, plans to build a 1-story, 100 x 160-foot factory on Granby street, Hartford. Estimated cost is \$45,000. Architects are Mylehrest & Reynolds, 238 Palm street, Hartford.

**MERIDEN, CONN.**—Connecticut Gas Products Co. Inc., George J. Fouser, vice president, New Haven, is considering construction of a factory on Main street, Meriden.

## Massachusetts

**MANSFIELD, MASS.**—Mansfield Japanery Lacquer Products plans alterations and repairs to its fire-damaged factory. Estimated cost is over \$45,000.

## New York

**BUFFALO, N. Y.**—American Brass Co., 70 Sayre street, will build a plant addition and has awarded the general contract to T. Franklin, Jackson building.

**BUFFALO, N. Y.**—National Aniline & Chemical Co., Abbott road, will take bids for factory superstructures. Hydro Construction Co., Stock Exchange building, has foundations contract.

**BUFFALO, N. Y.**—Frontier Fuel Oil Co., Ellicott square, will build an oil refinery with an annual capacity of 40,000,000 gallons. General contract has been given to Frontier Engineering Corp., Ellicott square. Estimated cost is \$150,000.

**HAMBURG, N. Y.**—Himes Bros. plans reconstruction of fire-damaged box factory. Estimated cost is over \$40,000.

**JAMESTOWN, N. Y.**—Automatic Voting Machines Corp., Jones street, will let contracts soon for construction of a plant addition costing \$40,000. Beck & Tinkham, Bailey building, are architects.

**LOCKPORT, N. Y.**—Harrison Radiator Co. will soon start construction of a \$500,000 plant addition, for which Associated Contractors Inc., Philadelphia, has

# Construction and Enterprise

## Ohio

**AKRON, O.**—Goodrich Tire & Rubber Co. will build a 3-story, 40 x 115-foot factory, and has given general contract to Carmichael Construction Co., Akron. Estimated cost is \$150,000.

**ATHENS, O.**—City is considering improvement to light plant which will cost \$90,000. Petitions are being circulated to have proposed \$90,000 bond issue approved by referendum. Len B. McCune is mayor.

**CHILLICOTHE, O.**—City is considering construction of municipal water plant. Council has appointed a committee to investigate cost and feasibility. Estimated cost is \$150,000, and probable engineer is Burgess & Niple, 568 East Broad street, Columbus.

**COLUMBUS, O.**—City soon will ask bids to be due around August 17 for a complete boiler unit of 150,000 pounds capacity, estimated to cost \$125,000, and for a complete multiple retort, underfeed, stoker unit, including all appurtenances, of 150,000 pounds capacity, estimated to cost \$60,000. L. Lewis is service director, city hall.

**ELYRIA, O.**—Elyria Foundry Co., subsidiary of Industrial Brown Hoist Co., Bay City, Mich., plans to build a 3-story, 90 x 175-foot foundry addition to cost around \$45,000.

**HAMILTON, O.**—Beckett Paper Co. plans to build three 2-story additions on Buckeye street. Total cost will be about \$60,000.

**LOGAN, O.**—City is taking bids July 26, for construction of a filtration plant at waterworks. Cost is estimated at \$20,067. Engineer is Burgess & Niple, 568 East Broad street, Columbus. Roy Loomis is city service director.

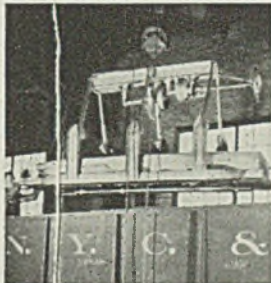
**LORAIN, O.**—Linde Air Products Co., 30 East Forty-second street, New York, has acquired a site on West River road, and plans to build a factory. R. S. Donnellon is in charge of construction. Estimated cost is about \$40,000.

**SANDUSKY, O.**—City is considering construction of a municipal electric generating station and an extended distribution system. PWA has allocated a loan and grant of \$1,515,000, on a 70-30 per cent basis. A bond issue of \$1,400,000 will be voted on Nov. 2 if a special election August 17 results in repeal of a city charter provision requiring that

plans and specifications be on file in city engineer's office before a bond issue can be voted upon. Consulting engineer for a survey of costs just completed has been Burns & McDonnell Engineering Co., Dixie Terminal building, Cincinnati. Albert J. Lauber is city engineer.

**WELLSVILLE, O.**—City has almost completed plans for waterworks improvements, including construction of a filtration plant of 2,000,000 gallons capacity. Total cost is estimated at \$187,000, city's share to be \$102,850, remainder to come from PWA. Engineer is R. M. Hunter, Wooster, O. C. Fred Gouth is city service director.

**ZANESVILLE, O.**—United States engineer's office is taking bids until August 10 for one motor-driven pumping unit with 5000 gallons-per-minute capacity for installation at Magnolia levee, and for another pumping unit



## SHEET STEEL HANDLING

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general contract. Bethlehem Steel Co. will furnish the structural steel.

**TONAWANDA, N. Y.**—Remington Rand Inc. will build a \$250,000 plant addition, for which the Austin Co., 16112 Euclid avenue, Cleveland, has general contract.

**YONKERS, N. Y.**—Habirshaw Cable & Wire Corp. plans to renovate and enlarge its plant on Point street at a cost of \$200,000.

**New Jersey**

**BLOOMFIELD, N. J.**—Bakelite Corp., 230 Grove street, will let contract soon for alterations and construction of additions to buildings 1, 2, 3, 4 and 8. Francisco & Jacobus, L. E. Putnam in charge, 511 Fifth avenue, New York, are engineers.

**Pennsylvania**

**CHESTER, PA.**—Scott Paper Co., Thomas B. McCabe, president, Market street, will take bids soon for construction of a 1-story addition to its mill. Engineer is Stone & Webster Engineering Corp., 49 Federal street, Boston. Estimated cost will exceed \$1,000,000.

**ERIE, PA.**—Penn Brass & Copper Co., 1130 West Eighteenth street, K. W. Wilks, manager, plans to build a 1-story, 150 x 350-foot plant on Powell avenue.

**PITTSBURGH**—W. A. Hailer Distilling Co. has leased a large building at 1009 Beech avenue, North side, and plans extensive improvements.

**SMETHPORT, PA.**—General Crushed Stone Co., Easton, Pa., plans construction of a plant costing over \$40,000, with equipment.

**Michigan**

**ANN ARBOR, MICH.**—King Seeley Corp. plans construction of a \$60,000 plant. Architects are Giffels & Vallet, Marquette building, Detroit.

**DEARBORN, MICH.**—Allied Chemical & Dye Corp., 61 Broadway, New York, plans to build a plant at River Rouge to manufacture chemicals.

**FLINT, MICH.**—Redmond Bros. Corp., 1109 East Stewart street, has been organized to manufacture automobile parts.

**GRAND RAPIDS, MICH.**—Grand Rapids Stamping division of General Motors Corp., G. C. Cashdollar, manager, plans to build a 1-story, 100 x 300-foot stamping plant costing \$45,000.

**HUDSON, MICH.**—City plans improvements to waterworks, and is taking bids July 30 for various materials and equipment. Cost is estimated at \$18,000. Engineer is Pate & Hrn, 532 Michigan boulevard, Detroit.

**PONTIAC, MICH.**—Pontiac Motor division of General Motors Corp. plans to install conveyors, motors and controls, electric hoists, regulators, and other equipment in plant addition totaling 60,000 square feet. Cost is estimated at \$400,000.

**RIVERVIEW, MICH.**—Dixie Refining Co. has acquired 154 acres on Sibley road and will build a cracking and refining plant costing \$1,800,000.

**TRENTON, MICH.**—National Glass Co. will start work soon on a new plant for making bottles on West road. Cost will be \$500,000 to \$600,000.

**Illinois**

**CHICAGO**—Crane Co., 836 South Michigan avenue, is taking bids for construction of a 1- and 2-story foundry at 4100 South Kedzie avenue, to cost over \$40,000. Architects are Graham, Anderson, Frobst & White, 80 East Jackson boulevard.

**KANKAKEE, ILL.**—General Foods Corp. plans to build a plant at Kankakee on a 32-acre site recently acquired.

**Indiana**

**ELKHART, IND.**—American Coating Mills plans to install motors and controls, conveyors, regulators and other equipment in 1-story addition to plant. Cost will be close to \$100,000 and work will begin soon.

**INDIANOLA, IND.**—City has author-

ized H. S. Dixon, Grain exchange, Omaha, to prepare specifications for installation of a 750-horsepower diesel engine with various appurtenances. Cost will be \$46,000. A. R. Smith is city clerk.

**Maryland**

**CUMBERLAND, MD.**—Potomac Edison Co., Hagerstown, Md., plans to build an addition to its power plant at Cumberland. Work will start soon. Additional equipment probably will be needed.

**District of Columbia**

**WASHINGTON**—Navy department, bureau of supplies and accounts, will take bids until August 3 for four motor-driven woodworking lathes, schedule 1237, five motor driven sensitive drills, schedule 1243, miscellaneous sizes of sheet steel, schedule 1247, and for air compressors, schedule 1250.

**Kentucky**

**JAMESTOWN, KY.**—Council plans to erect 60,000-gallon elevated steel tank on 60-foot tower for water system. Howard K. Bell, Lexington, is engineer.

**Florida**

**FERNANDINA, FLA.**—Fernandina Pulp & Paper Co., newly formed subsidiary of Ranier Pulp & Paper Co., will spend about \$6,000,000 for construction of a bleached sulphite mill with a daily capacity of 180 tons.

**JACKSONVILLE, FLA.**—International Harvester Co., 606 South Michigan avenue, Chicago, plans to build a \$300,000 plant at Jacksonville. J. L. Moore is local manager.

**ORLANDO, FLA.**—Orlando Utilities commission, M. W. Brown, manager, plans to improve and extend its power plant at an estimated cost of \$600,000. A 1500-horsepower boiler will be installed. Robert & Co. Inc., Bona Allen building, Atlanta, Ga., is engineer.

**South Carolina**

**CHARLESTON, S. C.**—General Asbestos & Rubber Co., 61 Willett street, Passaic, N. J., plans to improve its plant. Including equipment, estimated cost is \$40,000.

**HOLLY HILL, S. C.**—A. L. Cooler, general superintendent, Holly Hill Lumber Co., is in the market for a 100,000-gallon steel water tank on a 100-foot tower, and for two electric generator units, one of 400 kilovolt-amperes, and another of 125 to 150 kilovolt-amperes.

**Louisiana**

**BOGALUSA, LA.**—Gaylord Container Corp. will build a \$400,000 plant addition which will increase capacity 25 per cent. Maurice C. Cady is vice president of the corporation.

**LISBON, LA.**—Bramcoe Oil & Gas Co., post office box 945, W. E. Brown, president, plans to build a 1-story plant costing over \$40,000.

**NORCO, LA.**—Shell Petroleum Co., Norco, plans construction of additions to its refining plant. Total cost will be around \$750,000.

**Tennessee**

**COLUMBIA, TENN.**—Victor Chemical Works, 141 West Jackson boulevard, Chicago, has acquired a 130-acre site about two miles from Mt. Pleasant, Tenn., and will build a \$1,000,000 fac-

*(Please turn to Page 92)*

**PICKLING EQUIPMENT  
LASTS LONGER—**

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The combination of:

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- High Tensile Strength
- Freedom from Brittleness
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—assure the best in corrosion-resistant equipment.



**AMPCO METAL, INC.**

Milwaukee, Wisconsin

# IRWIN

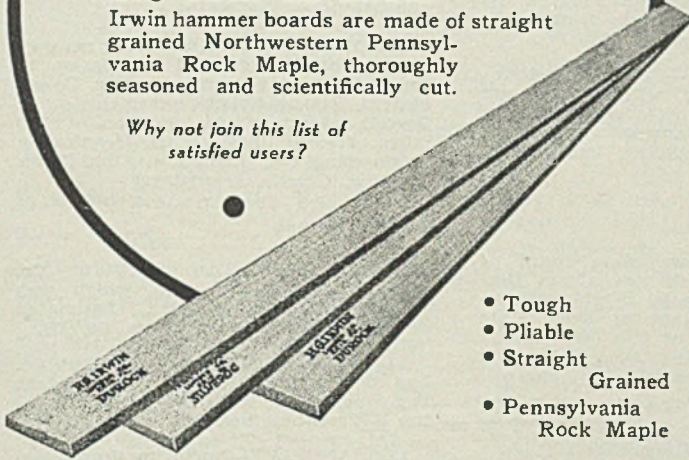
## HAMMER BOARDS

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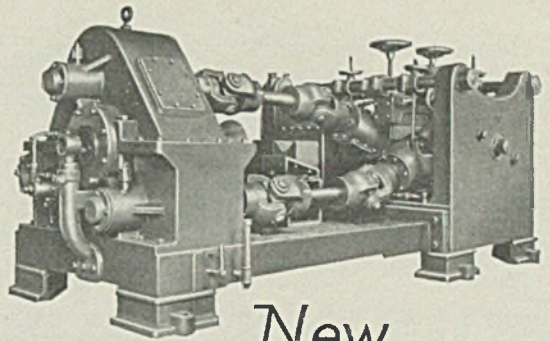
Irwin hammer boards are made of straight grained Northwestern Pennsylvania Rock Maple, thoroughly seasoned and scientifically cut.

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**THE SIMONDS MFG. CO.**  
25th Street, Pittsburgh

(Concluded from Page 90)

tory. Electric furnaces will be installed for the production of phosphorus. R. Weigel is vice president of Victor.

### Virginia

FRONT ROYAL, VA.—American Viscose Corp. plans to build a \$1,000,000 factory and has awarded general contract to Wark Co., 1608 Walnut street, Philadelphia.

### Missouri

KANSAS CITY, MO.—Tandy-Kendis Machinery Corp. has been formed by R. A. Tandy and M. B. Kendis, 2617 Garfield street.

ROCKPORT, MO.—City plans to begin work soon on new municipal power plant. City council has approved bond issue of \$90,000. Engineer is Engineering Service Co., Railway Exchange building, Kansas City.

SPRINGFIELD, MO.—City is considering construction of municipal water plant, and has retained C. W. McNear & Co. and Lewis Pickett & Co., 105 West Adams street, both of Chicago, to investigate feasibility.

### Oklahoma

THACKERVILLE, OKLA.—Red River Valley Rural Electric Co., W. C. High, president, plans to erect rural lines in Love county and to build outdoor substations. Bids will be asked soon, and financing will be arranged through federal aid. E. T. Arthur & Co., New England building, Kansas City, is engineer.

TULSA, OKLA.—Tulsa Portland Cement Co., 1537 East Admiral place, W. L. Harris, president, plans to install motors and controls, conveyors, transformers and accessories, electric hoists, and other equipment in new cement mill, whose cost is estimated at \$150,000.

### Texas

HOUSTON, TEX.—Standard Brass & Mfg. Co., 1015 North San Jacinto street, plans to build a new plant with two 1-story units. Including equipment, cost will be about \$50,000. Architect is John F. Staub, 4301 Main street.

ORANGE, TEX.—Orange Pulp & Paper Co., E. I. Hardy, manager, plans to build a pulp mill of 75 tons daily capacity costing \$1,500,000. Engineer care of owner.

### Wisconsin

FOND DU LAC, WIS.—Tobin Tool & Die Co. plans to build a 1-story, 51 x 79-foot plant addition, for which general contract has been awarded.

HAUGEN, WIS.—Wissota Sand & Gravel Co. will immediately rebuild its plant, which was recently damaged by fire. Estimated cost is about \$60,000.

MILWAUKEE—Cherry Burrell Corp., Milwaukee division, manufacturer of dairy and creamery equipment, plans to build a factory addition, 100 x 140 feet, estimated to cost \$75,000, with equipment. Edmund W. Neumelster is vice president in charge of the plant.

PORT WASHINGTON, WIS.—Simplicity Mfg. Co., W. J. Niederborn, president, will enlarge its plant at a cost of about \$25,000. The company manufactures garden tractors, plows, seeders, cultivators, etc.

RACINE, WIS.—Wisconsin Gas & Elec-

tric Co. will build a gas plant costing about \$500,000, and has awarded general contract to United Gas Improvement Co., 1401 Arch street, Philadelphia.

### Minnesota

MINNEAPOLIS—Fire Robot Inc., 410 Third street South, has been organized to manufacture a new type of moist air furnace, designed to utilize lignite or other low-grade types of coal.

MINNEAPOLIS—Chicago, Milwaukee, St. Paul & Pacific Railway Co. will make improvements and enlarge its roundhouse at the South Minneapolis yards, at a cost of about \$100,000.

ST. PAUL, MINN.—Griffin Wheel Co., wheel manufacturer, will enlarge and remodel its factory at a cost of about \$30,000. William Baumeister Construction Co., Pioneer building, has general contract.

### Iowa

AMES, IOWA—Iowa state board of education will install new steam generating unit and make other improvements to power plant at Iowa State college, at a cost of \$120,000. M. R. Pierson, State House, Des Moines, is secretary of the board.

CHEROKEE, IOWA—Iowa Public Service Co. plans construction of a power plant costing \$125,000.

DES MOINES—Iowa Power & Light Co. will begin work soon on addition to its steam-electric generating station on Carlisle road. A 47,000-horsepower turbo-generator with accessories and high pressure boilers and auxiliary equipment will be installed. Cost is estimated at \$500,000. General contract has been given to Arthur H. Neumann & Bros., Hubbell building.

GARNER, IOWA—REA has allotted \$122,000 to Hancock County Rural Electric Co-operative to finance erection of 335 miles of rural lines.

GARRISON, IOWA—Town plans construction of a waterworks plant costing \$20,000. Bond issue of \$17,000 was recently approved by voters. Engineer is H. R. Green Co., Cedar Rapids, Iowa.

HARLAN, IOWA—City will take bids soon for construction of a \$30,000 water softening plant. Currie Engineering Co., Webster City, Iowa, is engineer.

JEWELL, IOWA—Air Electric Machine Co. has been incorporated to manufacture wind electric machinery and equipment. C. H. Christiansen is president.

MARSHALLTOWN, IOWA—W. D. Kearney, city attorney, will apply to PWA for an allotment to aid financing the construction of a proposed sewage disposal plant.

MASON CITY, IOWA—Peoples Gas & Electric Co. plans to erect rural transmission lines in Hancock, Cerro Gordo, and Worth counties, at a cost of \$85,000.

WAVERLY, IOWA—City plans to build a 47 x 54-foot addition to its light plant and to install diesel power generators. Total cost is estimated at \$184,500. Young & Stanley Inc., Muscatine, Iowa, is engineer.

### Nebraska

LINCOLN, NEBR.—REA has approved a loan of \$490,000 to the Eastern Nebraska Public Power district, George W. Kline, secretary, 204 South Eleventh street, to finance erection of about 430

miles of rural lines in Richardson and Pawnee counties. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, is engineer. (Noted in STEEL, July 19.)

NEWCASTLE, NEBR.—City is considering construction of a sewage disposal plant costing about \$30,000. Scott & Scott, 522 Bankers Life building, Lincoln, is engineer.

OMAHA—Paxton-Mitchell Foundries has started construction of a plant addition, 70 x 70 feet.

OMAHA—Gross Box & Mfg. Co., Paul Gross, president, will rebuild factory recently damaged by fire.

STROMSBURG, NEBR.—State railway commission has granted permission to the Polk County Rural Electric Co-operative, Petrus Nelson, president, A. S. Torrell, secretary, for erection of 350 miles of rural lines. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, is engineer.

### Pacific Coast

GALT, CALIF.—Diamond Match Co. plans to repair its plant which was recently damaged by fire. Estimated cost, including equipment, is \$40,000.

LOS ANGELES—Hamer Oil Tool Co. has been incorporated. Correspondent is Evans, Pearce & Campbell, 1010 Pershing Square building.

LOS ANGELES—Northrup Corp., aircraft manufacturer, will build a plant addition costing \$108,000 at El Segundo, Los Angeles suburb.

LOS ANGELES—United States Electrical Motors Inc. will build a 1-story factory addition at 200 East Slauson avenue, at a cost of \$50,000.

SAN FRANCISCO—Ernst Envelope Co., 45 Fremont street, plans to install conveyors, motors and controls, electric hoists, regulators, and other equipment in new paper-converting plant at Fifth and Tehama streets. Work will begin soon. Cost will be about \$130,000. Day & Michelson, 405 Montgomery street, are architects.

WATSON, CALIF.—Richfield Oil Co. will build a \$4,000,000 oil refinery, for which C. F. Braun & Co., Alhambra, Calif., has general contract. An additional \$1,000,000 will be spent by Richfield for other work and equipment made necessary by construction of the new refinery.

SHELTON, WASH.—Rainier Pulp & Paper Co. is considering construction of a \$6,000,000 wood pulp plant at Fernandina, Fla.

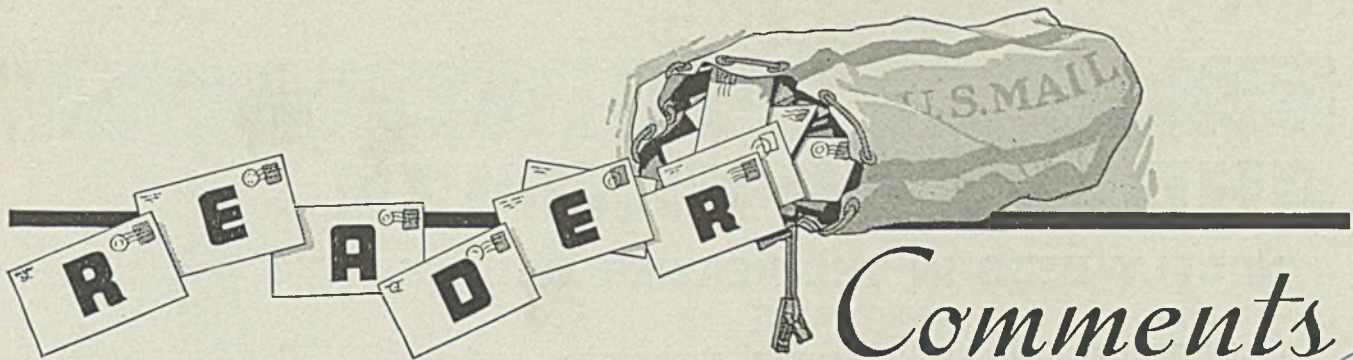
### Canada

PRINCE RUPERT, B. C.—F. L. Buckley, representing a syndicate, plans construction of an \$8,000,000 bleached sulphite paper mill of 250 tons daily capacity.

LARDER LAKE, ONT.—Kerr-Addison Gold Mines Ltd., 11 King street, East, Toronto, plans to build a 500-ton per day cyanide mill at Larder Lake. Cost will be about \$150,000.

PORT ARTHUR, ONT.—Provincial Paper Co., E. L. Goodall, chief engineer, plans to make improvements and extensions to its plant and machinery. Estimated cost is \$200,000.

TORONTO, ONT.—Aluminum Co. of Canada Ltd., 158 Sterling road, plans to build a \$40,000 plant on Perth avenue.



*Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.*



## Worker Recognizes Facts

*To the Editor:*

As a reader of STEEL I believe I have been getting a perspective on the labor situation which would be difficult to obtain from any other medium. To my mind factual matter presented in its columns during the present year sheds a great light on why the efforts of the CIO to unionize steelworkers failed to reach success.

In the issue of Feb. 1, 1937, two charts based on figures by the National Industrial Conference board showed that workers in manufacturing industries were receiving wages with higher buying power than in 1929. In the issue of May 31 the American Iron and Steel institute presented evidence that workmen in the steel industry in this country toil only a fraction as long to fill their food baskets as workers in the same industries of other nations.

Then, in the issue of June 21 figures showed that wages paid to steel workers totaled seven times the sum of dividends paid to stockholders.

The pyramid of facts which give an inkling as to why steelworkers are pretty well satisfied with their lot was capped in the current issue, July 26, which showed American Iron and Steel institute figures on steel wages compared with other industries. The steelworker gets \$10 more per week in his pay envelope than the average for all manufacturing industries, and only the newspaper and periodical industry has a higher average.

Is it any wonder the labor organizer views with hungry eyes the fat pickings from this industry? With \$1 a month dues from the almost half million steelworkers what a fund it would be for the officers to spend as they saw fit, without an audit or a financial statements to union members.

But the steelworker evidently

knows what his neighbors in other trades are earning and is glad to let well-enough alone rather than risk CIO tyranny.

A SATISFIED WORKER

## Figures Corrected

*To the Editor:*

On page 30 of the July 19 issue of STEEL you show the ratio between the total ingot tonnage and that obtained by the United States Steel Corp. I have not checked all these figures but anyone can see by simple inspection that the percentage shown for the last three years—namely, 1934, 1935 and 1936—are grossly in error on the low side, the correct percentage for 1936, according to the figures given, being 36 per cent and not 28 per cent, as you have shown.

In the interest of accuracy I should think you would wish to recalculate those percentages and publish a correction, as the tabulation is very misleading.

F. MASON

Box 478, Dallas, Tex.

The correct figures were printed in STEEL, July 26, page 24.—*The Editors.*

## Are Stresses Locked Up?

*To the Editor:*

As I am a regular paid subscriber to STEEL, and as in your July 5 issue, Robert E. Kinkead, in his department "Welding etc.", takes a crack at my sincere beliefs regarding locked up stresses, perhaps you would print part or all of this rebuttal.

Answering the second paragraph of that article on page 70, I would certainly be willing to put any amount of welding on any mild steel beam, and on any side. I would guarantee that neither the beam nor the weld would fail if the weld was made properly. I would also guarantee that there would be

no harmful stresses after the weld had cooled.

Of course, the column might deform from the contraction stress but it would not fail, unless in the sense that it was pulled out of shape so that its appearance would not pass, or that it was pulled out of the line of its design strain. A man that would weld thus on a column does not belong in the welding industry.

I repeat that I have never seen any of the so-called welding stresses causing a failure in mild steel *after the weld had cooled*. The way to weld such a beam is not to let it bend but hold it rigid. Let the weld take the contracting strains to itself, where no harm will result, if properly welded. If not welded properly, the weld will crack away from the parent metal or in itself. This fact, which always occurs in rigid welding, is the long-looked-for test of welding. Every weld tests itself.

In mild steel it does not hurt metal to stretch. As a matter of fact, there is nothing you can do to mild steel that will hurt it. It can be heated, chilled, rolled, forged, drawn, as in wire or deep drawing, can be bent or flanged, cold or hot. It can be caulked or peened, hot or cold. There seems to be no working mechanically or electrically, physically or chemically, that does not improve the quality of mild steel.

All this talk about locked up stresses is harmful to the advancement of the art.

As I look back over the 30 years of this system in this country, it has survived successfully the attacks that it would cause malignant growths, that it would kill normal life, that it would ruin one's eyesight, that it is dangerous to handle. There is no more danger from welding smoke than from cigar smoke and certainly it is less dangerous than the fumes of an old pipe. The

(Please turn to Page 62)

# SEYMOUR PHOSPHOR BRONZE

WIDELY USED IN THE HEAVIER GAUGES



**P**AST advertisements have placed much emphasis on the eminent suitability of Seymour Phosphor Bronze for fabrication into small springs, contacts, clips, cams, slides; nuts, bolts, etc., because a very important tonnage goes into these smaller fittings and parts.

However—the extreme corrosion resistance, toughness, and ability to function in face of almost endless fatigue cycles, make Seymour Phosphor Bronze sheet, wire and rod just as necessary in products where more "heroic" service is demanded.

Pictured here are a few of the heavy duty springs fabricated by Seymour customers for a wide variety of strenuous uses.

Railroad equipment claims many heavy duty Phosphor Bronze springs, for such places as in the pantograph shoes of electric locomotives, in numerous valve actions, and in train control systems.

The U. S. Government finds extensive use for these springs in boat and submarine design.

They are to be found in fire extinguishers, in a wide variety of valves, in general use, and in numerous other places where an important mechanical action is a part of heavy duty product design.

If you are a user of either large or small flat or coiled springs that must function unflinchingly in salt or fresh water dampness, or which must keep their resiliency in the face of long-term fatigue, you will find the

## SEYMOUR PHOSPHOR BRONZE MANUAL

of much interest. It tells a very complete story of Phosphor Bronze and contains general data of value. There is no charge for the book.

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