

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

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STEEL

July 20, 1936

As the Editor Views the News

SOMETIMES the important difference between the opinions held by social reformers and those of industrial executives amounts to a simple disagreement as to the length of time required to effect a change in conditions. The time element is a dominant factor in many of today's national issues. If new dealers and the so-called economic Tories could be persuaded to talk frankly, it would be found that both favor the principle of certain social advances. The essential difference is that the former want to do everything overnight, whereas the latter believe a more deliberate method is more conducive to enduring progress.

• • •

The time element also bobs up in the feud (p. 15) between Messrs. Green and Lewis. Both are working hard to advance the prestige of professional labor unions. Green stakes his future upon the crafts type of organization, which is a slow but relentless method of building up union strength. Lewis proposes an industrial union, which he thinks will produce results quickly. Green's method is safe and slow; Lewis' speedy but risky. Mass impatience with the pace of normal progress is at the root of Mr. Green's problem. Likewise, it plagues all persons in places of responsibility. They cannot afford to be reckless.

Impatience Is Trouble Maker

The impatient ones, whether they be followers of John Lewis, Dr. Townsend, or other extravagant promisers, usually have little conception of past, real progress toward the goals they are seeking. We wonder if any of these leaders, given unlimited opportunity to put their ideas into practice, could achieve as great a degree of social progress as has been won by the slow but steady process of utilizing the benefits of economic development. At times industry has

Past Progress Is Overlooked

held out too stubbornly against desirable changes in working conditions, yet in spite of occasional mistakes, it has provided employment to a generally increasing number of men, at a generally increasing rate of wages, for a steadily decreasing number of hours per day or week, and under constantly improving conditions. Impatient youngsters scoff at this record, but oldtimers appreciate its significance.

• • •

Compare the status of a typical industrial employe today with that of his prewar predecessor. His work is not as severe physically. The work day is shorter. His income is higher. His opportunity to protect his rights is greater. His home is more comfortable. His children enjoy better facilities for education. He owns a car and his household is equipped with numerous devices to reduce the drudgery of housework. In brief, the standard of living has been elevated markedly in almost every respect. Much progress has been made (p. 14), and everybody hopes that progress may be accelerated in the future. But it is dangerous to try to speed social progress beyond the load-carrying capacity of our economic structure.

• • •

New York Central has just put its new train "Mercury" (p. 19) into service between Cleveland and Detroit. Although it is one of the most attractive "name trains" introduced thus far by American railroads, N. Y. C. officials state frankly that the equipment is "experimental."

Super Trains "Experimental"

We believe that this word is well chosen. Further, it would be safe to say that all of the new trains—Zephyrs, Comets, 400's, Hiawatha's, etc.—are experimental. All of these super trains constitute a mobile laboratory (p. 31), in which the railroads are seeking experience to guide them in design, selection of materials, etc. for the development of better trains in the future. Producers and equipment makers should realize that the fate of profitable future markets rests upon the outcome of these current "experiments."

E. L. Shaner

Steel Work Humanized; Great Changes Made in Mills

ARE conditions in the steel industry so backward that outside influence is necessary to organize its workers?

In the prudent viewpoint of veteran steelworkers, the progress toward improvement of employe welfare in the last 20 to 25 years has been so great that the current furor falls on unsympathetic ears.

Everyone has heard that wage rates in the industry have increased more than 200 per cent since 1895, and that even in the depression wages were kept far above the level of prices. During the same period the industry has exerted its efforts toward bettering the lot of its employes in other directions as well.

"Mister, did you ever stagger out of a steel mill after working a 24-hour shift, and ride home so dirty that women wouldn't sit beside you in a street car? Well, I have, and that's why all this talk about a big union, the 30-hour week, more pay and longer vacations makes me laugh. The men today take a shower after their eight hours in the plant, and drive to their homes."

Workers Express Views

The man being interviewed was a veteran worker at the former Corigan, McKinney plant, now part of the Republic Steel Corp., Cleveland.

"Years ago I was looping at a wire mill," said John Bencak, who began in a blooming mill 30 years ago. "I lost my balance, stepped on a coupling. All my clothes were torn off and I was thrown on a pile of billets with my leg pretty badly smashed. Nowadays you can't get hurt like that."

"I can remember when men earning \$1.65 for a 12-hour day were sometimes expected to buy their foreman a quart of liquor or a case of beer each week to keep their jobs," said Frank Caffrey, a blast furnace man who started in 1898.

"In switching turns from day to night I used to start work at 7 Sunday morning, stay on the job until 7 Monday morning and come back at 5 Monday afternoon," said C. O. Pries, first helper at an open hearth, who began 25 years ago. "Every other week we had 24 hours off."

"Today if a man has 25 pounds to carry some place he can hook it to a crane instead of lifting it himself," said Andrew Eglinton, who started in a South Chicago mill in 1895.

"I have the workman's viewpoint

because I started in a sintering plant in 1913," said C. M. White, vice president in charge of operations at Republic. "There's a finger that nearly came off in an unguarded sprocket chain. It was your own hard luck if you got hurt in those days. The watchman at the gate was the nurse. His medical equipment consisted mainly of a bottle of iodine, some bandages and a stretcher."

After talking to a few of these veterans the improvements in employe welfare, in proportion to the relative newness of the modern steel industry, seemed tremendously rapid. The work is still tough, but what an amazing number of changes have been made! This year, for instance, vacations of one to two weeks are being given on a wider scale than ever before.

It Was Smart To Be Unsafe

"The pioneers in the safety movement had a hard task," said Mr. White. "The men ridiculed their efforts just as much as the superintendents. The fact that we will discipline a man for unsafe practices has been a major factor in the success of the movement."

"The foreman was the dictator when I started working. If you couldn't get along with him he didn't need a reason to fire you. No one ever investigated why a man was dis-

charged. In the sheet and tin mills the head rollers hired their own crews and paid them.

"I never saw a locker room until I had been in the steel industry for many years. If you washed, it was at a spigot or trough. As a repairman I worked overtime on an average of three nights a week, was called out on breakdowns at least twice a week, and sometimes twice a night. Compare that with your 8-hour days and five or six-day weeks at present.

"Group insurance, vacation plans, softball and bowling teams and gardens were unthought of 15 to 20 years ago. Today, too, the mills are clean, orderly and safe. A quarter of a century ago they were just the opposite.

"The physical work is still tough but nothing at all to the mean, slugging jobs of a few years ago. Imagine turning a crooked billet over by hand with a big wrench, or removing heavy cobbles with sledge hammers and cold cutters. Opening a tap hole was a slugging job, taking hours in the terrific heat. Breaking up pigs with a two-handled billy and loading pig iron by hand onto the cars were other back-breaking tasks."

Magnets and cranes are among the greatest boons to the men in the mills, but many of the veterans are more appreciative of being able to obtain hot food in the company restaurants, of physical examinations and health advice, or the safety belts, fireproof coats, safety shoes which are available.

"Charging a blast furnace by hand was a dangerous job in the old days," said Mr. Caffrey. "With the furnaces slipping we never knew whether we'd come down alive or not."



Old style sheet furnace, in use as recently as a decade ago

"Turning 3-ton billets over by hand was a tough job," asserted Mr. Bencak. "Today a man works his eight hours. In the old days you had to snatch a half-hour's sleep occasionally, because the shifts were 10 and 14 hours long."

"On cold days, when we were all sweated up, we used to go outside and walk half a mile to get supplies," said Mr. Pries. "Today all this is brought to us. We used to

pick up scrap by hand after it fell off the charging boxes. Today this is done by magnets."

Is there ample cause for the steel industry to keep silent before its critics? Many of the veteran wage workers, appreciative of the industry's accomplishments, don't think so. They say the young men agitating for less work and more pay don't know how greatly the industry has changed.

strike at the company's Portsmouth, O., plant included recognition of the Amalgamated, although the actual terms have not been disclosed.

More opposition was expressed last week by steel workers against the proposed CIO organization plans. Weirton Steel Co. employes formed a security league "to oppose any and all attempts to disturb the satisfactory conditions under which we are working." A total of 10,274, or 97 per cent of the company's workers, signed membership pledges, expressing confidence in the employe representation plan.

"There is a very strong feeling in our mills against this outside organization movement," said Norman K. Moore, league secretary.

"If any one tries to coerce or intimidate any of our workers he can turn to the league and it will see that he is protected to the full extent of the law. We feel capable of taking care of our own affairs without help from coal mining and ladies' garment workers."

At Ashland, Ky., 98.8 per cent of the 3000 employes of the American Rolling Mill Co. signed resolutions in support of the management. Only 34 of the Ashland employes refused to sign, others being absent. The Ashland plant is only 35 miles from Wheeling Steel's Portsmouth mill, which was closed by a two-months' strike with a loss of millions of dollars to employes and merchants.

CIO Opens Eastern Drive

Last week marked the beginning of the CIO campaign at eastern steel mills. Offices were established in Bethlehem, Pa., only a block or so away from the Bethlehem Steel Co.'s main offices. Organizers were dispatched to several other steel centers, including Coatesville, Steelton, Reading and Pottstown, Pa. A drive for membership also is said to be on at Bethlehem's Sparrows Point, Md., plant.

At Washington, William Green and the A. F. of L. executive council stalled off suspension of the 12 trade unions represented in the CIO by setting Aug. 3 as the date of a "trial" of those unions. Though another storm of invective against Green broke from Lewis, there were indications that the trial will not materialize. The government is taking considerable part in an effort to bring Green and Lewis together.

At a press conference last week Secretary Perkins said the Lewis-Green feud has "nothing at all" to do with the steel drive. She declined to discuss efforts made by Edward F. McGrady, assistant secretary of labor, to reconcile the factions.

Meeting at Cleveland the Brotherhood of Locomotive Engineers voted "no" on the question of joining Lewis' industrial organization campaign.

Steel Workers Consolidate; Government Seeks to Reconcile Union Factions

TENSION in the steel plants over the possibility of strike calls appears to be wearing off, and more solidarity is noted in the ranks of steel workers than at the top of trade unionism.

While the A. F. of L. and CIO still are feuding concerning organization plans, not only in steel but in other industries, notably automotive and glass, loyal steel workers are preparing to resist the CIO drive.

A three-cornered fight for the presidency of the Amalgamated Association of Iron, Steel and Tin Workers has become one dominant factor in the tangle of trade union disputes. Announcement of candidates for a four-year term discloses two other aspirants against Michael F. Tighe. The two are Edward W. Miller, Pittsburgh, now vice president of Amalgamated, and B. F. Bennett, Granite City, Ill. The latter is backed by the "progressive wing" of the western and mid-western members.

Tighe, 78, and head of the Amal-

gamated since April 1, 1919, has been virtually ignored in John L. Lewis' campaign to enroll steel workers in the Amalgamated.

Louis Leonard, secretary-treasurer of the Amalgamated, who has been taking active part in the Lewis drive, also faces opposition for re-election, as Arthur Skidmore, Granite City, came out as a candidate against Leonard, in a surprise move by the western faction.

Fantastic claims made by the CIO organizers concerning wholesale defections in the steel workers' representation groups are met with prompt denial. Reports widely circulated by the CIO that 3000 Carnegie-Illinois Steel Corp. workers at South Chicago joined the Amalgamated were denied by the company. Observers report that the mass meeting held there last Tuesday was attended by about 300, and productive of only 50 to 75 new members for the Amalgamated.

Wheeling Steel Corp. also denied CIO reports that a settlement of the



Modern continuous sheet furnace, manipulated by push button

Materials Handling Industry Making Strong Comeback

THE materials handling industry again is in a state of business activity reminiscent of pre-depression years.

This impression was gained by a staff representative of STEEL, who during the past few weeks has been interviewing manufacturers in the more important industrial centers of the East and Middle West.

With few exceptions, executives stated that the upturn which began last year—and which made 1935 the best year for the industry since 1930—carried over into the first half of 1936.

It is difficult to find any single division of the industry which is not experiencing a fairly satisfactory volume of business, and many of the divisions are actually booking sufficient orders to warrant prediction that this year will close with a substantial increase over the sales of a year ago.

One of the high spots in the materials handling industry appears to be the industrial truck division. As a whole, the manufacturers of this class of equipment have been selling

more trucks for several years, and in the case of some truck makers, there is indication that this year will rank well up among the best on record.

Crane and hoist manufacturers report that they have come a long way back from the low point to which their business had fallen during the years 1931-1934. While plenty of plant capacity still is available, the improvement in sales has been encouraging and there is a feeling that more crane and hoist business is in prospect for the industry during the latter half of this year.

Conveyor Sales Increase

Conveyor manufacturers also have booked many good orders in recent months and so have the monorail manufacturers. Hand-lift trucks and portable elevators, and casters and floor trucks have had their full share of the increased business, while manufacturers of scales are experiencing a really brisk period.

Leaders of the materials handling industry generally agree that the steel and metalworking industries are in No. 1 place as customers for

the various classes of equipment. In the case of at least one large subdivision, this class of business accounted for over 40 per cent of all its bookings, while in another the percentage runs far ahead of that, although the exact figures were not available for the past quarter.

Demand for materials handling equipment has been accelerated by a desire on the part of industrial executives to reduce their production costs in directions which will be most beneficial to themselves, as employers, and to their employes.

Labor-Serving Equipment

Not so many years ago, materials handling equipment was often improperly classified, but today by far the largest percentage of installations are of the *labor-serving* type.

Statistics of state labor departments have been indicating the high mortality among industrial workers from accidents incidental to handling, and from strains caused by lifting heavy objects. In the direction of eliminating such hazards, industry is making many improvements.

One manufacturer of materials handling equipment whose line includes barrel storage racks gave an interesting sidelight on consumption of steel for this particular type of equipment. He had just made shipments of racks to two large industrial plants who wanted them for storing lubricating oil and other barreled products. In one of the shipments were 60 tons of steel, while the other required 42 tons.

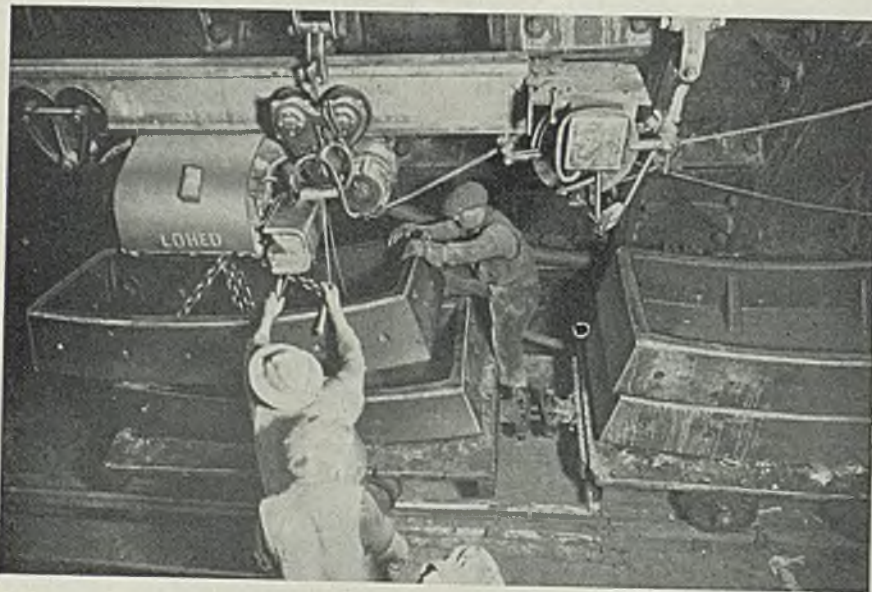
Sales gains for manufacturers of cranes and hoists were reported during a two-day meeting of the crane and hoist industries' leaders in Milwaukee.

Purchases by the steel industry have been a marked feature of the increase in orders during the past year, the delegates said, with strong support from automobile and tractor builders, and the utilities.

The Electric Overhead Crane institute held sessions July 8, and the Electric Hoist Manufacturing association met on the succeeding day. C. A. Moore, president, Shaw-Box Crane & Hoist Co., presided at the meetings.

Host of the occasion was Walter Harnischfeger, president, Harnischfeger Corp., who conducted the visitors through his plant and entertained them at his summer estate.

Electric Hoists Make Light Work of Midtown Tunnel Handling



LIFTING and moving cast iron segments of the shell, and transporting muck conveyors, present a difficult problem in materials handling in the new tunnel which is being constructed under the Hudson river to connect West 39th street, Manhattan, with the express highways leading into Weehawken, N. J. Motor-driven hoists with extremely low headroom were selected to do this handling job. They were furnished by the American Engineering Co., Philadelphia

Chart Guides Carloading

In an effort to assist in loading freight cars toward their home territory, to reduce mileage of empty hauls the Association of American Railroads, 3210 David Stott building, Detroit, has prepared a chart for use of shippers. This indicates at a glance proper selection of cars for

loading in the direction of their home territory, with second and third choice.

Suggestions are also given relative to information in ordering empty cars, that the railroad serving the plant may place cars best suited to the destination of the shipment. The effort in both respects is to give greater economy in use of equipment.

Financial

A MAJORITY of holders of Youngstown Sheet & Tube Co. 5 per cent series B bonds of 1970 called for redemption Oct. 1, have availed themselves of the company's offer to discharge the obligations at the call price, plus accrued interest to Oct. 1, regardless of date of presentation. The Bankers Trust Co. will discharge the bonds on verification of ownership and with the bonds carrying the Oct. 1 coupon intact.

WALWORTH'S ASSETS INCREASE

Walworth Co. and subsidiaries, New York, maker of valves and fittings, report current assets as of March 31, including cash of \$659,517, totaled \$5,673,079, comparing with \$560,132 and \$5,536,773 respectively on Dec. 31 last year. Current liabilities are \$1,042,167 against \$913,972 respectively. Inventories are \$3,664,895 against \$3,725,126, making total assets \$13,117,724 against \$12,983,754.

STEEL CAR REORGANIZED

Federal Judge B. M. Gibson has approved the re-organization of the one-time \$55,000,000 Pressed Steel Car Co., New York, whereby the General American Transportation Co., of Chicago, will gain operating control. The company has been in the hands of receivers since May, 1933.

EARNINGS STATEMENTS

Gulf States Steel Co., Birmingham, Ala., reports net profit of \$110,544 for the June quarter, equal after dividend requirements on first preferred to 38 cents a common share. This compares with \$93,929, or 31 cents a share, in March quarter, and net loss of \$66,663 in 1935 June quarter.

Mullins Mfg. Co., Salem, O., reports second quarter net profit after charges, but before federal income tax, at \$117,265 compared with \$158,021 in same 1935 quarter. For six months ended June 30, net profit before federal taxes was \$310,603 against \$284,124 a year ago.

Increase in net profits of more than 30 per cent for the first half is reported by General Electric Co. Net profit available for dividends on the

common stock is \$16,592,324, compared with \$11,541,429 for the first six months last year. This profit is equivalent to 58 cents a share, compared with 40 cents in the first half of 1935, on the 28,845,927 shares outstanding in both periods.

Bliss & Laughlin Inc., Harvey, Ill., reports for the six month period ended June 30, net profit of \$270,372 after all charges, equal after dividends requirements on preferred stock to \$1.74 a share on 152,680 shares outstanding. In the first six months of last year the company earned \$219,782.

Eaton Mfg. Co., Cleveland, had a net profit of \$1,335,285 or \$1.92 a share for the first six months against \$1,041,960, or \$1.83 a share, in the first half, 1935. The June quarter shows net profit of \$751,903 against \$583,382 in the preceding quarter, and \$436,688 in June quarter last year.

Transue & Williams Steel Forging Corp., Alliance, O., reports for the quarter ended June 30 net profit of \$41,456 after charges, against net profit of \$33,515 in the preceding quarter, and a net profit of \$21,556 in the June quarter last year.

DIVIDENDS DECLARED

National Steel Corp., Pittsburgh, has declared the regular quarterly dividend of 37 1/2 cents, payable July 30 to record July 20.

Continental Can Co., New York,

has declared the regular quarterly dividend of 75 cents, payable Aug. 15 to record July 25.

Minneapolis-Honeywell Regulator Co., Minneapolis, has declared an extra dividend of 12 1/2 cents and regular quarterly dividend of 37 1/2 cents on common, payable Aug. 15 to record Aug. 4. An extra dividend of the same amount was paid May 15.

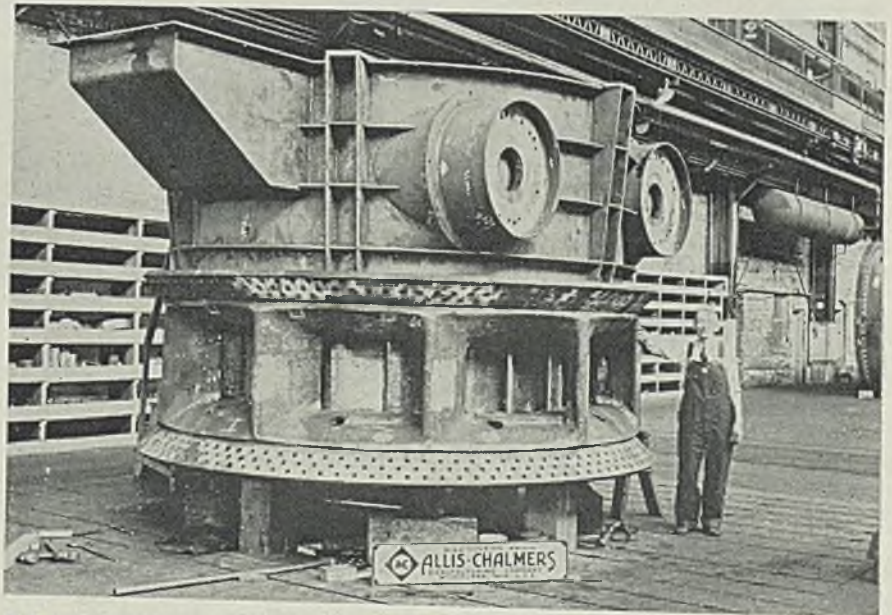
W. H. Davey Steel Co., Cleveland, has declared a regular quarterly dividend of 20 cents a common share, payable July 1 to shares of record June 20.

Keystone Steel & Wire Co., Peoria, Ill., has declared a dividend of 50 cents on the common, payable Aug. 1 to record of July 15. The last common dividend was \$1 paid on April 15. On April 6 stockholders approved an increase in the common stock, and directors then authorized issuance of three additional shares of common for each common share held as of record April 20.

McKeesport Sheet & Tin Plate Co., McKeesport, Pa., declared a regular quarterly dividend of \$1, payable July 1 to stockholders of record June 16. In the preceding quarter a dividend of \$1 and 25 cents extra, was declared.

Bridgeport Machine Co., Wichita, Kans., declared a dividend of \$1.75 a share on preferred stock, payable July 1, to shares of record June 20. A dividend of like size was paid April 25.

Steel, the Modern Canute



HYDRAULIC turbine equipment installed by the Allis-Chalmers Mfg. Co., Milwaukee, for the Platte Valley public power and irrigation district at North Platte, Nebr., is of special interest as nearly 75 per cent of the turbine parts are steel, including the welded steel pit ring, cast steel speed ring, cast steel guide vanes, cast steel runner, forged steel main shaft, riveted plate steel spiral casting, and plate steel draft tube. The steel parts in each of the two turbines installed weigh 120,000 pounds. Shown above are the guide case, speed ring, and pit liner assembly of one of these 18,000-horsepower turbines

Production

STEEL ingot production dropped 1 point last week to 68½ per cent, due largely to suspension of all 12 open hearths at the Lorain, O., works of the National Tube Co. Pittsburgh, Chicago, Buffalo and New England also registered losses, while Youngstown and Wheeling moved their operating schedules up slightly. Resumption of these 12 furnaces this week, together with a further increase at Youngstown will probably lift the rate this week. Further details follow:

Pittsburgh—Slipped off 1 point to 63 per cent last week. Steel corporation plants operated at about 60 per cent, and the independents, about 67 per cent. Sheet mill operations averaged around 62 per cent and strip operations around 54 per cent. With the Donora stack of the American Steel & Wire Co. blowing out for repairs, this leaves 35 stacks active out of 60.

Wheeling—The Portsmouth, O., works of Wheeling Steel Corp. resumed with seven open hearths Friday, after the plant earlier in the week started operations due to settlement of labor difficulty. This brought the operating rate up to 81 per cent, against 69 per cent in the preceding week.

Youngstown—Gained 2 points last week to 76 per cent, with indications of a rise to 78 per cent at this week's start. Sharon Steel Corp. added one openhearth furnace at Lowellville.

Cleveland—Off sharply to 51 per cent last week, due to shutting down of all 12 open hearths at National Tube Co.'s Lorain, O., works, where some 3000 of the plant's 6600 employes were on vacation for a week, while the remainder were put on repair work at the steelworks. Otis Steel Co. took off one furnace to operate 7, while Republic's Corrigan, McKinney division continued with 13.

Chicago—Declined 1 point to 70 per cent, partly because of furnace shutdowns for repairs. Hot weather retarded shipments of finished steel, output of most rolling mills being affected. Blast furnace schedules are steady, with 25 of 41 stacks being operated.

Detroit—Continued at 100 per cent, all of the district's openhearths being in operation. Hot weather, however, restricted finishing mill schedules.

Central eastern seaboard—Unchanged at 49 per cent last week, but a gain of probably a point or so is expected this week, as output is expected to be stepped up at two plants. Last week one plate mill put on an

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended	Change	1935	Same week 1934
	July 18			
Pittsburgh	63	— 1	38	21
Chicago	70	— 1	49	34
Eastern Pa.	49	none	20	25
Youngstown	76	+ 2	46	31
Wheeling	81	+12	73	27
Cleveland	51	—33½	41	36
Buffalo	84	— 2	37	21
Birmingham ..	52	none	31½	20
New England..	63	— 5	36	52
Detroit	100	none	94	76
Cincinnati	80	none	↑	↑
Average	68½	— 1	43	30

†Not reported.

extra open hearth, but this was offset by an operation curtailment at another plant.

Cincinnati—Continued at 80 per cent last week, with 20 of 24 open hearths active, all for light rolled material. Only slight change, if any, indicated for this week.

Buffalo—Down 2 points to 84 per cent. Heat and vacation schedules are holding down production to some extent. Thirty-one openhearths are on the active list.

New England—Down 5 points to 63 per cent, with indications the rate will be lifted to 78 per cent this week.

Birmingham—Unchanged at 52 per cent last week, with various mills steady and fabricating shops adding constantly to orders on hand. This rate is probable through the remainder of the month.

CANADA MAKES MORE IRON

Canada's output of pig iron for May was 58,832 tons, a gain of 9 per cent over April's 54,045 tons, and 29 per cent over the 45,432 tons produced in May, 1935. This was made up of 43,493 tons of basic iron, 7335 tons of foundry iron, and 8004 tons of malleable. Output of ferroalloys totalled 6171 tons, as against 4437 tons for the previous month, and 4978 tons for May, 1935.

Output of steel ingots and castings declined from 107,220 tons in April to 94,602 tons in May. For the first five months of 1936 pig iron production was 283,973 tons, compared with 215,222 tons for the same period of 1935. Output of steel ingots and castings, at 496,504 tons, showed an increase of 58 per cent over the first five months of last year. Four furnaces were in blast at the end of the month, with a combined capacity of 43 per cent of the total for Canada.

Meetings

ABOUT 35 technical papers, covering many phases of steelmaking and steel processing operations, will be presented at the thirty-second annual convention of the Association of Iron and Steel Engineers, Hotel Statler, Detroit, Sept. 22-25.

One day's sessions will be devoted to papers contributed by companies manufacturing sheet and strip steel and companies using steel in this form. Included in these sessions will be papers covering sheet and strip steel for deep drawing purposes and utilization of coiled strip steel.

Inspection trips will be made through the new strip mills of the Great Lakes Steel Corp. and Ford Motor Co.

TO HOLD MINING INSTITUTE MEETING ON MARQUETTE RANGE

Lake Superior Mining institute will hold its twenty-ninth annual meeting on the Marquette range, Aug. 28-29, according to an announcement made by S. R. Elliott, president. Headquarters will be at the Mather Inn, Ishpeming, Mich. The meeting will be informal in character with papers to be presented by title only and to appear later in printed proceedings. A. J. Yungbluth, Ishpeming, Mich., is secretary of the institute.

Milcor Management To Continue Under Inland

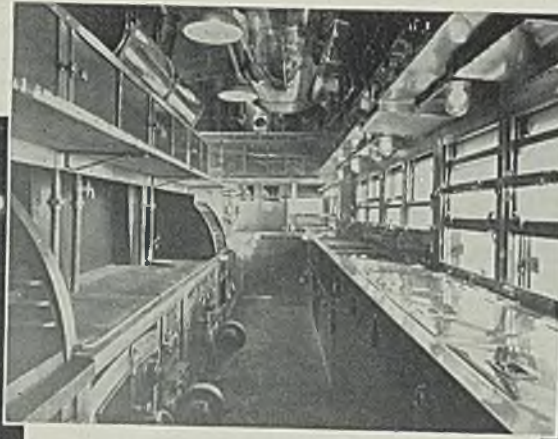
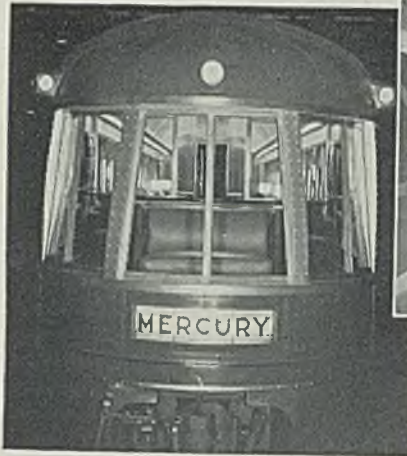
Milcor Steel Co., Milwaukee, became a completely-owned subsidiary of Inland Steel Co., Chicago, effective July 1. All outstanding stock of the Milcor company was purchased by Inland for 59,000 shares of Inland's capital stock.

No changes will be made in management or operations. Present officers will continue to operate the company as a unit, in line with previous practices.

Milcor is a large manufacturer of sheet metal building products, with plants at Milwaukee, and Canton, O., and warehouses at Chicago, Kansas City, Mo., and La Crosse, Wis.

Sustains J. & L. Decision

Sustaining its original ruling on June 15 in favor of the Jones & Laughlin Steel Corp., the United States circuit court of appeals, New Orleans, last week denied the application of the national labor relations board for rehearing of its petition to compel the steel company to reinstate 12 discharged employees. The court had ruled that the federal government does not have the power to regulate employer-employee relations in production or manufacture.



FIVE tons of stainless steel in the kitchen of New York Central's Mercury. Left, observation car; right, the steam locomotive, with its 1200-pound steel streamlined hood

Steel Cars Rebuilt Into "Train of Tomorrow"

FROM the standpoint of metalworking industries, New York Central's new Cleveland-Detroit flyer, the Mercury—"the wonder train", "the train of tomorrow"—offers little that is new, except as demand for steel and nonferrous metals may originate through conversion of other passenger coaches to the Mercury's modernistic style.

The "train of tomorrow", if this actually be the train, is a made-over from present equipment, using ordinary low-carbon steels in reconstruction of bodies, keeping stainless steel in the kitchen, splurging with aluminum for interior trim and lighting fixtures, and with a decorative scheme suggestive of a Fifth avenue furniture shop.

Behind the scenes, in the New York Central's family circle, this "train of tomorrow" is "the experiment"—frankly referred to as just that, an experiment not only in a cost-and-revenue sense, but also as a mechanical entity.

The Mercury last week began regular service, clipping an hour off the usual schedule, and making the one-way trip in 2 hours, 50 minutes, with ease.

The seven passenger cars, including diner, originally were light-weight passenger coaches on New York suburban runs. Central's mechanical engineers experimented with them, overhauled them in the Indianapolis shops; then called in Henry Dreyfuss, industrial designer, to plan the interior.

For streamlined locomotion they put a 1200-pound low-carbon steel hood or shield over an ordinary Pacific-type high-speed locomotive. Trucks and underframes of the old cars were used, wheel base was not lengthened, but special manganese-vanadium steel elliptical springs and silico-manganese coiled,

or equalizer, springs were installed.

Plain carbon steel sheets and plates were used in reconstructing bodies, little different from the original, except that they are extended straight out to the end, and the vestibules enlarged. Windows are flush with the sides. A steel skirting extends down the sides of each car to within 24 inches of the rails. The platform steps operate with the raising or lowering of the vestibule trap doors, and form a continuation of the skirting when closed.

The stern, or observation section of the rear car, has a pronounced torpedo-like contour.

Cars Are Tight Locked

A special type of tight-lock coupler with rubber buffers eliminates jerking when starting and stopping—the train moves as a unit. When Great Britain's "Flying Scot" came over here some years ago, American railroad men were surprised by the tight juncture of the cars—as tight as though they had been bolted together. The result impressed them favorably, though the same object has been accomplished in a dissimilar way.

The train, exclusive of locomotive, weighs 438 tons, or about 62 tons per car, compared with 85 tons for the standard all-steel Pullman passenger coach, about 42 tons for the ultra-modern stainless steel cars.

Inside, one may search in vain for any trace of steel, except in the kitchen, where 5 tons of Republic Steel Corp.'s Enduro shines and sparkles.

Elsewhere, all the paneling, ceilings, fixtures, and much of the furniture is aluminum and aluminum alloy—18 tons of it in all.

Examine some of the panels which have a soft, a satin-like finish, resem-

bling hand-rubbed wood. It is wood, indeed, but only the thinnest slice of it, cemented to flexible fabric, which in turn is cemented to the aluminum. Some of the aluminum decorative strips, offsets and inserts, have a matt finish like frosted silver; others are lustrous.

Tap the painted panels in the baggage and hat compartments, they sound like steel sheets, but they are aluminum.

At that, however, the total amount of steel in body and trucks of each car is close to 60 tons.

In this particular job, New York Central's engineers were confronted with the problem of keeping down weight. The original idea was to limit it to 52 tons for a car with capacity for 100 passengers. Beyond the point where lighter steel sheets could be used in superstructure, the weight factor dictated choice of materials.

The use of Timken roller bearings in the wheels enables the locomotive to pull the train at 80 miles an hour, with 25 to 30 pounds less steam pressure than the equivalent number of standard passenger coaches. The train is actually faster than New York Central's Twentieth Century limited. Its quiet, easy flight at 60, 70, 80 miles—as registered in the speedometer in the observation car—constantly gives the passenger the impression it could go much faster.

Cost of the Mercury, about \$300,000. Cost of the modern diesel engined stainless steel train, approximately \$1,000,000.

And so "the experiment" will go on, fascinating the public and perhaps, opening up vast possibilities for rebuilding existing passenger equipment, with just plain carbon steel.

Taxes Now Taking Over Sixth of American Income

TAXES for federal, state and local purposes combined now amount to more than one-sixth of the annual income of the American people.

Much as the federal government's revenue has been increased through taxes, the gap between expenditures and receipts is so wide that a substantial reduction in expenditures is essential if federal accounts are to be brought into balance.

This is the conclusion reached by the National Industrial conference board which recently released a voluminous report on government finances.

From a modest beginning of \$321 million for the third quarter of the fiscal year 1931, the net federal deficit in the January-March quarter of 1932 mounted to \$2140 million, and by the close of 1935 was up to \$14 billion.

"Approaching the deficit problem from the receipts side only," the board says, "the increases since 1932 might be interpreted as indicating the possibility of a marked improvement in the fiscal position of the government and the balancing of accounts at an early date.

"Total ordinary receipts for 1935 were \$1909 million larger than those for 1932. Further increases for the principal classes of revenues are forecast for 1936 and 1937, and it is planned to cover the loss of revenues resulting from the invalidation of processing taxes by means of new taxes.

"That in general the upward trend in the revenues of the government may be expected to continue is well shown by the increase in federal income tax collections. For March, 1936, the first month in which collections on account of 1935 incomes were made, receipts from this source were \$412 million, compared with \$326 million for March, 1935, and \$232 million for March, 1934.

"However, it would be erroneous to conclude that the budget can be balanced through increasing receipts."

Expenditures

Federal expenditures totaled \$6844 million for the fiscal year 1935. This is an increase of \$60 million over 1934; a rise of \$2 billion over the total for 1932 and 1933; and nearly \$4 billion more than annual expenditures for the period 1923 to 1931.

Social welfare accounted for the largest proportion of the 1935 expenditures, amounting to 28.8 per cent of the gross.

State expenditures for the fiscal

year 1934, the latest year for which data are available, totaled \$2044 million; local, for the same year, were \$5621 million. Combined state and local expenditures show a downward trend from 1931.

Expenditures of all governments in the United States totaled \$14,499 million for the fiscal year 1934 compared with \$12,232 million for the previous fiscal year. The 1934 total is more than \$1 billion in excess of the previous post-war peak reached in 1932. Per capita governmental expenditures were \$114.11 for 1934, and \$97.26 for 1933.

Debt

Gross federal debt at the close of the fiscal year 1935 totaled \$28,701 million. From \$16.2 billion on June 30, 1930, this debt reached \$30.5 billion on Feb. 29, 1936—an increase of \$14 billion. The rise in the debt from June 30, 1935, to Feb. 29, was \$1.8 billion.

Per capita federal debt on June 30, 1935, was \$225.07, a rise of approximately 72 per cent over the figure for the fiscal year 1930, which was \$131.49.

The federal government has in-

curred substantial contingent liabilities in recent years. These liabilities—for the payment of which the government is responsible in the event that the agency directly liable does not fulfill the obligation—are in addition to the direct debt. The total contingent debt Dec. 31, 1935, was \$4525 million and consisted entirely of debt issues of three federal corporations.

State and local debt for the fiscal year 1935 totaled \$19,277 million, a gain of \$335 million over 1934.

The gross debt of all governments in the United States on June 30, 1935, amounted to a little less than \$48 billion. The gross total is estimated at \$50 billion as of Feb. 29, 1936, approximately the amount of the national income for one year. Between 1929 and the early part of 1936, the gross public debt increased by about 50 per cent.

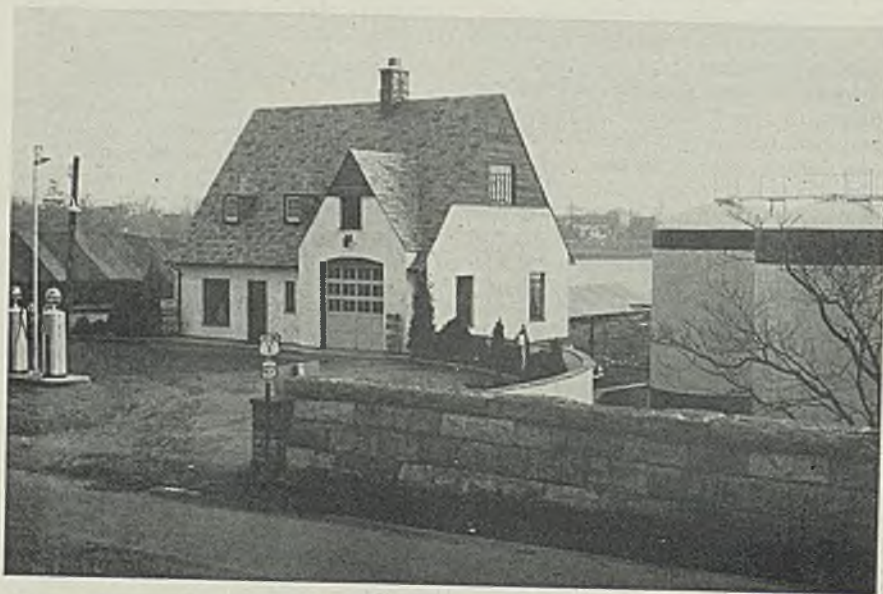
Per capita gross public debt was \$376.24 on June 30, 1935, compared with \$363.24 at the end of the fiscal year 1934, and \$331.13 for 1933.

Taxes

Federal tax collections for 1935 totaled \$3546 million, a figure higher than that for any year since 1921. They were \$654 million more than for 1934.

Federal, state, and local tax collections for 1934 totaling \$8767 million were equivalent to more than one-sixth of the annual income of the American people, the largest proportion in the nation's history.

Air Conditioned, and Selling Air Conditioners



A*IR conditioning equipment—one of the largest of the newer outlets for steel—is now being sold through a large gasoline and oil service station and terminal at Mamaroneck, on the Boston Post road, between Boston and New York. The Mitchel Oil Corp., which billboards "First air conditioned service station," demonstrates with its own installation. Other stations are preparing to market oil-fired domestic furnaces, and air conditioners. Photo courtesy National Petroleum News*

Burden on Accused Under Price Act

BURDEN of proving innocence is placed upon the accused under the new Patman-Robinson price discrimination law, according to the National Association of Manufacturers, which has analyzed the measure in comparison with the law that it amends, the Clayton anti-trust act of 1914.

The association advised its members "the new law purports to create a presumption that any price discrimination is unlawful, and places upon the person accused the duty of proving the contrary before the federal trade commission." The Clayton act placed upon the commission the burden of proving an alleged violator guilty.

"The Clayton act expressly allowed a discrimination in price based on differences in the grade, quality or quantity of the commodity purchased," said the association. "The new act allows price differentials based on quantity only to the extent they reflect differences in the cost of manufacture, sale or delivery resulting from the 'differing methods or quantities' in which such commodities are sold."

Extends Prohibitions

Price discriminations were prohibited under the Clayton act only when the effect of such discriminations was substantially to lessen competition or to tend to create a monopoly in any line of commerce, said the association, but the Patman-Robinson law has extended the prohibition to include any discrimination which may injure, destroy or prevent competition with the parties to the discrimination, or with their customers, without any necessary effect on the general level of competition in the industry or trade generally or in any particular locality.

"The prohibitions in the Clayton act applied only to persons granting the price discrimination. The new act would make it equally unlawful for any person knowingly to receive the benefit of any discrimination now declared unlawful.

"The Clayton act allowed a discrimination in price in the same or different communities made in good faith to meet competition. The amended act does not authorize such price discriminations expressly, but does permit persons charged with violating the law to prove in defense that a discriminatory price was made in good faith to meet the lower price of a competitor."

No prohibition against discrimination in the type of services performed by the seller for different buyers was made in the Clayton act,

but the amended act requires the seller to treat all customers on proportionally equal terms, said the association. The amendments prohibit commissions, brokerage or other allowances to persons acting on behalf of the purchaser, except to persons performing services for the seller. The Clayton act contained no criminal penalty for a violation of the section relating to price discriminations, but the amendments impose penalties of fine and imprisonment.

U. S.-Soviet Pact Renewed; Manganese Rate Unchanged

Under a one-year renewal of the special trade agreement between the United States and Russia, the import rate on the latter nation's manganese ore continues at ½-cent per pound. Protests from domestic producers of manganese were unavailing.

Until July 13, 1937, the United States agrees to extend to Russia the benefits of reductions in tariff rates granted in reciprocal arrangements with other nations. Russia agrees to spend not less than \$30,000,000 in this country for machinery and other goods, the same amount stipulated in the 1935 commercial treaty. In the first 11 months Russia purchased \$33,900,007 worth of products.

The ½-cent duty on manganese is extended automatically to Russia since the reciprocal treaty with Brazil halves the duty of 1 cent a pound.

Machine Tool Orders at Highest Level Since 1929

Domestic suppliers to consumers, principally in the automotive, electrical goods, and farm implement fields, were responsible for boosting June machine tool orders to the highest level since November, 1929. Rising from 91.1, the index figure of the National Machine Tool Builders association, Cleveland, for June of last year to 128.8 for June this year, the previous high during the depression of 125.8 last August was eclipsed.

Contrary to prevalent belief foreign orders, especially those from England, are not the backbone of the present boom in the machine tool industry. Foreign orders this year average 15 per cent of the total as compared with 24.3 in 1935 and 30.4 in 1932.

No shortening of delivery time appears imminent, orders for standard tools being accepted on a range of three to six months, and on special tools a year or more may elapse before orders can be completed.

The index figure for May was 118.9. July may reach a higher level than June.

Money Assured for Farm Machinery Investigation

Despite the fact congress adjourned without appropriating \$150,000 for the federal trade commission to make an investigation of agricultural machinery, the commission is starting work immediately, it was learned in Washington last week.

Congress passed a joint resolution, which is now law, providing for an investigation to take up such questions as violations of the anti-trust law, price fixing and price maintenance in the industry.

The commission discussed this with the bureau of the budget last week, and as a consequence a deficiency will be created, with the appropriation coming through in January.

Consumer Market Data Book For 1936 Available Now

Analysis of consumer markets for communities of 2500 or more persons has been improved in *Consumer Market Data Handbook: 1936*, now being sold by the bureau of foreign and domestic commerce. It is the latest of the series of market handbooks prepared by the bureau in the last few years.

Statistics are presented for cities, states and counties. Population figures, retail and wholesale sales, amusement and hotel receipts, postal receipts, income tax returns, number of wired homes, motor vehicle registrations, number of telephones, AAA payments and farm information are included in the various tables of the handbook.

Copies of the report at 50 cents each may be obtained from the bureau in Washington or through any of the bureau's district offices in principal cities.

Cost of Living Rises

Cost of living of wage earners in the United States continued to rise, increasing 1.7 per cent from May to June, according to the National Industrial Conference board, New York. This was due entirely to food prices and rents. Living costs in June were 4 per cent higher than in June, 1935, and 20.3 per cent higher than in April, 1933, the low point during the depression, but 13.3 per cent lower than in June, 1929.

The purchasing value of the dollar was 116.3 cents in June, 1936, compared with 118.2 cents in May, 1936; 120.9 cents in June, 1935, and 100 cents in 1923, the conference board reported.

Men of Industry

FRANK M. MEREDITH has been appointed assistant director of personnel of the Carnegie-Illinois Steel Corp., with offices in Pittsburgh. His association with the United States Steel Corp. began in 1910 in the metallurgical department, National Tube Co., McKeesport, Pa., continuing until 1917, when he entered the United States army during the World war for 21 months. After being mustered out, he followed newspaper work for one year.

In 1920 he entered the service of



Frank M. Meredith

the Carnegie Steel Co., Duquesne works, Duquesne, Pa., in the rolling mill department. For the past four years he has been active in industrial relations work for the Duquesne plant.

M. E. Nicklin has been appointed export sales manager of the Waukesha Motor Co., Waukesha, Wis., maker of gasoline, diesel, semi-diesel and oil engines for motor trucks and industrial equipment.

A. J. Lewis has been named district manager at Detroit, for the American Emery Wheel Works, Providence, R. I., manufacturer of grinding wheel business for many years, and for the past 15 years in the state of Michigan. He will assume his new duties July 16.

Carl J. Eberly has been appointed representative in the Detroit territory by the Newark Wire Cloth Co., Newark, N. J., manufacturer of wire cloth and wire cloth products. Mr. Eberly is located at 2-251 General Motors building.

George A. Sagendorph has been

elected president and general manager of Building Products Inc., Boston, a holding company owning all the stock of Penn Metal Co. Atlantic Gypsum Products Co., Craftex Co. Each company operates under its own corporate title.

Chester J. Roberts has been made manager of the Milwaukee branch of the Four Wheel Drive Auto Co., Clintonville, Wis. Mr. Roberts has been with the company since March, 1935. For six years he was manager of the industries and trade promotion divisions of the Milwaukee Association of Commerce.

P. K. Reed has joined the engineering and sales organization of C. O. Bartlett & Snow Co., Cleveland. For many years he was chief engineer for the R. H. Beaumont Co., later becoming manager at Chicago for that company, and more recently president of the Atlas Conveyor Co.

C. E. Wright, who for the past three years has been associated with the new York office of the Republic Steel Corp., Cleveland, and prior to that was identified with *The Iron Age* for 16 years, has returned to *The Iron Age* as managing editor.

Harry T. Smith, traffic manager, Worthington Pump & Machinery Corp., Harrison, N. J., was tendered a testimonial luncheon on the anniversary of 50 years of continuous service with that organization at the Newark Athletic club, Newark, N. J., July 8. Mr. Smith has been with Worthington since 1886, having started with the old Henry R. Worthington Hydraulic Works, then situated in Brooklyn.

J. A. Abbott, who was graduated from the University of Illinois in June, 1936, has been added to the furnace sales department of the Ferro Enamel Corp., Cleveland. Mr. Abbott was a member of the company's furnace-building crew a few years ago, but left to go to college and study engineering. He worked for Ferro during summer vacations to finance his schooling.

Prof. K. H. Donaldson has been made chairman of the newly formed Cleveland section of the American Institute of Mining & Metallurgical Engineers, which includes Cuyahoga, Lake, Summit, Stark, Lorain, Geauga, Portage, Ashtabula, Trumbull and Mahoning counties. Other officers are: Vice chairman, C. H. Lunge; secretary and treasurer, J. M. Fenner. Dr. H. A. Schwartz, Prof.

H. M. Boylston and C. B. Murray comprise the executive committee.

Herbert L. Sharlock, widely known in automotive circles, has been elected vice president of the Bendix Products Corp., South Bend, Ind. His official title will be vice president, director of publicity. Mr. Sharlock has been associated with the Bendix organization for many years, during which time he has planned and directed practically every exhibit of the Bendix corporation at the annual automobile shows in New York and Chicago.

Howard W. Reynolds has been named district manager in charge of the Boston office of the Wheeling Steel Corp., Wheeling, W. Va., succeeding S. H. Waters, who has been transferred to the New York office.



Howard W. Reynolds

Mr. Reynolds, who has been with Wheeling for a number of years moves East from Milwaukee, where he resided while engaged in sales work throughout the state of Wisconsin for the Chicago office of Wheeling Steel Corp.

Samuel Dunlap, 2914 Torrington road, Shaker Heights, O., has been elected auditor of the American Steel & Wire Co., Cleveland, succeeding Albert H. Garry, who retires after 47 years of service with that company and its predecessors. Mr. Dunlap formerly served as assistant auditor for several years, and the position he vacates will be taken over by C. S. Morris, Lakewood, O., who has been an accountant with the company for some little time.

Sigurd Brantingson has been named factory manager of Francis Keil & Son Inc., New York, maker of builders' hardware.

C. O. Beale has been appointed chief purchasing agent and stores officer for the Chesapeake & Ohio, Pere Marquette and Nickel Plate lines, Cleveland, and D. E. Ellis has been appointed chief

mechanical officer of the three roads. Both men served with the late W. G. Black who was vice president, under whose direction the mechanical department and purchases and stores departments of the three affiliated roads were consolidated. Mr. Beale, formerly assistant to the vice president, has been with Chesapeake & Ohio for 28 years, while Mr. Ellis, who was mechanical assistant to Mr. Black, has been in railroading since 1916.

Michigan Mining College Invites Iron, Steel Men

Many leaders in iron, steel and other metal industries are among the thousand honor guests invited to attend the inauguration of Grover C. Dillman as president of the Michigan College of Mining and Technology, Houghton, on Aug. 6.

Among them are Scott Turner, former director of the United States bureau of mines, and Donald B. Gillies, vice president, Republic Steel Corp., who served the Michigan Tech Alumni association as president.

Messrs. Gillies and Turner also are among the 14 honorary doctors of Science or engineering of the college who will attend its semi-centennial. Others include Charles Hook, president, American Rolling Mill Co. and William Kelly and Otto Davidson, prominent in the iron ore industry.

Revise Hack Saw Standard

Standing committee in charge of simplified practice recommendation R90-29, on hack-saw blades, has approved a revision of the recommendation, and the division of simplified practice of the national bureau of standards has mailed copies to all interests for consideration and approval.

The current recommendation, which became effective July 1, 1929, covers length, width, thickness and number of teeth per inch of tungsten and carbon steel and high-speed blades, hand and power sizes.

The proposed revision also covers tungsten alloy steel blades, double hardened blades, high speed steel blades, and special alloy blades, all hand, hand and power sizes.

Lower Scrap Rate Sought

A proposal to change the freight rate on iron and steel scrap for remelting purposes from Worcester to Hopedale, Mass., is before the New England Freight association, 517 South Station, Boston, and the association is willing to hold a hearing on the proposed change if shippers in the New England territory wish.

The present rate is 10 cents per 100 pounds, plus a switching charge



J. Edward Johnson

Who has been appointed by the Carnegie-Illinois Steel Corp. to take charge of its new department of training, in which employes are given the opportunity to receive practical and technical training, as noted in STEEL July 13

of 50 cents a gross ton. The proposed rate is \$1.90 a gross ton, including switching charges of the Boston & Maine or the New York, New Haven & Hartford railroads at Worcester. The reason for the change is to establish a commodity rate comparable with the rate now in effect in the reverse direction.

To Build Russian Refinery

Arthur G. McKee & Co., Cleveland, and Petroleum Engineering Inc., Tulsa, Okla., have received a contract to build a 35,000-barrel oil refinery in Soviet Russia, according to Amtorg Trading Corp., New York. About \$200,000 will be expended and refinery equipment is to be shipped not later than Oct. 25.

Died:

EDWIN W. HARRISON, 72, long identified with the steel industry until his retirement several years ago, at Bryn Mawr, Pa., July 10. He formerly was president of the Superior Steel Corp., Pittsburgh, and prior to that was chairman of the board of the American Tube & Stamping Co., Bridgeport, Conn. He was in charge of the Philadelphia district of the Superior Steel Corp. for many years before becoming president.

Rowland J. Millar, 67, vice president and general manager, Pease Foundry Co. Ltd., Toronto, Ont., in that city, July 12.

John J. Farrell, secretary-treasurer, Sheet Metal Mfg. Co., and postmaster of Youngstown, O., in that city, July 9.

In 1919 he joined his brother Thomas, and together they incorporated and operated the Sheet Metal Mfg. Co., stamping, etc., in the Brier Hill section of Youngstown.

William T. Bussey, 83, former president of the Chicago Stove Works, Chicago, in that city July 14. He had been retired from business for the last ten years.

Henry F. Moellering, 73, president, Moellering Construction Co., Fort Wayne, Ind., in Fort Wayne, July 12. He also was a director of the Fort Wayne Pipe & Supply Co.

L. Heeley Link, 49, vice president and secretary, Bass Foundry & Machine Co., Fort Wayne, Ind., in that city, July 12. He was identified with the Bass company for 33 years.

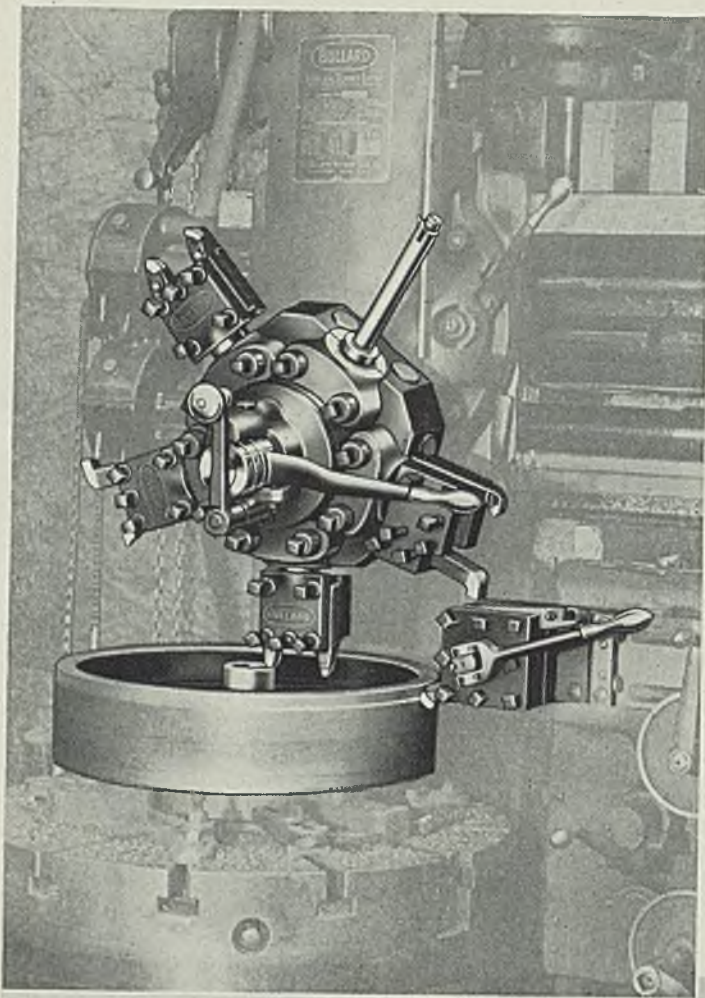
Edwin Elmer Frederick, 69, at Winter Haven, Fla., July 13. He was born at Wadsworth, O., and spent most of his life at Pittsburgh, where he was a member of the firm of Frederick & Elder, brass manufacturers.

Frank F. Tillotson 71, prominent banker and businessman of Detroit, in that city, July 8. He was a director of the Midland Steel Products Co., Cleveland.

Mary Hegeler Carus, 76, president, Matthiessen & Hegeler Zinc Co. and the Bronze Metal Products Co., La Salle, Ill., in that city, recently. A daughter of one of the founders of the company, Mrs. Carus was an engineering graduate of the University of Wisconsin and was unique in her capability as the executive head of this type of an industrial concern. She assumed the presidency of the company following the death of her father.

William H. Burn, 76, formerly identified with various sheet metal stamping companies, in his home near Rochester, Ind., July 14. Mr. Burn at one time was secretary of the Buhl Stamping Co., Detroit. He went to Chicago in 1893 and until his retirement ten years ago was secretary and director of the Sturges & Burn Mfg. Co., maker of dairy and sheet metal specialties. He was a former vice president of the Illinois Manufacturers' association.

Olaf Christian Smith, 63, vice president, Kansas City Structural Steel Co., Kansas City, Kans., in that city, July 3. Following graduation from the University of Minnesota, he was employed as superintendent of the Gillette-Herzog Steel Co., Minneapolis, and in 1900 when the firm was purchased by American Bridge Co., Mr. Smith remained until 1904, when he was appointed superintendent of the Minneapolis Steel & Machinery Co. With associates he organized the Kansas City Structural Steel Co. in 1907.



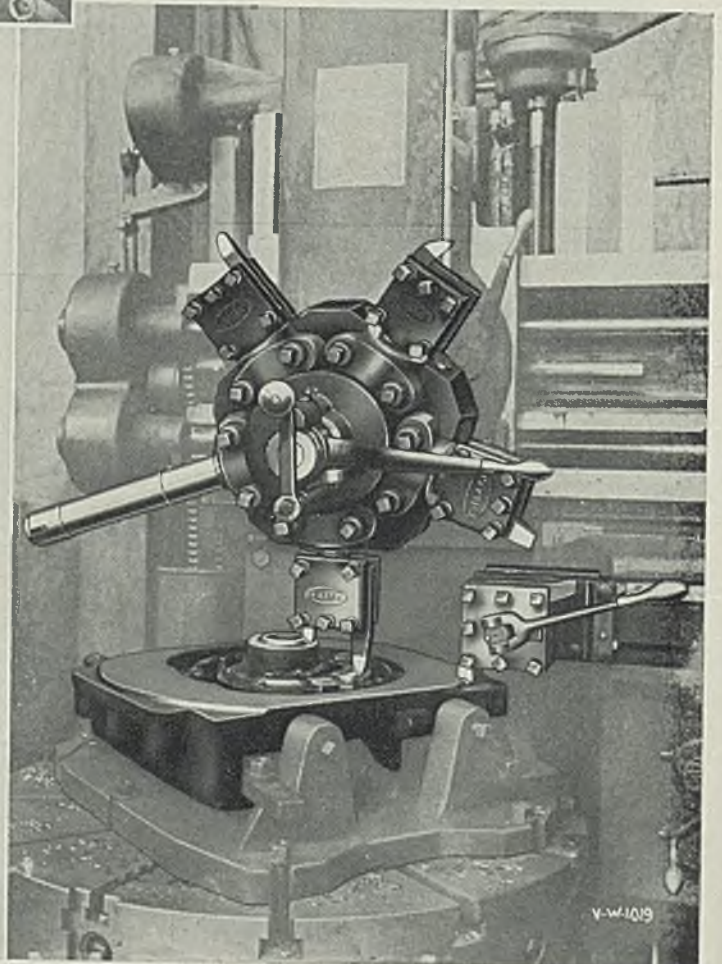
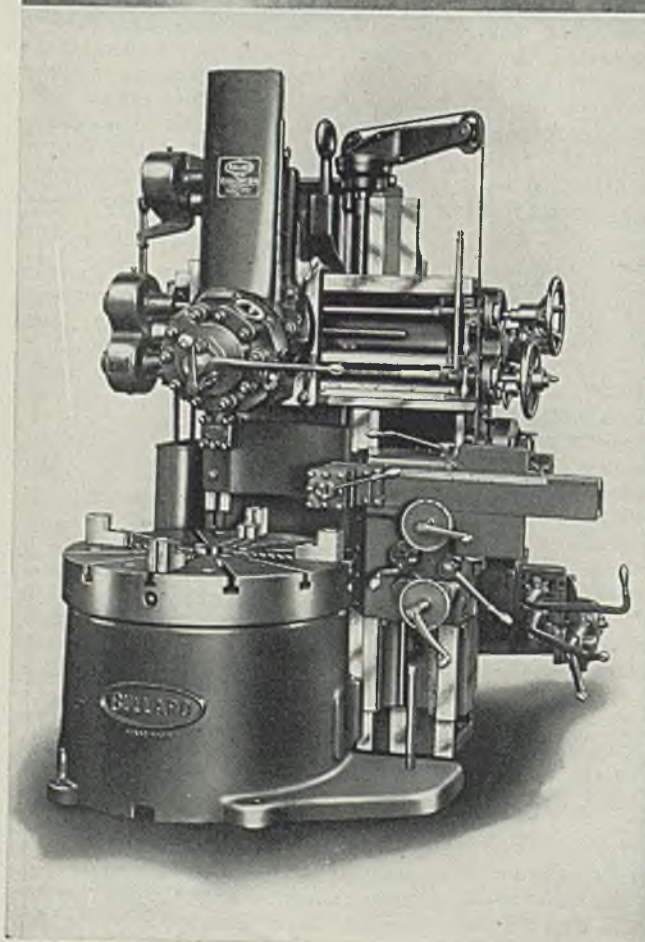
PRODUCING PROFITS—

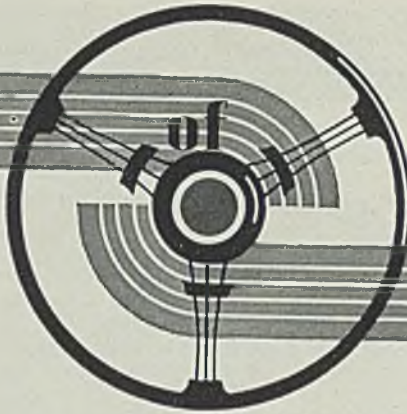
- 1—On "Short Run" as well as "Long Run" Jobs.
- 2—By Simplicity and Versatility of Tool set-up.
- 3—Through Accuracy with minimum spoilage.
- 4—Through maintained duplication of limits with minimum required inspection.
- 5—With Low Cost of Maintenance.
- 6—From Ease and Rapidity of Operating Control.

The Bullard Vertical Turret Lathe has been developed so that its design and construction cover these points and many others. The result is a machine tool assuring a Profitable Investment.

Bullard Engineers will gladly work with you to Save Costs and Increase Profits. If others Profit, so can you.

THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT





DETROIT

THE elements have been hard on the automotive industry this year. In January and February snow and zero weather over a large section of the country put the quietus on retail markets and caused a contra-seasonal decline in assemblies during February. However, March and April came back strong.

Last week Michigan sweltered in a record heat wave, and Detroit and other automotive centers found sustained temperatures above 100 degrees hardly commensurate with efficient operations. Consequently, schedules were curtailed.

General Motors output was estimated as 39,170 units compared with 43,248 in the preceding week. Ford's 23,750 was practically unchanged, while Chrysler's 21,200 compared with 23,275.

This is regarded as only a temporary interruption to the month's production program which, judged by usual July standards, is mildly ambitious. Predicated on a retail demand which is slow to respond to restricting influences of the season, however, assemblies this month appear likely to be well above levels indicated earlier in the year.

July Rate Set at 380,000

There was some slowing down in retail sales last week, partly attributable to the torrid weather. Excellent June reports give a favorable aspect to the July outlook, and in some cases, notably Ford, this month's proposed output has been increased over previous schedules.

Earlier estimates of domestic retail sales of 365,000 passenger cars in June have been revised upward to 380,000. This is only slightly below the 1929 peak. Part of July production will be for the purpose of bolstering dealers' stocks during the time when assembly lines are down for model changeovers. While there will be some decrease from June, this month should see an output of not much below 400,000 units.

Dates for ending 1936 model production for some companies remain

indefinite because of the lasting powers of retail buying. Preparations for the new models, of course, still are going forward, and machine and tool producers in some cases are being pressed to meet deliveries that are requested in order that the stage may be set for as quick a changeover as possible.

Eyeing the labor situation on both the steel and automotive fronts, motor car executives refuse to become alarmed over the possibility of an early shutting off of steel supplies because of a strike. What anticipatory steel buying—and there was not much—done recently was promoted largely by the price factor.

Auto Unionization Difficult

Organized labor again is attempting complete unionization of the automotive industry—admittedly a more difficult task than the lining up of steel workers. Organizers at this time face the problem of overcoming the satisfaction that has accrued to employes from months of steady employment and high wages. At the time of the last unionization drive, during the NRA era, the employment situation was far less favorable.

Hupp, out of production this year, is starting preparations to get back in the game with 1937 models. Crippled financially by the drain of depression years, the company expects to dispose of some unused property and to obtain sufficient funds from this and other sources to permit a resumption of operations. Engineering work has started on 1937 cars and exhibit space reserved at the New York automobile show which opens Nov. 11.

Willys-Overland, operating under federal court sponsorship, has built most of the 15,000 cars authorized by that government body and now is seeking permission to spend \$400,000 for tools and dies necessary for production of new models. It is planned to replace the present diminutive Willys with a longer car, widened to standard tread.

Despite the good volume of motor

car business, dealers' experiences with profits this year have been none too favorable in many instances. Allowances on used cars frequently have been excessive, particularly in view of the fact that price is somewhat less of a factor in making a sale than it was during the past several years.

Used car stocks still constitute a problem despite a reduction from the year's peak. Lately there again has been a tendency for trade-ins to accumulate, apparently because of greater buyer interest in the purchase of a new car than a used one. There is a growing fear that by the time 1937 models are introduced, the used car problem will have become further aggravated.

Some dealers are making price concessions to new car buyers who refrain from offering an old model in trade. A check in a large city of dealers for five of the lowest price makes recently showed price concessions ranging from \$25 to \$100. The seller offering the \$100 cut also agreed to throw in a free trip to Mackinac Island, the buyer to pick up his car on the way back.

May Enter Trailer Field

It is claimed that these allowances are no more than the expense of handling a trade-in. Frequently a dealer must sell three or four used cars in order to dispose of a new one, particularly when the first trade-in is a fairly new model. A second trade-in may be accepted in selling the first one, with the process repeated until a full cash sale is accomplished.

Automobile manufacturers are commencing to become interested in the rapidly growing market for house trailers. According to reports, it will not be long before motor car interests take a hand in this industry which is described as expanding faster than did demand for automotive vehicles years ago. One story has Ford preparing shortly to engage in the mass production of these mobile houses.

The trailer industry is credited

with having nearly 400 manufacturers. Only a handful of companies were in the business four years ago. Since that time, however, the trailer has acquired luxury and its owner a dignity. Some of the elaborate trailers now touring the country cost as much as \$5000, and persons from all walks of life have become converted to this movable sort of residence either for trips or for a permanent home.

It is estimated that several hundred thousand people are living in trailers, and predictions are made that the market for this equipment will continue to grow. This, obviously, is a field in which automobile body companies are adapted to participate. With mass production, lower prices would result, giving further stimulus to demand.

The trailer industry has been experiencing brisk operations this year, contributing to the large increase in number of companies engaged in building the miniature houses. Unlike the automotive industry, trailer builders are scattered over the country. Leading manufacturers in this district include the Covered Wagon Co., Mt. Clemens, Mich.; Roycraft Mfg. Co., Chesaning, Mich.; and Silver Dome Trailer Co. and Travelcar Co., both of Detroit.

If trailer production fulfills the rosy predictions made for it, a market is opening for a substantial tonnage of steel products. If some forecasters are to be believed, however, half of the population eventually will be living on wheels and there will be a sharp reduction in demand for the stationary type of home.

Polarizing Glass for Autos

There has been some talk of making use of polarizing glass to eliminate headlight glare—a common cause of accidents. To work effectively, both the windshield and headlight glass must be of the polarizing type, and therein lies the problem.

If all automobiles were so equipped, all drivers would be protected, but a polarizing windshield offers only small resistance to the rays from a light not provided with similar glass. Also, a non-polarizing windshield will allow the glare from an approaching car, equipped with polarizing headlight glass, to pass through it. Since it would be difficult to have all existing cars re-equipped, it will be necessary to have gradual application of this idea—if it is adopted—through in-

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	*436,000
6 mo.	1,738,241	2,223,022	2,472,921
July	264,933	332,109
Aug.	234,811	237,400
Sept.	170,007	87,540
Oct.	131,991	272,043
Nov.	83,482	395,059
Dec.	153,624	404,528
Year	2,753,111	3,946,934

Estimated by *Cram's Reports*

Week ended:	
June 20	100,733
June 27	99,695
July 4	100,697
July 11	97,833
July 18	91,317

*Estimated.

roduction of new cars furnished with such glass and eventual disappearance of older models. This of course would be a slow process.

Despite improvements in the lighting system of automobiles, manufacturers have made little progress in recent years in eliminating the glare hazard. The dimmer switch has helped, but since it requires manual operation, it frequently is neglected.

Ford's New Generating Plant

Steam started flowing last week through the 2,089,000-pound turbo-generator at Ford's Rouge plant, rated the largest high-pressure steam generating plant in the world, and raising capacity from 200,000 to 326,000 horsepower. Thousands of feet of all-welded pipe went into the boiler that provides 900,000 pounds of steam per hour at 900 degrees Fahr., which is claimed to be the highest temperature any American industrial power plant has achieved.

Increased power demands resulting from the company's \$37,000,000 expansions and modernization program at the Rouge plant made necessary this additional \$4,600,000 investment. The "steeple compound" type generator is equipped with a high-pressure condensing turbine that reconverts steam to water.

Chrysler and Ford have been staging a close production race lately. June output for all cars of both interests was practically identical, as also has been the weekly rate so far in July. . . Independent companies show a better comparison with 1935

output than does the Big Three, Chrysler, Ford, and General Motors built slightly more than 88 per cent of all cars produced the first half, against nearly 91 per cent a year ago. . . Hudson-Terraplane sales the first week of July were only slightly less than for the first week of June, despite the holiday, and 53.5 per cent head of last year. Only 1929 made a better showing. . . . May exports of automotive products were valued at \$23,495,164, a gain of 21.5 per cent over a year ago. For five months the gain was 10 per cent. Passenger car exports in May numbered 17,570, against 13,503 last year, with truck shipments increasing from 6234 to 10,806. . . . Ford is making deluxe equipment available on trucks and commercial cars, including trim and gadgets furnished on passenger cars. . . . Packard's six months' shipments were 33,107 units, against 17,287 last year and 30 per cent ahead of the previous record, established in 1929 when only the more expensive models were being built.

Natural gas has been turned into Detroit city mains, following completion of the connecting link to the line from the Southwest. . . . Chevrolet set a new record in truck sales during the first half, delivering 119,294 units, against 102,321 in the similar 1929 period, the former high. June sales were only 250 below the May total. Sales of light trucks the first half were 20 per cent ahead of last year. Chevrolet's gain was 41.7 per cent. . . Nash Motors Co. on July 29 will celebrate its twentieth birthday. . . Members of the Automobile Manufacturers Association, which does not include Ford, shipped more vehicles in June than in any previous June in the organization's history. . . DeSoto continues engaged filling taxicab orders.

Automobile and Railroad Demand Lifts Budd Sales

Improvement in the automobile body and parts business and a stronger trend toward light-weight railroad equipment is reflected in the 25 per cent increase in sales for the first five months of 1936, reported by the Edward G. Budd Mfg. Co., Philadelphia. This volume is larger than that of any similar period since 1930. Although the company has unfilled orders for 81 stainless steel cars, compared with 14 during the entire year 1935, these orders are not included in the 25 per cent sales increase.

EXCLUSIVE FEATURES

PERFECT *Oil Retainers*



PATENTED

INNER SEAL CONSTRUCTION

Accurately spaces cover washer and leather packing member, bracing the entire assembly and anchoring packing member against rotation. Also permits maximum spring clearance with a minimum difference between shaft diameter and outside diameter.

SPRING

Spring is free to balance tension uniformly and to assure predetermined lip pressure at all points around the shaft.

PACKING MEMBER

Made of specially tanned oil impervious leather. Delivered to you softened and oiled ready for installation. Self-lubrication prevents friction or shaft scoring.

WIPING LIP

Positive contact under minimum pressure—excludes all foreign matter and positively seals lubricant in the housing.

OUTER CUP

Incloses entire assembly in one rigid compact unit—centerless ground on outside diameter for easy and positive press fit into bearing housing assembly.

CHICAGO RAWHIDE MANUFACTURING COMPANY

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57 Years Manufacturing Quality Mechanical Leather Goods Exclusively

PHILADELPHIA

CLEVELAND

NEW YORK

DETROIT

BOSTON

PITTSBURGH

CINCINNATI

July 20, 1936

STEEL

Activities of Steel Users and Makers

AO. SMITH CORP., Milwaukee, is completing work on the fabricating of a welded steel frame for one of the largest mechanical presses ever built, designed by the Clearing Machine Corp., Chicago, for an unidentified automobile manufacturer for stamping passenger car bodies in sizes never before attempted in a single piece. The frame is 26 feet long, 10 feet wide and 40 feet high and the complete press will weigh in excess of 250 tons. Shipment will be made shortly to meet a rush delivery specification.

General Refractories Co., Philadelphia, has removed its general offices into new quarters in the Real Estate Trust building at Broad and Market streets, that city.

Witte & Burden, advertising agents, have moved from Third avenue to larger quarters at 5757 Cass avenue, Detroit. This expansion marks the tenth anniversary of the beginning of the partnership.

Conner Mfg. Co., Louisville, Ky., has been appointed distributor of Enduro stainless steel serving northwestern Kentucky with a complete stock of sheets, by Republic Steel Corp., Cleveland.

Charles Millar & Son Co., Utica, N. Y., has been added to the list of Enduro stainless steel distributors by the Republic Steel Corp., Cleveland. Republic also has named Taylor-Parker Co. Inc., Norfolk, Va., distributor for its tubular products.

Superior Steel Corp., Pittsburgh, has appointed Brace-Mueller & Huntley Inc. as sales representative for New York state, (excluding metropolitan New York), and northern Pennsylvania, with offices at Buffalo, Rochester and Syracuse, N. Y.

American Can Co., New York, has contracted with the Jacob Ruppert brewery to supply that company's beer can requirements. American Can, with the arrival of warm weather, has stepped up its deliveries of cans for beer to an estimated 15,000,000 to 18,000,000 weekly.

Ryerson & Haynes Inc., Jackson, Mich., manufacturer of steel tire covers, automotive jacks and other automobile parts and accessories, has opened a branch plant at New Brunswick, N. J., to supply automobile manufacturers who have plants or branch plants in the East.

Crane Co., with offices in Indianapolis, South Bend, Muncie, Terre

Haute, Evansville, and East Chicago, Ind., has been appointed representative in the state of Indiana by the American District Steam Co., North Tonawanda, N. Y., manufacturer of steam distribution equipment.

Dorr Co. Inc., New York, consulting engineer, has leased 20,000 additional square feet in the General Electric building, 570 Lexington avenue at Fifty-first street, that city. With the occupancy of these quarters this month, the company will have completed the transfer of all major functions to New York city from Denver, an operation which began several years ago.

American Electric Furnace Co., Boston, has appointed the following direct factory representatives for the sale and service of all its products. Earl E. Wright, Chattanooga, Tenn., covering eastern Tennessee; A. D. Heath, Indianapolis, state of Indiana; Clyde J. Boeringer, Pittsburgh, western Pennsylvania and state of Virginia.

National Acme Co., Cleveland, has booked sufficient business to keep its plant running at full capacity the balance of this year. F. H. Chapin, president, who has just returned from a business trip to England and parts of the Continent, brought back orders for machine tools totaling about \$500,000, and shipments are expected to start in from 12 to 16 weeks.

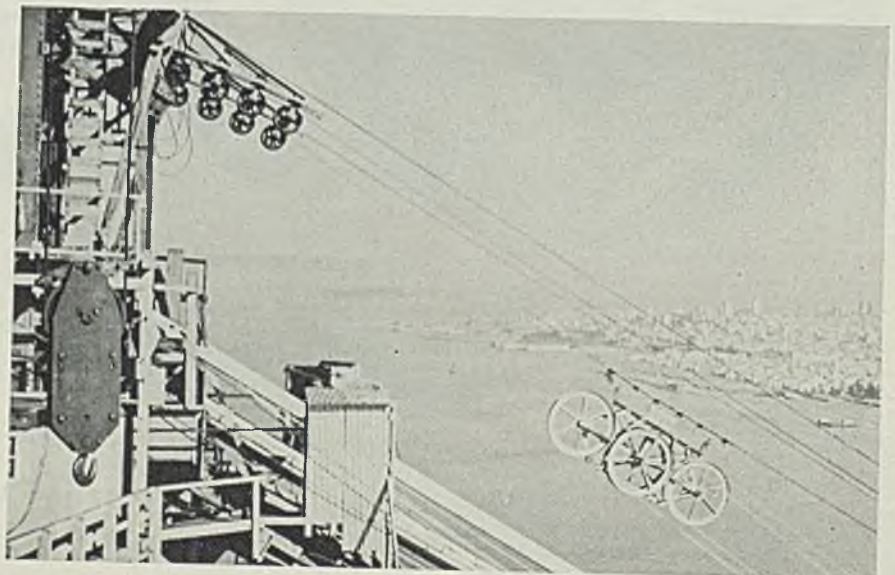
R. G. and T. C. Moeller have es-

tablished the Rawlplug Detroit Co., Detroit. They will handle all the products of the Rawlplug Co. Inc., main plant and general offices New York city. The Rawlplug Co. manufactures a complete line of anchoring devices for all types of material. It also manufactures a novel Lok-Crowner for locking and concealing bolt, rivet, and screw heads.

General Electric Co., Schenectady, N. Y., has recently tested what is said to be the largest diesel locomotive in the world. The locomotive weighs 346,000 pounds and has an overall length of 60 feet. The locomotive was built for the Busch-Sulzer Bros. Diesel Engine Co., St. Louis, and is to be placed in the freight transfer service of the Illinois Central railroad. Initial tests indicated that the locomotive was easily capable of hauling a capacity load at a speed of 24 to 26 miles an hour.

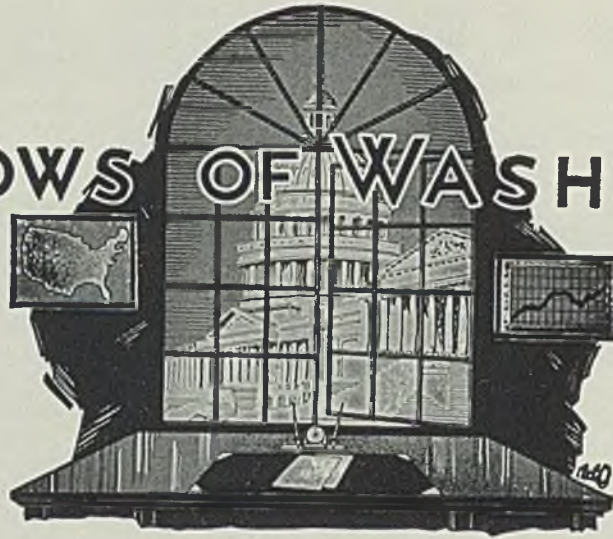
Cleveland Duplex Machinery Co. Inc., Cleveland, has been appointed exclusive agent for a number of machine tool lines by Bryant Machinery & Engineering Co., Chicago, general distributor for the following manufacturers and their products: Boye & Eames Machine Tool Co., lathes; Cleereman Machine Tool Co., heavy duty drilling machines; Dreses Machine Tool Co., radial drills and monitor brass lathes; Kling Bros. Engineering Works, heavy duty grinders; Ohio Machine Tool Co., shapers and planers, horizontal boring, drilling and milling machines.

Spinning Along at Twice the Former Speed



CARRYING six wires at one time, the new type of spinning wheel shown above is reported to have gained 50 per cent over the former arrangement for this type of cable operations on the Golden Gate bridge. This view, taken from the top of the San Francisco tower, looking toward San Francisco, shows the new type of wheel traveling toward the transfer point at mid-span. Engineers of the John A. Roebling Sons Co. made the improvement

WINDOWS OF WASHINGTON



WASHINGTON
PRESIDENT ROOSEVELT has been caught in a labor nut cracker. He is in rather a hopeless situation, due entirely to the fact that this is *the* political year.

Both John L. Lewis, who appears to have a key to the side and back doors of the White House, has promised his support and that of the men he represents to Mr. Roosevelt, while William Green, also has promised his political support. These two are pulling against each other, of course, and the President of the United States, is most anxious to avoid any open break between them until after election.

The whole situation has become somewhat involved owing to the steel unionization drive, the political support of the two head men of the labor show and the fact that the President wants both to stop industrial trouble, if possible.

Reference was heard here last week to Lewis as the labor Hitler and again as a labor racketeer. In some quarters there are stories that the laboring men are getting fed up with his tactics at this time.

Berry Denies CIO Hookup

The third labor leader whose head keeps sticking up in the show—due largely to his publicity man—is Major George L. Berry. He took occasion last week to deny rumors to the effect that any one joining the labor Non-Partisan league was also joining the Lewis CIO organization.

"There is another misapprehension concerning the league which I would like to kill off at once," said Major Berry. "We have found instances where a story is being circulated that anyone enrolling in the league automatically commits himself to the industrial form of unionism because John L. Lewis is on the league's board. This statement is diametrically opposed to the facts, and Mr. Lewis himself discredits such a rumor."

In talking last week before more than 300 newsmen at a luncheon at the National Press club, Mr. Lewis charged that "the House of Morgan always has and does now control the United States Steel Corp., and that corporation controls the American Iron and Steel institute."

In an impassioned speech he said that neither the Steel institute, the United States Chamber of Commerce, the National Association of Manufacturers, nor the A. F. of L. is going to keep his CIO organization from going ahead in trying to organize the steel and other major industries.

Telling of the organization of the mine workers under his direction he pointed out that they now have their own mouthpiece, but, he said: "Who knows what the steel workers of the country think on public questions?"

Contrasts Salaries, Wages

He said the Steel institute keeps them from organizing so they can not make their wants known. "I think that the time has come when the Institute cannot continue that policy with impunity."

Mr. Lewis discussing reported salaries of some of the steel company officers contrasted these with the wages of the laborer and said that they "cannot get away with this much longer, and it is going to be too bad for the United States, if they do."

He contrasted the "modern industrial autocrats" with the Bourbons of France and charged that the former "are draining the economic life blood of labor." Lewis said that he is working for a "greater degree of industrial democracy."

He said he will "make an effort to do in some other industries what I have done in the coal industry." He spoke of the displacement of men by machines, and asked: "What is to become of those men?"

President Green may make a talk shortly at the Press club. Some out-

standing official of the steel industry also may be invited to address the correspondents at a future time.

LA FOLLETTE COMMITTEE GIVEN MORE POWER

The time when the LaFollette subcommittee of the senate committee on education and labor will start its hearings in connection with collective bargaining, the arming of industrial plants, and similar activities, depends somewhat on how the steel labor situation develops.

In other words, if nothing much happens in that situation in the near future hearings are probably sometime off but if it should become acute the senate committee probably will take it upon itself to get into the picture.

The latest news in connection with this LaFollette subcommittee is that the President has issued an executive order granting the committee permission to go into income tax and corporation tax returns at the bureau of internal revenue, if it desires.

Considerable mystery is attached to this action. Officials of the bureau of internal revenue state that they have no way of knowing why the committee wanted this authority, and representatives of the committee who are in Washington apparently are not anxious to discuss the situation.

In the regulations governing the inspection of income, profits and capital stock tax returns by the committee on education and labor of the senate, which were issued by Wayne C. Taylor, acting secretary of the treasury, as the result of the President's executive order, provision is made that "the inspection of returns herein authorized may be by such committee or subcommittee of, by, or through such examiners or agents, as such committee or subcommittee may designate or appoint."

Further provisions are then made

for the actual obtaining of the information and then the regulations provide that "any information thus obtained which is relevant or pertinent to the purpose of the investigation, may be submitted by such committee to the United States senate."

The original resolution of investigation by the LaFollette committee read in part: "To make an investigation of violations of the rights of free speech and assembly and undue interference with the right of labor to organize and bargain collectively," etc.

LARGER GROSS, SMALL NET, IN CORPORATION RETURNS

In a preliminary report just made by the commissioner of internal revenue on corporation returns for 1934 filed up to Dec. 31, 1935, 20,348 metal and products manufacturers filed returns.

Of this number, 6844 showed net returns, the gross income of these firms totaling \$7,044,504,000 with their net income amounting to \$535,149,000. They paid an income tax of \$73,627,000 and an excess profits tax of \$787,000, their total tax being \$74,414,000.

Also 12,432 firms showed no net income, their gross income being \$3,582,745,000 and their deficits amounting to \$277,205,000. Returns also were received from 1072 inactive corporations.

LABOR BOARD COMPLAINS AGAINST REMINGTON-RAND

The national labor relations board has issued a complaint charging the wholesale discharge of workers for union activity against the Remington-Rand Co. Inc.

Other allegations in the complaint include the domination of company unions at four of the company's plants; the retaining of agencies to spy on its employees; physical interference with the workers and other matters.

The complaint states that a majority of the production, maintenance and machinists departments at the company's seven plants have, through enrolled membership of its affiliates, designated the Joint Protective Board as their representatives for the purposes of bargaining collectively with the company.

A. V. DYE PLEADS FOR NEW UNDERSTANDING

Talking last week at the institute of public affairs, Alexander V. Dye, director of the bureau of foreign and domestic commerce, made a plea for business to establish a relationship with the federal government such as that which has been established by both agriculture and labor.

Mr. Dye probably does not know that business has made a determined effort to co-operate with Mr. Roosevelt for a long time, but the breath-

ing spell so often talked about by the President has never quite developed.

"It is believed," said Mr. Dye, "that business could with profit to itself and to the economic welfare of the nation, establish the same relative position in the federal government as that now occupied by agriculture and labor, and along much the same lines.

"This could be done through the establishment of the same extensive research into the problems of business that are now carried on by the other two departments of government devoted to occupational classes of our population, and by devoting to the problems of business the proportionate share of time and federal income which is warranted by the share of business interests in our national life."

WORLD TIN PRODUCTION AND CONSUMPTION GAIN

That world production and consumption of tin have appreciably increased during the current year is indicated in a report from the American consulate-general, London, made public by the commerce department.

According to figures issued by the Hague statistical office of the International Tin Research and Development council, world output of tin in the first four months of 1936 amounted to 147,099 tons, against 119,596 tons in the corresponding period of 1935, an increase of 23 per cent.

Apparent world consumption of tin in the January-April period of this year amounted to 148,642 tons, compared with 123,619 tons in the 1935 period, an increase of 20 per cent.

Apparent consumption of tin in the United States, the Hague statistics show, in the first four months of 1936 amounted to 66,951 tons, an increase of 36 per cent. British consumption totaled 24,131 tons, an increase of 12.8 per cent, while German consumption, totaling 9431 tons, showed a decrease of approximately 7 per cent.

STAFF ORGANIZED TO STUDY ANTI-TRUST CASES

Refusing to discuss whether it has anything to do with the alleged steel collusive bidding report of the federal trade commission and its own activities in connection with this steel investigation, the department of justice has set up a general staff which is supposed to have something to do with an intensive drive which the administration says it will make against trusts and alleged monopolies in restraint of trade.

John Dickinson, former assistant secretary of commerce, and now assistant attorney general in charge of this work, discussing this matter last week, said that "our purpose in organizing a special staff of analysts to

study alleged violations of the anti-trust laws is to systematize and speed up investigations which will determine whether or not action is to be taken against alleged trusts.

"The federal bureau of investigation," he continued, "has co-operated fully with us in the past and will continue to do so. Our headquarters staff will simply tabulate and analyze the complaints made to the department and guide the FBI men in whatever investigations are considered necessary."

SOVIET AGREES TO SPEND ANOTHER \$30,000,000

The Soviet government will continue to ship Russian manganese ore into the United States at ½-cent a pound which is one half the regular rate under the trade agreement renewed as of July 13, as predicted in these columns last week.

Under the agreement the Soviet government gets all of the rates of the favored nation's and as in our trade agreement with Brazil, manganese is dutiable at ½-cent a pound, instead of 1 cent as provided in our tariff law, the Russians get this same consideration.

Under the recent trade agreement the soviet government promised to spend not less than \$30,000,000 in the United States instead of \$12,000,000 the previous year. The state department declares that the country has actually spent \$37,000,000 here. Much was for machinery of various kinds. Under the renewed agreement which holds until July 13 of next year, the soviet government again asserts that it will spend at least \$30,000,000 in the United States.

Under the provisions of the new agreement the United States government will continue to extend to soviet products duties proclaimed pursuant to trade agreements with foreign countries. This new agreement does not involve any new concessions.

GAIN OF 30 PER CENT SHOWN IN GERMAN TOOL EXPORTS

Exports of mechanics' tools from Germany showed a 30 per cent increase in volume during the first four months of this year compared to the corresponding period of 1935, according to a report to the commerce department. The value increase was 20 per cent.

Shipments in the first four months of 1936 totaled 8392 metric tons, valued at \$6,850,000, compared with 6521 tons, valued at \$5,800,000, in the 1935 period.

The larger share in the total increase was accounted for by overseas markets, but shipments also gained to all leading European markets with the exception of Italy and Switzerland. The German exports of mechanics' tools have been maintained at the cost of satisfactory prices.

Railroads Search Right Path for Future Development

ONE of the attractions of the Great Lakes Exposition is a swiftmoving pageant entitled "The Parade of the Years", which is built around the central theme of progress in transportation. The developments from primitive methods of transport to present day accommodations for travel by land, air or water are now quite familiar to millions, because pageants similar to that now being staged in Cleveland have been presented at several other expositions, including the Chicago Century of Progress, and at the centennial celebration of the Baltimore & Ohio railroad at Halethorpe, Md. in 1927.

Those who have witnessed these spectacles have been given a realistic picture of painful progress spanning a period of more than a century. That broad panorama furnishes a wonderful background from which one may study the present activity of the railroads in developing new service and equipment from a proper perspective.

Of course, it is a far cry from the Peter Cooper's TOM THUMB, the DEWITT CLINTON, or even the famous 999 to the locomotives of 1936. The contrast between the earliest American railroad cars and the current models is even more striking.

Renaissance in Train Building Provides Mobile Laboratory for Seeking Best Form

Nevertheless, one cannot compare the achievements of each successive year or decade without gaining the impression that the designers, engineers, and others responsible for each new advance in locomotives or cars looked upon their masterpiece as the ultimate in development. They could not foresee how their mechanical creations would appear to the eyes of the public 50 or 100 years later.

It is well to keep this point in mind when considering the numerous innovations now being introduced in the passenger service of progressive railroads today. No one will deny that the introduction of improved trains during the past two years represents a renaissance in American railroading. But it is a mistake to assume that the spectacular "name trains" now in operation or contemplated furnish the com-

plete answer to the problems of passenger traffic. It would be more correct to say that these trains provide a mobile laboratory, from which experience will direct the path of progress.

The metalworking industries have a big stake in the outcome of the experiments conducted in this laboratory. A choice of three types of motive power is involved. Will the future trend be toward steam, diesel or electric prime movers?

Again, in the matter of rolling stock, the field is wide open. In the popular "name trains" placed in operation recently almost every conceivable material or combination of materials is represented. We have seen trains in which aluminum is the principal car body material. In others, stainless steel dominates. Low alloy high strength steels are employed extensively in some. Carbon steel—the old reliable friend of the railroads through many decades—still is used generously in a number of the new trains.

Opportunity for Steelmakers in Improved Rail Sections To Suit New Conditions

But opportunities in the railroad field do not end with motive power and rolling stock. Maintenance of way is an important problem of railroading and no one is sure that the present standard track is as good as it should be. Recently a veteran student of railroad development pointed to a fine stretch of mainline track and asked, "Do we know positively that these rails are the economical weight for dense traffic? Isn't it possible that a heavier rail—weighing as much as 160 or 180 pounds per yard—might prove to be superior?"

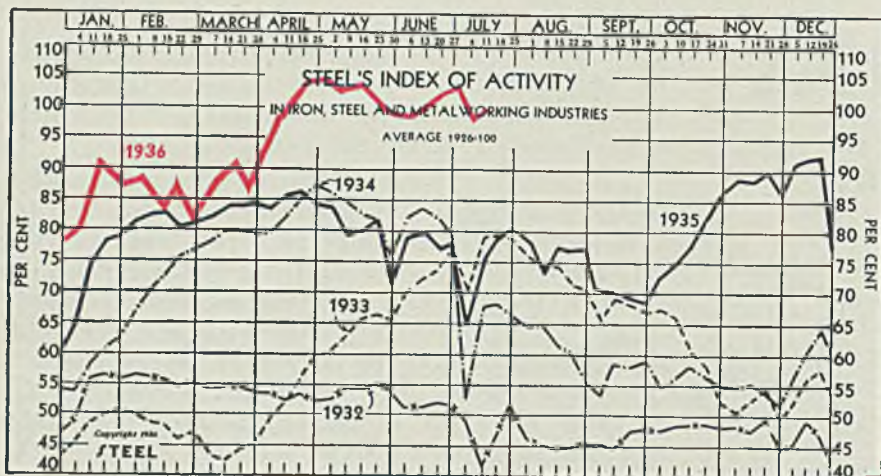
Then, significantly, he added, "Who should take the initiative in finding out whether the heavier rail is preferable?"

Being a firm believer in market development by the seller, the writer replied that in his opinion it is up to the railmaker to help his customers to determine the best product for their requirements. If it is true that greater mass in rails would promote economy, then here is another assignment for rail manufacturers, some of whom already are seeking better results.

In brief the railroads, which through many decades were industry's No. 1 customer, still are heavy purchasers of material and equipment. Today, perhaps more than anytime in several decades, they are in a receptive mood toward industrial companies that can contribute something valuable toward solving their problems.

Here is opportunity for the metalworking industries!

THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 2.5 points to 100.0 in the week ending July 11:

Week ending	1936	1935	1934	1933
May 2	103.2	84.6	86.0	60.3
May 9	103.0	79.3	84.4	62.5
May 16	103.1	80.5	82.4	65.2
May 23	100.4	82.8	81.9	66.1
May 30	98.6	71.9	75.7	65.3
June 6	98.8	79.3	82.3	69.9
June 13	99.4	80.0	83.6	72.1
June 20	101.0	77.3	81.8	73.9
June 27	101.9	78.4	79.4	77.0
July 4	97.5†	64.1	52.3	71.4
July 11	100.0*	76.5	67.8	79.1

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.

Index of Industrial Activity Again Is Tending Upward

JULY'S business activity is tracing an individualistic pattern which has had no counterpart in recent years. Seasonal influences are being disregarded in a large measure. Industry is writing a new chapter in the records of dog day activity.

Whereas the pace should slacken in the mid-summer, the third quarter of 1936 has started with an unusual burst of speed. The only drawback is the feeling that part of this unseasonal spurt is due to the stimulus of bonus payments and other phases of government bounty.

However it would be a mistake to discount the present activity too heavily on the score of artificiality. The fine record of machine tool or-

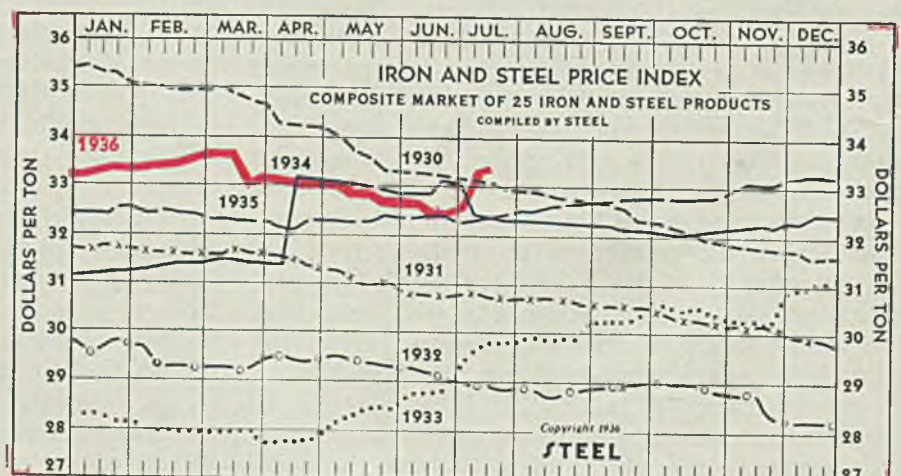
ders, the expanding demand from the railroads and the brisk pace witnessed in other branches of the durable goods industries indicate a more substantial foundation for recovery than can be attributed wholly to economic pump priming.

Viewed from any angle, the business record since July 1 is encouraging. The rebound from the holiday interruption has been gratifying and although a slackening of the pace due to a sustained period of extreme heat is indicated, there are no signs of the beginning of a marked summer letdown.

STEEL'S index, registering 97.5 in the week ending July 4, surged up to 100.0 in the week ending July 11. The gain was caused by a moderate rebound in the rate of steelworks operations and substantial increases in revenue freight traffic and electric power output. The latter again set an all-time record—the third in four weeks.

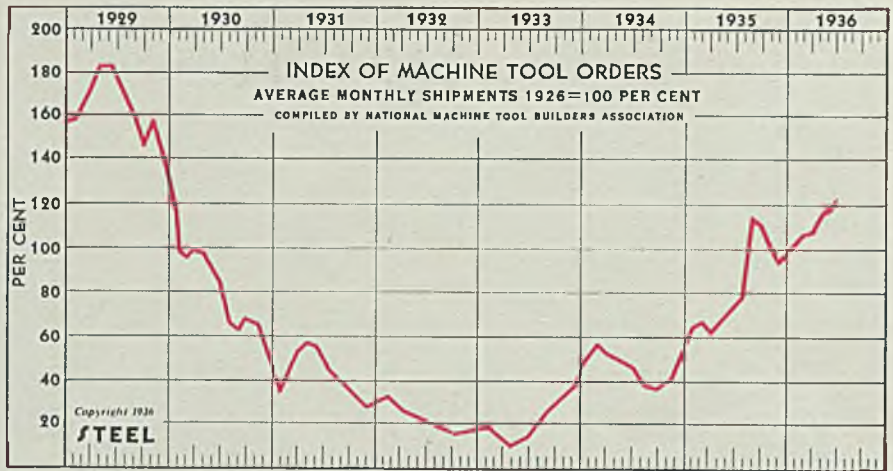
These gains more than offset a decline in automobile assemblies to 97,833 in the week ending July 11.

	1936	1935	1934
July 11	\$33.48	\$32.40	\$32.33
July 3	33.48	32.39	32.38
June 27	32.79	32.39	33.15
June 20	32.77	32.40	33.16
June 13	32.77	32.41	32.84
June 6	32.81	32.45	32.83
May 30	32.83	32.43	32.81
May 23	32.87	32.41	32.89
May 16	32.94	32.34	32.94
May 9	32.96	32.34	33.00
May 2	33.00	32.30	33.03
April 25	33.08	32.30	33.09
April 18	33.09	33.31	33.12
April 11	33.11	32.27	33.15
April 4	33.13	32.30	31.33



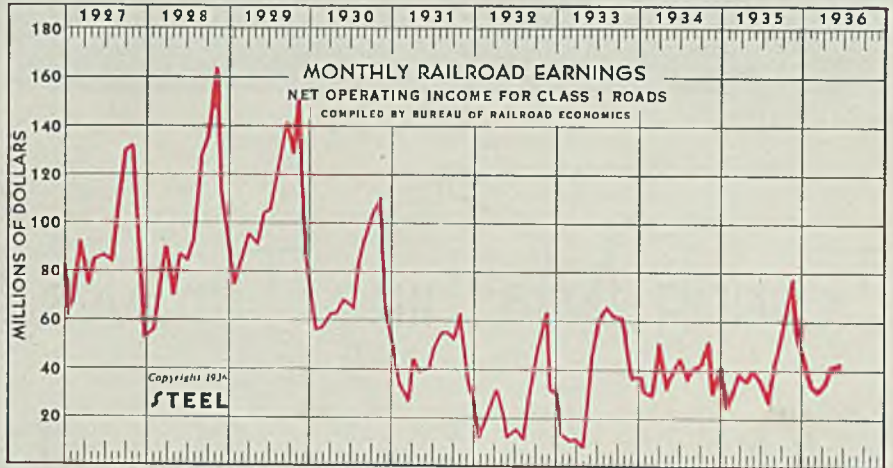
June Machine Tool Orders Continue Upward Trend

	1936	1935	1934	1933
Jan.	102.6	61.3	56.5	18.3
Feb.	107.1	61.5	58.2	15.2
March	109.4	60.3	50.9	11.1
April	114.4	60.3	48.5	8.3
May	116.6	67.1	46.8	10.6
June	124.5	76.7	42.6	15.5
July		94.7	38.6	22.4
Aug.		112.2	37.1	27.9
Sept.		108.5	37.4	30.9
Oct.		102.9	40.5	33.3
Nov.		93.8	44.2	38.0
Dec.		99.9	54.1	51.0



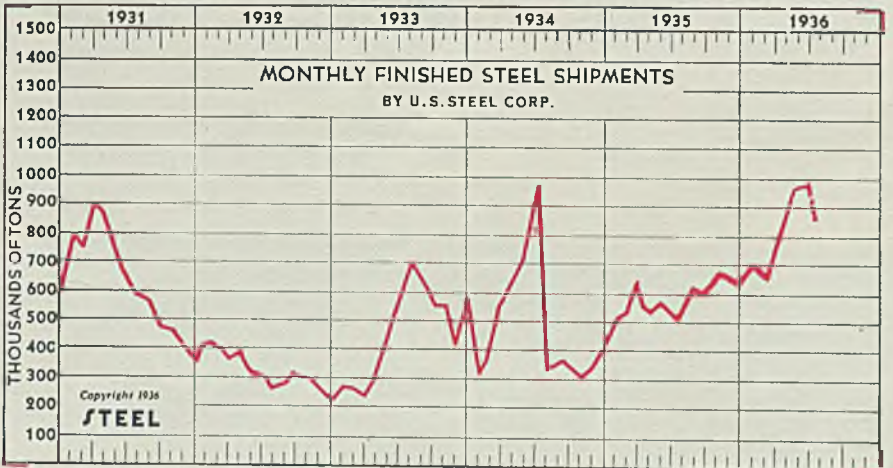
Class I Railroads Earn 2.17 Per Cent in Five Months

	1936	1935	1934
Jan.	\$35,764,748	\$21,348,557	\$31,058,275
Feb.	33,594,718	25,719,919	29,420,772
March	35,205,513	37,850,965	52,217,083
April	41,547,644	45,625,786	32,433,939
May	41,842,147	39,505,069	39,699,194
June		34,024,691	42,037,757
July		26,851,397	35,441,265
Aug.		42,074,108	40,564,071
Sept.		57,359,339	41,713,425
Oct.		75,425,092	49,336,307
Nov.		54,234,305	32,540,502
Dec.		46,040,165	38,738,295



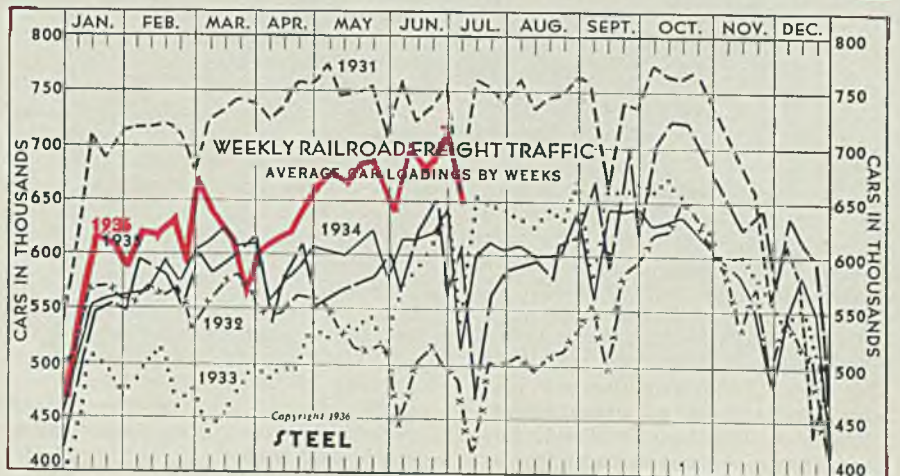
Finished Steel Shipments Decline in June

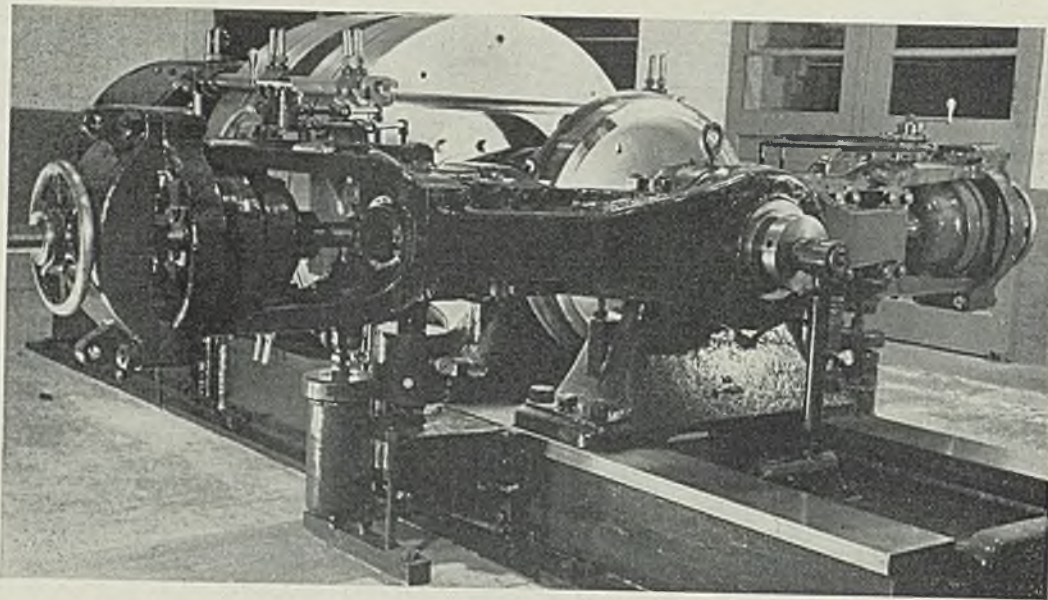
	Gross Tons		
	1936	1935	1934
Jan.	721,414	534,055	331,777
Feb.	676,315	533,137	385,500
March	783,552	668,056	588,209
April	979,907	591,728	643,009
May	984,097	598,915	745,063
June	886,065	578,108	985,337
July		547,794	369,938
Aug.		624,497	378,023
Sept.		614,933	370,306
Oct.		686,741	343,962
Nov.		681,820	366,119
Dec.		661,515	418,630



Holiday Lowers Freight Car Loadings; Above Year Ago

	1936	1935	1934
July 4	649,759	472,421	519,800
June 27	713,639	618,036	644,600
June 20	690,716	567,847	621,900
June 13	686,812	653,092	617,600
June 6	695,845	630,836	615,600
May 30	646,859	565,342	578,500
May 23	683,406	598,396	625,990
May 16	681,447	582,950	612,331
May 9	668,935	575,020	602,798
May 2	671,154	568,927	605,246
April 25	666,181	558,936	609,704
April 18	642,657	611,141	591,705
April 11	622,138	586,568	579,981
April 4	613,867	545,456	559,070





THIS machine is designed to test brake shoes on wheels varying from 17 to 42 inches in diameter and at speeds up to 150 miles per hour, anticipating requirements for years to come

Testing Machine Throws New Light on Modern Brake Shoe Performance

BY E. C. KREUTZBERG
Engineering Editor, STEEL

BRAKING of the new high-speed streamlined trains has introduced a number of important problems due to the high wheel loads and speeds involved. In some cases these wheel loads are as high as 27,500 pounds, in conjunction with speeds of 90 miles per hour, compared with conventional loads and speeds of 12,000 pounds and 60 miles per hour.

These new requirements have been met by the American Brake Shoe & Foundry Co., New York, by using larger brake shoes. The shoes employed are 18 inches long, 3 $\frac{3}{8}$ inches wide and 2 inches thick, as contrasted with standard 14-inch shoes. These now are performing the work of stopping the new high-speed units under all operating conditions. It has been realized, however, that many unknown factors are

involved at these high wheel loads and slower speeds provides no adequate answers.

To meet the needs of the railroad industry in this connection and to contribute data which will result in safer, better and less expensive braking, the company has just completed a new machine for testing brake shoes. It is located in a new laboratory building at Mahwah, N. J., and is dedicated to F. W. Sargent who for 45 years has been in charge of the company's engineering.

This new machine has capacity for braking at speeds up to 150 miles per hour on a 33-inch diameter wheel and it can apply wheel loads all the way from 4000 to 40,000 pounds. It permits of 26 possible wheel load combinations. It has two heads, permitting the use of clasp brakes, maximum shoe load being 55,000

pounds per shoe. It permits drag tests on 4 per cent grades, and braking may be either of the emergency or service type.

The machine previously developed by the company and still in service at Mahwah, is gaited to the old standards of wheel loads and speeds. It has a speed of 85 miles per hour on a 33-inch diameter wheel, has seven possible wheel load combinations ranging from 6000 to 20,000 pounds and has only one head with a maximum pressure of 20,000 pounds. The old machine may be used only for emergency applications and cannot be used in making drag tests.

In the immediate future the new machine will be devoted to tests aimed to solve the various problems of braking. Recently, for example, a new 18-inch shoe was tested in braking a 20,000-pound wheel load. This

shoe made 75 stops before being discarded; the stops were made continuously excepting for time out to cool the shoe every fifth application. This test was a part of an inquiry now under investigation to ascertain what effect size of the shoe has on the braking action and efficiency.

One of the major advantages of the new machine is that it will make possible a comprehensive study of materials in braking at high wheel loads and high speeds. The company already has found that the behavior of brake shoe material changes noticeably when the wheel loads go over 12,000 pounds and the speeds above 60 miles. Already the recording charts obtained on the new machine have revealed that the method of applying the brakes becomes of greater importance with high loads and speeds.

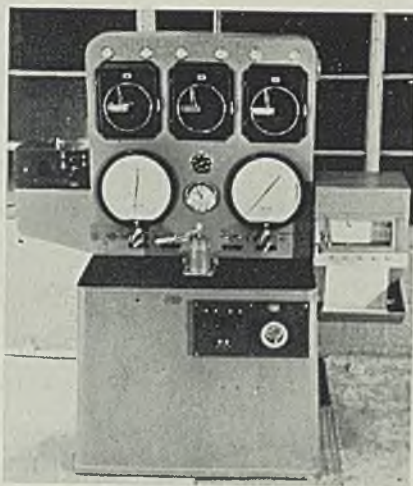
Incidentally, an interesting test was made recently in stopping with various speeds while the wheel load was at 27,500 pounds. With a brake shoe load of 27,500 pounds and using clasp brakes with 18-inch shoes, the wheel was stopped in 16 seconds from 60 miles per hour, 38 seconds from 90 miles and 65 seconds from 120 miles. When the brake shoe load was doubled to 55,000 pounds, the wheel was stopped in 15 seconds from 60 miles, 30 seconds from 90 miles and 36 seconds from 120 miles per hour.

Wheels To Be Studied

While the company will devote the new machine exclusively to tests of brake shoes, the results obtained from such tests are expected to yield information of value in connection with wheels. It is expected that much light will be thrown on the entire relationship of wheel loads and speeds and the materials used in brake shoes and wheels. It is hoped that the way will be pointed for sound conclusions as to whether materials can be improved for service under the new wheel loads and speeds; whether more wheels per unit are needed, so as to cut the load per individual wheel; whether wheels should be made in larger diameters, etc.

The new machine duplicates in the laboratory the actual operating conditions of braking a train with a predetermined wheel load and from any desired speed. It is designed to test brake shoes varying from 17 to 42 inches in diameter. Brake shoes may be applied to the car wheel either in single or clasp arrangement.

As with the older machine, the wheel load of the new testing unit is obtained in terms of energy from rings or flywheels attached to a shaft mounted on roller bearings. An increase in the number of possible variations in wheel load was accomplished by the design of the detachable rings. Instead of six identical rings, as used on the old ma-



Control panel is equipped with instruments for measuring and recording stop distance, retarding torque, air pressure in cylinders which apply load, time and other factors

chine, the new machine has seven rings of various weights which may be employed in any desired combination.

The testing machine is direct connected to a 230-volt, direct-current, special compound wound motor with a maximum speed of 1500 revolutions per minute. It has a continuous rating of 175 horsepower at 300 revolutions per minute. The necessity of providing sufficient power to conduct drag tests to simulate braking conditions on long mountain grades of 4 per cent or less dictated the capacity of the motor.

A car wheel is mounted on one end of the shaft with the driving motor on the opposite end. The arma-

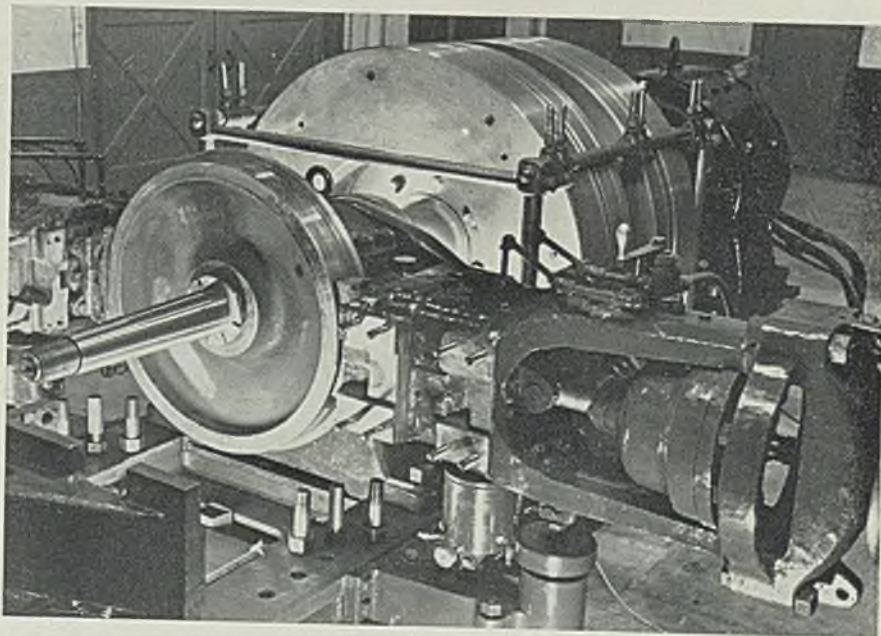
ture of the motor is automatically disconnected from the shaft, when making a stop, by means of an over-running clutch, thereby removing any motor influence on the wheel load energy. The brake shoe, or brake shoes in clasp arrangement, are applied to the tread of the wheel through a mechanism operated by air.

At each side of the wheel is an arm which supports the braking mechanism, consisting principally of an air cylinder, cross head and brake head. The brake shoe, keyed to the brake head in the conventional manner, is forced against the tread of the wheel by means of the cross head which is actuated by the air cylinder. In other words, the shoes are applied except for leverage, in approximately the same manner as in actual service.

Torque Is Measured

The arms which carry the brake shoes and the mechanism for applying the shoe to the wheel offer an accurate means of obtaining the tangential force or torque exerted on the wheel by the friction of the shoes. When the shoes are applied to the wheel, the tangential force or torque developed by the friction at each shoe is resisted and weighed by the hydraulic weighing cell for each arm, the cell for one arm being in compression and the cell for the other arm being in tension. The cells can weigh a tangential pull on the shoe up to 12,000 pounds on a 33-inch diameter wheel and are rugged enough to withstand double this amount.

The machine is equipped with a recorder which graphs a continuous record during the brake application. The graphs form the basis for obtaining in detail the action of the brake shoe on the car wheel throughout the



New testing machine with bearing pedestal drawn back so that the wheel may be changed. Seven flywheels, shown in background, can be used singly or in combination to permit 26 different wheel load conditions

entire braking cycle. The stop distance is measured by the length of the graph. The amount of torque or retarding force exerted on the wheel tread is represented at all times by the height of the graph, two pens being provided so that a separate record of each shoe may be taken during a stop with clasp brakes. A separate graph shows the load in pounds with which each shoe is applied to the wheel tread. A graph is made of the air pressure in the cylinders which apply the load to the shoes. The control panel also is equipped with an indicator which shows the speed of the machine at all times in revolutions per minute. There also are three air pressure regulators which operate in conjunction with two gages on the control panel.

The new 18-inch shoes developed by the company are of mottled, medium hard gray iron, the same as used in its standard Diamond S shoes. The iron is cast in the usual way around reinforcements made of layers of expanded sheet steel. A new heat-resisting compound has been developed for coating these inserts so that they are not melted by the iron; the coatings are tough and have high adhesive quality so that they do not chip.

Improvements in brake shoes for

freight cars also have been made by the company. One of these is a new brake shoe back. It is of rolled steel plate, in the form of a shallow channel produced by rolling. This back has shown itself to have greater strength and greater resistance to vibration fatigue.

Another improvement also has reduced vibration fatigue. It consists of a new brake lock, made of silico-manganese steel and heat treated; it is so designed as to lock the shoe firmly to the brake head. These improvements have resulted in longer brake head life and fewer broken shoes in service.

In addition to the new brake shoe testing laboratory, the company also has completed at Mahwah a new chemical and metallurgical testing laboratory. This is completely equipped for research work on alloy irons and steels produced by this company and its affiliated companies. It contains an electric furnace, complete heat treating laboratory, machine shop and physical testing laboratory and a chemical and metallurgical department. The purpose is to study the various alloys with respect to their machinability and their resistance to whatever conditions of wear and other attacks are encountered in the uses to which they may be put.

to produce a bulge which was later machined to the size of the collar. This is said to be a good method of using up short pieces of stock, but upsets are more commonly produced from single lengths of stock. In fact, there is some advantage in using only one piece since the upset does not produce a feather edge.

Upsetting to build up the diameter of stock can be applied to alloys, as well as steel, brass, bronze, monel and similar metals. The size of the upset is controlled by the length of push-up on the butt welder. When one push-up does not produce a bulge of sufficient diameter or of sufficient length, the clamps can be reset and the operation repeated several times, if necessary.

Each time the clamps are reset and the stock pushed together a bulge of slightly smaller diameter is produced and, at the same time, the bulge already on the rod is enlarged a little more. If the bulge appeared as sketched in No. 1 of the accompanying illustration, making three or four more push-ups on the same piece of stock would produce an effect like sketch No. 2.

Procedure for Quantity Work

When there is a considerable amount of this work to be done, it is possible to make large upsets by a single push-up rather than in steps. The stock is set up in the machine with one electrode clamp gripping the material firmly just to one side of the point where the bulge is to be made. Another clamp, located at the opposite side of the bulge point, grips the stock tightly enough to make a good electrical contact but not too tightly to prevent forcing the material through it. When the current is turned on, the stock is forced through the clamp at slow speed, forming a more symmetrical bulge than could be produced by the step method. Sketch No. 3 illustrates this type of bulge.

Upset forging is not limited in use to making integral collars on valve stems nor is the location of the bulge necessarily limited to a point between the ends of the stock. The heads of poppet valves can be built up on valve stems by using a solid block instead of one of the electrode clamps. Either the step or the continuous feed method can be used to do this work as shown in sketches Nos. 4 and 5. This type of work can be done in a machine which automatically feeds the stock and cuts off and ejects enough material for each valve.

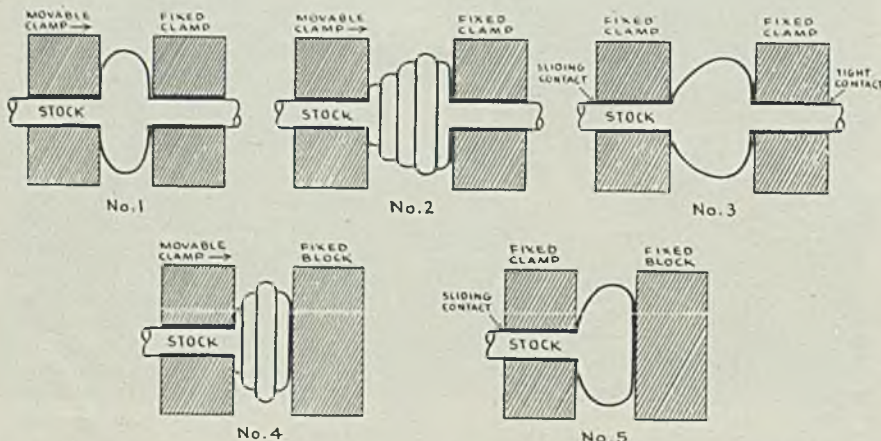
It is always possible to produce more than one upset on the same length of stock or actually to forge the metal into some special shape by means of dies that come up from the sides while the stock is still hot in the upsetting machine.

Making Upsets in Stock by Electric Resistance Heating in Butt Welders

AN ELECTRICAL resistance method for upsetting round stock such as valve stems to produce a collar part way down the stem was described in STEEL, June 1, page 49, the information having been taken from the March issue of *Flashes* published by the Thomson-

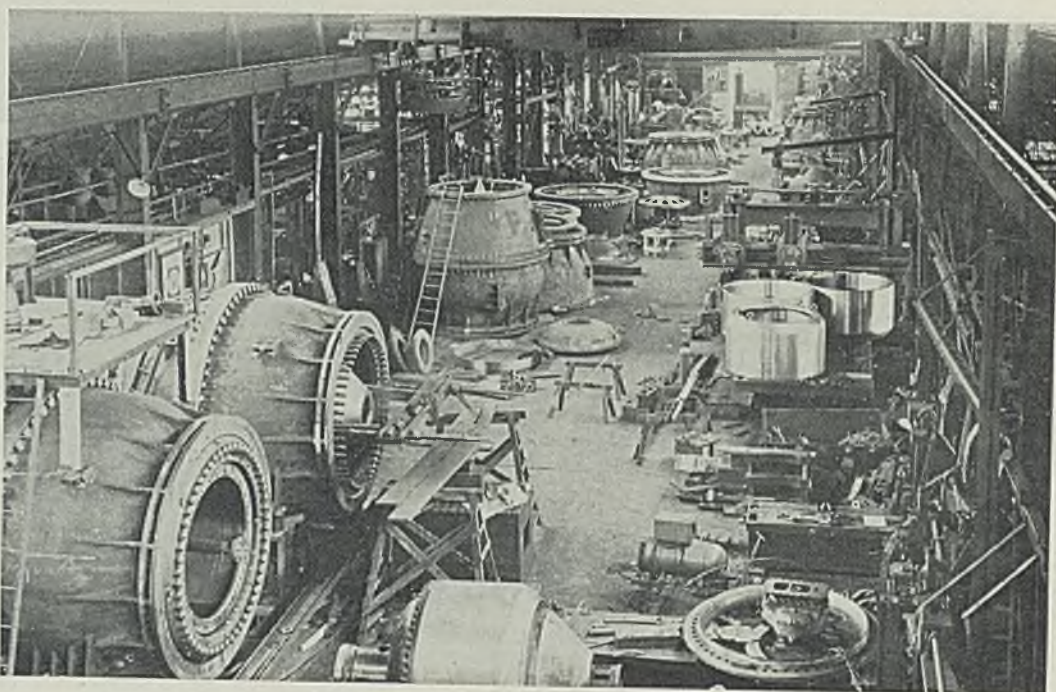
Gibb Electric Welding Co., Lynn, Mass. Interest in this subject prompted the presentation of further information in the May issue of *Flashes*.

The valve stems described in the previous article were made up from two lengths of stock upset heated in a butt welder and pushed together



These sketches illustrate how electric resistance upsets are produced in a butt welder by single or multiple push-ups

GENERAL view of the shop where twelve 60-ton valves are being machined and assembled. Operations cover 40,000 square feet of floor space



Arrange Shop for Progressive Machining of 72-Inch Needle Valves for Boulder Dam

REARRANGEMENT and reorganization of a machine shop to provide for continuous production of 60-ton valves were carried out recently by Thomas Spacing Machine Co., Pittsburgh, in filling a contract for twelve 72-inch needle valves for use at Boulder dam, Boulder City, Nev.

Some conception of the work and detail involved may be had by visualizing the handling of 125 individ-

BY M. K. MELLOTT

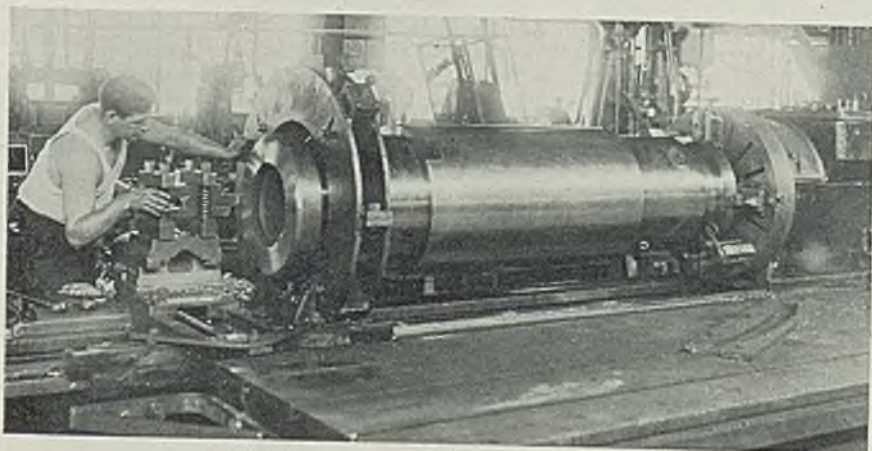
ual parts, the largest of which is approximately 20 tons, which go into the making of one of these mechanisms. The valves are produced in units of three which permit produc-

tion in progressive steps from the receipt of the large castings, through the many machining operations, assembly and testing, with a minimum loss of time and labor.

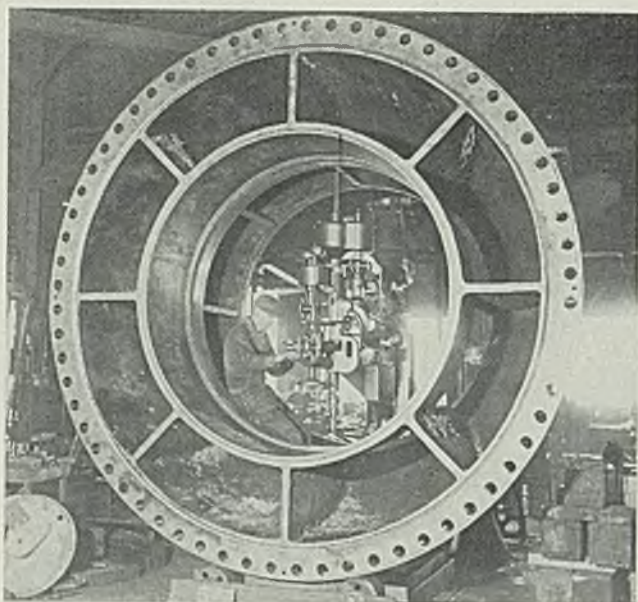
Principal parts of each valve include two steel castings which form the valve housing; a bronze casting from which the needle body is made; and a bronze casting which forms the valve diaphragm tube. The two steel castings account for approximately 78,000 pounds of the total weight of each valve. One section is known as the needle body, and the other as the nozzle. The heavy bronze parts weigh 17,000 pounds.

The two steel castings and the bronze needle body pass through three tooling operations, which include boring, milling and drilling. Each valve requires the drilling of more than 1000 holes, ranging in size to accommodate a $\frac{3}{8}$ -inch bolt to a $2\frac{3}{4}$ -inch stud. The central mating parts of the two housing sections alone require 128 holes of 2 $\frac{1}{2}$ inches diameter. Special jigs were devised to aid in all drilling operations, to assure precision matching of the holes in mating parts. These jigs, 50 in all, vary in shape, and range in size from 5 inches in diameter to 138 inches.

Approximately 40,000 square feet



Facing operation on the end of a 7000-pound bronze diaphragm tube, which is 90 inches long and has a finished outside diameter of $24\frac{1}{2}$ inches



Size of the valve housing is shown by the comparative size of the workman carrying out a drilling operation

springs and hydraulic shock absorbers, making for greater riding comfort. Since the axle has been eliminated for greater clearance, smaller wheels and tires with larger air capacity may now be used. Brakes of standard make may be installed on the wheels. The chassis weighs about 600 pounds.

Shown in the accompanying illustration, with one of the all-steel chassis, are, left to right, Alex R. Pribil, president of the Saginaw company; M. K. Pribil; and Ray Harroun, chief engineer.

British Factory Considers Psychology in Paint Color

The psychological effect of color on workers is the underlying principle of a new scheme of interior decoration that is being adopted in a large motor works in Birmingham, England. The lower part of the walls are painted green and the upper parts white, colors which combine a restful background to the eye and assist in distributing light.

All moving parts, such as conveyors, have been painted red for safety purposes, while a multicolored scheme for gas, steam, compressed air and water piping assists the work of maintenance and adds to the brightness of the factory.

Pulley Castings Reclaimed By Oxyacetylene Welding

The extent of use of the oxyacetylene process for reclamation of defective castings is illustrated by the work now being carried on by a southern plant. This company markets a complete line of multi-grooved cast iron pulleys. Castings are all purchased in rough form and the grooves are machined into them. During machining, minor defects develop. Adoption of a regular procedure of local preheating and bronze welding has meant the saving of many hundreds of pulleys, which would otherwise have been rejected.

of shop space is occupied in the production of these valves. The castings are unloaded from a freight car in one end of the building. They are placed into production in the boring machine as the first step and continue in progressive operation along one entire side of the shop, then back along the other. The valve is fully assembled and tested at the opposite side, but at the same end where the castings were started.

In one test, the valve is operated under a pressure of 400 pounds per square inch to insure that all parts will withstand the punishment of bypassing water from the dam at a rate of 3000 cubic feet, or 25,000 gallons, per minute at a velocity of 80

miles per hour. The valves are disassembled after testing and loaded for shipment to the point of installation.

They will be installed in two batteries of six each in the 2-ton tunnel plug outlet works located, respectively, in the lower Arizona and lower Nevada penstock tunnels of Boulder dam.

Steel castings were made by the Erie Forge Co., Erie, Pa., and the Otis Steel Co., Cleveland; bronze castings by the American Manganese Bronze Co., Philadelphia, and the Frontier Bronze Co., Niagara Falls, N. Y., and heat treated studs and bolts by the Republic Steel Corp., Cleveland.

Independent Wheel Suspension Feature Of All-Steel Trailer Chassis Unit

AMERICA'S so-called "floating population" will ride in greater comfort and safety, it is claimed, when their trailers are equipped with the new chassis units now being introduced by the Saginaw Stamping & Tool Co., Saginaw, Mich. Of all-steel construction, the new units feature independent wheel suspension similar to that used on automobiles as an aid to riding comfort. In addition, elimination of axles is possible, giving greater clearance.

In order to equip units already constructed with the advantages of independent wheel suspension, a separate structure has been designed to supplant the conventional rear axle and wheel assembly. It consists of a steel framework which may be

easily installed under the trailer. Wheels are equipped with heavy coil



All-steel trailer chassis with independently sprung wheels, eliminating rear axle



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A Metallurgist's View of Low-Alloy Steels

BY A. B. KINZEL
Union Carbide & Carbon
Research Laboratories Inc.

ONE of the most interesting developments in metallurgy during the past year has been that of low-alloy, high-tensile steels of a type suitable for fabrication in the as-rolled condition. Broadly speaking, such steels are not new as witnessed by the Eads bridge constructed in 1874 of metal supplied by the Chrome-Steel Co., the silicon steel in the MAURETANIA, the time-honored nickel steels in many bridges, and the medium-manganese steel in the Kill van Kull Bridge, as well as a great many other applications. Most of the above-mentioned steels have strengths of at least 85,000 pounds per square inch and 0.20 per cent or more carbon.

The newer types may be distinguished from the older, mainly in that the carbon content runs from 0.20 per cent down and in addition they contain other alloying elements to improve either the mechanical characteristics or the corrosion resistance, or both. This may be stated in another way—namely, that in the newer types of steels an increasing importance has been placed on ductility, weldability and corrosion resistance.

The characteristics desired in a high-strength, mild-alloy steel may be reviewed with profit. Higher ultimate strength obviously is the first criterion. With this, however, it is necessary that there be sufficient ductility for fabricating purposes and sufficient lack of sensitivity to minor variations in rolling conditions, rates of cooling and types of cooling from the welding operation,

so that difficulties on these scores will not be encountered and the finished structure will—locally as well as generally—contain steel having the desired ductility as well as strength.

To take advantage of the improved properties, the engineer uses a higher design stress. For the last century or more, the engineering profession has arrived at this figure by dividing the tensile strength of the material by a factor of safety. In this factor of safety, allowance is made for the combination of ignorance as to the properties of the steel, ignorance of exact stresses in the structure, ignorance as to service overloads on the structure, and ignorance as to uniformity of the materials and their behavior under special stress conditions. Gradually, as we learn more about steel and the properties to be measured and con-

sidered in our structures, the various factors of ignorance with regard to the material are being reduced.

Ductility is essential for a great many purposes, not only in ordinary fabrication in steel mills but also later in the shop where the steel must be formed successfully and worked into the final structure with the optimum results.

Steel manufactured in the mill on large-scale production is cooled as soon as it comes from rolls. For most economical production and particularly where large masses are involved, further heat treatment is practically out of the question; that is, the steel must be used as-rolled. As-rolled steel should be relatively uniform notwithstanding the variations in finishing temperature and in rates of cooling that are encountered in shop practice. This means that the steels should be so alloyed that they will respond within the limits desired.

Although added strength can be obtained by increasing the carbon content, this would give strength at the sacrifice of ductility and further increase the sensitivity of steels to mill conditions. Another way to increase the strength is to lower the carbon content and use alloying ingredients. This is the way of the new alloy steels, in which strength is achieved with low carbon content, and thus ductility of a high order. Broadly speaking, a 70,000 pound per square inch low-alloy steel has the same ductility as the 45,000 pound per square inch ordinary carbon steel, and a 90,000 pound per

THAT the growing importance of ductility, weldability and corrosion resistance has been kept in mind by metallurgists who have developed the increasingly popular low-alloy high-tensile steels, is pointed out in this abstract of a timely paper presented recently before the New York section of the American Welding Society by A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., New York

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square inch low-alloy steel has the same ductility as the 55,000 pound per square inch standard boiler plate. This shows the advance that has been made by the low-alloy steels.

Three General Types

The new alloy steels may be divided into three categories depending upon the main alloying element used to get the increased strength as follows: Chromium steels, nickel steels, and manganese steels. There are several well-known types of chromium steels, among which the two best known in the United States are the ones containing 0.50 per cent chromium with 0.75 per cent silicon and 1.25 per cent manganese with or without copper, and the second containing 1 per cent chromium, 0.75 per cent silicon and 0.50 per cent manganese, generally with copper and phosphorus. The carbon content of these steels is such that more of the carbide-forming element is present than necessary to satisfy the carbon, and strengthening of the steel results by means of solution in the ferrite as well as by finer, better-dispersed carbides.

Because of the presence of chromium in the ferrite of these steels, there is no sharp differentiation from steels strengthened with non-carbide forming elements, although some metallurgists have emphasized such a distinction. Silicon renders the steel relatively insensitive to minor variations in the final rolling temperature and hot bed cooling conditions. Further characteristics of the steels with respect to weldabil-

ity will be discussed later, together with those of the other two groups.

The second group in question contains from 0.50 to 2 per cent nickel and almost always from 0.50 to 1.50 per cent copper. Both the nickel and the copper are found in the ferrite grains in solid solution, with the exception that precipitation of the copper may be achieved by suitable heat treatment. This steel, too, is relatively insensitive to variations in mill operations. Modifications of the nickel steel include the use of molybdenum in quantities approximating 0.20 per cent and occasionally high silicon.

Medium Manganese Steels

In the third group—the medium-manganese steels—the manganese is distributed between the carbides and the ferrite and the desired strengthening effect achieved. In general, these steels are peculiarly sensitive to mill conditions which either must be carefully controlled or the steels given a normalizing treatment after rolling. The addition of molybdenum has been used to strengthen these steels further. The use of vanadium, however, renders the steels highly insensitive, and results in an order of uniformity and ductility in the as-rolled material equivalent to those of steels in the first two groups.

Most of the steels in question are made in two carbon grades—namely, one with maximum 0.14 per cent carbon or lower, and the second with carbon ranging from 0.18 to 0.23 per cent. Combined with this insensitivity to cooling rates, the lower car-

bon steels possess a high order of ductility so that in sheet form they may be readily pressed and formed. This ductility also serves a useful purpose in welded structures, in that it permits sufficient plastic deformation so that residual stresses are reduced to a minimum in the welding of any given structure. In order to achieve this ductility the carbon must remain at or below the 0.14 per cent limit quoted above, and with the alloying contents in question this automatically limits the ultimate strength to approximately 80,000 pounds per square inch or less.

All three types of low-alloy steels have approximately the same ultimate strength for the same carbon content—that is, for balanced steels the ultimate strength is independent of the type of alloy ingredients, nickel-copper, manganese-vanadium, or chromium-silicon. With properly balanced amounts of the alloying constituents, the ultimate strength and ductility are a function of the carbon content and are relatively independent of the particular alloy combination used. This is probably fixed by the nature of the austenite-pearlite transformation. In each of the steels in question the transformation takes place at the same temperature and at approximately the same speed for a given rate of cooling, and the strengthening effect by solid solution is approximately of the same order of magnitude.

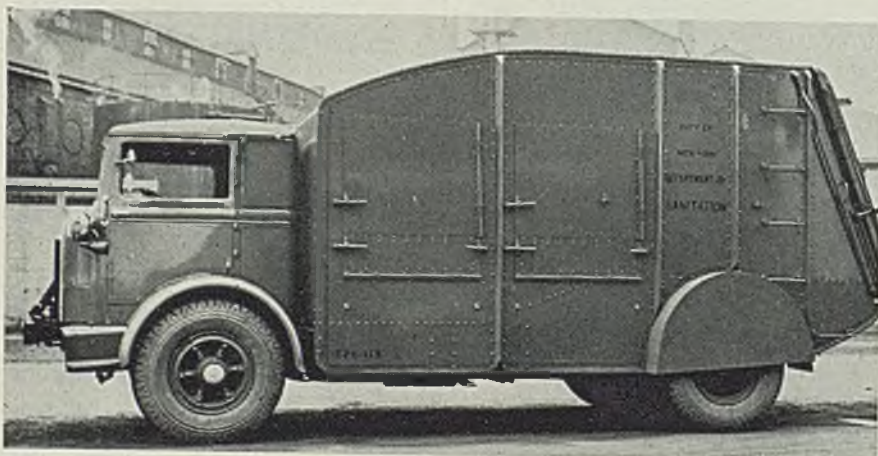
Weldability Is Factor

The most important other factor from the standpoint of manufacturing industry today is the matter of weldability, not in the narrow sense of mere ability to make a good weld free from inclusions and blowholes but rather in the broad sense, the ability to make a joint satisfactory for engineering purposes. The amount of alloy present in the steels just described is such as to give no great difficulty from blowholes and inclusions to anyone experienced in the art. That, therefore, is not a factor to be considered seriously.

The effect of the heat of welding on the metal adjacent to the weld must, however, be given attention. Immediately next to the weld there is a zone which has been in the mushy stage, between liquidus and solidus temperature. Immediately back of this there is a zone that has been subjected to temperatures in excess of those normally recommended for heat-treatment. The next zone contains material subjected to the usual normalizing or hardening temperature, and beyond that is material actually in the critical range. Still further from the weld is a zone which has been subjected to a subcritical annealing temperature, which if held long enough would result in a spheroidal structure.

As far as the mushy zone is con-

Low-Alloy Steel for Garbage Truck



NEW type garbage truck designed by and for the sanitary department of New York city, in which low-alloy high-tensile steel of the 70-90 type produced by the Alan Wood Steel Co., Conshohocken, Pa., is used to combat corrosive garbage acids. The truck, built by Fitz Gibbon & Crisp Inc., Trenton, N. J., is entirely self enclosed and is heavily insulated with rubber to reduce noise. It has a capacity of 22 cubic yards and is equipped with a 3-section hydraulic hoist, which brings the body up to an almost vertical position for dumping; the hoist also regulates the mechanism which opens the tail gate gradually, in conformity with the vertical movement of the body

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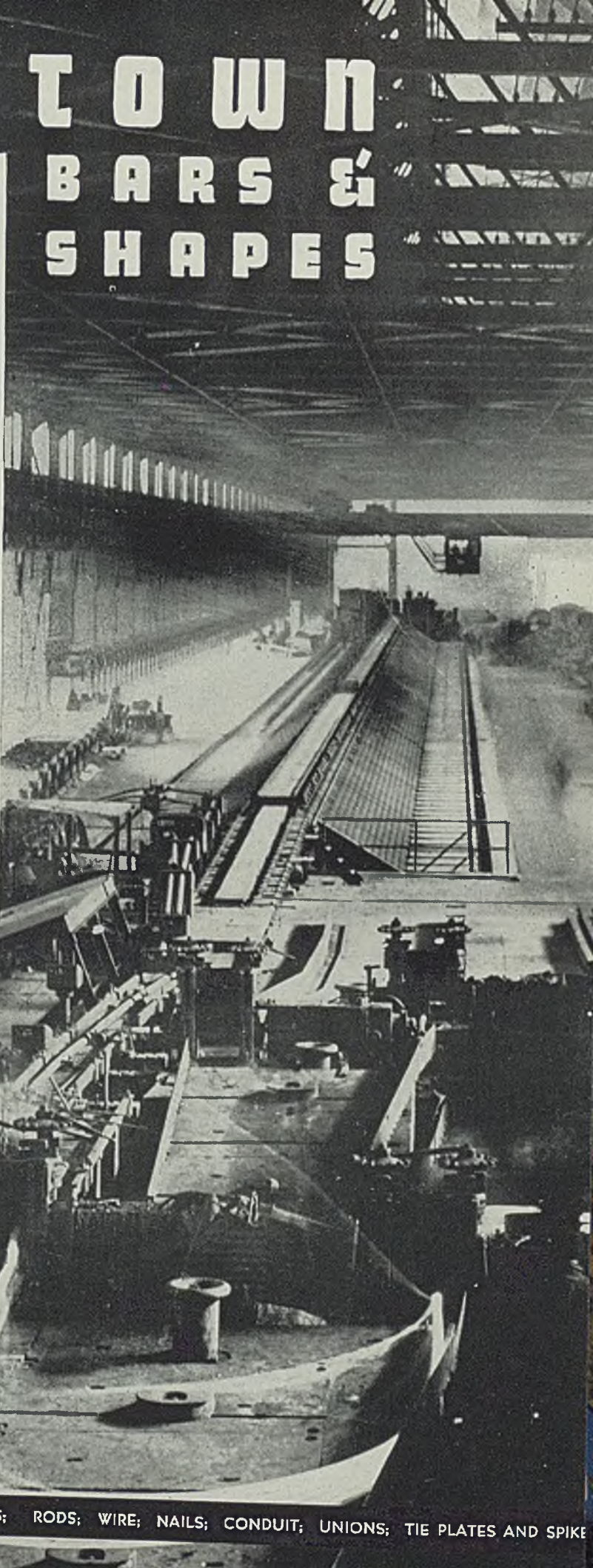
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - YOUNGSTOWN, OHIO

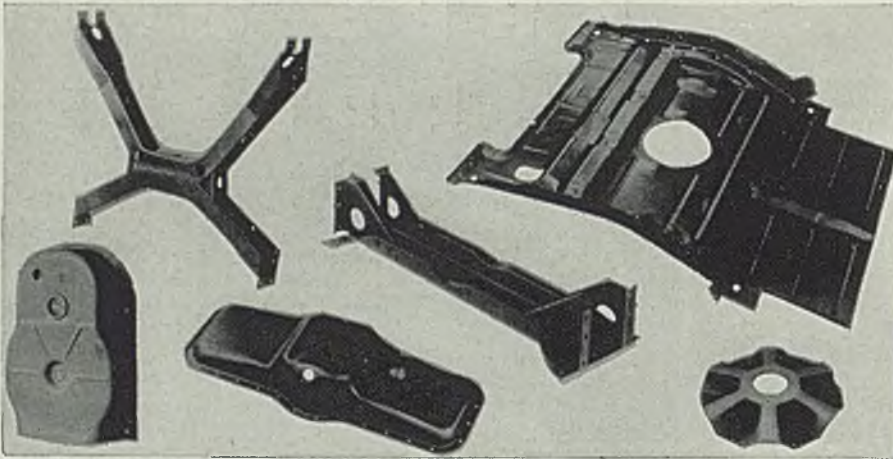


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TUBULAR PRODUCTS; SHEETS; PLATES; TIN PLATE; BARS; RODS; WIRE; NAILS; CONDUIT; UNIONS; TIE PLATES AND SPIKE

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cerned, the only matter of concern in alloy steels is segregation of the constituents. Metallurgists have long appreciated this, and naturally have so chosen their alloying additions as to avoid serious effects due to this phenomenon.

The next zone is that of rapid grain growth. If the temperature of this zone is maintained long enough, excessively large grains might result, but the time of welding is usually so short that this is not a matter of concern to present-day welders.

The zone subjected to normalizing temperature, and also the high temperature zone, do however require further consideration. As the welding operation progresses, the material in the normalizing zone is heated well into the austenite range, but is then quenched by transfer of heat into the cold mass of metal. A drastic heat treatment results.

The new low-alloy steels with their carbon content below 0.14 per cent in the 75,000 to 85,000 pounds per square inch range are so insensitive to the rapid cooling under these conditions that the degree of hardening is inappreciable and the steels may be considered foolproof from this standpoint. This is particularly important and is true for all the steels of lower carbon content (under 0.14 per cent in general) in each one of the groups previously mentioned, no matter whether chromium, manganese or nickel is the metal used for the alloy base.

Welding Produces Stresses

In the higher carbon range of the steels in question, where tensile strengths are 90,000 to 100,000 pounds per square inch, the effect of the rapid cooling is not negligible but it can be controlled. There is a moderate increase in hardness, which in itself is not a matter of grave concern, particularly in butt welds. However, internal stresses are produced in welding these high-yield, high-ultimate-strength steels, and it is common practice and sound engineering to stress-relieve most structures built with these steels. The stress-relieving operation not only does what its name implies — relieves the stresses—but in addition is a true tempering or annealing treatment. Any increase in hardness that may have resulted during the welding is reduced to practically the initial level by this treatment. Because this stress-relieving is desirable and considered necessary by the profession, we cannot call these steels foolproof from the welding standpoint. They must be handled intelligently, and each case treated individually.

So much has been said about the corrosion resistance of the new steels that no discussion can pretend to be

complete without a word on this subject. It seems to be fairly well established that copper, phosphorus, silicon, and chromium—either alone or in combination—increase resistance to corrosion under some conditions, and under many conditions this increase may be of an appreciable order of magnitude depending on the quantity and combination of the above-mentioned elements and the specific corroding conditions involved.

Surface Checking Occurs

A phase of this subject which requires mention is the tendency of the higher copper steels to show surface checking unless suitably protected by means of other additional elements. Nickel seems to be the outstanding element for the protection of steels containing 1 per cent or more of copper, but chromium, manganese and silicon—alone or in combination—have been used effectively to prevent checking in steels containing up to 0.6 per cent copper.

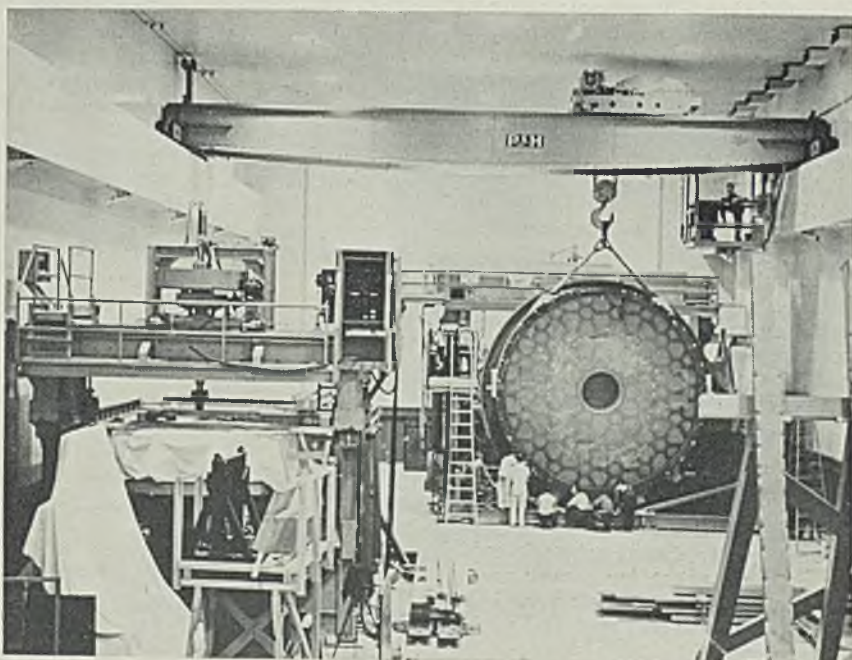
In considering corrosion resistance, phosphorus requires special mention. It is generally agreed that phosphorus increases the corrosion resistance under many service conditions, particularly when used in

combination with copper. Generally, chromium is used with the phosphorus to offset some of its other effects. Recently, however, it has been claimed that in the lower carbon steels, phosphorus acts like carbon and carries with it no correlated phenomena which require the presence of chromium for the elimination of these effects.

To sum up briefly, ultimate strength would still seem to be the major criterion for steels for light-weight construction, with ductility and insensitivity to welding operations as the prime adjuncts and with improved corrosion resistance as a desirable feature. Various types of alloy steels have been developed which meet the above-mentioned requirements, and as far as those properties which are usually measured are concerned there is little significant difference between them.

It will remain for service experience and the full evaluation of those properties which are not susceptible to laboratory measurements, to determine the relative worth of each of the steels in question. The final choice of any particular one will depend upon the balance of this worth and the economics involved in the case in question.

Built To Carry Priceless Load



DELICATE handling methods were called for by the 200-inch telescope reflector supplied recently to the California Institute of Technology by Corning Glass Works, Corning, N. Y. The crane shown here was built by Harnisch-Jeger Corp., Milwaukee, and installed in the institute to handle the huge mirror. Operating speeds are geared down as low as 1/16-inch per second. The four-motored crane has a capacity of 50 tons, and "dead-man" control through self-centering devices which automatically return control levers to "off" position when they are released. Thus all motion stops if anything happens to the operator. Electrical and mechanical brakes cushion the fragile lens against possible strains which might cause damage

Surface Treatment and Finishing



Rack Coating Minimizes Electrical and Metal Losses in Electroplating

BY DR. H. E. FRITZ AND G. R. MILLIGAN
B. F. Goodrich Co., Akron, O.

IN GENERAL, objects plated in production quantities are suspended on plating racks which, in addition to supporting the parts to be plated, must conduct electricity to them so that the metal in the plating solution will be deposited as desired. If the racks are not electrically insulated there are two sources of loss. First, a large proportion of the electrical energy is dissipated through useless plating on the rack and, secondly, the metal deposited on the rack itself is a substantial loss.

Properties Desired In Coating

Many rack coatings have been developed to overcome these losses. The perfect coating would be one easily applied in the plater's shop, and capable of withstanding the action of all cleaning and all plating solutions indefinitely without losing insulating value. This perfect coating should drain quickly so there would be no carryover of solution, thus contaminating one tank with the contents of the previous one. It should withstand the wear and tear to which racks are subjected in service and should not, itself, contaminate plating solutions.

One recently developed rack coating, on the market for a year under the trade name of Korolac, is a synthetic, rubber-like material which can be applied in the electroplating plant if the proper equipment is provided. This material retains its insulating properties through long periods, although constantly subjected to the action of alkalis, acids, and plating solutions.

It drains quickly and thus minimizes carryover. The coating itself does not contaminate sensitive solutions, even those used in silver and chromium plating. This material is claimed to give long and satisfactory

service when the racks are handled with reasonable care and if they are of proper design.

The material can be obtained as a stiff jelly which must be heated to 195 degrees Fahr. before melting to a viscous liquid, after which it can be cooled to 175 degrees Fahr. before solidifying. The recommended dipping temperature, however, is 185-200 degrees Fahr. It does not adhere to metal but maintains its position on the rack due to high shrinkage on cooling and drying. It can be applied only by dipping and in a few cases by pouring the molten material over the rack.

The equipment necessary for the application of this rack coating is shown in Fig. 1. It consists of an enamel, glass, or vitreous lined tank surrounded by an oil bath heated by

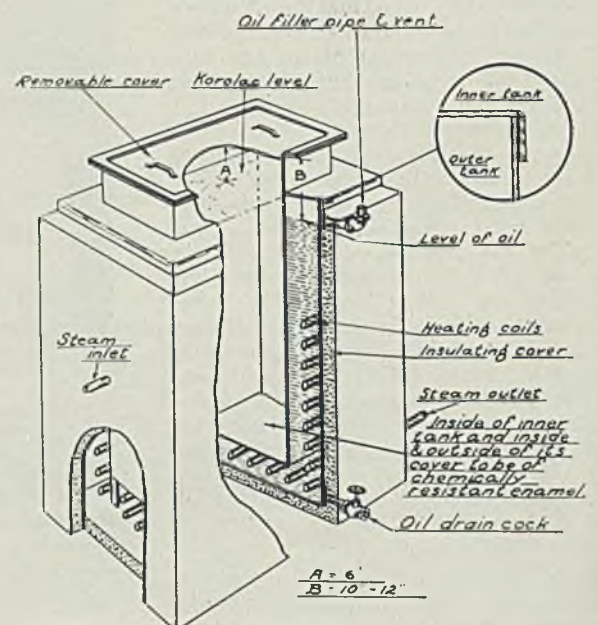
either steam coils or electric immersion heaters. The inner tank and the cover must be lined with a chemically resistant enamel or glass to prevent the picking up of metal, small percentages of which will cause the molten material to solidify and render it useless in time. The outer tank should be covered with an insulating material to avoid heat loss.

Oil Bath Necessary

The oil bath is essential, as direct heating will char the coating material due to the fact that it conducts heat slowly. In Fig. 1 it will be noted that the inner tank is higher than the outer tank. This is to provide a cool zone for the condensation of the solvent vapors arising from the molten material.

After the rack has been dipped it is necessary to dry the coating before applying additional material or putting the rack in service. It is recommended that an oven be used which can be controlled within 135-150 degrees Fahr. while having a high rate of air change in order that the solvent vapors will be kept at low concentration. Adequate ventilating equipment for the oven and dipping tank must be supplied.

FIG. 1 — Diagram showing details of apparatus required to apply rack coatings by immersion





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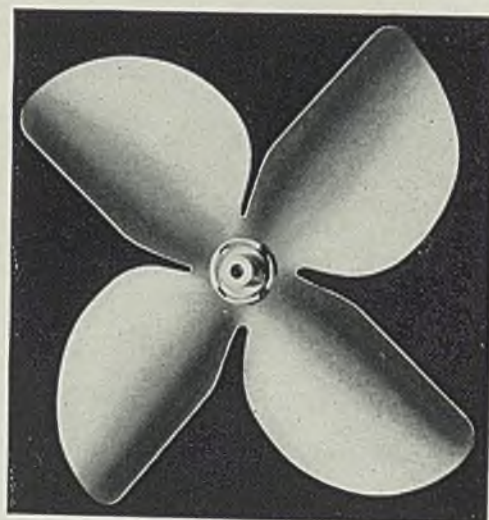
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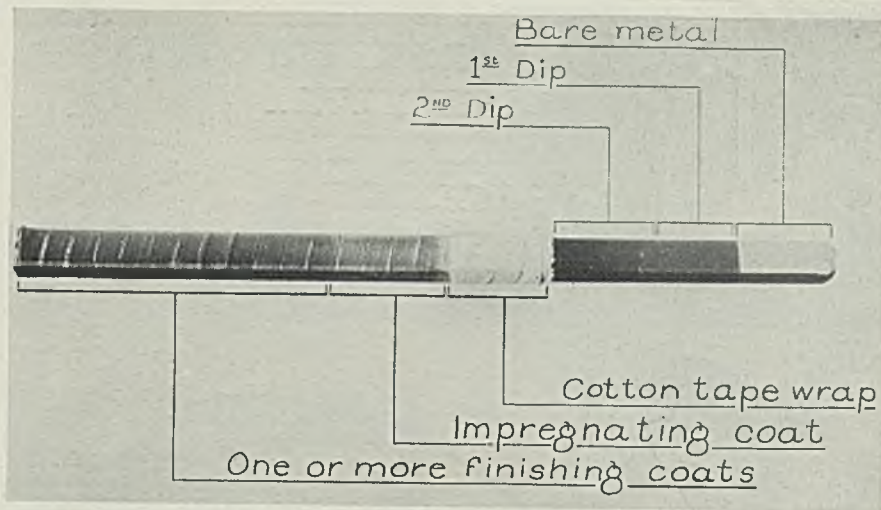


Fig. 2—Progressive treatment recommended for plating racks which are subjected to severe conditions

It is not essential that an oven be provided for drying the racks as this may be done in a well-ventilated room, but, due to the fact that drying at room temperature is so slow, it is more satisfactory to use an oven.

The proper design of racks plays an important part in the service obtained from the coating and it is recommended, therefore, that the following points be observed in building new racks. The racks should be of round or round-edge stock. All sharp angles should be well filleted. This may be done by filling with solder or by brazing. The contacts should not be bolted or riveted unless the cavities formed are later filled with solder.

Application Procedure

Racks must be clean and dry before they are dipped. It has been found that putting them through the electro-cleaner usually removes all solder flux, grease and loose metal so that they are satisfactory for dipping.

Korolac can be applied by reasonably intelligent workmen. The actual dipping is a simple operation, consisting of immersing the clean cold rack into the molten material and immediately withdrawing it at a fairly rapid, steady rate. Stringers which form from the congealing of excess liquid may be immediately removed, whereupon the uncongealed material under the surface seals the place from which the stringer was removed, insuring a surface which is free from defects.

The rack is then placed in the oven at 150 degrees Fahr. for approximately 40 minutes, allowed to cool to room temperature and then other succeeding coats may be applied, until at least four coats are in place. After the last coat has been applied the rack should be left in the oven for about 2 hours and

allowed to air dry for several hours before the equipment is again placed in service.

Where severe handling is encountered it has been found that good service can be obtained from racks coated according to the construction shown in Fig. 2. The rack is given two coats in the usual manner after which it is wrapped with a bare cotton "twill or herring-bone" tape. The assembly is then immersed in the bath for several minutes until the bubbling ceases in order that the tape will become impregnated. After this coating is dried several regular dips are applied. This construction provides an outer coating backed by the cotton tape which acts as a cushion for blows. If the outer film is broken the inner one will still protect the rack.

Users of rack coatings have reported that their electrical consumption has been reduced as much as 40 per cent and in many cases the quality of the plating obtained has been improved. This coating eliminates metal build-up on the racks and, therefore, permits worthwhile savings by the prevention of loss of metal from plating solutions. Due to its long life and the ease of making repairs, appreciable savings have been made through lower maintenance costs.

Coating is Economical

The coating permits worthwhile savings through its property of draining quickly which minimizes carry-over and run-back. Carryover causes plating solutions to be contaminated which frequently results in poor plating and sometimes when the condition is too severe it is necessary to discard all the material in the tank. Run-back of solutions over the plated articles frequently causes staining of the finished product with resultant losses in rejects and replacements. It has also been pos-

sible to dispense with re-racking where this practice had previously been used between nickel and chrome plating. The savings in handling charges alone thus are appreciable.

Adherence of Organic Finish To Aluminum Increased

Application of organic finishes which will adhere firmly to aluminum in the past has met with more or less difficulty because of the oxide film which forms on aluminum surfaces when exposed to the air. Even if the finish could be applied successfully to a cleaned surface before the film had time to form, the action of moisture and air eventually led to its undoing by forming the film under the surface of the organic finish.

A finish system has been developed which increases the life of a finish on aluminum appreciably. The aluminum is first given a wash with a solution of phosphoric acid to clean and etch the surface. A priming coat of zinc chromate in a synthetic vehicle is then applied followed by a coating of one of the newly developed elastic surfacers. The finishing coat is applied subsequently after the surfacer has been sanded to proper smoothness.

It has been found that zinc chromate, which is partially soluble in water, has an etching action upon aluminum giving the primer a firm grip upon the surface which it retains for a long period of time. The bright blue finish seen on many large buses is applied using this system with satisfactory results.

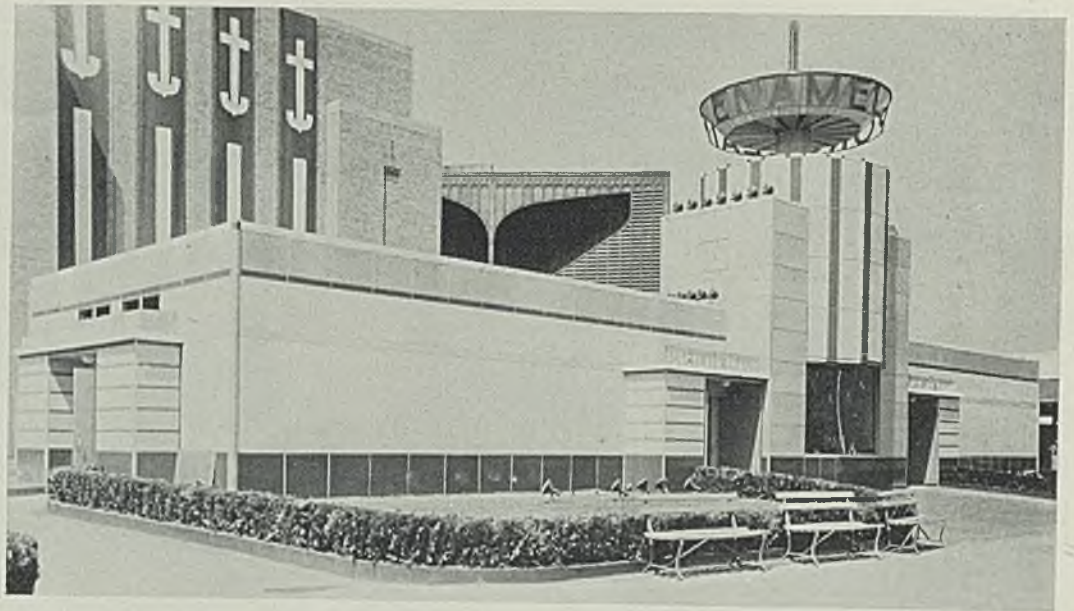
Correct Storage Increases Life of Galvanized Sheets

The practice of storing galvanized sheets by stacking them in flat horizontal piles has been the cause of their deterioration to a degree which is unsuspected by many users. The early failure of many galvanized roofs and other installations is directly traceable to this method of storage and not to poor quality of the original galvanized sheets.

When bundles of galvanized sheets are stored horizontally there is no opportunity for air to circulate between the sheets and sweating takes place. This causes the formation of zinc carbonate and, in time, base metal rust, which takes place in a surprisingly short time. The formation of zinc carbonate is indicated by a white deposit on the metal.

This condition can be eliminated by stacking the sheets on end and loosening them so that air can circulate freely between them.

SPECIAL color and lighting effects add to the beauty and brilliance of this 30 by 100 foot porcelain enamel building which is attracting thousands of exposition visitors in Cleveland this summer



Enamel Building at Great Lakes Exposition Is Co-operative Display

THROUGH the co-operation of producers of steel sheets, manufacturers of enameled ware and related industries a 30 x 100 foot building, completely finished on the exterior with porcelain enameled

sheets has been constructed on the grounds of the Great Lakes Exposition in Cleveland, which since June 27 has drawn over 500,000 people, and will continue until Oct. 4.

The color scheme of this building

includes blue, violet, mulberry, lemon, orange and red. A huge revolving sign, illuminated by a novel use of floods and porcelain enamel reflectors flashes the words "Porcelain Enamel" from the top of the building.

Exhibits include sinks, washers, ranges, cooking utensils, tile, enamel-lined tanks and a model grocery store. The model store is half in wood and half in porcelain enamel in order to show the advantages of the latter type of construction. There is also a porcelain enamel furnace in which ash trays and other articles are fired in a few minutes and subsequently sold to the public. The latter work is under direction of H. Edward Winter, designer for Ferro Enamel Corp.

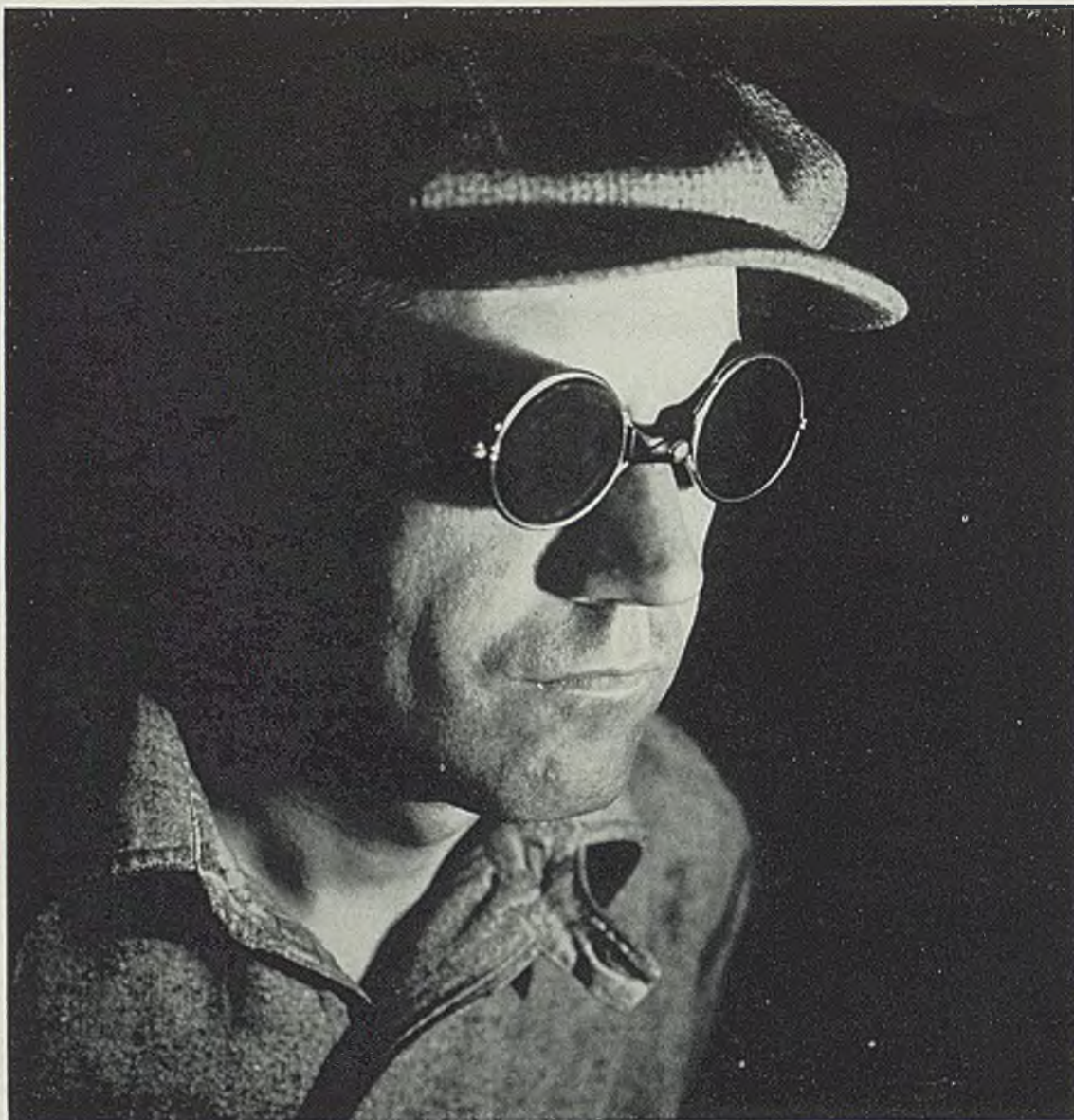
The American Rolling Mill Co., Middletown, O.; Great Lakes Steel Corp., Detroit; Newport Rolling Mill Co., Newport Ky.; Otis Steel Co., Cleveland; Republic Steel Corp., Cleveland; Sharon Steel Corp., Sharon, Pa.; and Youngstown Sheet & Tube Co., Youngstown, O., jointly furnished approximately 5200 square feet of 20 and 22-gage enameling sheets and approximately the same amount of 27-gage galvanized sheets for preparing the specially constructed panels for the building.

The entire project is directed by the Ferro Enamel Corp., Cleveland, which prepared the color standards and the enamel frits especially developed for the purpose. These frits produce an enamel which has a non-glossy matte finish. Ferro Enamel supplied the following companies with frits and the enameling sheets were distributed to them on a pro rata basis for enameling: Davidson Enamel Products Co., Lima, O.; Toledo Porcelain Enamel Products Co.,

(Please turn to Page 66)

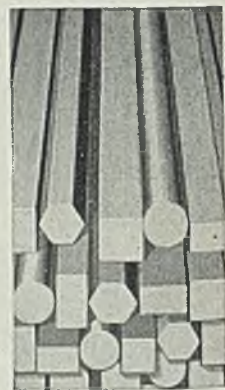


Complete range of porcelain enameled products is on display inside the building, as well as a model store, half in wood and half in enameled steel



Guardian of the Customer's Interests

AT the open-hearth furnace, where the foundation must be laid for the desired properties, at each subsequent step where they must be fostered to full development, the steel for Bethlehem Carbon Bars moves through production under the critical eyes of metallurgical observers. These men guide each stage of manufacture in a way to provide the qualities needed for the intended processing and service. Melting, pouring, soaking, rolling, inspecting are all carried out with a view to producing Bethlehem Carbon Bars that accurately conform to the needs of the customer.



BETHLEHEM STEEL COMPANY

Power Drives



Appreciable Saving in Floor Space Possible with Short Center Drives

ON MANY old-type machines with open belt drives the motors or countershafts are floor mounted several feet from the machine, thus occupying considerable valuable floor space and also requiring guarding to prevent accidents. The nature of the open belt drive, until comparatively recently, required some distance between the driving and driven pulley so that gravity acting on the slack side of the belt could maintain the necessary tension. The use of an idler to permit shorter centers was not wholly satisfactory.

Three developments in short center drives, which have been great savers in floor space as well as providing more efficient drives, will be listed in the order of their development. These are: Silent and roller chains, multiple V-belts, and pivoted motor bases using flat belt. Today practically any one of the three may be used with satisfactory results providing it is designed to carry the load under the operating conditions and service requirements. Sometimes one of the types fits into a particular application somewhat to better advantage than the others.

Saving Floor Space

The following is a good example of the space saving possibilities of short center drives. A group of machines was mounted in rows back to back with the drives occupying a floor space of about 8 feet wide between the rows. The driveshafts of the machines carrying the pulleys extended out at one side of the machines. All this made it difficult and dangerous for the operator to get around the machine.

By using a short center drive the motor was placed under the machine and connected up to the driveshaft. The extended end of this shaft carrying the pulley was cut off even with the bearing. This installation permitted closing the gap between rows and also enabled the operators and

machine adjuster safe and free access to all sides of the machines at any time. The floor space saved enabled the management to add a row of machines which increased the shop capacity about 50 per cent.

In another case a short center drive replaced not only the exterior part of the drive but an additional gear reduction built into the machine. The gears had worn rapidly because of the abrasive dust created in operation and soon became noisy. The replacement of this drive paid for itself in about a year and a half due to the reduction of gear replacement alone.

With the many modern adaptations of short center drives it is possible to attach the drive in almost any position relative to the machine, so that the drive need no longer be in the way.

Clutch Trouble

WHEN industrial maintenance men are asked what element of power drives gives them the most trouble many denounce clutches as the worst offender — maintenance Enemy No. 1. Undoubtedly, clutches can cause a great amount of trouble, particularly those of older types. Much of this is due to abuse; the remainder is the result of a type of design hardly able to cope with the increased requirements of present-day higher speeds and greater production.

On clutches with plain bearings the tendency is for the sleeve to wear on the shaft. Lubrication becomes impossible as the wear increases and soon the shaft is worn too, so that new sleeves do not fit. As the sleeve wears most at the outer end, the sleeve tips. Then when the clutch is engaged all the load is thrown on a few shoes so that clutch pulleys or sheaves ride at an angle and wobble. Wear is increased by neglect to adjust and abuse. Most workmen

throw all their weight and strength on the clutch lever, thus "grabbing" the full load at operating speed instead of "easing" the clutch into the lead. (This reference does not include built-in machine clutches.)

Modern clutches are designed to slip and gradually to pick up the load as it is applied. The elements which absorb the slip are adjustable for wear and replaceable. Also, anti-friction bearings on clutches of both old and new types increase the clutch life several times by assuring better lubrication and eliminating the sliding friction on the shaft and wear between the sleeve and shaft. Ease of adjustment of modern clutches is another important point in their favor.

With the improved designs of clutches now available, lineshaft clutch troubles, whether in clutch pulleys or cut-off couplings, should be reduced to the minor element of maintenance and servicing.

♦ ♦ ♦

Checking against motors driving idle machines and lights burning needlessly is only a beginning toward reducing power wastes. While these obvious savings are often worthwhile, the hidden losses in inefficient drives, poorly designed and installed electrical distribution circuits, improper control, poor or worn bearings, improper lubrication, and low power factor penalties are usually much more expensive but not so easily located.

♦ ♦ ♦

More lubricant "runs out" of bearings than "wears out" in them. However, on poorly fitted or open bearings letting the oil run out is about the only way to wash out dust and dirt which would be disastrous to the bearings.

♦ ♦ ♦

Modern high speeds would not be possible except for the perfection of high-grade antifriction bearings and quality lubricants. The two must be co-ordinated for perfect service.

♦ ♦ ♦

Most of the losses and results of inefficiency in lubricants or bearing servicing are hidden from observation and not easily or quickly determined.

Welding, etc. . . .



Legend About Alloys

ACCORDING to legend, metallurgists of the lost continent of Atlantis once discovered a new alloy that had many desirable physical properties to a much greater degree than any noble metal that was ever known in those times. All the producers promptly began to make the new alloy. Soon it was discovered that, owing to its high price, the market was limited. None of the producers could sell the marvelous new alloy for as much as it cost to make.

All the wise men were called together to ponder solving the problem but no one could suggest a practical remedy. Finally the court jester knelt before the king and sang a song to the effect that if the producers would stop trying to make everything out of the solid alloy and use the alloy only on the surface where it was needed and could be seen, that the cost would be lowered so that everyone could have some of the marvelous new metal.

The great producers roared with laughter because the court fool had suggested that less of the alloy be used in construction as a solution to the problem of not being able to sell enough of it. But one producer tried it and soon his sales exceeded those of all the rest. By using the alloy only where it was needed, the cost was greatly reduced.

The legend is of interest to many alloy producers of today.

Poor Welding

USE of welded steel construction in machinery and equipment usually involves many fillet welds made by the electric arc process. The contour of these fillet welds is a matter of great importance since the contour affects service life, appearance, susceptibility to plating and galvanizing.

The most perfunctory accelerated life tests will convince anyone that lumpy convex fillet welds do not have satisfactory service life in loading transverse to the long dimension of the fillet. If the weld is made

by *Robert E. Kinkead*

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

convex and of uneven shape, no amount of peening will improve its appearance to permit the job to meet the most liberally interpreted specification that the job is to display good workmanship.

But the most severe indictment of lumpy convex weld fillets is that they cost more to make than welds which are concave and have the correct contour. Correct contour is obtained by using sufficient welding heat and positioning the work. The complaint that the manufacturing establishment does not have positioning

equipment is first class evidence that the management does not realize the penalty for not having it. Good welds always cost less to make.

Welding Americana

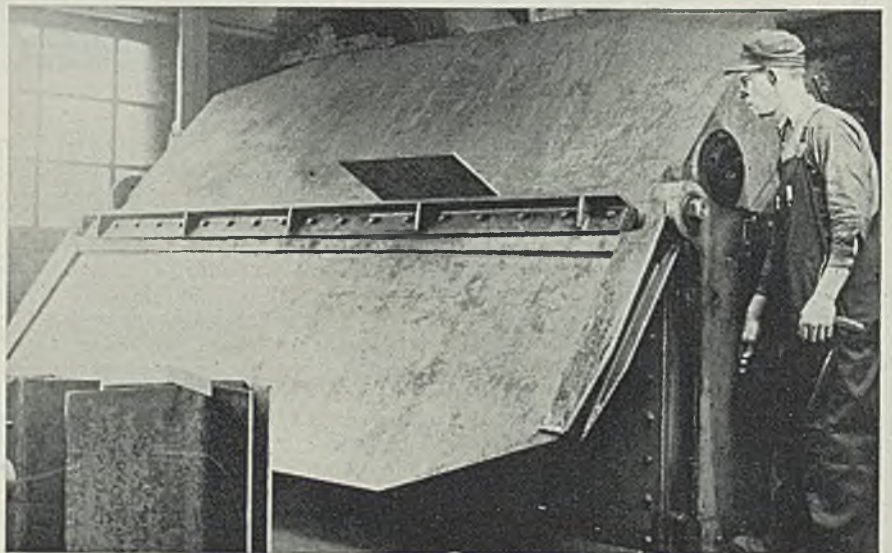
A WESTERN New York manufacturer recently ran into trouble with his welding. In less than two hours, the purchasing agent had called the steel producer and shouted into the telephone, "Your steel is no good, we cannot weld it." To the welding machine manufacturer who supplied the machines he barked, "Your welding machine is no good, we cannot weld with it." To the supplier of the welding rods he screamed, "Your welding rods are unsatisfactory, we cannot get good welds with them."

Bright and early the next morning three delegations began to arrive by train, plane and mud-spattered automobile that had been driven all night. There were two vice presidents, one chief engineer, one sales manager, five district service men, nine district sales representatives.

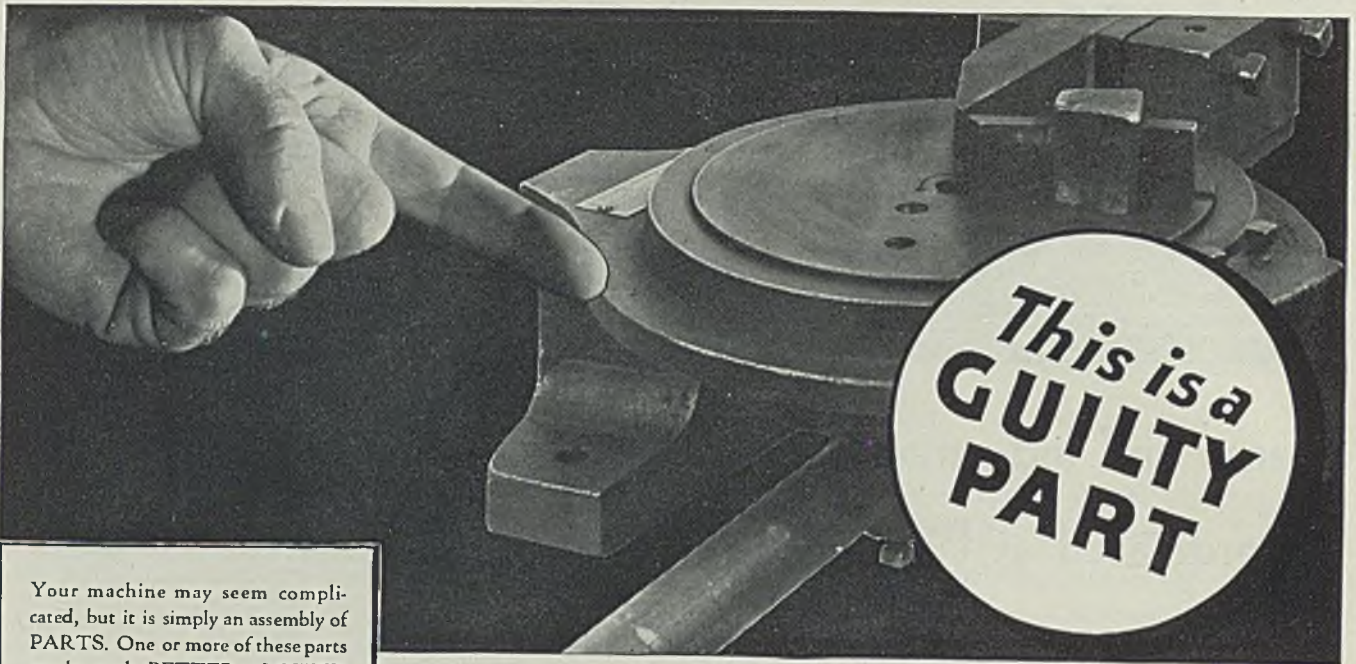
Work practically stopped in the plant while the several delegations interviewed everyone who had any complaint to make. What had happened was that the shop was trying out a new incentive system and the men were having a swell time with it.

Service based on the theory that the customer is always right is often expensive.

Bends Half-Inch Armor Plate

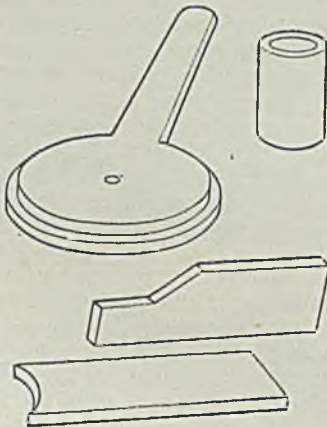


BECOMING its own customer, a machine shop in Portland, Oreg., built the steel brake illustrated here at a cost of about \$3000. Weight of the machine is 25,000 pounds; arc welded construction is used throughout. The unit was built of sections torch-cut from sheets of 1-inch armor plate. Capacity is angles up to 120 degrees in armor plate up to 1/2-inch thick and 12 feet long. The clamping force is exerted by hydraulic action at each end of the machine with a total grip of 80 tons. A 7 1/2-horsepower motor actuates the bending leaf through rack and pinion assembly. Gripping head is adjustable to a 3-inch or 6-inch opening



Your machine may seem complicated, but it is simply an assembly of PARTS. One or more of these parts can be made BETTER at LOWER COST by "Shield-Arc" welding.

You can start now. Change one part at a time to "Shield-Arc" welded construction and thus reduce your costs and improve your product. Simply take standard mill shapes and cut them to proper size, like this—



Then assemble and fuse these shapes into a single unit by "Shield-Arc" welding, like this—



The Lincoln man nearby can show you how. He is at your service without obligation. Photos courtesy of Wallace Supplies Mfg. Company.

It weighs 50 lbs. too much

This small bending machine could make a much quicker trip to market if it were made easier to use at the workman's bench. For one thing, its weight could be cut 50 lbs. by changeover to steel construction, "Shield-Arc" welded.

Until this part is changed to the lighter, more serviceable "Shield-Arc" welded construction, it is a Guilty Part on the shipping floor.

The odds are five-to-one that there is also a Guilty Part in the metal product which you manufacture. Earn its acquittal! Make it stronger. Make it lighter. Make it at less cost. "Shield-Arc" weld it!

The Lincoln man nearby can help you locate those Guilty Parts; he can suggest profitable short-cuts in manufacturing machine parts by welding. Get in touch with THE LINCOLN ELECTRIC COMPANY, Department Y-275, Cleveland, Ohio. Largest Manufacturers of Arc Welding Equipment in the World.

P. S.—The above bending machine has been changed to "Shield-Arc" welded construction. It now weighs 29 lbs.; it can be mounted in a vice and requires less set-up time; it is smoother in operation; it will do jobs that will break the old machine; and its cost of manufacture is slightly less!

THE LINCOLN ELECTRIC CO.
Dept. Y-275, Cleveland, Ohio

Send me a free copy of the new booklet, "Lower-Cost Manufacturing by Shielded Arc Welding."

Firm

Name

Position

Address

City.....State.....

LINCOLN

"SHIELD-ARC" WELDING

Progress in Steelmaking



Cranes and Industrial Trucks Are Co-ordinated at Pittsburgh Mill

SHEETS in the process of reduction at a mill in the Pittsburgh district are handled largely by electric trucks. As the sheets come off the automatic hot mill they are picked up by an overhead crane and loaded onto a truck similar to the unit shown in the accompanying illustration. Loads weighing as much as 5 tons are handled by this means. The sheets are transferred to the pickling department by truck and thence back again for additional rolling, annealing and other treatment. At the finishing end electric trucks are used to convey the sheets to storage or into box cars for shipment.

Approximately 12 trucks of varying types and sizes, all powered by Edison nickel-iron-alkaline batteries

are used in handling materials in process at this plant. The articulated "wobble-tail" unit is employed for loading large silicon sheets for dynamos and transformers into box cars. The truck goes in cab first with the first two loads and tail first with the second two loads. A car carries 30 tons and one truck with six to eight men has loaded as many as 14 cars in a single 8-hour day. The truck is operated by a battery of 30 cells with a 300-ampere hour capacity.

Surfaces Rolls with Nickel

After several months of research work, a company has succeeded in

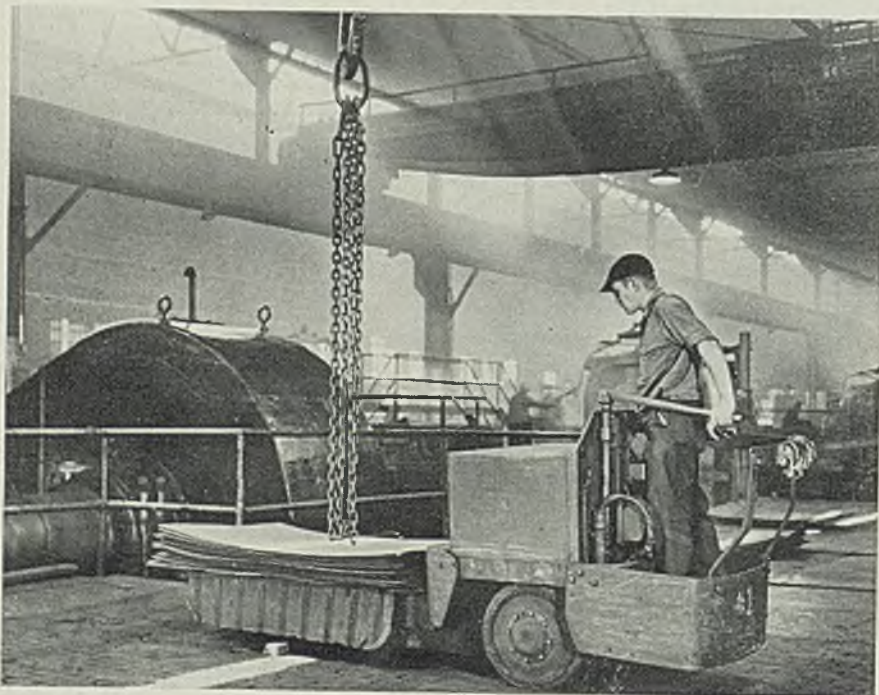
covering steel rolls with nickel and monel metal. In the various experiments to find an acid-resisting roll, plating with noncorrosive metals was tried as well as spraying metal on a steel base, but neither of these methods was successful. Solid rolls of monel metal proved too expensive. The new surfaced rolls are expected to find wide usage in the steel and other industries.

Gage Measures Mill Loads

Rolling mill loads now can be measured accurately by a newly designed meter which utilizes the stretch of the mill housing as a means of actuating electromagnetic instruments. This stretch over a properly chosen gage length is used to change the air gap of an induction micrometer, which consists essentially of two relatively movable armatures, one of which carries coils forming two legs of an A. C. bridge, the other two legs being formed by a potentiometer. By the proper proportioning of the mechanical and electric parts, housing elongations of the order of 0.00001-inch can be observed. Equipment of this type can be applied to all types of mills for either hot or cold rolling. About 12 mills in the country already have installed gages of this type.

Life of Pinions Extended

A set of pinions serving a 3-high 28-inch rail and structural mill and schedule to be scrapped was kept in service three years longer by the use of a different lubricant. Before the change was made about 400 pounds of lubricant was used per week on the gears and from 25 to 30 gallons of cylinder oil on the necks. This was replaced with an oil having a shock, pressure and metal grab resisting film, from 40 to 60 pounds being used per week. The change effected a reduction of 75 per cent in lubricating costs.



Electric truck for transferring sheets from the hot mill to the pickling department

Wanted...

A MOTOR THAT CAN TAKE IT!



THIS wasn't a request by a customer, it was a demand made by our own organization, thirty years ago.

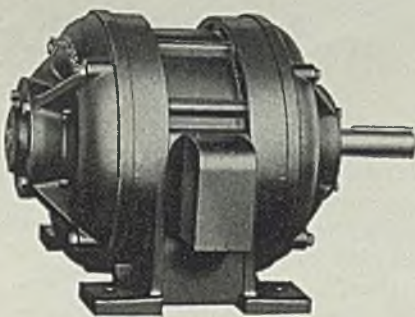
The machinery that we were building was designed for the toughest jobs and was easily equal to them. But we required a motor that could take the beatings that many of these applications required and measure up to the standards that Allis-Chalmers engineers demanded.

So, through our electrical department, working in conjunction with all the highly specialized knowledge of all our various departments, we developed a motor distinctly designed for severe industrial duty. A motor sturdy enough to be a counterpart to our own vast line of rugged power driven machinery.

That motor met the exacting demands of our engineers thirty years ago. For thirty years engineering experience and knowledge have been advancing rapidly and each step of that advance, whether minute or revolutionary, has year after year painstakingly been incorporated in Allis-Chalmers Motors. That is why they are the sturdiest motors on the market—bar none.

Today Allis-Chalmers Motors are the most profitable motor buy on the market because their great mechanical strength reduces maintenance costs to the minimum and extends their life beyond that of all less sturdily constructed motors.

The Allis-Chalmers Mfg. Co. builds standard motors of every type from 1 hp. up—also motors for special application



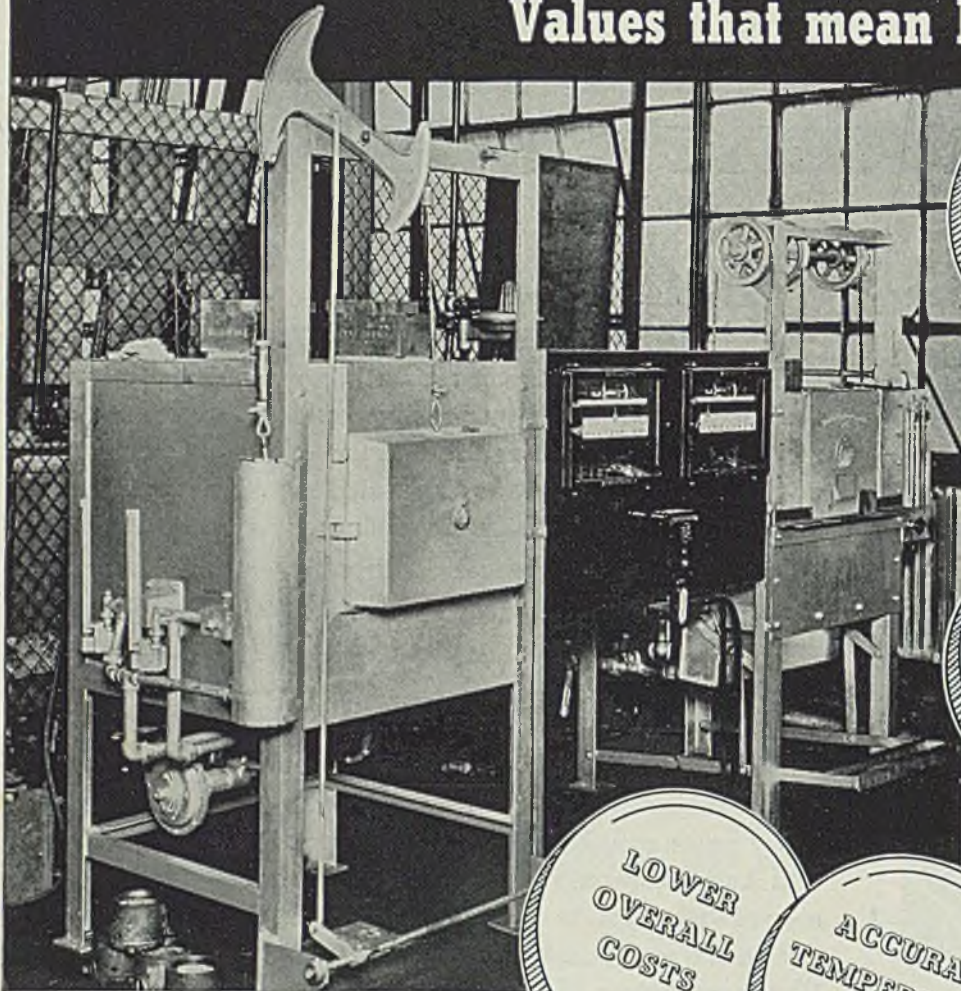
MOTOR DIVISION
ALLIS-CHALMERS



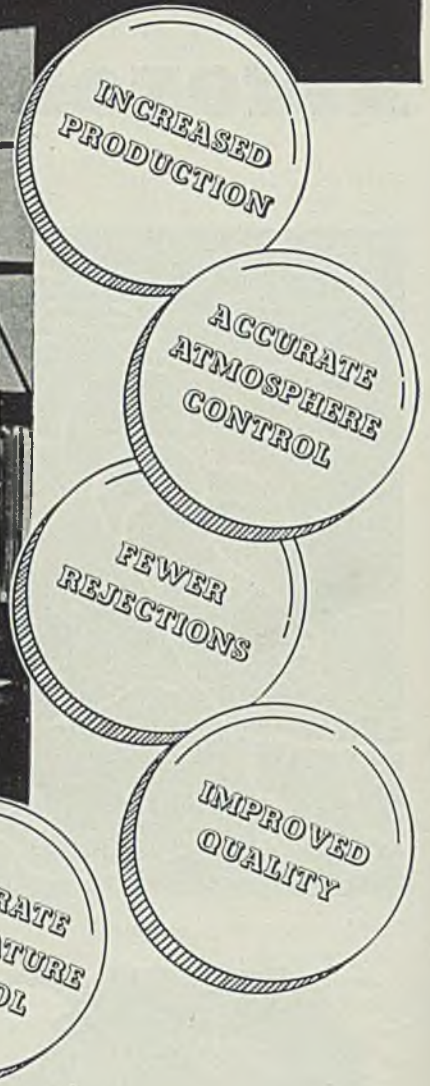
M I L W A U K E E W I S C O N S I N

YOU GET MANY VALUES WITH GAS FUEL

Values that mean Profits



This recent installation of modern, efficient gas-fired equipment—an oven furnace (left) and a controlled atmosphere furnace (right)—means profits for its user. The up-to-date temperature control mechanism installed between the two furnaces uniformly maintains the desired temperatures, helping to assure uniform quality of work.



The many advantages of gas fuel in the metal working industry are important advantages . . . important because they give definite values. For example, fewer rejections, lower overall costs, increased production, accurate temperature control—each means a value to you because it contributes to your profits.

These values are possible because research and development have brought forth efficient equipment that has reduced Gas costs, and made possible many new heating operations and better quality than ever before.

Many manufacturers, some of whom have always used gas, report such results as these: "Paid for itself in a few months," . . . "Improved quality and saves 40% of fuel costs," . . . "Saves labor and floor space," . . . "Shorter heating time, Control more accurate," . . . "Saves 60% of production costs."

Such results as these mean *values* to users—values made possible by the many important advantages of *modern* gas utilization. These values mean *profits* to you.

INDUSTRIAL GAS SECTION
AMERICAN GAS ASSOCIATION
 420 LEXINGTON AVENUE—NEW YORK CITY

THE TREND TODAY IS TO **GAS**
 THE MODERN
 INDUSTRIAL FUEL

British Foundry Institute Holds Meeting in Glasgow

MEETING in Scotland for the first time in 11 years, the Institute of British Foundrymen conducted its thirty-third annual conference in Glasgow, June 9-11. Conditions under which the congress was held were much more favorable to the foundry industry than they were in 1925. In that year, most of the shipyards along the Clyde were silent; this year, Glasgow and surrounding industrial districts teemed with activity. Visitors to the congress came from all parts of the British Isles and from overseas.

Proceedings of the conference commenced on June 9 with the annual general meeting with President J. E. Hurst, Sheepbridge Stokes Centrifugal Castings Co. Ltd., Sheffield, in the chair. The Oliver Stubbs gold medal was awarded to E. Longden, Manchester, and F. Hudson, Glenfield & Kennedy Ltd., Kilmarnock, Scotland. Both received the medal for valuable contributions to foundry knowledge by way of research work and published papers.

New Officers Selected

Harry Winterton, chairman and managing director, William Cumming & Co. Ltd., Glasgow, was elected president for 1936-37. Other officers were selected as follows: Senior vice president, C. W. Bigg, director, Qualcast Ltd., Derby; junior vice president, J. Hepworth, chairman, Bradford Piston & Piston Ring Co. Ltd., Bradford, Yorkshire; honorable treasurer, W. B. Lake, chairman, Lake & Elliot Ltd., Braintree, Essex; and secretary and editor, Tom Makemson, St. John Street Chambers, Deansgate, Manchester, 3.

New members of the general council include Prof. A. Camplion, Glasgow; J. W. Gardom, Birmingham; Ben Hird, Stamford, Lincolnshire; F. K. Neath, president, West Riding of Yorkshire branch; and J. M. Primrose, Grangemouth Iron Co. Ltd., Falkirk, Scotland.

Prof. Albert Portevin, Ecole Centrale des Arts et Manufactures, Paris; and Dr. Percy Longmuir, Sheffield, one of the original members and a past president of the institute, were elected honorary life members.

Greetings from various overseas foundry associations were read, including a cable from F. G. Steinebach, managing editor, *The Foundry*, Cleveland, who is chairman of the committee on international relations of the American Foundrymen's association. The second Edward Wil-

liams lecture was delivered by Prof. A. L. Mellanby, Royal Technical college, Swansea. Title of the lecture was "Cast Iron and the Engineer."

At a session on June 11, the Meritorious Services medal was presented to James Smith, president of the Newcastle branch of the institute, in recognition of the many years which he has devoted to the interests of the institute, particularly in respect to the founding of the Newcastle branch and its development during the past two years.

In his presidential address, Mr. Winterton reminisced on progress in the foundry industry since founding of the institute, then discussed development of the iron-founding industry in Scotland. Although the Scottish industry went through various ups and downs during the past century, output of iron increased and small plants were erected in various parts of the country.

The iron trade took pre-eminence

in the Clyde valley. Production of water pipe from 1 to 2 feet in diameter became a specialized industry in the industrial part of Scotland, but it has fallen gradually, owing to competition from England, and the last of the old pipe foundries closed down about 1926.

Engineering and light castings foundries have continued to flourish, however, particularly in the districts of Falkirk, Kirkintilloch, Barrhead, Glasgow, and along the Clyde. Edinburgh, too, now has its foundries and mechanical principles have been adopted in many works.

In concluding, Mr. Winterton remarked upon the ubiquity of the Scottish molder, who can be found in any part of the world. He also expressed satisfaction at the new spirit shown by the management of most works, which is more receptive than in the past to the exchange of information and less prone to suspicion and secrecy.

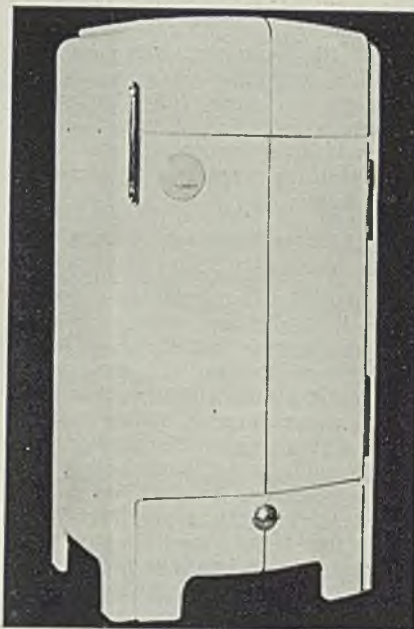
The French exchange paper, "Capillarity as a Factor in Foundry Practice," by Prof. Albert M. Portevin, Paris High School of Foundry, and Dr. Paul G. Bastien, Ecole Centrale des Arts et Manufactures, Paris, constituted a discussion of the function of surface tension in the phenomena of castability and "searching"—the term adopted in the translation to define the penetration of the molten metal into the sand of the mold. The paper, of somewhat scientific character, covered new ground. The phenomena of capillarity, it was developed in discussion, is one that should be further studied, particularly with the view of attracting the interest of practical foundrymen.

Steel Castings Discussed

Dr. R. Hunter and J. McArthur, in a paper, "Manufacture of Intricate Thin-Walled Steel Castings," described how a solution was arrived at to the problem of manufacturing castings of an intricate nature and varying thin walls. C. H. Kain, Lake & Elliot Ltd., Braintree, Essex, opened the discussion by stating that the steel castings subcommittee, of which he is chairman, is investigating defects in steel castings. He pointed out that at present there are still a number of contradictory views in regard to the method to be followed in manufacturing steel castings. For instance, some founders say that the metal should be cast cool, whereas others say that it should be cast at as high a temperature as possible.

He also expressed the opinion that further investigations should be carried out as regards the influence of composition of the steel in relation to certain defects of the castings, such as hot tears. Referring to the position of test-blocks, he expressed the opinion that such blocks should be placed in such a manner that the

Sealed in Steel



NEWLY styled by industrial designer Raymond Loewy, the Coldspot refrigerator of Sears-Roebuck has met with unusual acceptance from buyers. The sides and front of this box are of one-piece construction, while the exterior design is carried out in the interior fittings as well. The shelves are of flat bar aluminum to resist corrosion and prevent spilling

steel will pass through the casting before passing through the test-block. Referring to the question of molding sands, he thought that the high temperature at which metal is poured for thin-walled castings causes a strong erosive effect in the mold near the gate.

G. W. Brown, Austin Motor Co. Ltd., Birmingham, drew attention to the importance of internal and external chills. One speaker asked what variations of contraction were noticed in relation to the sulphur content as between 0.04 and 0.06 per cent, the authors replying that hardly any variation was noticed within those limits. J. E. Hurst asked the authors whether the aluminum paint used in the experiment was ordinary paint or a special preparation, and the authors replied that they employed a sodium solution.

Daniel Sharpe, president of the Scottish branch, asked whether some of the castings described could be made in green sand, in answer to which question the authors stated that they were experimenting on that point. Mr. Sharpe added that he believed that runners have as much to do with the successful manufacture of steel castings as the heads. C. H. Kain stated that he employed a combination of green sand and dry sand, one being used for the drag and the other for the cope. He also thought that high sulphur has dangerous effects over 0.04 per cent.

Sand Composition Considered

F. Hudson, Glenfield & Kennedy Ltd., Kilmarnock, Scotland, in a paper, "Composition and Its Effect upon Properties of Mold and Core-Sand Mixtures at Elevated Temperatures," outlined in a general way the properties which could be expected in the materials mentioned during and after the casting operation, and stated that from the results obtained it was apparent that there was room for considerable improvement.

Discussing this paper, J. J. McClelland, honorary secretary of the Wales and Monmouth branch, referred to the author's statement that the addition of sawdust to dry sand has long been a standard practice in many foundries, but its action has never been fully understood. He said that, in his opinion, sawdust is used more for its permeability effects than for the presence of volatile matter. He also suggested use of finely-cut straw or hay, and said that in certain cases blacking is added to the sand.

In reply, Mr. Hudson stated that in his paper he was dealing with high temperatures and that, therefore, the volatile matter contained in sawdust had an effect at that temperature. He also said that blacking can be used for certain specialized work, but not for average castings.

R. Ballantine expressed the opin-

ion that more experiments should be effected, and, relating his own experience in the manufacture of ingot molds, he said that the question of sand was not of more importance than the actual method of molding, and he stressed the danger of over-drying the sand. C. H. Kain asked how the author crushed his fire-bricks, and what degree of fineness he obtained, and in reply he was told that the results were more successful when the fines were not removed.

In a paper, "A Study of the Influence of Manganese and Molybdenum Additions to Cast Iron," J. E. Hurst described the investigation which he carried out with the primary object of studying the influence of additions of these elements conjointly to cast iron. The German exchange paper was presented by H. Jungbluth, Krupp Co., Essen, Germany, and was entitled "The Influence of Wall-Thickness on the Mechanical Properties of Cast Iron." Dr. A. L. Norbury and E. Morgan, British Cast Iron Research association, contributed a paper dealing with "The Fracture of Pig Iron and Cast Iron." The American exchange paper "Founding of Pressure Castings," was read by H. H. Judson, foundry superintendent, Gould's Pumps Inc., Seneca Falls, N. Y., in which paper the author describes the two-cupola process using two types of mixtures.

General discussion on these four papers was initiated by F. J. Cook, who mentioned the case of a foundry which had run for a number of years with two mixtures for the manufacture of thick castings and where good results were consistently obtained; a relation between the two iron mixtures was found, and those two mixtures were melted separately and then mixed.

Discuss Exchange Papers

Dr. A. B. Everest, Mond Nickel Co. Ltd., London, referring to the paper by Mr. Hurst, wanted to know why the author had chosen the particular combination of manganese and molybdenum additions described in the paper apart from the question of heat treatment. The speaker was of the opinion that nickel-chromium iron appeared to be more interesting commercially. In reply, Mr. Hurst stated that he had used the particular combination of metals because he had undertaken his experiment purely for investigation purposes as regards the effect of that combination of alloys, and he said that he had not yet investigated nickel-chromium irons on the same lines.

Referring to Mr. Judson's paper, Dr. Everest asked whether the process of pouring the metal quickly was to get it into the mold hastily or to have a modified structure. Mr. Judson replied that it was not advisable to let the soft and the hard iron constituting the mixture remain together

longer than necessary, and it was advisable to pour quickly.

G. L. Harbach, Worthington-Simpson Ltd., Newark-on-Trent, Nottinghamshire, referring to a statement in Mr. Jungbluth's paper that under certain conditions satisfactory agreement between the strength of a casting as a whole and that of a test-bar can be obtained if the diameter of the bar is made twice the wall thickness under test, stated that the sensitivity of test-bars varies with the quality of the pig iron.


Also referring to Mr. Judson's paper, Mr. Harbach welcomed the classification of gray iron castings, as proposed by the author, into two broad classes, viz. structural castings and pressure castings. He stated that, in his opinion, as good results could be obtained by using only one cupola in conjunction with the inoculation method as by using the two-cupola process. Referring to the difficulty of using low-carbon irons, he believed that it is better to keep around 3 per cent carbon, as this assures consistent results.

Mr. Judson replied that, his intention being to present a purely practical paper, he did not use the term "inoculation," as he did not want to theorize. He also stated that he definitely wished to have low-carbon iron, but with at least 1.35 per cent silicon.

Test Pieces To Be Investigated

J. G. Pearce, director, British Cast Iron Research association, referring to Mr. Hurst's paper, said that constant fracture does not necessarily mean constant composition of the iron. He stated that one cannot buy pig iron both by fracture and by analysis. As regards the question of nonmetallic inclusions, he said that this problem faces manufacturers of ferrous and nonferrous castings forcibly. Turning to Mr. Jungbluth's paper, Mr. Pearce stated that each casting is a problem in itself, and, therefore, general deductions are difficult to arrive at in theoretical work.

C. E. Williams referred to Mr. Jungbluth's paper and mentioned that he had had experience of castings weighing several tons with walls 6 to 7 inches thick, and he had found that tensile test pieces cast on in such cases were not satisfactory as regards the obtention of true results. P. A. Russell, S. Russell & Sons Ltd., Leicester, chairman of the subcommittee on cast iron, referred to Mr. Williams' remarks and said that the subcommittee was investigating the matter of tensile test pieces, and that Mr. Jungbluth's paper would be of great assistance in that connection; and while he agreed that a test-bar of a length ranging from 9 to 12 inches is not a practical proposition, he expressed the hope that the test-bar which would eventually be chosen would constitute a good compromise.



FOREMOST

in extreme pressure gear lubrication

PENOLA COMPOUND

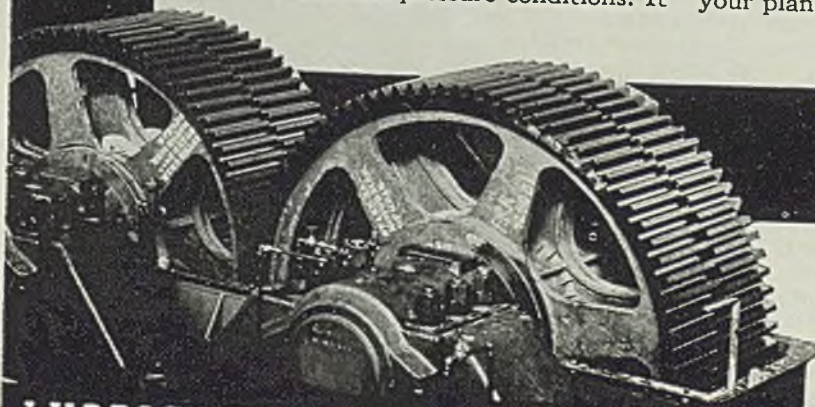
WHEN steel mill gear units must operate under high external temperatures with heavy tooth loads, high peaks or shocks, steel mill engineers specify Penola Compound as a matter of course.

At 3 to 5 times the pressure where regular mineral oils fail, Penola Compound's tough film is still giving complete protection.

Penola Compound is the ideal lubricant for extreme pressure conditions. It

is supplied in many consistencies, each exactly right for both gears and bearings. Penola Compound helps reduce wear, noise and power loss.

For over 50 years, Penola has been the leader in steel mill lubrication. Penola engineers gave the industry its *first* high pressure lubricants. Today, Penola engineers are always ready to cooperate closely with you in your lubrication problems—to save you money and protect your plant investment.



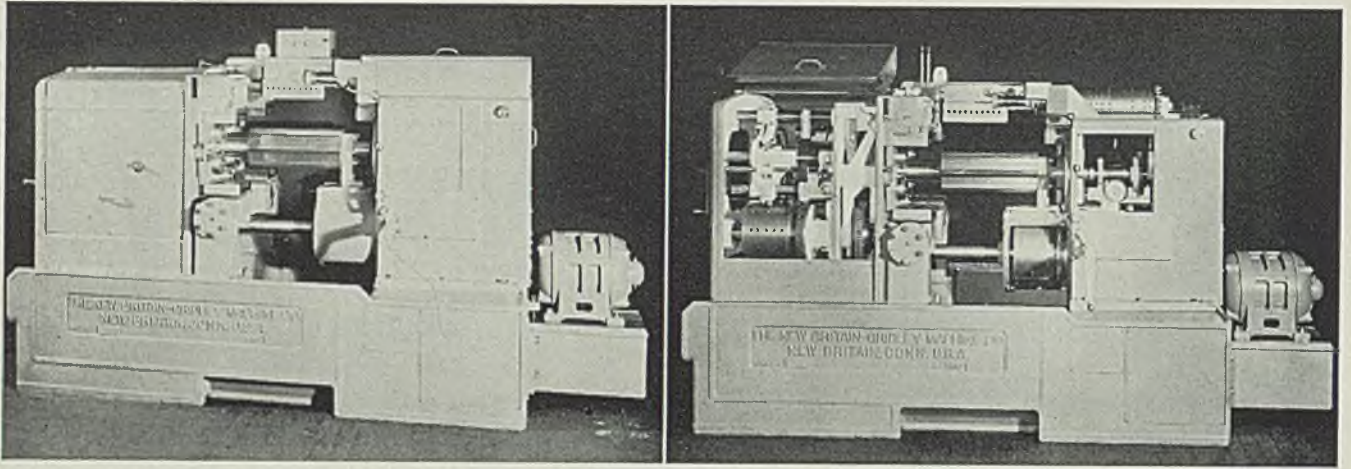
PENOLA LUBRICANTS

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Grease Works Operated at

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LUBRICATION FOR THE STEEL INDUSTRY • 1885 to 1936



Left—Front view of the New Britain-Gridley model 61 six-spindle automatic screw machine. Right—Front view of model 61 with the covers removed to show the ready accessibility of working parts

Introduces New Line of Automatic Screw Machines

NEW BRITAIN-GRIDLEY MACHINE CO., New Britain, Conn., is announcing a new line of automatic six-spindle screw machines. These machines, to be known as model 61, are based on the experience gained on the earlier models 40 and 41. The new line consists of three six-spindle sizes, bar capacities 1½, 2 and 2¼ inches, and two four-spindle sizes of 2½ and 3-inch bar capacity. Features of both types are substantially the same, and one description will suffice.

The headstock, base and power box are rigidly bolted and doweled together, with an overhead member connecting the headstock and power

box, forming practically one complete unit. The main tool slide is hexagonal in shape on the six-spindle models and square on the four-spindle models, and reciprocates on the stem. The cam for operating the main tool slide is entirely enclosed and out of the way of chips and grit, yet is readily accessible for changeover. The cams are so placed that they are directly in line with two roughing spindles and the power to the slide is transmitted through chip and grit protected torque guide plates.

Cams Are Accessible

The cams are all jig drilled, insuring interchangeability and rapid changeover. Universal cams can be applied for a variety of short runs. The operating cams for the cross slide are located on cam disks located just back of the front face of the head stock. These cams are readily and instantly accessible through removable guards and are free of any interference from chips or grit. One screw securely locks each cam in position, making changeover simple.

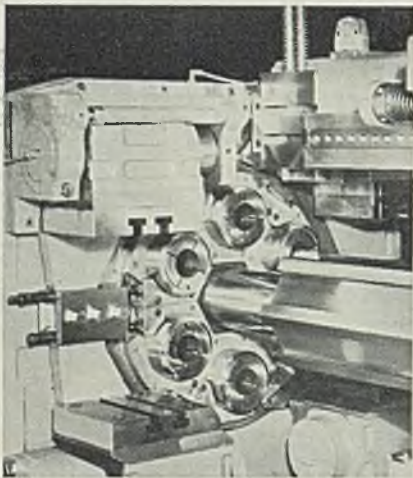
Accelerated tools, such as reamers, taps or any other tool requiring motion independent of the main slide can be operated in Nos. 4, 5 or 6 positions. Tools in any two of these positions can be operated independently of each other and a third tool can obtain this independent motion in conjunction with either of the other two.

The power box is at the right-hand end of the machine opposite the spindle and is accessible, front

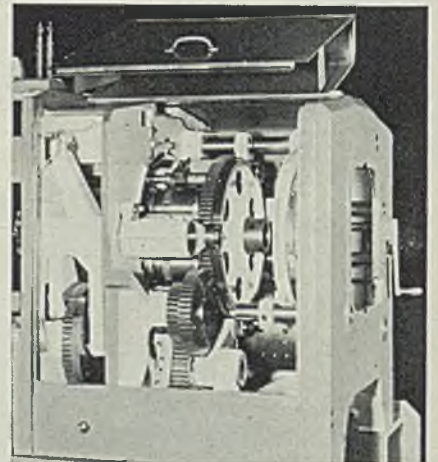
and rear, through large sliding panels and all parts are readily accessible for inspection and adjustment.

All shafts are mounted in antifriction bearings, and all gears are of heat treated alloy steel with the gear teeth finished after the heat treating operation. The power box, together with the rest of the machine is automatically lubricated, with a circulating pressure and splash type lubricating system. The lubricant is first drawn through a filter assuring a clean supply of oil at all times. A pressure switch interconnected with the main drive motor prevents operation of the machine until full oil pressure has been built up in the lubricating system to assure ample lubrication to all parts and mechanisms of the machine.

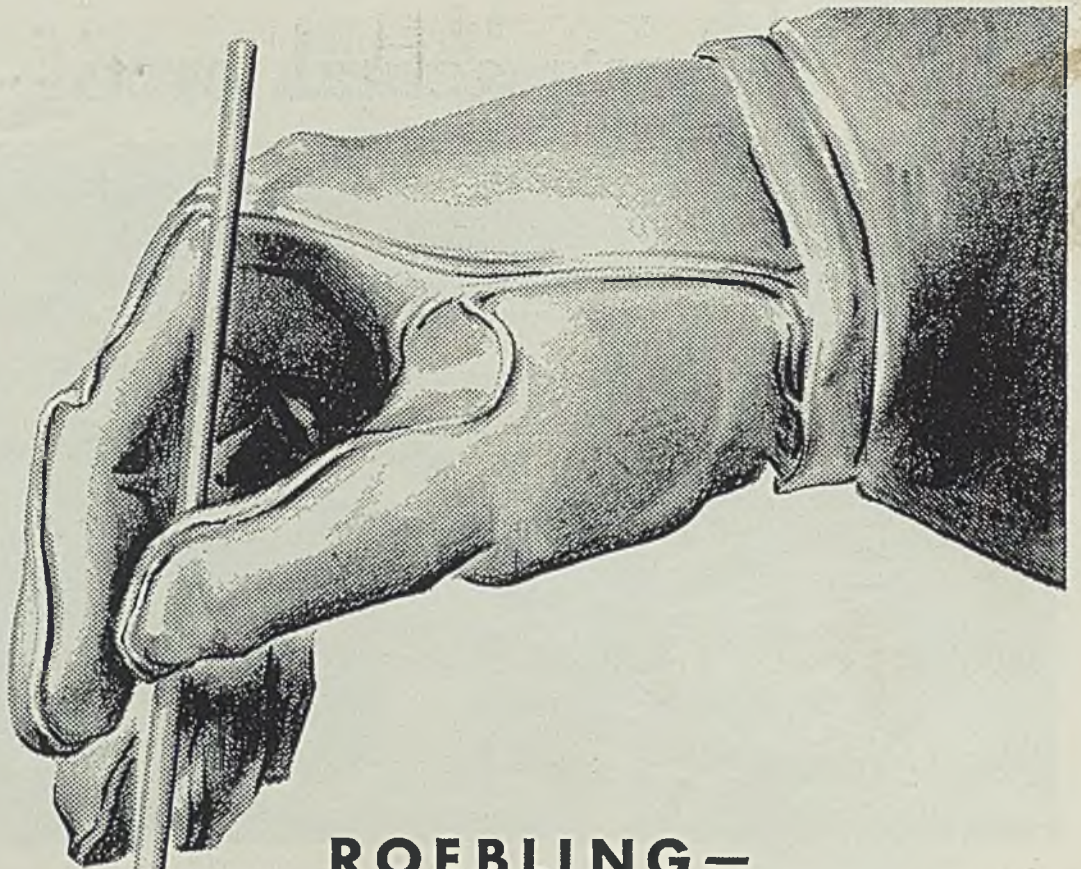
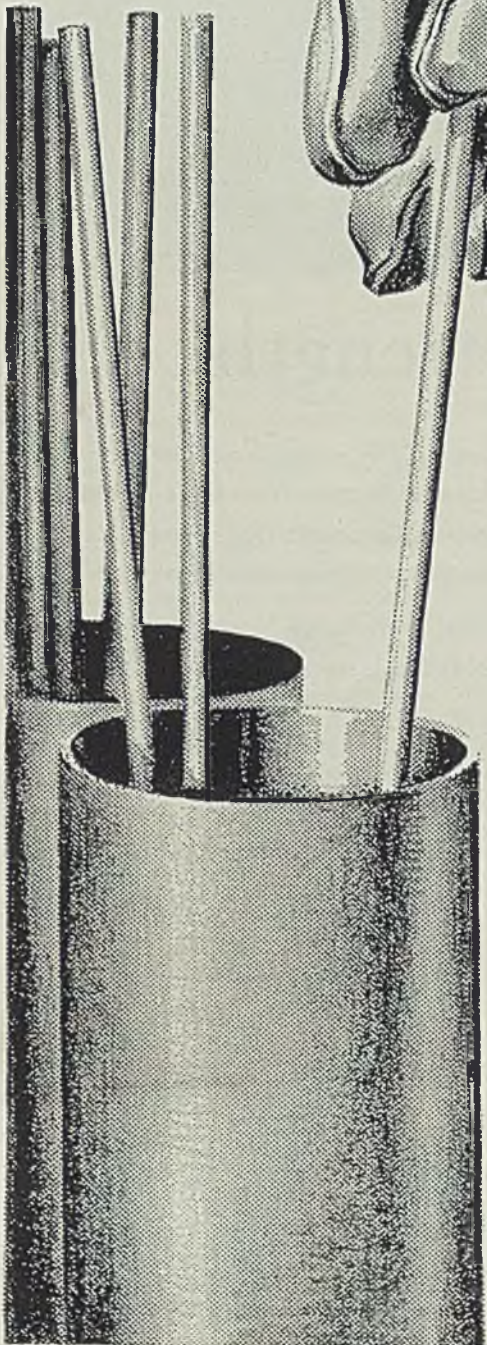
Indexing of the carrier is accomplished through a modified Geneva motion, operating smoothly and quickly at high speeds. The indexing is timed with the lifting of the carrier, whereby the circumference of (Please turn to Page 66)



Closeup view of the model 61 showing the six-spindle construction. Spindles are mounted on ball bearings



Cam mechanism is readily accessible through this opening in the rear of the new models



ROEBLING— the custom-made wire for exacting welders

Not a welding wire made of ordinary tonnage steel. To the contrary...a wire produced of a purer and more costly steel...made in special small open-hearth furnaces by Roebling's custom methods.

A welding wire absolutely uniform in quality and free of non-metallic impurities.

Electric and gas welding types. Available in a variety of standard straight lengths and in coils.

Roebling Welding Cables: Made in a complete line of rubber and braided types for arc welding purposes.

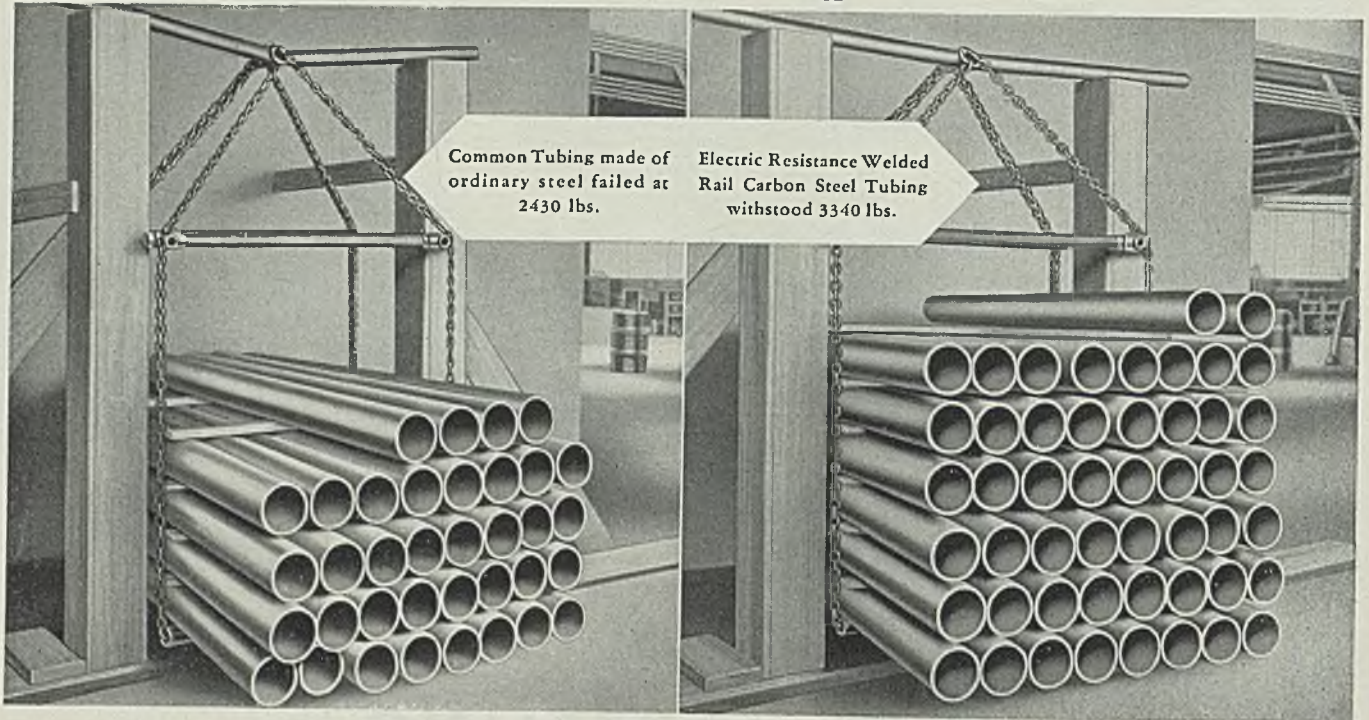
JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N.J.
Branches in Principal Cities

ONLY A FINE PRODUCT MAY



BEAR THE NAME ROEBLING

Here's actual proof -



- of 37 % greater strength

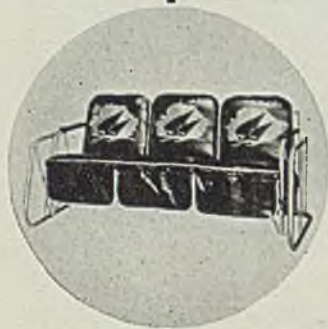
● Electric resistance welded rail carbon steel tubing, as manufactured by Steel and Tubes, Inc., is exceedingly tough and rigid. By the loading test illustrated here, it is 37% stronger for structural purposes than tubing made of ordinary steel.

Many manufacturers are finding it economical for the making of agricultural implements, beds, frames and fences, handles, shafts, scaffolding, towers and metal specialties of every kind. It

gives toughness, rigidity, strength and permits weight reduction, because it is made from basic open-hearth steel high in carbon. Cost and strength considered, it is the greatest structural tubing value obtainable today.

Rail Carbon Steel is available in a variety of electric resistance welded tubing shapes and also in open U-Bar sections. Complete engineering information and illustrations are contained in Handbook C-918. A copy will be sent upon request.

Steel and Tubes Inc.
WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING
CLEVELAND . . . OHIO

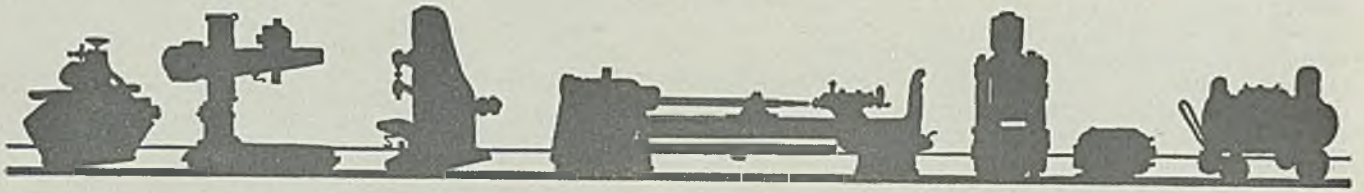


**ELECTRIC RESISTANCE WELDED
RAIL CARBON
STEEL TUBING**



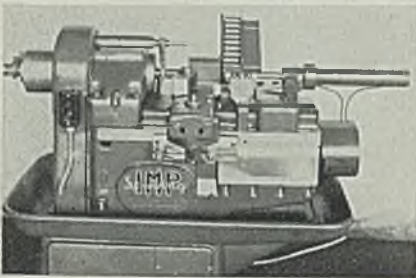
When writing Steel & Tubes, Inc. for further information, please address Department ST.

New Equipment



Feeder for Automatic Lathes—

Seneca Falls Machine Co., Seneca Falls, N. Y., has recently equipped its Lo-Swing Imp automatic lathe



This Seneca Falls automatic lathe is equipped with a self-feeding device

with a new automatic safety work handling device. This lathe is a small, high-speed lathe designed for handling bushings, pistons, valves, bearings and other similar turning jobs. The illustration shows one of these lathes working on a bronze bushing job. The work chute is kept filled by the operator and work is fed automatically to work holding arbor for machining. After the work is finished, the tool withdraws and returns to the starting point, while the finished work is removed from the mandrel and discharged into a chute as the next piece is loaded into the arbor. The fully automatic action of the cycle eliminates extra handling at a high rate of speed and reduces possibility of accidents, it is claimed.

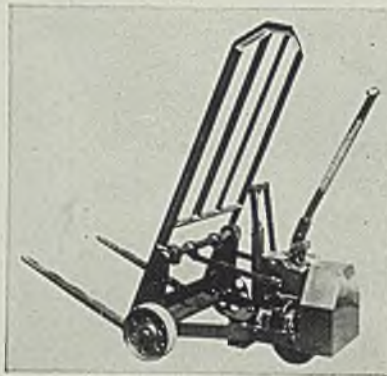
Tube Forming Machine—

Kane & Roach, Syracuse, N. Y., recently have built a series of radiator tube forming machines. The equipment illustrated herewith is being furnished for the Amtorg Trading Corp., New York. This series of machines includes a cold roll forming machine, tinning machine, straightening machine and rotary cutoff. Being formed is rectangular lockseam radiator tubing, from 0.0075-inch brass strip stock. These machines operate at a rate of 110 feet per minute, the product passing from the forming machine through the tinning machine, where it receives a coating of solder, and through the power-

driven straightening machine to the rotary cutter, where it is cut into lengths of 20 3/8 inches. The tinning machine is equipped with an automatic thermostatic control, and the entire electrical equipment is wired in series so that in case of trouble in any motor, the whole line is automatically shut down.

Fork-Type Lift Truck—

Yale & Towne Mfg. Co., Philadelphia, has designed a new counter-weighted fork-type pallet handling truck, intended for use in unloading shipments sent out on wooden pallets. The truck will handle both single faced and double faced pallets, and may be operated by one man. The handle is of the multi-stroke type, and controls the tilt of the load as



Handle on this Yale pallet lift truck controls both tilt and lift of the load

well as the lift. A large hydraulic release check mounted between the lifting head and the load rack drops the load when the operator exerts

pressure on the treadle. The truck is of simple construction and all wearing parts are easily lubricated, according to its makers. The model

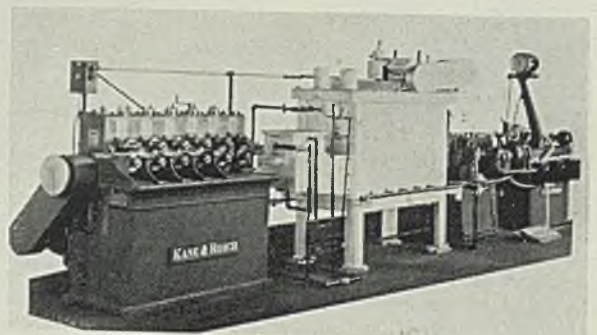


Ingersoll-Rand is the maker of this new lightweight wagon mounting for rock drills

illustrated here has a capacity of 700 to 1125 pounds and is equipped with 2-inch forks measuring 31 1/2 inches in length.

Wagon Mounting For Rock Drills—

Ingersoll-Rand Co., 11 Broadway, New York, is presenting a new lightweight wagon mounting for rock drills. It will handle 20-foot steels and will accommodate a 6-foot steel change. The new unit has a positive feed at any angle. The feed is by air-motor with a range of from 1 to 1000 pounds. A self-locking worm drive permits feeding the drill up to the rock the same as with a hand-



Russia has ordered this layout of tube-forming equipment from Kane & Roach

cranked drill. The new mounting provides an easier method of handling the heavier drills, resulting in increased yardage with less fatigue, it is claimed. The frame is of one piece tubular construction, and swivel axles are provided so that wheels may be turned at right angles for close drilling or hillside work. Controls are all located together for convenience, and a four-cylindrical air motor provides power for operation. Four anchor pins hold the mounting in position while drilling.

Pneumatic Drill—

Buckeye Portable Tool Co., Dayton, O., announces a new pneumatic



Hercules pneumatic portable drill just announced by Buckeye Portable Tool Co.

portable drill for use in work up to 1/4-inch. The drill is 12 inches long, weighs 4 1/2 pounds, and operates at 2200 revolutions per minute. This drill finds special use in the fabrication of bus bodies, airplanes, refrigerator cabinets and similar work. It is small and light and can be operated with one hand. Action is controlled by a thumb lock throttle. The air motor operates the chuck spindle direct through planetary gears, and the tool is of ball bearing construction throughout. The smooth operation of the motor is claimed to reduce drill breakage to a minimum.

Discharge Indicator

Electric Storage Battery Co., Philadelphia, has recently perfected a new device for warning operators of electric industrial trucks when the battery should be removed and re-



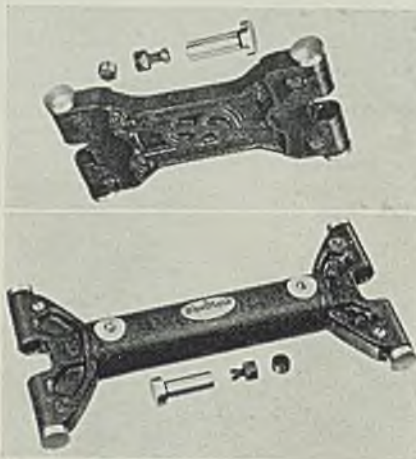
Exide discharge indicator for electric industrial trucks

charged. The indicator is a small device which is mounted on the truck in sight of the operator. When the voltage reaches a predetermined

point a red bull's-eye flashes its warning to the operator, who then knows that the battery must be removed for recharging. The operation of the indicator consists of a relay set to operate on a predetermined voltage. When the battery discharges to that point, the relay trips and the current flows to the signal lamp. Exide discharge indicators will be made in standard sizes for operation with 12, 15, 16 and 18-cell batteries. Special indicators will be supplied for use with other combinations of cells.

Adjustable Plug Gages—

Sheffield Gage Corp., Dayton, O., announces a new line of adjustable plug gages manufactured in two types to provide coverage of standard sizes from 2 1/2 inches to 12 1/2 inches. In the accompanying illustration the gages are shown assembled. The top gage is furnished in sizes up to 4 inches, while the lower gage covers



Sheffield adjustable plug gages are manufactured in the two types shown here

the remainder of the range. There are 23 sizes. The diameter of each gage may be adjusted within its complete range. The lock is positive and utilizes a flat on a lock bushing, which by screw adjustment against a flat on the anvil holds the anvil in a set position. Gages will be furnished with either button or pin type anvils. Among its uses are checking holes for diameter, out of round and taper; and checking the widths of slots and the like by means of flat anvils.

Vises—

Athol Machine & Foundry Co., Athol, Mass., announces two new vises, a heavy pipe vise especially designed for the needs of plumbers and steamfitters, and a new milling machine vise with a removable swivel indexing base. The steamfitters vise has base and jaws of

heavy semisteel castings, proportioned to withstand the strains of steamfitters work. The back jaw moves, allowing long lengths of pipe to rest on the bench. Large deeply-checked tool steel flat jaw facings with straight section for ordinary work are provided. The special pipe grip sections have correctly shaped double-radius curves. The pipe vise handles pipe from 1/8-inch to 6 inches and has 5-inch jaw width. The

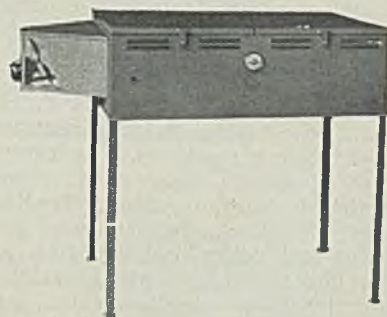


Left, steamfitters vise, and right, milling machine vise introduced by Athol Machine & Foundry Co.

new milling machine vise provides for a wide range of general machine shop uses. Used with the indexing base, milling machine and other operations requiring accurate angle settings are conveniently handled. The vise may be removed from the base for drill press and similar uses. The base is graduated in 180 degrees, extending 90 degrees each way from zero. Two clamp bolts hold the vise in position on the base. The vise bed, base, and jaws are semisteel castings and the removable jaw facings are of tool steel. The milling machine vise is available in two sizes, with 4-inch or 6-inch jaw.

Blueprint Machine—

Milligan & Wright Co., 1243 West Third street, Cleveland, announces the addition of another model to its line of Blueprinters. The new machine is 24 x 36 inches in size, and uses an incandescent lamp as a light source. Belt feed is eliminated by a flat bed printing surface. A heavy-duty timing switch has been developed for automatically breaking



Larger model blueprint machine added to the line of Milligan & Wright

the heavier current, and forced ventilation is provided to prevent any tendency to overheat.

THERE'S NO SUBSTITUTE FOR GOOD WIRE IN CLEANING!

Cleaning and removing burns from metals, scraping off plaster, paint, dirt and rust, even removing grease from the butcher's block would quickly destroy ordinary wire. But the Wissco Round and Flat Brush Wire is not ordinary wire. It is one of the special purpose Wissco Wires developed in the Wickwire Spencer Laboratories. It resists wear from abrasion, retains its stiffness and does not go "dead". Contrast these essential requirements of Wissco Brush Wire with those of perfectly soft annealed Wissco Florist Wire, or high tensil Wissco Rope Wire. Yes, there is a special Wissco Wire best for every purpose, including yours. Ask about it . . . today.

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



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

WISSCO WIRE
by Wickwire Spencer

New Trade Publications

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.

Abrasives—Norton Co., Worcester, Mass. A pamphlet, form 1299-11P-3000-4-36, discussing economics of grinding rail welds after welding by the oxy-acetylene torch or electric arc.

Lathes—Boye & Emmes Machine Tool Co., Cincinnati. Bulletin No. 25, giving a minute description of the various sections of its lathes; table of specifications.

Fire Prevention Facts—Garrison Engineering Corp., Great Barrington, Mass. A brochure stating the meaning and the causes of fire, explaining in detail how to gain control of fire.

Riveter—Hanna Engineering Works, 1765 Elston avenue, Chicago. A circular illustrating what one customer was able to accomplish in savings, with a Hanna differential riveter.

Pipe Machine—Beaver Pipe Tools Inc., Warren, O. Bulletin covering beaver model-A special and standard pipe machines, fully analyzing by illustrations; prices, shipping weights and code words.

Plating Barrel—Udylite Co., 1651 East Grand boulevard, Detroit, Mich. A folder illustrating performance records of the Udylite plating barrel and describing the practical advantages of operation and construction.

Fuel Oil Heater—Griscom-Russell Co., 285 Madison avenue, New York. A bulletin, form 707, describing a fuel oil heater with flexible capacity for varying fuel requirements; diagrams show how the heater reduces spare heating capacity.

Rail Brace—Bethlehem Steel Co., Bethlehem, Pa. Folder No. 352, describing the Bethlehem spring rail brace, design 811; a new product recently developed, an adjustable brace of the wedge type, that can be easily installed.

Wire Machine—Lewis Machine Co., 1592 East Twenty-fourth street, Cleveland. Bulletin No. 536, covering new travel-cut automatic wire straightening and cutting machine, combining a proved cam cut-off mechanism with a traveling cut-off head.

Electric Marker—Ideal Commutator Dresser Co., Sycamore, Ill. A leaflet describing the Ideal electric marker, a portable electric tool supplied with a special point suitable for marking materials, including hardened steel; operates on 110 volt, 60 cycle, alternating current, and consumes approximately 75 watts.

Blast Cleaning Equipment—Pangborn Corp., Hagerstown, Md. Booklet No. 621-5-436, starting with dust control and modern types of dust collectors, exhaust fans, etc., it goes on to describe airless blast cleaning as accomplished by various roto-blast barrels, tables, cabinets and special

machines, blast rooms, hydro casting washer, accessories and supplies.

Mechanical Lifters—Lewis-Shepard Co., 253 Walnut street, Watertown, Mass. Circular No. 320, describes and illustrates unusual mechanical lifters for product manufacturing and handling, where standard materials handling equipment devices are not so well adapted.

Electric Furnace—Firth-Sterling Steel Co., McKeesport, Pa. A folder on the new Firth "Braze-Rite" electrically operated furnace, developed principally for brazing sintered carbide cutting tools. Each furnace is equipped with two heat-resisting alloy muffles having a capacity of 2 inches.

Electric Melting Pots—Harold E. Trent Co., 618 North Fifty-fourth street, Philadelphia. Leaflet, No. TD-11, describing the Trent electric melting pots for melting babbitt solder, tin, type metal, lead, for continuous service and temperature up to 1000 degrees Fahr. with automatic controls and panels for melting pots.

Introduces New Line of Automatic Screw Machines

(Concluded from Page 60)

the spindle carrier has no wearing contact while indexing. The lift of this carrier is indicated by a conveniently located indicator which shows clearly at all times the position of the adjustable lifting shoe.

The stock feed mechanism is of the spring and cam operated type. Cams readily accessible at the left-hand end of the headstock are quickly changed and different cams are provided for feeding different stock lengths. Overtravel is provided so that three stock feed cams cover the entire range of the machine. The stock stop is in upper front position and is of the disappearing type to permit removal of bar ends.

An automatic electric stop is built into the machine and through this device the machine is automatically stopped in the loading position with the collet open when the stock is exhausted in any spindle. At the same time, the signal light warns the operator that the machine needs attention. This stop is also semiautomatic in operation, and permits making one cycle of the machine and then automatically stops with the slides withdrawn to facilitate checking of the work and adjusting tools.

Chip Clogging Minimized

Collets are of the drawback type,

hardened and ground internally and externally to allow of minimum run-out of stock, and are equipped with felt plugs in splits to prevent chips and grit working into the seats.

Tool accessibility is provided with the extra large spacing of the spindles, positions of the slides and the fact that the roughing spindles are in the lower positions preventing the heavy chips from interfering with and clogging up the finishing tools. The chip space is of large capacity with no interfering members to prevent chips from dropping directly into the base.

An automatic chip conveyor can be provided which automatically pulls the chips from the base of the machine into a separate chip pan placed under the stock reel.

Threading tools may be operated in any one or two of No. 4, 5 or 6 positions. The same threading attachment is transposable to No. 4 or 6 positions without any changes and can be operated in No. 5 position with the addition of an offside drive mechanism. Self-opening die revolving mechanism may be operated in any or all positions.

Drill speeders are preloaded ball bearing mounted and are driven at a variable ratio through pick off change gears. Speeders can be used in any desired position on the machine.

Co-operate in Enamel Building at Exposition

(Concluded from Page 49)

Toledo, O.; Erie Enameling Co., Erie, Pa.; and Davidson Enamel Co., Clyde, O.

The enameled sheets were sent to the Haskelite Mfg. Corp., Chicago, where they were mounted on a 5-layer plywood which was backed up with the 27-gage galvanized sheets previously mentioned. The finished panels were then sent to the exposition grounds where their installation was supervised by Ferro Enamel.

Oxides and other mill additions were furnished by B. F. Drakenfeld & Co., New York. Copper which was coated with a clear transparent enamel for special color effects was furnished by C. G. Hussey & Co., Cleveland. Electric light fixtures and apparatus for special lighting effects were furnished by Benjamin Electric Mfg. Co., Desplaines, Ill.

Architects for the building were Charles Bacon Rowley & Associates, Cleveland. Mr. Rowley has designed several porcelain enameled buildings, including the first porcelain enameled residence, erected in Cleveland several years ago.

The entire arrangement for the exhibit reflects a wholesome spirit of co-operation between companies to further the interests of porcelain enameling.

Steelworks Operations Tapering Moderately

Market Conditions

More Divergent; Sharp

Decline Is Unlikely

A MODERATE tapering-off in steelworks operations appeared last week, although backlogs and the strong demand from heavy material and miscellaneous users seemed likely to prevent any sharp decline.

With automobile, tractor and farm implement production receding slowly, and heat hampering mill schedules, the national operating rate was down 1 point to 68½ per cent, but still within 2 points of the high June average. Last year at this time the rate was 43 per cent.

The shipbuilding industry is more active, with inquiries last week including two tankers involving about 9000 tons of hull steel. Aggregate gross tonnage of eight tankers recently contracted for, 103,000 tons, exceeds by more than 12,000 tons that of boats under construction in the second quarter of this year in all yards of the nation.

Industrial equipment manufacturers are busy on an extraordinarily good volume of orders. Machine tool orders in June were the highest since November, 1929.

Sheet mills are still under heavy pressure for speedy deliveries and some are booked solidly until the middle of next month. Demand for tin containers, besides that from fruit and vegetable packers, is helping sustain the activity of tin plate producers, now operating at 95 to 98 per cent.

Automobile assemblies last week were down 6516 units to 91,317. Some manufacturers have been unable to set a definite date for ending production of their 1936 models, because of the relatively good current demand. A small amount of steel buying has begun for 1937 cars.

Labor organization in steel is driving in a certain amount of tonnage from consumers seeking to build up stocks as a hedge against possible interruptions in production. Buying attributed to this situation has been particularly noticeable in material on which mills are quoting deferred deliveries.

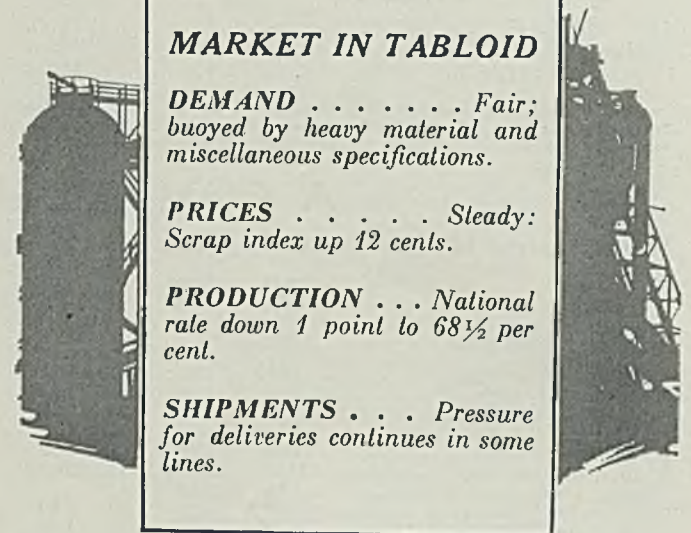
MARKET IN TABLOID

DEMAND Fair; buoyed by heavy material and miscellaneous specifications.

PRICES Steady; Scrap index up 12 cents.

PRODUCTION . . . National rate down 1 point to 68½ per cent.

SHIPMENTS . . . Pressure for deliveries continues in some lines.



Awards for steel pipe and reinforcing bars were comparatively heavy, but shape awards were off 18,736 tons to 23,216 tons. Steel pipe awards included 10,500 tons for the Birmingham, Ala., industrial water project, 5000 tons of seamless and lap-welded for a Houston, Tex., utility and 1500 tons for a 30-mile line in Texas. Pending plate awards include 45,000 tons for the floating drydock at Pearl Harbor, Hawaii, on which bids will be opened Sept. 30. Heavy deliveries of reinforcing bars are in prospect since backlogs shortly will be supported by substantial tonnages now pending.

The shape awards included 5000 tons of piling for a lock in the Chicago sanitary district.

Railroad awards included 379 freight and passenger cars last week, while rail purchases amounted to 6600 tons. However, inquiries for the repair of cars indicated activity will be greater soon.

Operations in the Youngstown district were up 2 points to 76 per cent, and in the Wheeling district 12 points to 81. Pittsburgh was down 1 point to 63; Chicago 1 to 70; Cleveland 33½ to 51; Buffalo 2 to 84 and New England 5 to 63. Others were unchanged.

Activity in the scrap market has been quiet but STEEL'S scrap composite has made small gains for three consecutive weeks, the latest a 12-cent increase to \$12.91. The iron and steel price index is up 1 cent to \$33.49, and the finished steel composite remains at \$53.40 for the third straight week.

The first large contract for Connellsville beehive coke since the depression began calls for shipments of 15,000 to 20,000 tons a month, for at least five months and may run for a year, for Pittsburgh Steel Co.

COMPOSITE MARKET AVERAGES

	July 18	July 11	July 3	One Month Ago June, 1936	Three Months Ago April, 1936	One Year Ago July, 1935	Five Years Ago July, 1931
Iron and Steel	\$33.49	\$33.48	\$33.48	\$32.79	\$33.10	\$32.44	\$30.78
Finished Steel	53.40	53.40	53.40	52.20	52.20	54.00	48.68
Steelworks Scrap.....	12.91	12.79	12.76	12.55	14.39	10.64	8.70

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

	July 18, 1936	June 1936	April 1936	July 1935		July 18, 1936	June 1936	April 1936	July 1935
Finished Material					Pig Iron				
Steel bars, Pittsburgh	1.95c	1.85c	1.85c	1.80c	Bessemer, del. Pittsburgh	\$20.8132	20.8132	20.8132	19.81
Steel bars, Chicago	2.00	1.90	1.90	1.85	Basic, Valley	19.00	19.00	19.00	18.00
Steel bars, Philadelphia	2.26	2.16	2.16	2.11	Basic, eastern del. East. Pa.....	20.8132	20.8132	20.8132	19.81
Iron bars, Terre Haute, Ind.	1.85	1.75	1.75	1.75	No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
Shapes, Pittsburgh	1.90	1.80	1.80	1.80	No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Shapes, Philadelphia	2.11½	2.01½	2.01½	2.01½	Southern No. 2, Birmingham.....	15.50	15.50	15.50	14.50
Shapes, Chicago	1.95	1.85	1.85	1.85	Southern No. 2, del. Cincinnati...	20.2007	20.2007	20.2007	19.38
Tank plates, Pittsburgh	1.90	1.80	1.80	1.80	No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Tank plates, Philadelphia	2.09	1.99	1.99	1.99	Malleable, Valley	19.50	19.50	19.50	18.50
Tank plates, Chicago	1.95	1.85	1.85	1.85	Malleable, Chicago	19.50	19.50	19.50	18.50
Sheets, No. 24, hot rolled, Pitts....	1.95	1.85	1.85	1.85	Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Sheets, No. 24, hot ann., Pitts....	2.50	2.40	2.40	2.40	Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Sheets, No. 24, galv., Pitts.....	3.20	3.10	3.10	3.10	Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67
Sheets, No. 10, hot rolled, Gary....	2.05	1.95	1.95	1.95	Scrap				
Sheets, No. 24, hot anneal., Gary..	2.60	2.50	2.50	2.50	Heavy melting steel, Pittsburgh..	\$14.00	\$13.80	\$15.75	\$12.30
Sheets, No. 24, galvan., Gary.....	3.30	3.20	3.20	3.20	Heavy melt, steel, No. 2, east. Pa.	11.50	10.90	12.70	9.75
Plain wire, Pittsburgh	2.40	2.40	2.40	2.30	Heavy melting steel, Chicago	13.25	12.75	14.35	10.25
Tin plate, per base box, Pitts.....	5.25	5.25	5.25	5.25	Rail for rolling, Chicago	14.00	14.00	15.75	11.25
Wire nails, Pitts.	2.10	2.10	2.10	2.60	Railroad steel specialties, Chicago	14.75	14.40	15.85	11.75
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs.	\$30.00	\$28.00	\$28.00	\$28.00	Connellsville, furnace, ovens	\$3.50	\$3.50	\$3.50	\$3.30
Sheet bars, open-hearth, Pitts.....	30.00	28.00	28.00	28.00	Connellsville, foundry, ovens	4.25	4.25	4.25	4.25
Billets, open-hearth, Pittsburgh....	30.00	28.00	28.00	27.00	Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25
Wire rods, Pittsburgh	38.00	38.80	40.00	38.00					

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel		Tin Mill Black No. 28		Corrosion and Heat-Resistant Alloys		Structural Shapes							
Prices Subject to Quantity Extras and Deductions (Except Galvanized)		Pittsburgh	2.75c	Pittsburgh base, cents per lb.		Pittsburgh	1.90c						
Hot Rolled No. 10, 24-48 in.		Gary	2.85c	Chrome-Nickel		Philadelphia, del.	2.11½c						
Pittsburgh	1.95c	St. Louis, delivered	3.08c	No. 302 No. 304		New York, del.	2.16¼c						
Gary	2.05c	Cold Rolled No. 10		Bars	23.00 24.00	Boston, delivered....	2.30½c						
Chicago, delivered..	2.08c	Pittsburgh	2.60c	Plates	26.00 28.00	Bethlehem	2.00c						
Detroit, del.	2.15c	Gary	2.70c	Sheets	33.00 35.00	Chicago	1.95c						
New York, del.	2.30c	Detroit, delivered....	2.80c	Hot strip	20.75 22.75	Cleveland, del	2.10c						
Philadelphia, del.....	2.26c	Philadelphia, del.....	2.91c	Cold strip	27.00 29.00	Buffalo	2.00c						
Birmingham	2.10c	New York, del.	2.95c	Straight Chromes		Gulf Ports	2.30c						
St. Louis, del.	2.28c	Pacific ports, f.o.b. cars, dock	3.20c	No. 410 No. 430 No. 442 No. 446		Birmingham	2.05c						
Pacific ports, f.o.b. cars, dock	2.50c	Cold Rolled No. 20		Bars	17.00 18.50 21.00 26.00	Pacific ports, f.o.b. cars, dock	2.45c						
Hot Rolled Annealed No. 24		Pittsburgh	3.05c	Plates	20.00 21.50 24.00 29.00	Bars							
Pittsburgh	2.50c	Gary	3.15c	Sheets	25.00 28.00 31.00 35.00	Soft Steel							
Gary	2.60c	Detroit, delivered....	3.25c	Hot strip	15.75 16.75 21.75 26.75	(Base, 3 to 25 tons)							
Chicago, delivered....	2.63c	Philadelphia, del.....	3.36c	Cold stp.	20.50 22.00 27.00 35.00	Pittsburgh	1.95c						
Detroit, delivered....	2.70c	New York, del.	3.40c					Chicago or Gary....	2.00c				
New York, del.....	2.85c	Enameling Sheets						Duluth	2.10c				
Philadelphia, del	2.81c	Pittsburgh, No. 10..	2.45c					Birmingham	2.10c				
Birmingham	2.65c	Pittsburgh, No. 20..	3.05c					Cleveland	2.00c				
St. Louis, del	2.82c	Gary, No. 10	2.55c					Buffalo	2.05c				
Pacific ports, f.o.b. cars, dock	3.15c	Gary, No. 20	3.15c					Detroit, delivered....	2.10c				
Galvanized No. 24		Tin and Terne Plate						Pacific ports, f.o.b. cars, dock	2.50c				
Pittsburgh	3.20c	Gary base, 10 cents higher.						Philadelphia, del....	2.26c				
Gary	3.30c	Tin plate, coke base (box) Pittsburgh	\$5.25					Boston, delivered....	3.37c				
Chicago, delivered..	3.33c	Do., waste-waste..	2.75c					New York, del	2.30c				
Philadelphia, del.	3.51c	Do., strips	2.50c					Pitts., forg. qual.....	2.20c				
New York, del.	3.55c	Long ternes, No. 24 unassorted, Pitts.	3.50c					Rail Steel					
Birmingham	3.35c	Do., Gary	3.60c					To Manufacturing Trade					
St. Louis, del.....	2.83c									Pittsburgh	1.80c		
Pacific ports, f.o.b. cars, dock	3.80c									Chicago or Gary....	1.85c		
												Moline, Ill.	1.85c
												Cleveland	1.85c
												Buffalo	1.90c

Iron	
Terre Haute, Ind....	1.85c
Chicago	1.90c
Philadelphia	2.16c
Pittsburgh, refined..	2.75-7.50c
Reinforcing	
New billet, straight lengths, quoted by distributors.	
Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.....	2.26c-2.36c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	1.90c
Chicago, Buffalo, Cleve- land, Birm., Young.....	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; less carloads \$4 higher; less carloads fencing \$5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
Stand. wire nails....	2.10c
Cement c'd nails....	2.10c
Galv. nails, 15 gage and finer	4.10c
do. finer than 15 ga. (Per pound)	4.60c
Polished staples....	2.80c
Galv. fence staples	3.05c
Barbed wire, galv...	2.60c
Annealed fence wire	2.65c
Galv. fence wire....	3.00c
Woven wire fencing (base column, c.l.)	\$58.00
To Manufacturing Trade	
Plain wire, 6-9 ga..	2.40c
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth up \$2; Birming- ham up \$3.	
Spring wire, Pitts. or Cleveland	3.05c
Do., Chicago up \$1, Worc. \$2.	

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination	
10,000 to 19,999 lbs.	2.25c
20,000 to 59,999 lbs.	2.20c
60,000 to 99,999 lbs.	2.15c
100,000 lbs. and over.....	2.12½c
Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.	

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons.)

Pittsburgh, Buffalo, Chi- cago, Massillon, Can- ton, Bethlehem	2.55c
Alloy	
S.A.E. Diff.	S.A.E. Diff.
2000.....0.25	3100.....0.55
2100.....0.55	3200.....1.35
2300.....1.50	3300.....3.30
2500.....2.25	3400.....3.20
4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25- 1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9200 spring flats	base
9200 spring rounds, squares	0.25

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

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

Hot strip to 23½-in.	
Pittsburgh	1.95c
Chicago or Gary....	2.05c
Birmingham base	2.00c
Detroit, del.	2.15c
Philadelphia, del.	2.26c
New York, del....	2.30c
Cooperage hoop, Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.25 carbon and under, Pitts., Cleveland..	2.60c
Detroit, del.	2.81c
Worcester, Mass..	2.80c
Cleve- Pitts. Worcester, Mass.	
Carbon	
0.26-0.50....	2.60c
0.51-0.75....	3.45c
0.76-1.00....	4.95c
Over 1.00....	6.50c

Rails, Track Material

(Gross Tons)

Standard rails, mill	\$36.37½
Relay rails, Pitts. 20-100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi....	\$35.00
Do., reroll. qual....	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel....	2.10c
Spikes, R. R. base..	2.60c
Track bolts, base....	3.60c
Tie plates, base.....	1.90c
Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up \$2; 16 and 20 lbs., up \$1; 12 lbs. up \$2; 8 and 10 lbs., up \$5. 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	
½ x 6 and smaller.....	70-10 off
Do. larger	70-5 off
Tire bolts	50 off
Plow Bolts	
All sizes	70-5 off
Stove Bolts	
In packages with nuts at- tached 75 off; in packages with nuts separate 75-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts	65 off
Elevator bolts	65 off

Nuts

S. A. E. semifinished hex.:	
½ to ¾-inch.....	60-20-15 off
Do., ½ to 1-inch.....	60-20-15 off
Do., over 1-inch.....	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off
Square Head Set Screws	
Upset, 1-in., smaller.....	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pitts- burgh, Cleveland	3.05c
Struc., c. l., Chicago	3.15c
¾-in. and smaller, Pitts., Chi., Cleve. 70 and 5 off	
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs....	\$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	\$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	\$3.05

Do., under 5 kegs; no
disc. on size extras..... \$3.20

Pipe and Tubing

Base \$200 net ton, except on
standard commercial seamless
boiler tubes under 2 inches and
cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe,
Pitts., Lorain, O., to consumers
in carloads. Gary, Ind., 2 points
less. Chicago, del. 2½ points
less. Wrought pipe, Pittsburgh.

Butt Weld Steel			
In.	Blk.	Galv.	
¼ and ¾.....	60	44½	
½.....	64½	55	
¾.....	67½	59	
1-3.....	69½	61½	
Iron			
½.....	31½	15	
¾.....	36½	20½	
1-1½.....	39½	25½	
2.....	41½	26	

Lap Weld Steel			
2.....	62	53½	
2½-3.....	65	56½	
3½-6.....	67	58½	
7 and 8.....	66	56½	
9 and 10.....	65½	56	
Iron			
2.....	37	22½	
2½-3½.....	38	25	
4-8.....	40	28½	

Line Pipe Steel			
½, butt weld.....	56		
¾ and 1, butt weld.....	59		
¾, butt weld	63½		
¾, butt weld	66½		
1 to 3, butt weld	68½		
2, lap weld	61		
2½ to 3, lap weld.....	64		
3½ to 6, lap weld.....	66		
7 and 8, lap weld.....	65		
Iron			
½-1½ inch, black and galv. take 4 pts. over; 2½-6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8-12- inch, no extra.			

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2-2¼.....	33	1¼.....	8
2½-2¾.....	40	2-2¼.....	13
3.....	47	2½-2¾.....	16
3¼-3½.....	50	3.....	17
4.....	52	3¼-3½.....	18
4½-5.....	42	4.....	20
		4½.....	21

In lots of a carload or more,
above discounts subject to
preferential of two 5% and one
7½% discount on steel and
10% on charcoal iron.

Lapwelded steel: 200 to 9999
pounds, ten points under base,
one 5% and one 7½%. Under
2000 pounds 15 points under
base, one 5% and one 7½%.
Charcoal iron: 10,000 pounds to
carloads, base less 5%; under
10,000 lbs., 2 points under base.

Seamless Boiler Tubes
Under date of May 15 in lots
of 40,000 pounds or more for
cold-drawn boiler tubes and in
lots of 40,000 pounds or feet or
more for hot-finished boiler
tubes, revised prices are quoted
for 55 cold-drawn boiler tube
sizes ranging from ¼ to 6-inch
outside diameter in 30 wall
thicknesses, decimal equivalent
from 0.035 to 1.000, on a dollars
and cents basis per 100 feet
and per pound. Less-carloads
revised as of July 1, 1935, card.

Hot-finished carbon steel boiler
tube prices also under date
of May 15 range from 1 through
7 inches outside diameter, in-
clusive, and embrace 47 size
classifications in 22 decimal
wall thicknesses ranging from
0.109 to 1.000, prices also being
on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.
100 ft. or 150 lbs. 32%
15,000 ft. or 22,500 lbs. 70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm. \$39.00-40.00	
4-in., Birmingham....	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago..	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00
Class A pipe \$3 over Class B Std. ftgs., Birm. base..	\$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton	
Pitts., Chi., Cleve., Buffalo & Young.	\$30.00
Philadelphia	36.67
Duluth	32.00
Forging Billets	
6 x 6 to 9 x 9-in., base	
Pitts., Chi., Buff....	37.00
Forging, Duluth	39.00
Sheet Bars	
Pitts., Cleve., Young, Chi., Buff., Can- ton, Sparrows Pt.	30.00
Slabs	
Pitts., Chi., Cleve., Young.	30.00
Wire Rods	
Pitts., Cleve., No. 4 to 5	\$38.00
Do., No. 5 to ¾-inch	40.00
Do., over ¾ to 1-inch	42.00
Chicago up \$1; Worcester up \$2	
Skep	
Pitts., Chi., Young, Buff., Coatesville, Sparrows Point....	1.80c

Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, fur....	\$3.50-3.65
Connellsville, fdry....	4.25-4.35
Connell, prem. fdry.	5.35-5.50
New River fdry.....	6.00
Wise county fdry....	4.45-5.00
Wise county fur....	4.00-4.50
By-Product Foundry	
Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	5.00
Chicago, del.	9.75
New England, del....	11.50
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50-8.00
Detroit, ov., out. del.	9.00
Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

Tank lots		Spot
Pure and 90% benzol....	18.00c	
Toluol	30.00c	
Solvent naphtha	30.00c	
Industrial xylol	30.00c	
Per lb. f.o.b. Frankford, Phenol (200 lb. drums) ..	15.50c	
Do. (450 lbs.)	14.50c	
Eastern Plants, per lb.		
Naphthalene flakes and balls, in bbls., to jobbers	7.25c	
Per 100 lbs. Atlantic seaboard Sulphate of ammonia....	\$1.25	
†Western prices, ½-cent up.		

Pig Iron

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$20.50	\$21.00	\$20.00	\$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	20.50	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	20.00
Jackson, O.	20.25	20.25	19.75	20.00
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	17.00	17.00	17.00
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	20.00	20.00	21.50
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00

Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	21.08	19.96	21.08
Boston from Birmingham	20.62	20.62	20.50	21.08
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	20.00	21.00
Brooklyn, N. Y., from Bmghm.	22.50	22.50	20.00	21.00
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	19.72	19.72	19.60	20.00
Cincinnati from Hamilton, O.	20.58	20.58	20.08	21.00
Cincinnati from Birmingham	20.20	20.20	19.20	20.00
Cleveland from Birmingham	19.62	19.62	19.12	20.00
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.27	21.07
Muskegon, Mich., from Chicago	22.60	22.60	22.10	23.10
Toledo or Detroit	21.61	21.61	21.11	22.11
Newark, N. J., from Birmingham	21.99	22.49	20.00	21.00
Newark, N. J., from Bethlehem	21.99	22.49	20.00	21.00
Philadelphia from Birmingham	20.93	20.93	20.81	21.00
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	21.00
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and \$1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25
St. Louis, northern	20.00	20.00	19.50	20.00

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	19.68	19.68	19.50	20.00
St. Paul from Duluth	21.94	21.94	21.94	22.44
†Over 0.70 phos.				

Low Phos.
Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$24.00, Phila. base, standard and copper bearing, \$25.13.

Gray Forge
Valley furnace 19.00 Lake Superior fur. \$22.00
Pitts. dist. fur. 19.00 Do., del. Chicago 25.25
Lylees, Tenn. 22.50

Charcoal
Lake Superior fur. \$22.00
Do., del. Chicago 25.25
Lylees, Tenn. 22.50

Silvery†
Jackson county, O., base; 6-6.50 per cent \$22.75; 6.51-7—\$23.25; 7-7.50—\$23.75; 7.51-8—\$24.25; 8-8.50—\$24.75; 8.51-9—\$25.25; 9-9.50—\$25.75. Buffalo \$1.25 higher.

Bessemer Ferrosilicon†
Jackson county, O., base: Prices are the same as for silveries, plus \$1 a ton.
†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.
Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1. per ton.

Refractories				
Per 1000 f.o.b. Works				
Fire Clay Brick				
Super Quality				
Pa., Mo., Ky.	\$55.00			
First Quality				
Pa., Ill., Md., Mo., Ky.	\$45.00			
Alabama, Georgia	\$38.00-45.00			
Second Quality				
Pa., Ill., Ky., Md., Mo.	40.00			
Georgia, Alabama	35.00			
Ohio				
First quality	\$40.00			
Intermediary	37.00			
Second quality	28.00			
Malleable Bung Brick				
All bases	50.00			
Silica Brick				
Pennsylvania	\$45.00			
Joliet, E. Chicago	54.00			
Birmingham, Ala.	48.00			
Ladle Brick (Dry Press)				
Pa., O., W. Va., Mo.	\$24.00			
Do., wire cut	22.00			
Magnesite				
Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Bal-				
timore bases (bags)	\$45.00			
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00			
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00			
Basic Brick				
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.				
Chrome brick	\$45.00			
Chem. bonded chrome	45.00			
Magnesite brick	65.00			
Chem. bonded magnesite	55.00			
Fluorspar, 85-5				
Washed gravel, duty paid, tide, net ton	\$21.50			
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$18.00			
Do., for barge	\$19.00			
Ferroalloys				
Dollars, except Ferrochrome				
Ferromanganese, 78-82% tidewater, duty paid	75.00			
Do., Balti., base	75.00			
Do., del. Pittsburgh	80.13			
Spiegeleisen, 19-20% dom. Palmer-ton, Pa., spot	26.00			
Do., New Orleans	26.00			
Ferrosilicon, 50% freight all, cl.	69.50			
Do., less carload	77.00			
Do., 75 per cent. Spot, \$5 a ton higher.	126-130.00			
Silicomane, 2½ carb.	85.00			
2% carbon, 90.00; 1%, 100.00				
Ferrochrome, 66-70% chromium, 4-6 carbon, cts. lb. del.	10.00			
Ferrotungsten, stand., lb. con. del.	1.30- 1.40			
Ferrovandium, 35 to 40% lb., cont.	2.70- 2.90			
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50			
Spot, 1 ton, frt. allow., lb.	7.00			
Do., under 1 ton	7.50			
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage	58.50			
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage	75.00			
Ferromolybdenum, stand. 55-65%, lb.	0.95			
Molybdate, lb. cont.	0.80			
†Carloads. Quan. diff. apply.				

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper				Straits Tin	Lead	Lead East	Zinc	Aluminum	Antimony	Nickel	
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	New York	N. Y.	St. L.	St. L.	99%	Chinese Spot, N. Y.	Cathodes	
July 11	9.50	9.62½	9.15	43.37½	42.00	4.60	4.45	4.75	*19.00	13.00	35.00
July 13	9.50	9.62½	9.15	44.75	43.62½	4.60	4.45	4.75	*19.00	13.00	35.00
July 14	9.50	9.62½	9.15	44.37½	43.25	4.60	4.45	4.75	*19.00	13.00	35.00
July 15	9.50	9.62½	9.15	44.00	42.75	4.60	4.45	4.75	*19.00	13.00	35.00
July 16	9.50	9.62½	9.15	43.37½	42.00	4.60	4.45	4.75	*19.00	13.00	35.00
July 17	9.50	9.62½	9.15	43.37½	42.00	4.60	4.45	4.75	19.00	13.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.50c Conn. copper

Yellow brass (high)	15.12½
Copper, hot rolled	17.00
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	17.37½
Seamless copper	17.50
Rods	
High yellow brass	12.12½
Copper, hot rolled	13.75
Anodes	
Copper, untrimmied	14.50
Wire	
Yellow brass (high)	15.37½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	6.00- 6.25
Cleveland	6.25- 6.50
*Chicago	5.87½-6.12½
St. Louis	5.75- 6.25
Heavy Copper and Wire	
New York, No. 1	7.50- 7.75
*Chicago, No. 1	7.37½-7.62½
Cleveland, No. 1	7.00- 7.50
St. Louis, No. 1	7.00- 7.50
Composition Brass Borings	
New York	5.75- 6.00
Light Copper	
New York	6.12½- 6.25
*Chicago	5.87½-6.12½
Cleveland	5.75- 6.00
St. Louis	5.50- 6.00

Light Brass	
Chicago	3.50- 3.62½
Cleveland	3.25- 3.50
St. Louis	3.25- 3.75
Lead	
New York	3.50- 3.75
Cleveland	3.50- 3.75
Chicago	3.25- 3.75
St. Louis	3.25- 3.75
Zinc	
New York	2.25- 2.50
Cleveland	2.25- 2.50
*St. Louis	2.50- 2.75
Aluminum	
Borings, Cleveland	8.00- 8.50
Mixed, cast, Cleve.	11.75-12.00
Mixed, cast, St. L.	11.25-11.75
Clips, soft, Cleve.	13.75-14.00
SECONDARY METALS	
Brass ingot, 85-5-5-5	9.50
*Stand. No. 12 alum.	16.25-16.75

Iron and Steel Scrap Prices

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

HEAVY MELTING STEEL		COUPLERS, SPRINGS		Buffalo	8.00- 8.25	Chicago, rolled steel	14.50-15.00
Birmingham	9.00- 9.50	Buffalo	14.75-15.25	Cincinnati, dealers..	5.00- 5.50	Cincinnati, iron.....	10.50-11.00
Bos. d'ck, No. 1, exp.†	10.50-10.75	Chicago, springs.....	14.50-15.00	(Cleveland	8.25- 8.75	Eastern Pa., iron.....	14.50
N. Eng. del. No. 1..	10.00	Eastern Pa.	16.00-16.50	Detroit	7.00- 7.50	Eastern Pa., steel....	16.00-16.50
Buffalo, No. 1	12.50-13.00	Pittsburgh	16.50-17.00	Eastern Pa.	5.75- 6.50	Pittsburgh, iron	14.50-15.00
Buffalo, No. 2	11.50-12.00	St. Louis	13.25-13.75	New York	†2.25- 2.50	Pittsburgh, steel	16.50-17.00
Chicago, No. 1	13.00-13.50			Pittsburgh	8.00- 8.50	St. Louis, iron	11.50-12.00
Cleveland, No. 1.....	13.00-13.50	ANGLE BARS—STEEL		Toronto, dealers	4.00	St. Louis, steel	14.00-14.50
Cleveland, No. 2.....	12.00-12.50	Chicago	14.00-14.50			Toronto, net	8.50
Detroit, No. 1	10.25-10.75	St. Louis	14.00-14.50	CAST IRON BORINGS			
Detroit, No. 2	8.75- 9.25	Buffalo	14.50-15.00	Birmingham, plain..	3.50- 4.00	NO. 1 CAST SCRAP	
Eastern Pa., No. 1..	12.00-12.50	RAILROAD SPECIALTIES		Boston dist. chem...†	6.00- 6.25	Birmingham	10.00-11.00
Eastern Pa., No. 2..	11.00-11.50	Chicago	14.50-15.00	Boston dist. for mills†	3.50- 4.00	Bos. dist. No. 1 mach.†	7.75- 9.00
Federal, Ill.	10.00-10.50	LOW PHOSPHORUS		Buffalo	8.00- 8.25	N. Eng., del. No. 2..	9.50-10.00
Granite City, R. R...†	11.75-12.25	Buffalo, billet and		Chicago, dealers	6.00- 6.25	N. Eng. del. textile..	11.00-11.50
Granite City, No. 2..	9.75-10.25	bloom crops	14.75-15.25	Cincinnati, dealers..	5.00- 5.50	Buffalo, cupola	11.50-12.00
New York, No. 2.....	†7.75- 8.25	Cleveland, billet,		Cleveland	8.25- 8.75	Buffalo, mach.	13.00-13.50
N. Y. d'ck, No. 1, exp.†	10.00-10.25	bloom crops	17.50-18.00	Detroit	7.00- 7.50	Chicago, agri. net....	10.00-10.50
Pitts., No. 1 (R. R.)	14.25-14.75	Eastern Pa., crops..	16.50	E. Pa., chemical.....	10.00-13.00	Chicago, auto	11.00-11.50
Pitts., No. 1 (dlr.)..	13.75-14.25	Pittsburgh, billet,		New York	†4.25- 4.50	Chicago, mach. net..	12.00-12.50
Pittsburgh, No. 2..	12.75-13.25	bloom crops	17.25-17.75	St. Louis	3.50- 4.00	Chicago, rail'r'd net..	11.00-11.50
St. Louis, R. R.	11.50-12.00	Pittsburgh, sheet		Toronto, dealers.....	5.00	Cincl., mach. cup...†	11.25-11.75
St. Louis No. 2.....	9.75-10.25	bar crops	15.50-16.00	PIPE AND FLUES			
Toronto, dealers	7.50	FROGS, SWITCHES		Cincinnati, dealers..	7.50- 8.00	E. Pa., mixed yard..	12.00-12.50
Valleys, No. 1.....	13.50-14.00	Chicago	13.00-13.50	Chicago, net	7.50- 8.00	Pittsburgh, cupola..	16.00-16.50
COMPRESSED SHEETS		St. Louis, cut	13.00-13.50	RAILROAD GRATE BARS			
Buffalo, dealers	11.50-12.00	SHOVELING STEEL		Buffalo	10.50-11.00	St. Louis, No. 1	10.75-11.25
Chicago, factory	11.50-12.00	Chicago	13.00-13.50	Chicago, net	8.25- 8.75	St. L., No. 1 mach.†	12.50-13.00
Chicago, dealer	11.00-11.50	Federal, Ill.	10.00-10.50	Cincinnati	7.00- 7.50	Toronto, No. 1	
Cleveland	12.75-13.25	Granite City, Ill.	9.75-10.00	Eastern Pa.	10.00-10.50	mach., net	9.00
Detroit	11.00-11.50	Toronto, dealers	6.50	New York	†6.00- 6.25	HEAVY CAST	
E. Pa., new mat.....	12.00-12.50	RAILROAD WROUGHT		St. Louis	9.00- 9.50	Boston dist. break..†	7.00- 8.50
E. Pa., old mat.....	10.50-10.75	Birmingham	7.50- 8.00	FORGE FLASHINGS			
Pittsburgh	13.75-14.25	Boston district	†7.25- 7.50	Boston district	6.50- 6.75	New England del....	9.50-10.00
St. Louis	7.75- 8.25	Buffalo, No. 1	11.50-12.00	Buffalo	11.50-12.00	Buffalo, break.	10.25-10.75
Valleys, No. 1	13.00-13.50	Buffalo, No. 2	12.50-13.00	Cleveland	11.50-12.00	Cleveland, break	12.50-13.00
BUNDLED SHEETS		Chicago, No. 1, net..	12.50-13.00	Detroit	9.50-10.00	Detroit, No. 1 mach.	
Buffalo	10.00-10.50	Chicago, No. 2	13.00-13.50	Pittsburgh	12.75-13.25	net	13.00-13.50
Cincinnati, del	7.75- 8.25	Cincinnati, No. 2..	10.50-11.00	FORGE SCRAP			
Cleveland	9.00- 9.50	Eastern Pa.	13.50-14.00	Boston district	†5.50- 6.00	Detroit, auto net....	11.00-11.50
Pittsburgh	12.75-13.25	St. Louis, No. 1.....	11.25-11.75	Chicago, heavy	14.00-14.50	Eastern Pa.	13.50-14.00
St. Louis	6.25- 6.75	St. Louis, No. 2.....	11.75-12.25	Eastern Pa.	12.00-12.50	New York breakable†	9.50-10.00
Toronto, dealers	4.50	Toronto, No. 1, dir.	7.00	ARCH BARS, TRANSOMS			
SHEET CLIPPINGS, LOOSE		SPECIFICATION PIPE		St. Louis	13.50-14.00	Pittsburgh	12.50-13.00
Chicago	8.00- 8.50	Eastern Pa.	12.00-12.50	AXLE TURNINGS			
Cincinnati	6.25- 6.75	New York	†7.75- 8.25	Boston district	†5.75- 6.00	Birmingham, R. R..	11.50-12.50
Detroit	7.75- 8.25	BUSHELING		Buffalo	11.00-11.50	New England del....	15.00-16.00
St. Louis	5.50- 6.00	Buffalo, No. 1	11.50-12.00	Chicago, elec. fur...†	12.75-13.25	Buffalo	15.50-16.00
STEEL RAILS, SHORT		Chicago, No. 1.....	11.50-12.00	Eastern Pa.	11.00-12.00	Chicago, R. R.	15.50-16.00
Birmingham	12.00-12.50	Cincinnati, No. 2..	4.50- 5.00	St. Louis	9.50-10.00	Cincinnati, agri. del.	12.50-13.00
Buffalo	15.50-16.00	Cleveland, No. 2	8.25- 8.75	Toronto	4.50	Cleveland, rail	15.75-16.25
Chicago (3 ft.)	15.00-15.50	Detroit, No. 1, new..	9.75-10.25	STEEL CAR AXLES			
Chicago, (2 ft.)	16.00-16.50	Valleys, No. 1	12.75-13.00	Birmingham	11.50-12.50	Boston dist.†	11.50-11.75
Cincinnati, del.	14.50-15.00	Toronto, dealers	6.00	Boston district	†11.50-11.75	Buffalo	15.50-16.00
Detroit	15.00-15.50	MACHINE TURNINGS		Chicago, net	15.00-15.50	Chicago, R. R.	15.50-16.00
Pitts., open-hearth,		Birmingham	4.00- 5.00	Eastern Pa.	17.00	Cincinnati, rail	15.75-16.25
3 ft. and less	15.75-16.25	Boston district	†3.50- 3.75	St. Louis	14.50-15.00	Detroit, auto, net....	14.50-15.00
St. Louis, 2 ft. & less	15.50-16.00	Buffalo	6.50- 7.00	Toronto	8.50	Eastern Pa., R. R..	15.50-15.75
STEEL RAILS, SCRAP		Chicago	6.00- 6.50	SHAFTING			
Boston district	†7.50- 8.00	Cincinnati, dealers..	5.75- 6.25	Boston district	†13.50-13.75	Pittsburgh, rail	17.00-17.50
Chicago	13.00-13.50	Cleveland	7.50- 8.00	Eastern Pa.	19.00	St. Louis, R. R.....	13.00-13.50
Pittsburgh	14.25-14.75	Detroit	6.25- 6.75	New York	†14.00-14.50	Toronto, net	7.00
St. Louis	13.00-13.50	Eastern Pa.	8.00- 8.50	St. Louis	13.50-14.00	RAILS FOR ROLLING	
Buffalo	12.50-13.00	New York	†4.00- 4.25	5 feet and over			
Toronto, dealers	8.50	Pittsburgh	9.50-10.00	Birmingham	11.50-12.50	Boston district	†9.00- 9.50
STOVE PLATE		St. Louis	4.00- 4.50	Buffalo	15.00-16.00	Buffalo	12.50-13.00
Birmingham	7.00- 7.50	Toronto, dealers	4.00	Eastern Pa.	17.00	Chicago	13.75-14.25
Boston district	†5.00- 5.25	Valleys	9.50- 9.75	St. Louis	14.50-15.00	Eastern Pa.	15.00-15.50
Buffalo	10.00-10.25	BORINGS AND TURNINGS		New York	†14.00-14.50	New York	†9.50-10.00
Chicago	7.50- 8.00	Boston district	†2.00	St. Louis	13.50-14.00	St. Louis	13.75-14.25
Cincinnati, dealers..	7.75- 8.50	For Blast Furnace Use		LOCOMOTIVE TIRES			
Detroit, net	9.00- 9.50	iron, 6-10% man.	10.50	Chicago (cut)	14.50-15.00	Chicago, No. 1	12.00-12.50
Eastern Pa.	10.50	No. Afr. low phos.	10.50	LOW PHOS. PUNCHINGS			
New York, fdry.....	†7.00- 7.25	Swedish basic, 65%	9.50	Buffalo	14.75-15.25	Buffalo	14.75-15.25
St. Louis	7.50- 8.00	Swedish low phos..	10.50	Chicago	15.50-16.00	Chicago	15.50-16.00
Toronto, dealers, net	5.50	Spanish No. Africa		Eastern Pa.	16.00-16.50	Eastern Pa.	16.00-16.50
		basic, 50 to 60%	10.50	Pittsburgh (heavy)†	17.00-17.50	Pittsburgh (heavy)†	17.00-17.50
		Tungsten, spot sh.		Pittsburgh (light)..	16.00-16.50	Pittsburgh (light)..	16.00-16.50
		ton unit, duty pd..	†15.35-16.60				
		N. F., fdy., 55%	7.00				
		Chrome ore, 48%					
		gross ton, c.i.f.....	19.25				

Iron Ore

Lake Superior Ore		Eastern Local Ore	
<i>Gross ton, 51½%</i>		<i>Cents, unit, del. E. Pa.</i>	
Lower Lake Ports		Foundry and basic	
Old range bessemer	\$4.80	56-63% con. (nom.)	8.00- 9.00
Mesabi nonbess.	4.50	Cop.-free low phos.	
High phosphorus	4.40	58-60% (nom.)....	10.00-10.50
Mesabi bessemer	4.65	Foreign Ore	
Old range nonbess.	4.65	<i>Cents per unit, f.a.s. Atlantic</i>	
		<i>ports (nominal)</i>	
		Foreign manganiferous ore, 45.55%	

iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos..	10.50
Spanish No. Africa	
basic, 50 to 60%	10.50
Tungsten, spot sh.	
ton unit, duty pd..	†15.35-16.60
N. F., fdy., 55%	7.00
Chrome ore, 48%	
gross ton, c.i.f.....	19.25

Manganese Ore

(Nominal)

<i>Prices not including duty.</i>	
<i>cents per unit cargo lots</i>	
Caucasian, 50-52%	26.00
So. African, 50-52%	26.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	Cincinnati	3.25c	Buffalo	3.47c	Pittsburgh (h)	3.05c	St. Louis	3.65c
Baltimore*.....	Houston	3.25c	Chattanooga..	3.66c	San Francisco	3.45c	St. Paul	3.65c
Boston††	Los Angl., cl..	2.45c	Chicago	3.30c	Seattle	3.80c	COLD FIN. STEEL	
Buffalo	New Orleans	3.50c	Cincinnati	3.52c	St. Louis	3.40c	Baltimore (c)	3.88c
Chattanooga..	Pitts., plain (h)	3.05c	Cleveland, ¼-		St. Paul	3.40c	Boston	4.05c
Chicago (j)....	Pitts., twisted		in. and over	3.31c	Tulsa	3.80c	Buffalo (h)....	4.05c
Cincinnati	squares (h)	3.175c	Detroit	3.52c	NO. 24 BLACK		Chattanooga*	3.70c
Cleveland	San Francisco	2.45c	Detroit, ⅜-in.	3.85c	Baltimore*†...	3.70c	Chicago (h)...	4.28c
Detroit	Seattle	2.45c	Houston	3.10c	Boston (g)....	4.05c	Cincinnati	3.87c
Houston	St. Louis	3.35c	Los Angeles..	3.70c	Buffalo	3.35c	Cleveland (h)	3.65c
Los Angeles..	Tulsa	3.25c	Milwaukee ...	3.41c	Chattanooga*	3.41c	Detroit	3.79c
Milwaukee 3.21c-3.36c	Young.....	2.30c-2.60c	New Orleans..	3.65c	Chicago	3.95c	Los Ang. (f) (d)	6.00c
New Orleans..	SHAPES		New York†(d)	3.50c	Cincinnati	4.12c	Milwaukee	3.76c
New York†(d)	Baltimore*....	3.10c	Philadelphia*	3.10c	Cleveland	3.91c	New Orleans..	4.45c
Pitts. (h)....	Boston††	3.29c	Phila. floor..	4.95c	Detroit	4.04c	New York†(d)	3.96c
Philadelphia*	Buffalo	3.35c	Pittsburgh (h)	3.25c	Los Angeles..	4.45c	Philadelphia*	3.91c
Portland	Chattanooga..	3.66c	Portland	3.45c	Milwaukee ...	4.06c	Pittsburgh	3.50c
San Francisco	Chicago	3.30c	San Francisco	3.35c	New Orleans	4.50c	Portland (f) (d)	6.30c
Seattle	Cincinnati	3.52c	Seattle	3.65c	New York†(d)	3.99c	San Fran. (f) (d)	6.10c
St. Louis	Cleveland	3.31c	St. Louis	3.55c	Philadelphia*†	3.75c	Seattle (f) (d)	6.30c
St. Paul.....	Detroit	3.52c	St. Paul	3.55c	Pitts.** (h)	3.55c-4.85c	St. Louis	3.90c
Tulsa	Houston	3.10c	Tulsa	3.60c	Portland	4.20c	St. Paul	4.17c
IRON BARS	Los Angeles..	3.70c	NO. 10 BLUE		San Francisco	4.10c	Tulsa	4.80c
Portland	Milwaukee ...	3.41c	Baltimore*....	3.10c	Seattle	4.50c	COLD ROLLED STRIP	
Chattanooga..	New Orleans..	3.65c	Boston (g)....	3.40c	St. Louis	4.20c	Boston	3.245c
Baltimore*....	New York†(d)	3.47c	Buffalo	3.72c	St. Paul	4.00c	Buffalo	3.39c
Chicago	Philadelphia*	3.10c	Chattanooga..	3.46c	Tulsa	4.85c	Chicago	3.27c
Cincinnati	Pittsburgh (h)	3.25c	Chicago	3.15c	NO. 24 GALV. SHEETS		Cincinnati (b)	3.22c
New York†(d)	Portland (i)..	3.60c	Cincinnati	3.32c	Baltimore*†...	3.90c	Cleveland (b)	3.00c
Philadelphia*	San Francisco	3.35c	Cleveland	3.11c	Buffalo	4.10c	Detroit	3.18c
St. Louis	Seattle (i)....	3.55c	Det. 8-10 ga.	3.24c	Boston (g)....	4.05c	New York†(d)	3.36c
Tulsa	St. Louis	3.45c	Houston	3.45c	Chattanooga*	3.96c	St. Louis	3.41c
REINFORCING BARS	St. Paul	3.55c	Los Angeles..	3.85c	Chicago (h)...	4.65c	TOOL STEELS	
Buffalo	Tulsa	3.60c	Milwaukee ...	3.26c	Cincinnati	4.82c	(Applying on or east of	
Chattanooga..	PLATES		New Orleans..	3.65c	Cleveland	4.61c	Mississippi river; west	
Chicago.....	Baltimore*....	3.10c	New York†(d)	3.41c	Detroit	4.82c	of Mississippi 1c up)	
Cleveland (c)	Boston††	3.31c	Portland	3.45c	Houston	4.50c	Base	
			Philadelphia*	3.20c	Los Angeles..	4.50c	High speed	57c
					Milwaukee ...	4.76c	High carbon, high	
					New Orleans	4.95c	chrome	37c
					N. Y.†(d)	4.30-4.50c	Oil hardening	22c
					Philadelphia*†	4.50c	Special tool	20c
					Pitts.** (h)	4.30c-5.55c	Extra tool	17c
					Portland	4.60c	Regular tool	14c
					San Francisco	4.60c	Uniform extras apply.	
					Seattle	5.10c	BOLTS AND NUTS	
					St. Louis.....	4.90c	(100 pounds or over)	
					St. Paul	4.60c	Discount	
					Tulsa	5.20c	Chicago (a)	65
					BANDS		Cleveland	70
					Baltimore*....	3.30c	Detroit	70
					Boston††	3.40c	Milwaukee	70
					Buffalo	3.52c	Pittsburgh	65-5
					Chattanooga..	3.71c		
					Chicago	3.40c	(a) Under 100 pounds,	
					Cincinnati	3.57c	60 off.	
					Cleveland	3.36c	(b) Plus straighten-	
					Detroit, ⅜-in.		ing, cutting and quan-	
					and lighter	3.49c	tity differentials; (c)	
					Houston	3.35c	Plus mill, size and	
					Los Angeles..	4.20c	quantity extras; (d)	
					Milwaukee ...	3.51c	Quantity base; (e)	
					New Orleans..	4.05c	New mill classif. (f)	
					New York†(d)	3.66c	Rounds only; (g) 50	
					Philadelphia*	3.30c	bundles or over; (h)	
					Pittsburgh(h)	3.30c	Outside delivery, 10c	
					Portland	4.35c	less; (i) Under 3 in.;	
					San Francisco	4.20c	(j) Shapes other than	
					Seattle	4.35c	rounds, flats, fillet an-	
					St. Louis	3.65c	gles, 3.25c	
					St. Paul	3.65c	Prices on heavier	
					Tulsa	3.55c	lines are subject to new	
					HOOPS		quantity differentials:	
					Baltimore	2.30c	399 lbs. and less, up 50	
					Boston††	4.40c	cts.; 400 to 3999 lbs.,	
					Buffalo	3.52c	base; 4000 to 7999	
					Chicago	3.40c	lbs., 15 cts., under; 8000	
					Cincinnati	3.57c	to 14,999 lbs., 25 cts.	
					Det., No. 14		under; 15,000 to 39,999	
					and lighter	3.49c	lbs., 35 cts. under; 40,-	
					Los Angeles..	5.95c	000 lbs. and over, 50	
					Milwaukee ...	3.51c	cts. under; (except	
					New York†(d)	3.66c	Boston).	
					Philadelphia*	3.55c	†Domestic steel; *Plus	
					Pittsburgh(h)	3.80c	quan. extras; **Under	
					Portland	5.70c	25 bundles; ††50 or more	
					San Francisco	6.25c	bundles; †New extras	
					Seattle	5.70c	apply; ††Base 40,000	
							lbs., extras on less.	

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, July 16

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

PIG IRON	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
	£	s d	Quoted in dollars at current value	**Quoted in gold pounds sterling
Foundry, 2.50-3.00 Silicon	\$15.72	3 2 6*	\$13.86	£ 15 0
Basic bessemer.....	15.72	3 2 6*	11.89	1 10 0
Hematite, Phos. .03-.05..	18.74	3 14 6		
SEMIFINISHED STEEL				
Billets.....	\$29.55	5 17 6	\$18.61	2 7 0
Wire rods, No. 5 gage....	45.02	8 19 0	35.65	4 10 0
FINISHED STEEL				
Standard rails.....	\$41.50	8 5 0	\$43.57	5 10 0
Merchant bars.....	1.74c	7 15 0	1.12c to 1.16c	3 2 6 to 3 5 0
Structural shapes.....	1.69c	7 10 0	1.11c	3 1 6
Plates, ½ in. or 5 mm....	1.81c	8 1 3	1.53c	4 5 0
Sheets, black, 24 gage or 0.5 mm.....	2.19c	9 15 0	2.08c	5 16 0††
Sheets, gal., 24 gage, corr.	2.64c	11 15 0	2.15c	6 0 0
Bands and strips.....	1.97c	8 15 0	1.43c	4 0 0
Plain wire, base.....	2.19c	9 15 0	1.89c	5 5 0
Galvanized wire, base....	2.59c	11 10 0	2.10c	5 17 6
Wire nails, base.....	2.70c	12 0 0	1.71c	4 15 0
Tin plate, box 108 lbs....	\$ 4.72	0 18 9		

British ferromanganese \$75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d (\$43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£	s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, Si. 2.5.....	\$18.86	3 15 0(a)	\$17.26	260	\$13.86
Basic bessemer pig iron...	18.86	3 15 0(a)	12.62	190	11.83
Furnace coke.....	5.66	1 2 6	6.31	95	4.12
Billets.....	30.81	6 2 6	28.55	430	18.76
Standard rails.....	1.86c	8 5 0	1.68c	671	1.50c
Merchant bars.....	2.10c	9 7 0	1.65c	560	.98c
Structural shapes.....	2.11c	9 7 0	1.65c	550	.98c
Plates, ½ in. or 5 mm....	2.18c	9 13 9	2.10c	700	1.20c
Sheets, black.....	2.59c	11 10 0	1.80c	600†	1.31c
Sheets, galv., corr., 24 ga. or 0.5 mm.....	3.04c	13 10 0	3.00c	1,000	2.25c
Plain wire.....	2.19c	9 15 0	2.85c	950	1.73c
Bands and strips.....	2.27c	10 2 0	1.95c	650	1.20c

*Basic. †British ship-plates. Continental, bridge plates. \$24 ga. \$1 to 3 mm. basic price. ††del. Middlesbrough. b hematite. ††Close annealed. **Gold pound sterling carries a premium of 62.75 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh—Mills are under considerable pressure for steel bar deliveries, with makers of cold-finished taking most of the bars currently rolled. Some slight falling off in demand from auto partsmakers is noted and also a slight hesitancy on the part of farm implement makers, but these are being offset in other directions. The new price on bars has gone over quietly and no longer is a matter for trade discussion.

Cleveland—Enough new business has appeared to show favorable acceptance of the recent price advance. Buying by auto partsmakers and farm equipment manufacturers predominates. Stocks of cold bar finishers, roadmaking equipment and steel forging concerns are normal, indicating little speculative buying.

Chicago—Bar sales are lighter, influenced by previous forward coverage and by declining activity in the farm implement, tractor and automotive industries. These three groups still are running exceptionally well for this period, however. Heavy shipments continue against contracts and backlogs are such that average delivery of three to four weeks is required on new business. The 2.00c, base, on billet steel bars is being tested by relatively small lots.

Boston—In view of labor tension some consumers are expanding stocks of steel bars. As a result, bookings have been unusually heavy. The new 1.95c, base, Pittsburgh, price is being done on all this new business.

New York—Railroads and bolt and nut manufacturers are specifying actively for steel bars, with leading producers booked ahead for four to five weeks.

Philadelphia — Miscellaneous demand for commercial steel bars is less active than a week ago; nevertheless, sellers are well booked ahead, not only on commercial bars, but even more particularly on hot alloy bars and cold-drawn forms. Machinery equipment builders continue to make heavy demands for cold-drawn bars. Prices are firm at the \$2 increase, effective at the beginning of this quarter, on carbon and hot alloy bars, and at the \$3 advance on cold-finished bars.

Youngstown, O.—Steel bar requirements are being pressed upon mills in generous lots. In the month of June it was thought the good bar business was due to anticipation of higher third quarter price. However, it would appear that this June material has already gone into consumption and new lots are being required to replace them.

Metallizing Engineering Co. Inc.

New York and Chicago, has established a branch office at 5432 Cass avenue, Detroit. J. Hammond, formerly of the New York office, has been appointed manager.

Plates

Plate Prices, Page 70

New York—Texas Co., New York, is inquiring for two tankers for which about 9000 tons of hull steel will be required. Recent award of

eight tankers by Standard Vacuum Transportation Co., New York, is followed by announcement that the gross tonnage of these ships is 103,000 tons, exceeding by 12,000 tons that of all craft under construction in all yards of the United States in second quarter. This contract involves about \$13,000,000 and is understood to be the largest ship order ever placed by a private corporation in the United States. They will be entirely fireproof, including furniture and fittings, powered by water tube boilers by Foster Wheeler Corp. and Babcock & Wilcox Co.

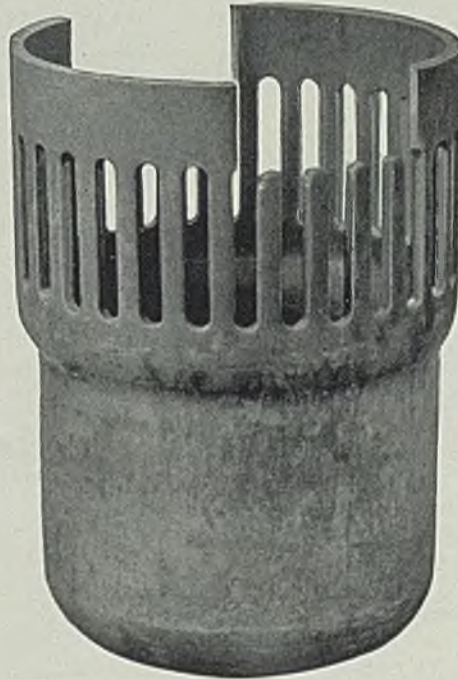
SPECIAL SEAMLESS SHELLS SHAPES

**A
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THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

Pending appointment of marine authority to administer the new ship subsidy bill some cargo ship tonnage is being held up, including one ship for the Matson Line, requiring about 6000 tons of hull steel.

Cleveland — While considerable tonnage was placed on identified jobs before July 1, with the purpose of getting price protection, little has actually been let; during the latter part of the month the remainder is expected to materialize.

Chicago—Railroad equipment and structural work continue to provide the best sources for new plate busi-

ness. Additional freight car orders lately will serve to bolster plate backlogs further. A good outlook holds in the structural market, while tank fabricators expect to continue busy through the summer.

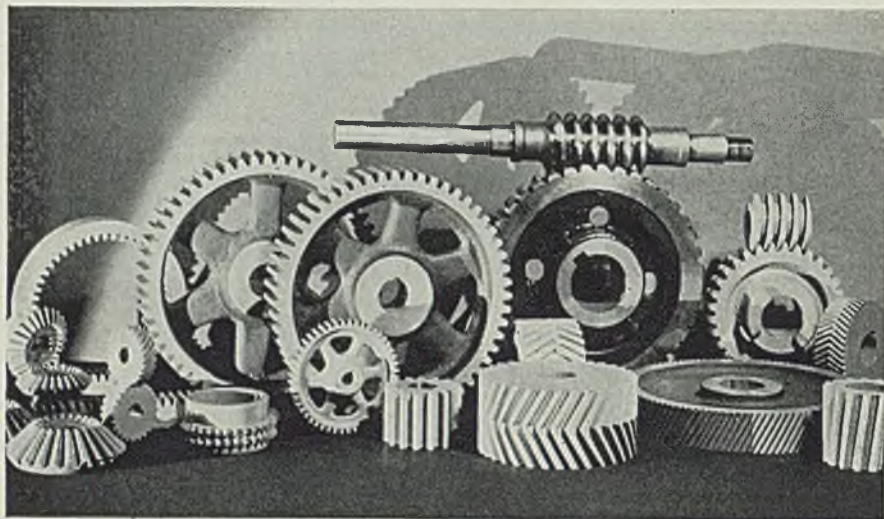
Boston—The steel plate market is more active than at any time since 1929, due to difficulty in obtaining prompt shipment. In many cases shipment cannot be made in less than four to six weeks.

Philadelphia — Plate production in this district is at the heaviest rate, perhaps, in several years. Producers see little let-up before next

month; in fact, the rate will probably be increased, due to pressure for deliveries. New contracts over the past week have been confined principally to identified work, on which former prices will rule for the first 30 days of this quarter. Within the week the Sun Shipbuilding & Dry Dock Co., Chester, Pa., placed a substantial tonnage with at least one Pittsburgh mill and two eastern producers participating. This tonnage is said to be for a tanker to be built for the Sun Oil Co. The market is firm at 2.00c, Coatesville, Pa., or 2.09c, Philadelphia.

San Francisco—The only plate award of size went to Western Pipe & Steel Co. and involved 100 tons for a 30-inch welded steel line for the metropolitan water district, Los Angeles. The district has just opened bids on 100 tons of 18-inch welded pipe. Denver has opened bids on 3610 tons of 43-inch welded steel pipe and has taken an alternate bid on reinforced concrete pipe. Bookings so far this year total 94,726 tons, compared with 23,115 tons for the same period a year ago.

Seattle—Several projects involving tonnages of plates are developing but are not yet up for figures. Small lots for tank and boiler jobs and ship repair work predominate. Commercial Iron Works, Portland, has taken a contract to build nine large steel bell buoys for the Lighthouse department, involving a reported tonnage of 100.



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THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

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Contracts Placed

615 tons, two 82,000-barrel tanks, Texas Co., Port Neches, Tex., to Petroleum Iron Works Co., Beaumont, Tex.
510 tons, two oil tanks, Sheldon, Mo., for Empire Companies, to Chicago Bridge & Iron Works, Chicago.
270 tons, tank, Hartford Electric Light Co., Hartford, Conn., to Chicago Bridge & Iron Works, Chicago.
145 tons, gas holder, Warsaw, Ind., to Chicago Bridge & Iron Works, Chicago.
130 tons, elevated tank, Cotuit, Mass., to Chicago Bridge & Iron Works, Chicago, through R. H. Newell Co., Uxbridge, Mass.
110 tons, three tanks, Gulf Refining Co., Evansville, Ind., to Chicago Bridge & Iron Works, Chicago.
100 tons, tanks, Tide Water Oil Sales Co., to Warren City Tank & Boiler Co., Warren, O.
100 tons, 30-inch welded steel pipe, metropolitan water district, Los Angeles, bid 62,667; to Western Pipe & Steel Co., Los Angeles.
100 tons, tank, Cambridge Gas Light Co., Cambridge, Mass., to Chicago Bridge & Iron Works, Chicago.
100 tons, bell buoys for lighthouse department, to Commercial Iron Works, Portland, Oreg.
Unstated tonnage, 80 miles of 8½-inch pipe for Penn-York Natural Gas Co., Buffalo, N. Y., to A. O. Smith Corp., Milwaukee.

Contracts Pending

45,000 tons, principally plates, steel floating dry dock for Pearl Harbor,

Hawaii, bids to be opened by the bureau of yards and docks, navy, Washington, D. C., Sept. 30.

Sheets

Sheet Prices, Page 70

Pittsburgh—Heavy pressure continues to be exerted upon sheet mills in this district for quick deliveries. Buyers of sheets appear fully as anxious today for deliveries as they were in the middle of June, showing that most of the material bought before July 1 has gone immediately into consumption. Mills seem booked for sheets well into August and are not anxious to take more additional tonnage than possible at this time. Volume of new buying for new model automobiles is not large as yet, but a great deal of the current sheet shipments is earmarked for the completion of building schedules for the old models. The new price schedule is being adhered to firmly and buyers apparently have accepted it without question.

Cleveland—Auto demand is unusual for this time of year and orders at the advanced prices, some involving heavy tonnages, have been received for the present models. Some mills have been forced to turn away orders because of inability to meet required delivery. Cold-rolled sheets are in greater demand than hot-rolled with galvanized far ahead of enameled sheet and well above normal.

Chicago—Shipments continue heavy but recently were reduced by hot weather, which made full operation of mills difficult. New business is in fair volume, considering that consumers during June anticipated part of their current needs. Automotive interests are placing some small lots for 1937 models and continue to take heavy deliveries.

Boston—New England consumers are placing orders considerably in excess of present consuming requirements to accumulate stocks to tide them over any emergency shortage. In the sheet market considerable business of this character has involved cold-rolled and galvanized sheets, at the advanced prices.

New York—Demand for steel sheets is slowing although there is still considerable pressure for deliveries. Most producers are well booked ahead.

Philadelphia—A tight situation continues in sheets, with consumers pressing for deliveries and some mills now booked solidly until the middle of next month and on some grades two or three weeks beyond that. While some current demand is undoubtedly speculative, probably induced in part by fear of labor trouble in the steel industry later, a heavy

amount of steel is being consumed with new tonnage badly needed. Bids were opened July 15 on 250 tons of automobile license tag stock by the state of Pennsylvania. The material will be 25 gage, one-pass cold-rolled, blue-pickled and annealed. Federal Industries board, Northeast prison, Lewisburg, Pa., is inquiring for 225 tons of 18-gage and lighter, hot rolled annealed and hot rolled pickled sheets.

Youngstown, O.—Sheet mills are operating at practical capacity and backlogs insure continued operations

through July. Some material is going to automotive builders for old models and some to partsmakers engaged on new model equipment. This indicates the usual break between old and new model periods will be short, probably not more than a week or so in mid-August.

St. Louis—A fair volume of new orders for sheets has been booked at the new price shipments on contracts continue at the high rate of recent weeks. Consumption is apparently heavy, and despite strong buying before the July 1 advance,



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Every bar is a "thoroughbred" . . . made to meet any given requirements . . . the one best steel to meet your most exacting specifications in cold drawn steel . . . why Wyckoff is your logical specification, always.

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General Offices: First National Bank Bldg., Pittsburgh, Pa.

Mills at Ambridge, Pa. and Chicago, Ill.

Manufacturers of Carbon and Alloy Steels

Turned and Polished Shafting Turned and Ground Shafting

consumer stocks as a rule are not large. This fact is emphasized by pressure for deliveries.

Cincinnati—Sheet mills will maintain production this month much higher than anticipated. Buying at the old prices created a backlog which is nearly exhausted, but new buying by miscellaneous users falls to show the customary July lull.

Farnham Mfg. Co., Buffalo, has moved to larger quarters in the International Railway Co.'s building at Seneca and Elk streets. The company makes machines for the mill-

ing, bakery, chemical, airplane and gold mining industries.

Bolts, Nuts and Rivets

Bolt, Nut, Rivet Prices, Page 71

Consumption of bolts, nuts and rivets in the farm implement and tractor industries is declining seasonally, though partly offset by heavier requirements of railroad shops and railroad equipment builders. Miscellaneous consumption is fairly steady for this period, but is tend-

ing downward slightly. Prices so far have been tested by rather small lots. Large rivets are steady at 3.05c, Pittsburgh, 3.15c, Chicago.

Transportation

Track Material Prices, Page 71

After fairly heavy bookings of cars and rails railroads are taking a breathing spell and in the past week only 360 freight cars and 19 passenger cars were placed, with 6600 tons of rails.

However, car repair work is furnishing some prospective steel tonnage, the Pittsburgh and Lake Erie inquiring for steel for the repair of 1000 steel hoppers and the Pennsylvania is said to be planning an extensive car repair program.

Buying of track fastenings is fairly steady at a good rate and further buying of steel rails is expected to get under way shortly.

Cars Orders Placed

Green Bay & Western, 50 box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Minneapolis & St. Louis, 60 hoppers, to General American Tank Car Corp., Chicago.

Seaboard Air Line, six passenger coaches and four combination passenger and baggage coaches, to Pullman-Standard Car Mfg. Co., Chicago.

Temiskaming & Northern Ontario, nine coaches, five to be air-conditioned, to National Steel Car Corp. Ltd., Montreal.

Wisconsin Central, 250 box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Rail Orders Placed

Boston & Maine, 2100 tons rails, to Bethlehem Steel Co., Bethlehem, Pa.

St. Louis-Southwestern, 3500 tons to Carnegie-Illinois Steel Corp., Chicago, 1000 tons to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

Kennecott Copper Co., 50 100-ton ore cars, pending.

Lehigh & New England, six caboose cars, pending.

Pittsburgh & Lake Erie, rebuilding of 1000 hopper cars, bids asked.

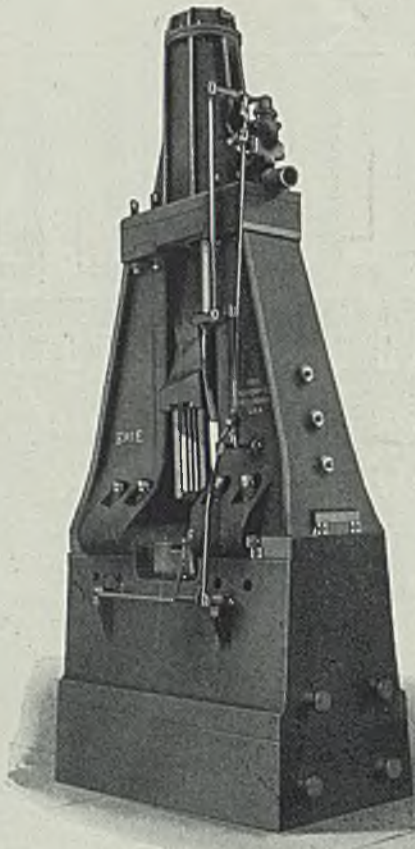
Locomotives Pending

Monessen Southwestern, one 0-6-0 switch engine, bids asked.

Quicksilver

New York—Quicksilver prices are steady with moderate improvement in buying interest. Small lots of 15 to 25 virgin flasks are quoted at \$74 to \$74.50 per 76-pound flask and round lots of 100 flasks are quotably \$73.50. Sales volume also has picked up during the past week.

The Pyramids Have Stood The Test Of Time



Merely a glance will show the relation between this **ERIE** steam drop hammer and the pyramids. Closer study will reveal what its pyramidal construction will mean in rigidity, accuracy, force of blow. Drop forgers will know from experience that, like the pyramids, it will stand the test of time.

The picture shows an **ERIE** steam drop hammer equipped with ring type piston valve. **ERIE** steam hammers can also be furnished with balanced, flat slide valves.

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Pipe

Pipe Prices, Page 71

Pittsburgh—While no single large orders are reported for line pipe, other grades are showing continued activity. Some new business in small lots is going in lap and butt welded pipe and also the smaller sizes of seamless tubing, most destined directly for building construction. Jobbers are also taking some interest in replenishing stocks of smaller sizes of pipe.

Cleveland—Deliveries still remain two or three weeks behind. Much standard pipe has been going into industrial building work; little tonnage has been used in repair work. Large orders have been few the last few weeks. Demand for cast pipe has been mild, little municipal work appearing.

Chicago—Original low bidder on 689 tons of 24-inch cast pipe for Chicago has been disclosed as low on second bids taken recently. Cast pipe orders include small lots principally. Producers have sufficient backlogs and orders in prospect to maintain fairly heavy deliveries through the quarter.

Boston—While not many large orders are included in recent cast pipe lettings, a good total is made up by many small orders. Despite the fact that pipe foundries are well provided with business, some irregularities in price are reflected.

New York—The leading event in the cast pipe market here during the past week has been the appearance of a new inquiry involving 750 tons. Otherwise demand is quiet. Prices reflect no change.

Cities Service Co., through its subsidiary the Penn-York Co., has closed bids on several thousand tons of 8 and 10-inch steel pipe for a 120-mile line from Harrison Valley, Pa., to Buffalo and Dunkirk, N. Y. Rochester Gas & Electric Co., Rochester, N. Y., has plans for the installation of a 4-inch steel pipe line near Parmo, N. Y., to cost about \$50,000.

Texas Pipe Line Co., Houston, Tex., has awarded a lapwelded six-inch pipe line to White Deer Pipe Line Co., about 1500 tons, to run between Crowell and Quanah, Tex., 30 miles. The line will be Lindewelded throughout.

Birmingham, Ala.—Heavy shipments of cast iron pressure pipe is noted, a considerable tonnage moving to the far west. Schedules of operations range between three and five days per week.

It develops that the large order for 60-inch steel pipe for the local industrial water project, some 883,-

000 lineal feet, totals 10,500 tons. Award was to Chicago Bridge & Iron Works and Ingalls Iron Works, both for Birmingham shops.

Youngstown, O.—All grades of wrought pipe continue in active demand. The largest new pipe order, aggregating 5000 tons, has been started into production at the Brier Hill Electric Weld mills of the Youngstown Sheet & Tube Co. for the United Gas Public Service Co., Houston, Tex.

Denver—Lock Joint Pipe Co.,

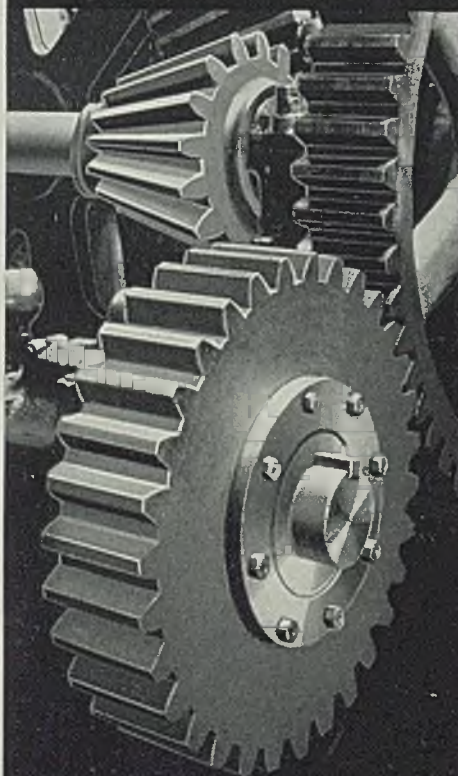
Newark, N. J., has been awarded ten miles of 42-inch concrete water pipe for this city. Steel requirements are about 3500 tons, divided fairly equally between rods and 14 to 8 gage steel sheets.

San Francisco—Few cast pipe inquiries are current and aggregate less than 600 tons.

Seattle—Demand is slow and sales consist of small lots out of stock. Several sizable projects are planned but details have not been released. Portland, Oreg., received eight identical bids for furnishing a ton-

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THE illustration at the left shows INSUROK bevel and spur pinions subjected to 24-hours per day continuous duty on a 132-inch board machine backdrive; hard, gruelling, destructive—the final and conclusive test of performance of any material.

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Indianapolis, Ind.

nage of small diameter copper tubing.

Cast Pipe Placed

5000 tons, seamless and lap-welded pipe for new plant of the United Gas Public Service Co., Houston, Tex., to Youngstown Sheet & Tube Co., Youngstown, O.
 1130 tons, 4 to 16-inch, East Bay municipal utility district, Oakland, Calif., allocated as follows: 747 tons to United States Pipe & Foundry Co., Burlington, N. J., and 383 tons to American Cast Iron Pipe Co., Birmingham, Ala.
 467 tons, 6 to 12-inch, Class 250, Glendale, Calif., to United States Pipe & Foundry Co., Burlington, N. J.
 415 tons, city of Toledo, O., to J. B. Clow

& Sons Co., Chicago.
 127 tons, 4 to 16-inch, Brookline, Mass., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.
 100 tons, 12-inch, Class B, Huntington Park, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.
 100 tons, Arlington Gas & Electric Co., Arlington, Mass., to United States Pipe & Foundry Co., Burlington, N. J.
 100 tons, Waterville, Me., to United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Placed

10,500 tons, 60-inch insulated water pipe, for Birmingham, Ala., industrial water project, to Chicago Bridge & Iron

Works and Ingalls Iron Works, both Birmingham, Ala.

Cast Pipe Pending

750 tons, 4 and 6-inch; Public Service Corp. of New Jersey, Newark, N. J.
 689 tons, 24-inch, Chicago; Glamorgan Pipe & Foundry Co., Lynchburg, Va., low.
 148 tons, 4 and 6-inch, Inglewood, Calif.; National Cast Iron Pipe Co., Birmingham, Ala., low.
 110 tons, 4 to 20-inch, Santa Monica, Calif., American Cast Iron Pipe Co., Birmingham, Ala., low.
 100 tons, for three pipe culverts for highway department, Massachusetts.
 Tonnage unstated; Auburn, Me.

Steel Pipe Pending

5904 feet, 24-inch steel water pipe, Chicago; Bethlehem Steel Co., Bethlehem, Pa., low.
 Unstated tonnage, 120-mile line of 8 and 10-inch pipe; Penn-York Co., subsidiary of the Cities Service Co., 60 Wall street, New York, for installation from Harrison Valley, Pa., to Buffalo and Dunkirk, N. Y.
 Unstated tonnage, 4-inch steel pipe line; Rochester Gas & Electric Co., Rochester, N. Y., for installation near Parmo, N. Y., contemplated.

Strip Steel

Strip Prices, Page 71

Pittsburgh—Both wide and narrow strip needs continue to be urged upon mills by a wide line of miscellaneous consumers. While the automotive industry still is the largest single consumer, the tonnage going to other lines of industry makes an even larger total. Strip makers are operating at about an average of 65 per cent, with variations above and below this rate from week to week. The mills are producing at about 61 per cent hot rolled and 48 per cent of cold rolled capacity. Quotations are steady and mills appear booked through this month and into next.

Cleveland—Most mills are having a hard time cutting down backlogs and at the same time meeting delivery requirements. In a few cases orders had to be rejected. Stock conditions of some consumers are negligible, thereby making the delivery situation more acute. Consumption of electrical equipment manufacturers has recently increased. The demand from auto parts-makers is holding up much better than anticipated.

Boston—Fear of possible labor trouble is causing some consumers of strip to accumulate stocks. Delayed delivery dates also causes need for larger stocks. Cold-rolled strip, not advanced July 1, is expected to be marked up \$2 per ton for fourth quarter.

Chicago—Despite some recession in strip consumption, both new business and shipments are being maintained better than usual for this



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 OUTSIDE
 ROOMS
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Club Breakfasts—
 30c . . . 50c . . . 75c

Lunches—
 40c . . . 50c . . . 75c

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 75c . . . \$1 . . . \$1.25

From the moment you enter our doors you will know that here you are indeed a *guest*. You will appreciate the courteous, cheerful, but *unobtrusive* service for which the Leland is noted. You will revel in the luxury you have a right to expect in a hotel that's as modern as tomorrow's motor car. You will like the superbly convenient downtown location. We hope you will accept our invitation to make the Leland your home in Detroit.

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(AT CASS AND BAGLEY AVENUES)

D E T R O I T

period. Deliveries of hot-rolled strip still are influenced by anticipatory buying during last quarter. Some automotive business is appearing in connection with 1937 models, but tonnages involved still are small. Demand for current automotive needs continues to better expectations.

New York—Automobile manufacturers are specifying less actively for strip, but there is little change in volume taken by manufacturers of electrical devices.

Youngstown, O.—Strip requirements not only of auto partsmakers but also a wide variety of miscellaneous consumers, are being pressed upon mills in hot and cold-rolled narrow and wide. Important mills here have sufficient business to continue at current rates of operation through July and August.

Wire

Wire Prices, Page 71

Cleveland — The recent drought has had little effect on agricultural demand for merchant wire products. Demand for nails, wire rods and spring wire is holding well, some concerns reporting the first half of July as good as June. Prices remain firm.

Chicago—Manufacturers' wire demand holds closely to the June rate, an unusual trend for this period, which usually is accompanied by receding activity.

Boston — Steel wire buying has been stimulated by apprehension as to the labor situation and a growing impression that wire prices will be advanced for fourth quarter. Several users of manufacturers' wire are building reserves for three to six months as a cushion and will continue to buy current requirements. Deliveries in four to six weeks now is the earliest generally promised. The only weakness is in nails, quoted at \$2.10, base, Pittsburgh, per keg, with shading of 10 cents per keg.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Tin mill activity continues to be an unusual feature of the trade this year. Mills making tin plate continue to operate about 95 to 98 per cent of capacity and apparently no let-up is in sight. The new demand for tin cans for other purposes than fruit, vegetable and fish canning apparently is bridging over the usual dull spells between the old time seasons, making it more of a continuous affair throughout the year.

Philadelphia—Tin plate demand here and in the Baltimore district

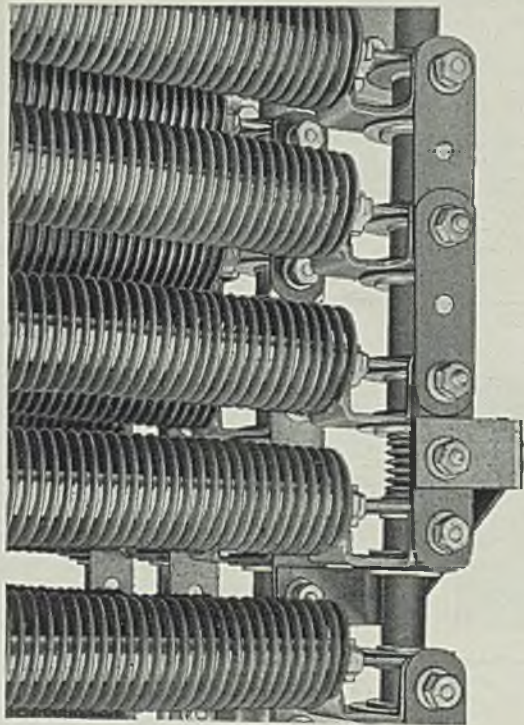
continues high. While specifications in some areas inland have been adversely affected by dry weather, this has not proved the case here to date, probably due in part to the fact that considerable tin plate is going into manufacturers' cans and for oil and beer containers. Of interest to the trade here is the sale of the Wilkes-Barre Can Co., Wilkes-Barre, Pa., to the Continental Can Co., New York. Work here on the new plant of the Acme division of the Crown Cork & Seal Co., Baltimore, is being rushed.

Semifinished

Semifinished Prices, Page 71

Pittsburgh—Billets and sheet bars for the general trade continue scarce since makers themselves are using up practically every pound of semifinished they can produce. Hence only small surpluses are available for sale, and even then, buyers are compelled to watch shipments closely if their needs be urgent. Quotations are unchanged and prices show steadiness and strength.

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We announce an improved Clark Edgewound Non-Breakable Resistor.

The improvement includes a new welded terminal construction and wider spacing between sections.

The welded terminal insures a permanently perfect connection. The wider spacing gives easier access to the entire bank and allows better air circulation for dissipating the heat.

The terminal is copper strip welded direct to the edge of the resistance metal and firmly supported by the frame.

This construction is used only on Resistors built for separate mounting.



THE CLARK CONTROLLER CO.

1146 East 152nd St.
CLEVELAND, OHIO



Shapes

Structural Shape Prices, Page 70

New York—While awards in the metropolitan area totaled under 2000 tons the pending list was increased by 13,300 tons, involved in seven projects. A large amount of tonnage in the aggregate is under negotiation. On much of the pending tonnage quotations were made before the end of June so that they will be accepted at the old 1.90c base, Bethlehem, Pa., price if closed during

July. On new work coming out since the beginning of July the price on plain material is 2.00c base, Bethlehem.

Cleveland—Since most anticipated tonnage is for identified jobs placed at the old price, little new business at the advanced price has been placed or expected until after the first of August when price protection will expire. Inquiries for the hockey rink here and the extension of the Libby-Owens Ford glass plant at Toledo, O., have not yet been awarded.

Chicago—Placing of 8225 tons of

shapes and piling has bolstered structural awards. The contract for the Chicago river lock, involving 5450 tons of shapes and piling, has been placed. New inquiries are headed by 2300 tons for the Ashland avenue bridge and 1000 tons for a truck terminal building. Low bidders have been announced on 1043 tons for four Illinois bridges in various districts. A large tonnage is involved in pending work.

Boston—While only four new lettings of size are reflected in the New England structural market, all fabricating shops are busy. On all new work the new price of 2.00c, base, Bethlehem, Pa., on plain shapes is being quoted and market is firm. So far, however, the new price has not been done on large tonnage in view of the extent to which quotations on identified tonnages were made before the end of June.

Philadelphia — Activity has slumped with no outstanding orders reported and with probably not more than six or seven pending projects running over 300 tons each. Practically all of these latter, moreover, came up for figuring originally in June. Nevertheless, district fabricators report considerable business from the outside and much tonnage in various districts is pending. Shape prices are firm at the new level of 2.00c, Bethlehem, Pa., or 2.11½c, delivered, Philadelphia.

Birmingham, Ala. — Fabricating shops are maintaining active operating schedules and heavy shipments are being made. New business aggregates well and business in hand and in sight warrants continuation of present schedules for an indefinite period.

San Francisco—The structural shape market is active and 3588 tons were placed last week, bringing the aggregate for the year to 115,251 tons as compared with 53,460 tons for the corresponding period in 1935.

Seattle—Business continues in good volume, new projects are coming up for figures and considerable tonnage is pending. Local fabricators have bid on 900 tons on six units for the proposed plant addition by

Behind the Scenes with STEEL

Mercury Shows Heels

NEW YORK CENTRAL did not ask us to take a ride on its new Cleveland-Detroit whizzer, the MERCURY, last Monday when a party of some 50 reporters and other press attaches steamed up to Detroit and back for the day, but we heard all about the trip from one of our operatives who made the journey.

The boys all piled on the seven-car streamliner about 9 a. m. and had practically the run of the train, with a dozen or so officials of the N.Y.C., including President Williamson, to answer questions. One intrepid reporter insisted on riding in the engineer's

Wiggs of the cabbage patch at Monroe, Mich.; and no sour-pussed conductor coming around to shout: "TICKETS!"

That "low-pitched musical whistle" is what bothers us. To our way of thinking, half the thrill of railroading was contained in the two-long, two-short mournful wails of the old-time passenger locomotives. That plus the smell of rich bituminous smoke, plus penny drinking cups and water so cold it could scarcely be downed, plus standing on the rear platform and watching two shining ribbons of steel clicking away into the distance.

Still, if the N.Y.C. would like us to try out the MERCURY ourselves sometime, we might do it, just to see if we couldn't get a little bit better streamlined outlook on things. (see article on p. 19)

Copy Service

WHOEVER dashes off those advertisements for New York's Hotel Piccadilly, which appear regularly in STEEL, seems to have a flair for turning a neat phrase or two. Witness: "Pick the Piccadilly . . . Say 'Hello' to a good 'Buy' . . . Times SQUARE is all 'ROUND you . . . soft 'sleepyhead' beds . . . center of the city's glamour yet removed from its clamor."

A few others come to mind; we offer them to the Piccadilly free of charge: "Try some Piccalilli at Hotel Piccadilly. . . Piccadilly—the place for peccadillos. . . Ho-tel us please if the service doesn't appease. . . no booms allowed in our rooms. . . just the spot for a spot."

Prize Gehoo

PROBABLY takes all sorts of people to make a world, as some by-gone cliché expert once observed, but there is one form of genus chiselus whose outlook on life must be a sorry one. That is the type of person who receives by hook or crook one of STEEL's business reply envelopes, some airmail variety, on which no postage is required, and then uses it to mail us some tripe-like publicity about a Little Marvel Gold-Plated Oilcan with Detachable Air Conditioned Spout.

Such a gesture is one sure way to guarantee against ever interesting us or any of our friends (5½) in a Little Marvel Gold-Plated Oilcan with Detachable Air Conditioned Spout.

—SHRDLU

INQUISITIVE CAMERA DEPT.—X



E. C. "ED" KREUTZBERG, engineering editor of STEEL, who has been pounding the editorial typewriter for better than 20 years. Former Eastern Manager for STEEL. Ed probably can be found at this moment at the corner of Broadway and 42nd, wondering whether or not to go down to the Village for an evening.

lap, and over the engineer's objections this was permitted.

Opening her up when the flyer hit the clear stretches of track, the engineer pulled his charge into Detroit shortly before noon, covering the 180-mile jaunt in 2 hours and 47 minutes—three minutes better than scheduled time.

Our observer reports the run characterized by effortless, noiseless speed; delightful air conditioning (it was 100 outside the closed windows); a low-pitched musical whistle rarely heard by passengers; a hearty wave from Mrs.

Shape Awards Compared

	Tons
Week ended July 17	23,216
Week ended July 10	41,952
Week ended July 3	46,249
This week, 1935	16,598
Weekly average, 1935	17,081
Weekly average, 1936	22,309
Weekly average, June	25,036
Total to date, 1935	443,054
Total to date, 1936	646,976

Soundview Pulp Co., Everett, Wash.
No award has been made.

Shape Contracts Placed

- 5000 tons, piling, Chicago river lock, Chicago sanitary district, to Jones & Laughlin Steel Corp., Pittsburgh.
- 1760 tons, dam, Lynxville, Wis., to R. C. Mahon Co., Detroit.
- 1625 tons, piling, Mississippi river lock, Clarksville, Mo., to Inland Steel Co., Chicago.
- 1200 tons, Hope street senior high school, Providence, R. I., to Bethlehem Fabricators Inc., Bethlehem, Pa.
- 1190 tons, highway bridge for state of Ohio, Sheffield Village, to Mt. Vernon Bridge Co., Mt. Vernon, O.
- 900 tons, school, Whitesboro, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.
- 900 tons, plant buildings, Flint, Mich., to Palmer-Bee Co., Detroit.
- 700 tons, additional, two hangars for Yerba Buena shoals, San Francisco, to Judson-Pacific Co., San Francisco.
- 640 tons, factory addition for Inland Mfg. Co., Dayton, O., to Burger Iron Works, Akron, O.
- 626 tons, three bridges for United States engineer office, Los Angeles, as follows: 217 tons, Washington boulevard bridge, 212 tons, Adams boulevard bridge and 197 tons, Concord street bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 530 tons, alterations to Allegheny high school, Pittsburgh, to Bethlehem Steel Co., Bethlehem, Pa.
- 505 tons, malt house, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.
- 500 tons, plant building, Monroe, Mich., to Grand Rapids Steel & Supply Co., Grand Rapids, Mich.
- 498 tons, sheet piling for bureau of reclamation at Potholes, Calif., under three specifications, A-42045-A, A-42,044-A and 29-24-A, to Bethlehem Steel Co., Bethlehem, Pa.
- 485 tons, bridge, Lake county, Illinois, to American Bridge Co., Pittsburgh.
- 480 tons, bridge Buchanan county, Missouri, to St. Joseph Structural Steel Co., St. Joseph, Mo.
- 475 tons, plant addition, Detroit, to R. C. Mahon Co., Detroit.
- 410 tons, manufacturing building, Starcor Realty Co., Maspeth, N. Y., to Gaynor Iron Works, Brooklyn, N. Y.
- 375 tons, Wood River bridge, Madison county, Illinois, to St. Louis Structural Steel Co., East St. Louis, Ill.
- 340 tons, highway bridge for state of Minnesota, at Minneapolis, to Bethlehem Steel Co., Bethlehem, Pa.
- 310 tons, Franklin street viaduct, Washington, to American Bridge Co., Pittsburgh.
- 270 tons, two bridges for Chicago, Burlington and Quincy railroad, Wiggins, Colo., and Chariton, Iowa, to American Bridge Co., Pittsburgh.
- 250 tons, Kenilworth street bridge for United States engineer office, Los Angeles, to Consolidated Steel Corp., Los Angeles.
- 220 tons, state highway bridge for Indiana, at Highland, to American Bridge Co., Pittsburgh.
- 200 tons, highway bridge for state of Ohio at Hamilton, O., to Bethlehem Steel Co., Bethlehem, Pa.
- 200 tons, bridge work for All-American canal system, invitation A-42,001-A, California, to Virginia Bridge & Iron Co., Roanoke, Va.
- 190 tons, state highway bridge, Strassburg, Va., to Bethlehem Fabricators Inc., Bethlehem, Pa.

- 160 tons, highway bridge, for state of Maine, at Dyer Brook, Me., to American Bridge Co., Pittsburgh.
- 155 tons, bridge, Terrace avenue and 103rd street, Chicago, to Lakeside Bridge & Steel Co., Milwaukee.
- 152 tons, Blackfoot river bridge, Montana, to unnamed interest.
- 150 tons, office building, Automatic Fire Alarm Co., Boston, to New England Structural Co., Everett, Mass.
- 150 tons, state grade crossing elimination, Sharon, Mass., to United Structural Steel Co., Worcester, Mass.
- 150 tons, sheet piling, jetty repairs, Nome, Alaska, to Bethlehem Steel Co., Seattle.
- 140 tons, St. Johns Seminary building, Brighton, Mass., to New England

- Structural Co., Everett, Mass.
- 135 tons, highway project, Jenkins county, Georgia, to Bethlehem Fabricators Inc., Bethlehem, Pa.
- 125 tons, office addition, Kimberly-Clark Corp., Neenah, Wis., to Lakeside Bridge & Steel Co., Milwaukee.
- 125 tons, H-steel piling, state bridge Pasco, Wash., to Bethlehem Steel Co., Seattle.
- 125 tons, state overcrossing, Centralia, Wash., to Pacific Car & Foundry Co., Seattle.
- 125 tons, archives building, Springfield, Ill., to A. F. Anderson Iron Works, Chicago.
- 115 tons, two buildings, Aluminum Co. of America, New Kensington, Pa., and Garwood, N. J., to American Bridge Co., Pittsburgh.



Chain links made from our Special "DD" Steel.

Strength!

Whether it's chain links, digger teeth, crusher bars, gears, clamshell or shovel buckets and dippers, pug mill knives, scraper bars or similar heavy duty castings, you will get maximum satisfaction from the strength and hardness of Damascus castings.



Our modern foundry is equipped with two 1½-ton Heroult electric furnaces with a capacity of 200 tons per month. We are prepared to produce castings of from one to 750 pounds in Manganese and Alloy Steels.

The DAMASCUS STEEL CASTING CO.

New Brighton, Pa.

(Pittsburgh District)

D **DAMASCUS STEEL CASTINGS**
(Manganese and Alloy)

**NINE MORE MEN
ON THE JOB AND NO
PAYROLL
INCREASE**

At a temperature of 110°F, the average worker has only 10% of his efficiency, as careful studies under factory conditions have proved. With Coppus Heat Killers (the only kind that direct the heat on the job, and that cannot recirculate stale air) — you make the worker 10 times as efficient. For a slight investment and small operating cost, you get as much more efficient work done as if you put 9 extra men on the job.

AEROPLANE

for moving large volumes of air (3,700 - 15,600 C.F.M.) at moderate velocities (2,600 - 3,850 F.P.M.)



TWO TYPES



VANO

for moving moderate volumes (1,500-3,000 C.F.M.) at high velocities (4300 F.P.M.)

BOTH are portable, light-weight, sturdy. Both useful also for general ventilating, cooling, drying, driving out foul air, removing dust, smoke, gasses, etc.

Write for Bulletin 164-2

**COPPUS
ENGINEERING CORPORATION**

375 Park Ave., Worcester, Mass., sales offices and distributors listed in Thomas' Register. In Sweet's — Steam Turbines, Air Filters, Blowers, Heat Killers.

- 115 tons, repairs to international boundary commission bridge at El Paso, Tex., to Darbyshire Harvie Iron & Machine Co., El Paso.
- 110 tons, state highway bridge, Charlotte, N. C., to Phoenix Bridge Co., Phoenixville, Pa.
- 105 tons, Wheelock bridge, Grafton, Vt., to Vermont Structural Steel Corp., Burlington, Vt.
- 100 tons, two state bridges, Alna, Me., to American Bridge Co., Pittsburgh.
- 100 tons, malt house addition, D. D. Weschler & Sons Co., Milwaukee, to Milwaukee Bridge Co., Milwaukee.
- 100 tons, warehouse for Copelin Co., Pasadena, Calif., to Pacific Iron & Steel Co., Los Angeles.

- 113 tons, Del Amo street bridge for United States engineer office, Los Angeles; Bethlehem Steel Co., Bethlehem, Pa., low.
- 100 tons, North Carolina state highway bridge, Greenville, N. C.; bids opened July 16.
- 100 tons, warehouse addition, United States Gypsum Co., Chicago.
- 100 tons, bridge, Douglas county, Illinois; Mississippi Valley Structural Steel Co., Decatur, Ill., low.
- 100 tons, west side police station, Milwaukee; Milwaukee Structural Steel Co., Milwaukee, low.

Shape Contracts Pending

- 7400 tons, Sixth avenue subway, route 101, section 9, Thirty-third to Fortieth streets, New York; bids Aug. 4.
- 4195 tons, including 1620 tons of piling, Mississippi river dam No. 22, Saverton, Mo.; bids to United States engineer, St. Louis, Aug. 18.
- 3500 tons, federal building, Cincinnati; bids July 31; reinforcing steel requirements, 600 tons.
- 2300 tons, Ashland avenue bridge, Chicago; bids to commissioner of public works, Chicago, July 31.
- 2000 tons, garage, department of sanitation, Fifty-sixth street and Twelfth avenue, New York.
- 1500 tons, shapes and piling, pier, Sinclair Refining Co., Marcus Hook, Pa.; bids opened July 17.
- 1300 tons, apartment, 19 East Seventy-second street, New York; general contract to Hegeman-Harris Co., New York.
- 1100 tons, subway alterations, route 108, sections 10 and 11, New York; J. Leopold & Co., New York, low.
- 1000 tons, building, Brooklyn state hospital, Brooklyn, N. Y.; Edward Corning Co., New York, low.
- 1000 tons, Keeshin terminal building, Chicago.
- 920 tons, highway bridges, for state of Illinois, at Lake Bluff and Sherman, Ill.
- 770 tons, state bridge, Crawford county, Pennsylvania; new bids to be asked July 24.
- 750 tons, cantilever bridge, Woodville, Miss.
- 600 tons, overhead crossing, Milwaukee.
- 526 tons, bridge, Sangamon county, Illinois; Mississippi Valley Structural Steel Co., Decatur, Ill., low.
- 400 tons, Maxwell school, Syracuse university, Syracuse, N. Y.
- 350 tons, synagogue, Brooklyn, N. Y.
- 230 tons, New Jersey state highway bridge, Jersey City, N. J.; bids opened July 20.
- 225 tons, bridge in St. John's county, Florida, for United States engineers corps.
- 217 tons, including 52 tons steel piling, Puyallup river bridge, Pierce county, Washington; Teufel & Carlson, Seattle, low.
- 200 tons, assembling plant, Chevrolet Motor Co., Tarrytown, N. Y.
- 160 tons, bridge for Southern railway, Clifton, Va.
- 160 tons, bridge, Lake county, Illinois; Gage Structural Steel Co., Chicago, low.
- 150 tons, baking building, New Standard Baking Co., Philadelphia.

Reinforcing

Reinforcing Bar Prices, Page 71

New York — Awards aggregated considerably less than 500 tons with little new work coming out at the moment. While most sellers are on the basis of 2.05c, base, Pittsburgh, equivalent to 2.40c, New York, or 2.50c delivered at the building site, not all sellers have firmed up to this level.

Pittsburgh—While a considerable number of pending projects involve some fair-sized tonnages, composed mostly of public work, there is some hesitancy in closing these. A number of private projects involving 50 to 75 tons each are being closed from time to time, making a fair total at the end of each week. Considerable road work is in progress and more is planned for later in the summer, into which some large tonnages of steel are expected to go. Ferguson & Edmondson, Pittsburgh, were low on a state highway letting at Harrisburg, Pa., in Cumberland and Perry counties, involving about 180 tons of bars..

Cleveland — Mills are operating close to capacity. The earliest date on which shipments can be promised is almost two weeks. Most of this tonnage is composed of small orders for private work. Some fabricators are having a hard time obtaining material from mills, thereby upsetting their production schedules.

Chicago—While orders for concrete bars are only fair, mills are rushed in attempting to fill old com-

Concrete Awards Compared

	Tons
Week ended July 17	8,641
Week ended July 10	6,107
Week ended July 3	22,414
This week, 1935	4,608
Weekly average, 1935	6,862
Weekly average, 1936	6,536
Weekly average, June	3,303
Total to date, 1935	132,900
Total to date, 1936	189,541

mitments. Heavy deliveries are in prospect for the balance of this quarter since backlogs shortly will be supported by the substantial tonnages now pending. Several thousand tons for river locks and dams will be placed soon. A steady flow of small orders continues.

Boston—New business in concrete reinforcing bars aggregates between 4000 and 5000 tons. Considerable additional tonnage is pending. While some sellers recently published their concrete reinforcing bar price, new billet material, at 2.10c, base, Buffalo, equivalent to 2.46c, delivered, Boston, some others did not and the current price level is not entirely firm.

Philadelphia—A marked easing up in tonnage is noted here. No orders of 100 tons or more have been reported over the past few days, and apart from some federal housing work due late this month and early in August, little outstanding tonnage is being figured. The largest award to be noted was placed in Washington, involving 1365 tons for a warehouse. Billet steel bar prices are holding fairly well while rail steel bar prices are subject to marked concessions in some instances. On a large school job recently \$42 a ton was reliably reported as having been quoted, this involving bending, size extras, drawings and trucking.

San Francisco—More than thirty projects calling for 100 tons or more of reinforcing bars have just been placed. Republic Steel Corp. secured six specifications for the bureau of reclamation, Denver, for delivery at Potholes, Calif., Odair, Wash., and Moon Lake dam, Utah, aggregating 985 tons. Colorado Fuel & Iron Corp. booked two projects for the same bureau, involving 194 tons for Odair, Wash., and 162 tons for Potholes, Calif.

Seattle—The week's awards involved small lots of less than 100 tons each but the aggregate totaled several hundred tons. Local mills are busy, backlog being larger than for some time. Industrial requirements are increasing, giving the outlook more promise. There are still calls for merchant bars notwithstanding the increase effective July 1. Business pending is normal.

Reinforcing Steel Awards

1500 tons, Old Harbor village housing project, Boston, to Northern Steel Co., Medford, Mass., through Mathew J. Cummings Co., Boston.

1365 tons, Hecht warehouse, Washington, to Rosslyn Steel Co., Rosslyn, Va.; possibly 300 tons of shapes also will be required; Consolidated Engineering Co., Baltimore, is general contractor.

900 tons, to W. Ames & Co., Jersey City, N. J., through procurment division, treasury department, New York.

650 tons, Hope street school, Providence, R. I., to Barker Steel Co., Cambridge, Mass., through John Bowen Construction Co., Boston.

557 tons, four specifications, bureau of reclamation at Potholes, Calif., to Republic Steel Corp., Cleveland.

400 tons, public schools, Los Angeles, to unnamed interests.

350 tons, building for Hollywood high school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

300 tons, buildings for Manchester avenue school, Los Angeles, to unnamed interest.

270 tons, United States veterans hospital building, Bedford, Mass., to Bucher Steel Co., Cambridge, Mass.

248 tons, invitation 38267-A for bureau of reclamation, Odair, Wash., to Republic Steel Corp., Cleveland.

194 tons, invitation 38269-A for bureau of reclamation at Odair, Wash., to Concrete Engineering Co., Omaha, Nebr.

180 tons, invitation 43071-A for bureau of reclamation at Moon Lake project, Utah, to Republic Steel Corp., Cleveland.

162 tons, invitation A-42,049-A for bureau of reclamation, Potholes, Calif., to Colorado Fuel & Iron Co., Pueblo, Colo.

150 tons, malt house addition, D. D. Weschler & Sons Co., Milwaukee, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, Main street school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

130 tons, grade crossing elimination, Sharon, Mass., to Truscon Steel Co., Youngstown, O., through Arute Bros., New Britain, Conn.

125 tons, Malabar street school, Los Angeles, to Blue Diamond Corp.,

Los Angeles.

110 tons, sewage disposal plant, Rockland state hospital, Orangeburg, N. Y., to Truscon Steel Co., Youngstown, O., through F. H. McGraw Co., New York.

100 tons, alterations to gymnasium, Burroughs junior high school, Los Angeles, to Blue Diamond Corp., Los Angeles.

100 tons, gymnasium, Gardena high school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

100 tons, auditorium, Gage avenue school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

100 tons, office addition for Kimberly-Clark Corp., Neenah, Wis., to Truscon Steel Co., Youngstown, O.

100 tons, American Railway Express Co. garage, Boston, to Capital Steel Co., Brooklyn, N. Y.

100 tons, state highway work, Dover, N. H., to Truscon Steel Co., Youngstown, O., through Central Construction Co., Lawrence, Mass.

100 tons, building, Cushman Bakery Co., Lynn, Mass., to Joseph T. Ryerson & Son Inc. Chicago.

100 tons, state highway underpass, Springfield, Mass., to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, state grade crossing elimination, Goodmans, N. J., to Igoe Bros., Newark, N. J., through Weldon Contracting Co., Westfield, N. J.

Reinforcing Steel Pending

2900 tons, including 2000 tons of trusses, paving Golden Gate bridge, San Francisco; bids opened.

900 tons, Hill Creek housing development, Philadelphia, new bids Aug.

A STUDY IN "BLACK AND WHITE"



MOUNTING costs in both labor and materials are in part, responsible to the manufacturer's consistent switch to steel stampings. Not only have stampings proved themselves economically correct, but they have become more practical in application.

To justify this lower stamping cost, your product must be studied by men thoroughly skilled in stamping practice and backed by a plant modernly equipped with presses of great productive range . . . These are *your* facilities at Parish and Parish welcomes *your* blue-prints and specifications.

PARISH PRESSED STEEL CO.

Specialists in difficult stamping design

Robeson & Weiser Sts., READING, PA.

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal.

7; bids on two other federal housing projects, Wayne, Pa., and Camden, N. J., will be opened this month.
600 tons, New Jersey state highway, route 25, section 24; John F. Lafferty, Haddon Heights, N. J.; low.
500 tons, state bridge, Lynnfield, Mass.
500 tons, air terminal building, San Francisco; bids July 22.
400 tons, grain elevator, Landish-Stoppenbach Co., Milwaukee, at Jefferson Junction, Wis.; bids soon.
250 tons, New Jersey state highway, route 44, sections 2A, 4A and 7; Charles D. Prosser, Pitman, N. J., low.
125 tons, reservoir, Arlington, Mass.; O'Malley & Delaney, Waltham, Mass., low.
100 tons, contract B, metropolitan district water supply commission, Boston; Benjamin Foster Co., Philadelphia, low.
Unstated tonnage, Montgomery-Ward Co. store, Salem, Oreg.; bids at Chicago, July 20.
Unstated tonnage, 294-foot overcrossing, Bonner county, Idaho; bids to state at Boise, Idaho, July 17.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Continued steadiness in quotations and regularity of shipments are features of the pig iron market. Most sales are for 50 to 100 tons, practically for immediate shipment, most frequent buyers being malleable and gray iron foundries.

Cleveland—Shipments so far this month are exceptional in exceeding the first two weeks in June; however July is expected to end slightly behind June. A noticeable decrease in shipments to farm equipment suppliers has been felt, the tractor division being the only one to hold the

high level recently reached. Motor car foundries also show a tapering off in consumption, but the reverse is true in demands from railroad casting foundries.

Chicago—Hot weather last week curtailed foundry schedules and contributed slightly to reduced shipments of pig iron. Consumption of castings has been receding in the farm implement, tractor and automotive fields, and some reduction in deliveries this month is not unlikely. Demand for railroad equipment parts partly offsets the lighter activity elsewhere. Prices are firm.

Boston—The pig iron market is disturbed by offers by a Buffalo producer at \$1 under the market; a stock of only about 2000 tons is involved so that the market is not affected. The melt at New England foundries continues good, but most consumers are well stocked so that new buying is scattered and does not involve any large lots.

New York—Seasonal influences and continued strikes at iron foundries here have restricted sales. Such buying as prevails continues to be chiefly carlots for nearby shipment. Prospects of labor trouble in the steel industry are viewed with less concern and hence there is less protective buying. Sellers look for relatively little activity before September.

Philadelphia—Purchase of several thousand tons of basic iron is outstanding in the market, and represents consumer's requirements for this quarter. Although buying otherwise is of hand-to-mouth character,

volume of this miscellaneous business appears to be expanding. One leading seller reports business so far this month is in excess of bookings in June. Domestic quotations are firm.

Buffalo—Merchants are utilizing this period to add to stocks. Consumers are not pressing for deliveries, but sales continue in good proportions. Ten blast furnaces are in production.

Cincinnati—Decreasing melt in foundries on automobile parts and those supplying machine tool manufacturers is reflected in a modest decline in pig iron shipments. Other foundries are holding close to previous levels. Most ordering is for immediate needs.

St. Louis—Melt of pig iron has receded from the contra-seasonal high levels in June and earlier this month. Mills and foundries are well equipped with orders, for a large part of which they are under pressure for prompt delivery. Shipments are holding up well, and some new business has been booked, though most users are fully covered for normal third quarter requirements.

Birmingham, Ala.—Slight increase in pig iron demand is noted, with ten furnaces active. Pipe makers are steady melters, but are buying only against immediate needs.

Seattle—With foundry operations increasing, demand has improved for pig iron. Third quarter price for Columbia No. 1 remains unchanged at \$17.50 base, Ironton, Utah. Steel foundries in the Pacific northwest are practically running to capacity, some plants having refused new business. Iron foundries are less active, the situation being irregular.

Toronto, Ont.—Severe hot weather has limited pig iron sales and awards for the week dropped below 500 tons. Demand is entirely for spot delivery and melters show no interest in future needs. Sales mostly were in foundry grades and odd lots of malleable, with no demand for basic. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 73

Pittsburgh—The scrap market seems to be the only spot in the iron and steel trades upon which the summer doldrums have settled. New business in scrap is being restricted to a minimum both by buyers and sellers. The price of \$14 for No. 1 heavy melting steel is not attractive to those holding some surplus supplies and the mills are not receptive to that price. About the only activity this week in the trade is continued good shipments on contracts



Whitey Sez:

Carving your name in the Hall of Fame can now be superseded by chiseling your name into ill repute.

Arc-Welding Electrodes

for welding all corrosion and heat resisting products. Send for data book.

MAURATH INC

7300 UNION AVENUE • CLEVELAND



OHIO

while both dealers and brokers are marking time. Quotations on all grades are unchanged.

Cleveland—Strength continues in steel and iron scrap but activity is at a minimum. Melt is heavy but consumers have sufficient reserves and are out of the market. Scarcity exists in important grades.

Chicago—Scrap prices continue strong but the market has been quiet. New business in heavy melting steel is low, with this grade nominally continuing \$13 to \$13.50. Dealers are paying \$13.25 to \$13.50 to pick up this grade, with substantially higher figures for railroad material. Steel foundry grades continue active.

Boston—To obtain iron and steel scrap in larger volume, brokers here have increased buying prices on steel car axles 50 cents a ton on forge flashings, mixed shafting, skeleton and machine shop turnings 25 cents. They also have advanced buying prices on steel scrap for export.

New York—Continued good buying of iron and steel scrap by domestic users, as well as for export, has brought further advances in prices paid by brokers. They have advanced No. 1 machinery cast by \$1 a ton for shipment to Eastern Pennsylvania and now are quoting \$10 to \$10.50, f.o.b. cars, New York and Brooklyn, on this grade. They have advanced machine turnings 50 cents and now are paying \$4 to \$4.25 for this item.

Philadelphia—Further strength prevails in scrap, with advances in several grades. The principal grades of steel and cast scrap are unchanged, although largely untested. Apart from continued buying for Bethlehem, Pa., at \$12 to \$12.50, delivered, with the inside figure representing scattered nearby purchases, there have been no important purchases of No. 1 steel scrap in this district recently.

Buffalo—Nominal prices prevail in scrap as dealers ask a minimum of \$13.50 for No. 1 heavy melting steel and mills offer only \$12 to \$12.50. Such sales as have been made at lower offers are of material on which there are deductions according to grade, some dealers assert. New business is lacking in specialties but deliveries of all grades continue heavy and melt is at the peak of recent years.

Detroit—The market is strong, and a number of grades have been marked up 25 to 50 cents. Demand from outside districts is active, and production of scrap at automotive plants is holding up better than was anticipated.

Cincinnati—Dealers' buying prices on iron and steel scrap show strength despite mill reluctance to buy. Heavy melting steel and No. 1 cast are 50

cents higher in sympathy with neighboring markets. Turnings and borings are dull and unchanged.

St. Louis—Tone of the market for iron and steel scrap is strong. A contributing influence has been efforts of dealers to secure material to apply on contracts. There is a shortage of a number of grades, notably railroad steel specialties and malleable.

Birmingham, Ala.—Consumers of scrap are buying in limited quantities, and the market is still dull with prices low. Heavy melting steel is quoted around \$9 but purchases are in small tonnages.

Seattle—The Orient continues apathetic but Japanese buyers are willing to deal for desirable tonnages under the market. Domestic turnover is steady as local mills are buying in considerable volume, paying \$10 for No. 1 and \$8 for No. 2. These prices control the export situation in which rails are quoted at \$12. Improved foundry operations are stimulating domestic scrap sales. Exporting houses are replenishing their stocks anticipating increased inquiry from the Orient within a short time.

Toronto, Ont.—Trading in iron and steel scrap dropped sharply during the week and dealers state there was little movement. Mills in the

Hamilton district took small tonnages of heavy melting steel and there was minor call from Montreal but very little new buying was reported. Prices are unchanged.

Warehouse

Warehouse Prices, Page 74

Cleveland—The market on cold-rolled jobbing steel items has been advanced \$3 a ton, effective July 15, to meet the recent rise in mill products. General demand has recovered after a mild recession in the first week of July.

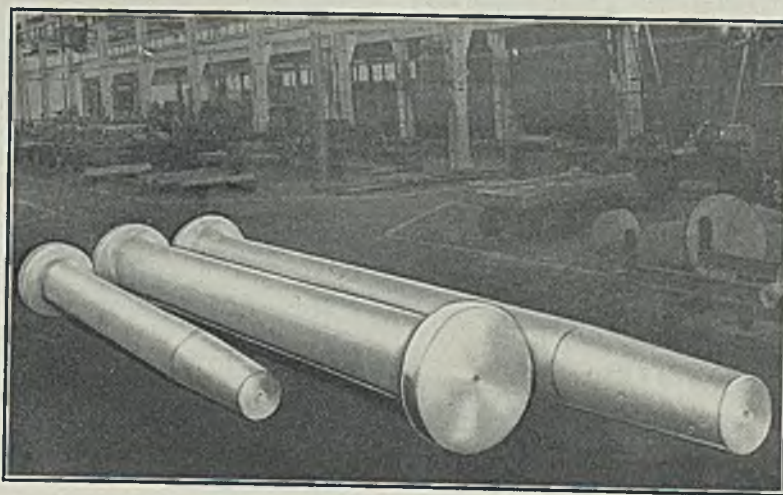
Chicago—Sales declined last week, attributed to intense heat, which curtailed operations at many consuming plants.

Boston—The fact that business booked by iron and steel jobbers is slightly below the record breaking June rate is not regarded as significant since indications are that there has been no drop in consumption.

New York—Iron and steel jobbers here have put into effect a general advance of \$2 a ton to parallel the advances in mill prices on sheets, bars, plates and shapes which became effective July 1.

Philadelphia—Contrary to earlier

QUALITY FORGINGS



Ship Tail and line Shafts

Rolled Steel Wheels — Rolled Steel Rings and Flanges
Forgings — Steel Castings — Steel Tires
Springs — Gear Blanks

STANDARD STEEL WORKS COMPANY

BURNHAM, MIFFLIN CO., PENNA.

District Offices

New York

Philadelphia
Portland, O.

Chicago
St. Louis

San Francisco

expectations, warehouse demand has not yet responded to the usual seasonal influences, but has been well maintained at the June rate. Increases of \$2 to \$3 a ton, which became effective July 1, have been well received by consumers.

Detroit — Sales continue fairly steady, though recently were affected adversely by the heat wave. July business is expected to be equal to or in excess of that of June.

Cincinnati—Demand for warehouse materials for industrial needs is active. Because of combination with sustained building requirements the present level of sales is slightly

higher than last month. New prices are well established.

St. Louis—Demand for warehouse materials holds up well, though the average daily rate during the past week or ten days has fallen slightly below the June average. New purchasing is mainly in small lots for prompt delivery.

Seattle—Business is fair, although the reaction from last month's volume, due to price increases July 1, is now being felt. Retailers are well stocked and jobbers report less turnover under the higher price schedules. Effective July 3, Seattle and Tacoma houses advanced hot-rolled 10 cents and added 25 cents to cold-rolled and some alloy steels. Portland jobbers have agreed to certain advances effective July 13, but on some items will continue to underquote Washington dealers.

Corp. The contract provides for coke shipments of 15,000 to 20,000 tons monthly for five months with price adjustment at the end of the third month. The contract may run for a full year. The coke will be made at Continental No. 1 ovens, which were leased to the Lemont Coal & Coke Co. by the H. C. Frick Coke Co., a subsidiary of the United States Steel Corp. Wieman & Ward, Oliver building, Pittsburgh, are sales agents for this coke.

Shipments of coke in all districts are steady at about the same rate as in June.

PHILADELPHIA'S



HOTEL VALUE!

The Benjamin Franklin is not merely Philadelphia's biggest hotel. It's a big hotel value. Large, modern rooms. Delicious food. Marvelous service. A convenient location in the business and shopping center. Rates from \$3.50 a day.

If you demand full value for your money, you'll like the Benjamin Franklin.

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SAMUEL EARLEY, *Managing Director*

Philadelphia

Steel in Europe

Foreign Steel Prices, Page 74

London—(By Cable)—Due to the shorter month pig iron production in Great Britain in June dropped to 644,100 gross tons from the 661,000 tons turned out in May. However, the daily rate in June was 21,470 tons, compared with 21,332 tons daily in May. The same number of blast furnace stacks, 112, was active in both months. Production of steel ingots and castings in June totaled 965,900 gross tons, a daily average of 37,150 tons, compared with 963,000 tons in May, a daily average of 38,520 tons.

Imports of steel products in June were 110,619 tons, compared with 117,500 in May and exports were 173,536 tons, compared with 206,800 in May.

The effect of recent increases in price have not been perceptible in the market owing to heavy forward contracting, which has given steel-makers large backlogs on structural. Some falling off has been seen in demand for common strip and small bars. Pig iron producers are limiting contracts to the current year. Domestic demand is the chief factor in this product. The Continent reports improvement in exports continues but sales are small, due to unsettled labor conditions.

Metallurgical Coke

Coke Prices, Page 71

The first large contract for Connellsville beehive furnace coke to be closed since the depression began is announced as the Pittsburgh Steel Co. plans to relight by the end of July an additional blast furnace at Monessen, Pa., for production of pig iron for shipment to the Sharon Steel

Iron Ore

Iron Ore Prices, Page 73

Stocks of iron ore at the Lower Lakes ports and furnaces June 1, were approximately 6100 tons less than on the comparable date last year, reflecting the increase in consumption this year, according to Lake Superior Iron Ore association. The association's report follows:

	Tons
Consumed in April	3,485,293
Consumed in May	3,882,173
Increase in May	396,880
Consumed in May, 1935	2,466,585
On hand at furnaces, June 1..	15,268,869
On Lake Erie docks, June 1..	3,973,624
Total on hand at furnaces and Lake Erie docks, June 1....	19,242,493
Reserves total, June 1, 1935..	25,324,575

Further transfers have been noted this past week, in the sale of three bulk freighters by the Kinney Steamship Co., of which R. B. Wallace is manager, to the Wilson Transit Co. of which Capt. Joseph T. Wood is president. Acquisition of the three ships brings the Wilson fleet up to fourteen. The freighters will be used in the coal and ore trade.

No effort has been made recently to take some boats out of service as a move against possible labor trouble in the near future and the expected decrease in automobile shipments. No real labor difficulty is looked for until possibly next winter, for working conditions have been improved and labor organization work is a lessening proposition during the navigation season, since the men are in port only a few hours at a time.

Ferroalloys

Ferroalloy Prices, Page 72

New York—Importers of fluorspar, describing the situation as the tightest in many years, have advanced prices \$1 to \$21.50 per net ton, duty paid. Importers here are not only confronted with expanding domestic inquiry along the eastern seaboard, but a shrinkage in sources of supply, notably Spanish mines, where

strikes have disrupted output, and Germany, where domestic consumption is so heavy that only light shipments are available for export.

Coke By-Products

Coke By-Product Prices, Page 71

New York—Prices on sulphate of ammonia have been established until the end of June, 1937. The price of \$25 per net ton in bulk carloads, f.o.b. cars Atlantic and Gulf ports, which was quoted on July only, now applies to July, August and September, with equal monthly shipments stipulated. For October and November, also on the basis of equal monthly shipments, the price is \$25.50. On December to June, inclusive, the price is \$26, for shipment as specified by customers. The price announcement has brought out early buying to take advantage of the lower price. Prices on other coke by products are unchanged. Demand for all these products is active, particularly for toluol, xylol and solvent naphtha.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—A sudden spurt in copper sales and gradual decline in tin prices featured major nonferrous metals market last week.

Copper—Sales increased to an average over 1000 tons daily for the first three days of the week and to over 3000 tons for the next two days compared with about 625 tons per day for the previous two months. The improved rate may possibly be a forerunner of a new buying wave but no price change is seen for this month. Electrolytic held firm at 9.50c, Connecticut.

Lead — Market continued fairly active with sales well above normal for this season of the year. No let-up in demand is expected over the next few weeks. Prices held unchanged on the basis of 4.45c, East St. Louis.

Zinc—A slightly firmer tone developed in zinc on continued fair rate of shipments to consumers. Prime western held at 4.75c, East St. Louis.

Tin — Straits spot sagged to 43.12½c on dull consumer demand and steady decline in London prices. It is believed that the bottom of the movement has been reached.

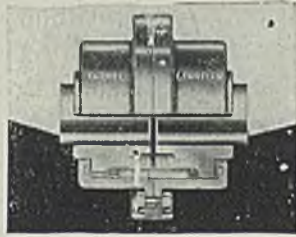
Equipment

Chicago — Machinery and plant

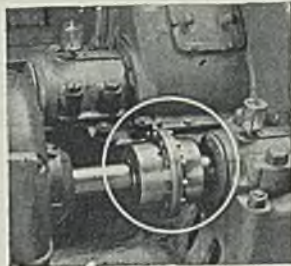
equipment demand is holding well, and July business is expected to total close to that of June. Some machine tool sellers report a slackening in number of orders, but the dollar volume is up to the level of a month ago. Less than seasonal recession in operations of metalworking plants is reflected in the sustained demand for small tools. Good activity continues in contracting for foundry equipment.

New York — Manufacturers of cylindrical grinding machines just have advanced their prices by ap-

proximately 10 per cent, being one of the last groups in the entire machine tool field to advance prices. Demand for machine tools and other equipment continues exceedingly active and the current volume is the heaviest in many years. There is no hint of a summer let-down in equipment buying. In addition to heavy domestic buying, foreign buying continues active, particularly from England where the priority given to munitions manufacture makes it difficult to purchase equipment for other purposes.



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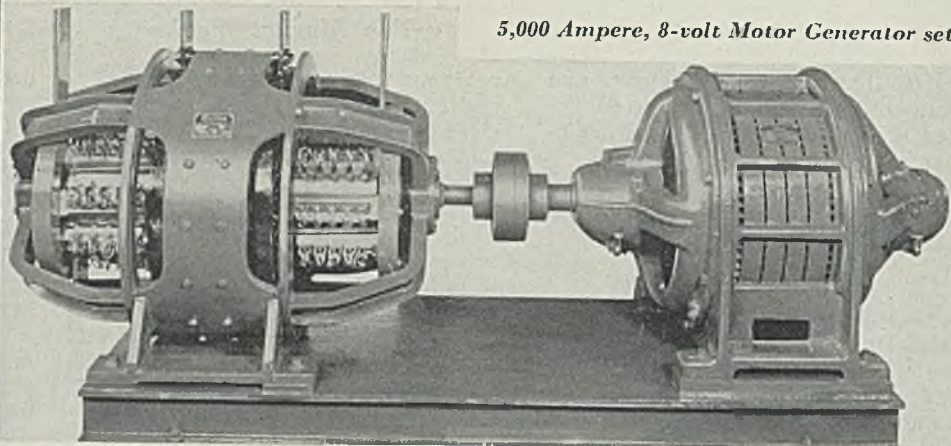
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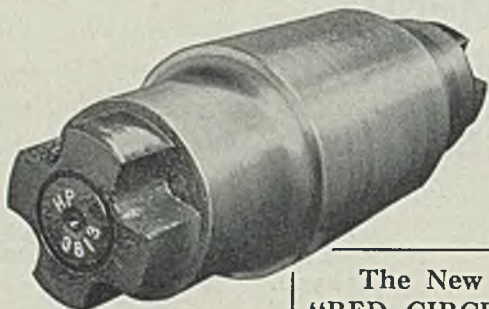
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and other upstate points are increasing barge shipments, due principally to the expanding movement of grain, which is putting a premium on barge capacity. Another factor may be the desire to get stocks laid down before possible labor trouble in the steel industry. Decline in specifications is attributable largely to a general suspension of operations at iron foundries in New York and Brooklyn as a result of strikes which began early last week. Japan is said to be inquiring for as much as 100,000 tons of iron.

Philadelphia—Pig iron buying continues to be comprised largely of single carlot orders. To date there has apparently been no protective buying, due to possible labor trouble in the steel industry. Foundry melt is being well sustained and this is reflected in an even flow of specifications.

Buffalo—Demand is strong with consumers stocking against possible price increases and suspended production. Delivery of ore is proceeding at a pace which indicates a high rate of operations through the coming winter. Ten blast furnaces continue active.

Cincinnati — The melt is lighter, and this situation is translated in smaller shipments, although seasonal curtailment so far has been moderate. Third quarter contracting is without feature. Prices are firm.

St. Louis — Business in pig iron continues at high levels. In the immediate past there has been a slowing down in new business but the volume is still large for the season, and while most of current orders are for immediate needs, there is still a fair amount of contracting for balance of third quarter. Total tonnage shipped in June was slightly ahead of May, measurably greater than a year ago, and the largest for the month since 1930.

Birmingham, Ala.—Furnaces have been piling up some pig iron, but not to an alarming extent. Ten blast furnaces are still producing, all but four on foundry iron. Demand is fairly firm, and cast iron pipe shops, which are steady consumers of foundry iron, hold out promise of active purchasing, though in small tonnages, for an indefinite period.

Ferroalloys

Ferroalloy Prices, Page 74

New York—The movement of ferromanganese continues brisk, although the general trade opinion is that the month may fall short of June, which was one of the best this year in point of shipments. Prices are firm at \$75, duty paid, Atlantic and Gulf ports. Domestic spiegel-eisen, 19 to 21 per cent, also is mov-

ing relatively well with prices unchanged at \$26 Palmerton, Pa., on lots up to 50 tons, and \$24 on lots of 50 tons and over. Of considerable interest in this market is the recent arrival of 500 tons of Russian spiegel-eisen at Philadelphia, the largest arrival of Russian spiegel-eisen, in fact the first arrival at this port in at least many months. The ultimate destination has not been revealed, although a few weeks ago a similar tonnage from Russia arrived at Baltimore, it is said, for a consumer at Newport, Ky.

Scrap

Scrap Prices, Page 75

Chicago—Scrap is marking time but the market retains recently acquired strength. Heavy melting steel is unchanged at \$13 to \$13.50, with dealers generally offering \$13.25 to \$13.50 for material to cover orders. New business from mills is light, but consumption continues heavy. Steel foundries still are fairly active as a result of better operations, and quo-



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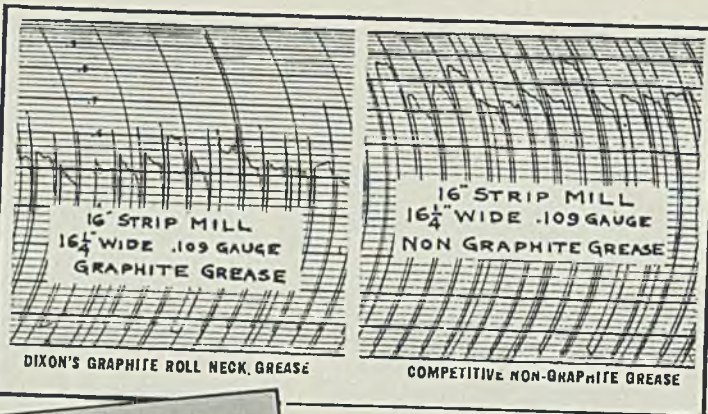
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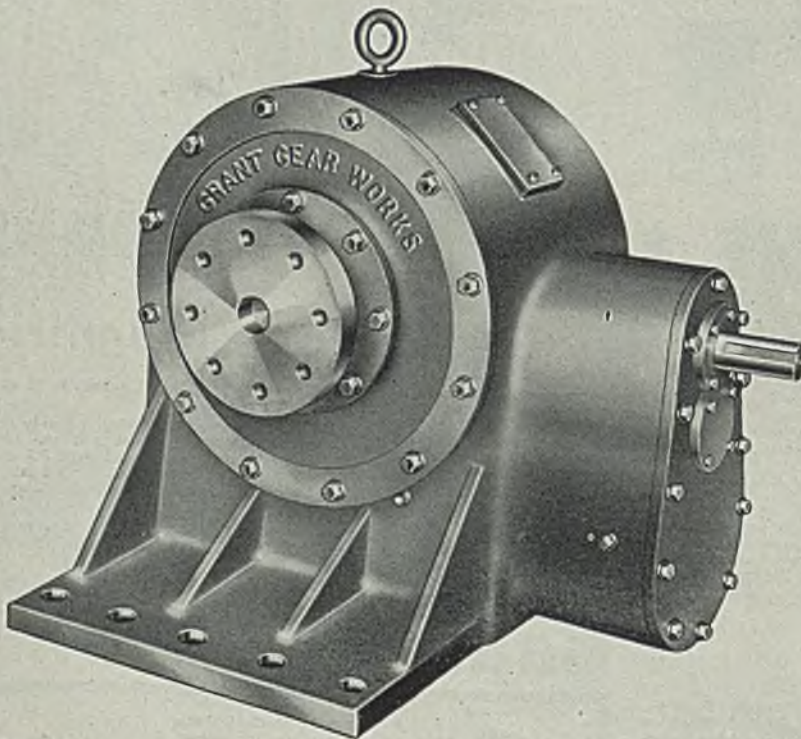


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GRANT GEAR WORKS — BOSTON

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Pittsburgh—Scrap continues to gain strength on a number of small sales by two important buyers. Both dealers and brokers are hesitant to take on obligations of any size at this time. The Pennsylvania railroad steel, it is understood here, went at \$14.30 to \$14.60, and the specialties brought higher prices than usual. Norfolk & Western is offering a fair sized list to close July 16.

Cleveland—Heavy melting steel is becoming scarce at the current price and dealers find difficulty in obtaining tonnage for filling contracts. Demand is light as melters have good supplies. A few less important grades are off 25 to 50 cents but steel scrap is unchanged.

Boston—Improved demand for iron and steel scrap has resulted in higher prices by brokers for some grades. They have advanced buying prices on heavy breakable cast 50 cents to \$8 to \$8.50 f.o.b. cars Boston district, stove plate 25 cents to \$5 to \$5.25 and machine shop turnings 25 cents to \$3.25 to \$3.50. No. 1 heavy melting steel, delivered at New England consuming points, has moved up 50 cents to \$10.

New York—Placing of new business by Eastern Pennsylvania consumers has caused iron and steel scrap brokers here to put up some buying prices to obtain material for prompt shipment. They now are paying \$8.75 to \$9.25, f.o.b. cars, New York and Brooklyn, for No. 1 heavy melting steel for shipment to Bethlehem, Pa., against orders placed at \$12, delivered, \$7.75 to \$8.25 for No. 2 or auto steel for shipment to Bethlehem at \$11 delivered, and \$9.50 to \$10 for heavy breakable cast for shipment to Coatesville, Pa. No. 1 machinery cast is a little higher, the brokers paying \$9 to \$9.50 for material to be shipped to Eastern Pennsylvania.

Brokers' buying prices for steel scrap for export also tend somewhat higher. They are paying \$10.00 to \$10.25 New York and Brooklyn docks for No. 1 heavy melting steel and \$9.00 to \$9.25 for No. 2 or auto steel.

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Detroit—Prices are stronger and several grades have advanced 25 cents. The increase reflects, to a large extent, higher levels paid by dealers, since there have been no orders from mills recently. Scrap offerings by automotive plants are heavier than was expected and lately have commanded more than was paid on previous transactions. Heavy melting steel and compressed sheets have advanced 25 cents.

Cincinnati—Conditions in other districts have exerted influence on scrap here, causing a stronger undertone, despite inactivity. Mills have not closed for tonnages but contracts are near completion. Extreme weather has slowed collection of country scrap in which demand has been none too keen. Quotations remain nominally unchanged.

St. Louis—Following the recent purchase of a round tonnage of steel by an east side mill, transactions in scrap have been confined to small lots for prompt shipment. Mills, two in particular, are casting about for material, but have not made definite offers either of tonnage or prices, and dealers are disposed to hold their stocks. The trend is firmer, with particular strength exhibited by railroad steel specialties and rails, there being a shortage of the latter.

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Philadelphia—Warehouse demand has held up well since the first of the month, being about on a parity with the daily June rate, which in turn was somewhat in excess of the May daily rate. Prices generally are firm at the new levels which became effective July 1.

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Cincinnati—New prices on warehouse steel, reflecting mill advances, are in effect and firm. Demand has shown no recession, holding at June levels. Tonnage for construction jobs is far ahead of last year.

St. Louis—The advance in prices which took effect July 1, has not halted buying activity. Demand continues brisk and for this time of year, unusually diversified. June business was ahead of May, and the largest for the month since 1930. Buying by machine shops has held up well and the drought has been less drastic than elsewhere, with little effect on distribution of products in the rural areas. The outlet through the building industry is well maintained.

Metallurgical Coke

Coke Prices, Page 73

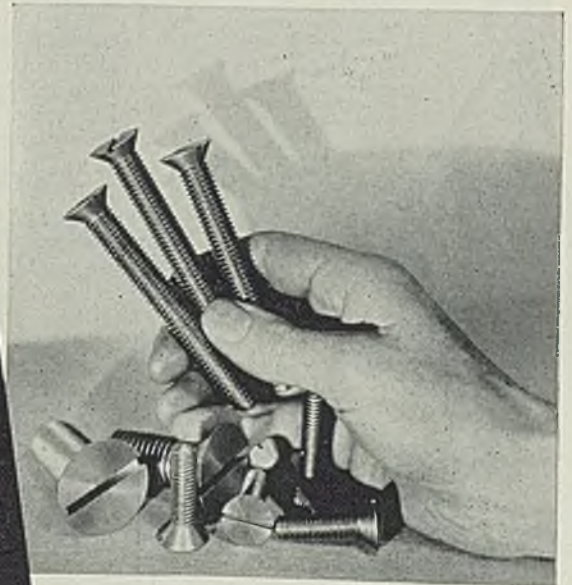
Coke buying and shipments are steady at about the same rate as in

Warehouse

Warehouse Prices, Page 76

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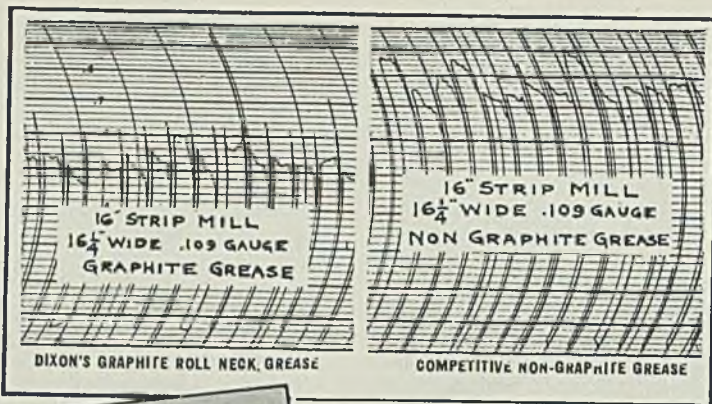
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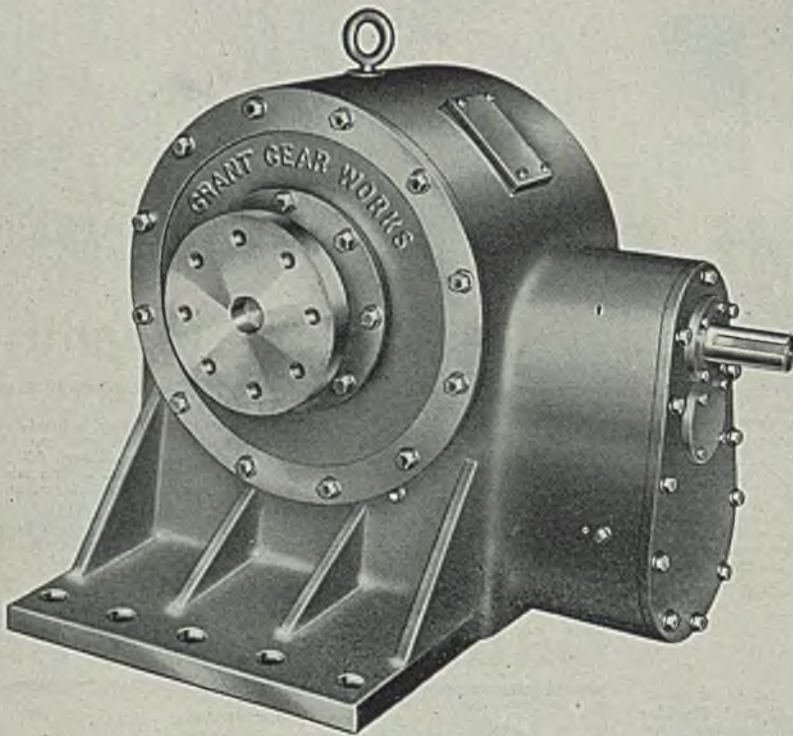


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tive plants have work in prospect in connection with model changes which will require a moderate quantity of warehouse steel, while miscellaneous building activity continues to contribute a fair share of business.

Cincinnati—New prices on warehouse steel, reflecting mill advances, are in effect and firm. Demand has shown no recession, holding at June levels. Tonnage for construction jobs is far ahead of last year.

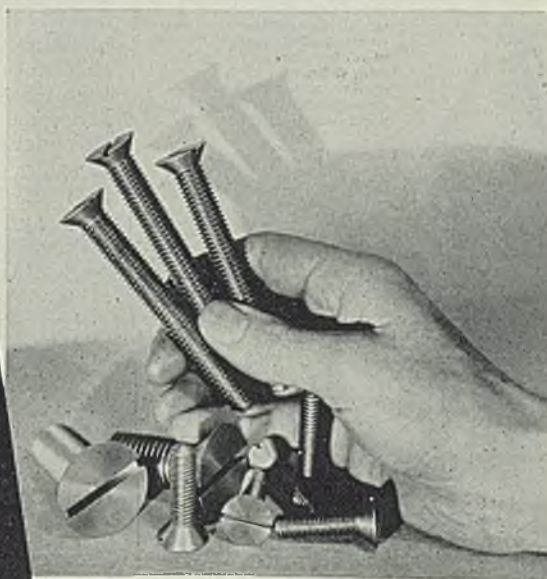
St. Louis—The advance in prices which took effect July 1, has not halted buying activity. Demand continues brisk and for this time of year, unusually diversified. June business was ahead of May, and the largest for the month since 1930. Buying by machine shops has held up well and the drought has been less drastic than elsewhere, with little effect on distribution of products in the rural areas. The outlet through the building industry is well maintained.

Metallurgical Coke

Coke Prices, Page 73

Coke buying and shipments are steady at about the same rate as in

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CAP SCREWS
promptly?



• Accuracy of thread fit, adequate tensile strength, fine finish—these requirements are fully met by our Flat Head cap screws. Like any Cleveland Cap Screw product these fine machine parts are available in a full list of sizes, USS thread, properly packaged and labeled. A complete stock of them is available to you from our factory, nearest warehouse or through your Distributor. Catalog D, and Discounts, on request. THE CLEVELAND CAP SCREW CO., 2935 East 79th St., Cleveland, Ohio.

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WHEREVER men work in intense heat, your labor costs rocket upward. Medical figures show that a man is but 10% efficient when working in a temperature of 110°F. So, where work is done under intense heat, Coppus Heat Killers save many times their cost by saving your workers' efficiency. The Coppus Heat Killer is the only type which *directs* the air on the job—prevents recirculation.

COPPUS HEAT KILLERS
are made in two types.

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The Coppus Vano Heat Killer is a light, portable cooler which directs a concentrated beam of air by means of a long diffuser. It is easily moved to concentrate on a particular job.



AEROPLANE TYPE

The Coppus Aero-plane Heat Killer moves large volumes of air at moderate speeds.



THE AIR CANNOT RE-ENTER THE BLOWER

because of the specially designed enclosed fan, *exclusive* in Coppus Heat Killers. Also used for general ventilation, cooling, driving out foul air, removing dust, smoke, etc.

For complete information on these two types and their multiple uses other than cooling, write for Bulletin 164-2.

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ENGINEERING CORPORATION**

359 Park Avenue
Worcester, Mass.

A Cooling Fan For Every Hot Job!

June. Prices have been held at an unchanged level. Foundry and blast furnace requirements are heavy and show no sign of declining. In the Chicago district deliveries are a shade lower than in June, with prices reaffirmed from second quarter. Cincinnati suppliers also find demand holding steady at unchanged prices. In the St. Louis district rate of consumption is higher than usual for the summer with indications of continuance.

Resumption of beehive coke production in the Connellsville region to supplement by-product output, which is becoming inadequate, is being discussed by steelmakers. Increase is expected to be put into effect before autumn.

Steel in Europe

Foreign Steel Prices, Page 76

London — (By Radio) — British foundry pig iron has been officially increased 5s per ton. Production is heavier, easing the matter of meeting demand. A rise in production costs is expected, owing to higher ore prices. Steel mills are operating full on almost all classes of products and higher prices have not caused any setback in demand. Export trade is more active, especially in rails and sheets. An order for rolling stock has been received from the South African railroads. Tin plate and galvanized sheets are quiet.

The Continent reports export trade is livelier and some prices for England and South Africa have been increased. Strikes in French steel-works in the Lorraine steel district are ending.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York—A market recovery in tin prices and a cut of \$2 per ton in zinc were the only price movements in the major nonferrous metals last week. Demand was generally light.

Lead—Demand was fairly active with sellers quoting unchanged prices at 4.45c, East St. Louis, for prime western. Deliveries are expected to show a marked improvement this month over June which in turn would improve the stock position of the industry. Stocks are still large but held in strong hands.

Copper—Active consumption of copper combined with the favorable statistical position of the industry continued to aid materially in supporting current levels. Sellers are

not concerned over the light rate of sales as they are still making heavy shipments on orders previously placed, especially those of April. No pickup in demand is expected before mid-August while electrolytic is expected to hold firm at 9.50c, Connecticut.

Zinc—Unexpected cut of \$2 a ton in zinc prices in the face of very favorable statistics for June and continued fair rate of consumption appears to have been beneficial to zinc producers here. The domestic market is now believed well protected against foreign imports of the metal. Prime western is now well established at 4.75c, East St. Louis.

Tin—Price soared following the surrendering by Bolivia of her right to export over 10,000 tons of arrears as of the end of May. Some observers now fear a sharp reaction. Straits spot closed around 43.37½c against 40.62½c a week previously. The future price trend is uncertain.

Antimony—Prices held unchanged at 13.00c on Chinese and 11.62½c on American spot in a generally quiet market.

Equipment

New York—Despite arrival of typical summer weather, demand for machine tools shows no signs of any let-down. In fact, most sellers report a further increase in bookings and in inquiries. One feature of the market is the lack of long lists which regularly were placed before the trade for quotations in the days prior to 1930. Buying at present is restricted almost entirely to single tools. Demand from England for all types of tools continues active.

Chicago—Inquiry for machinery and plant equipment is well sustained, helping to support the favorable outlook for new business this quarter. Machine tool buying so far this month is equal to or in excess of the June volume, with demand for small tools holding unusually well for this period. Chicago, Rock Island & Pacific railroad has yet to close on its recent list which, in addition to three lathes, includes a double-end punch and precision grinder. Allis Chalmers Mfg. Co. has a number of tools pending for its new Springfield, Ill., plant. Miscellaneous equipment and machinery buying generally is steady.

Seattle—Demand continues active particularly for road building machinery and mining equipment. Lumber mills and logging camps are engaged in mid-year overhaul and replacement, calling for many items. Canning plants are active.

Construction and Enterprise

Ohio

COLUMBUS, O.—L. Lewis, service director, is taking bids due July 28 for furnishing, testing, and installing main transformers, exciter motor generator sets, power wiring, power feeders, and other appurtenances and equipment.

DAYTON, O.—Contracting officer, materiel division, Wright Field, asks bid until July 21 for a wood borer, circular 36-1039.

DAYTON, O.—Pantorium Inc., Earl G. Fox, president, 2934 Salem avenue, proposes to construct a 1-story, 40 x 70 foot boiler house.

DAYTON, O.—Purchasing officer, materiel division, Wright Field, asks bids until July 24 for furnishing 250 pump assemblies, vacuum type, B-3, circular 1019.

DELPHOS, O.—Board of public works has engaged Carl Simon, Van Wert, O., engineer, to make a survey for a proposed municipal power and light plant.

EAST LIVERPOOL, O.—City service director E. B. Laughlin soon will ask bids for furnishing two new stokers, or repair present equipment, for the East End waterworks pumping station; to cost \$7000.

LIMA, O.—Public welfare department, state office building, Columbus, O., is asking bids for furnishing \$3500 worth of water supply pumps for state hospital here.

LIMA, O.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has acquired former plant of Relay Motors Corp. and plans to install machine tools and other equipment here to manufacture small motors for home appliances. Springfield, Mass. works is to be devoted to other lines. R. F. Frenger is to manage the Lima plant.

MARION, O.—City service director has submitted a proposal to city for construction of a \$1,600,000 municipal water plant. E. D. Barstow, 31 North Summit street, Akron, O., and George Holmes, Chicago, engineers participated in submitting the proposal to the city.

MASSILLON, O.—Ceres Supply Co., 405 Tremont avenue, Southwest, plans to install soon a conveyor for carrying corn to the grain elevator.

NEWTON FALLS, O.—City clerk may ask for bids on July 14 for construction of an electric power plant and distribution system to cost approximately \$150,000. Bryant & Sigmon Engineering Co., 6900 Madison avenue, here is consulting.

SPRINGFIELD, O.—City Manager Wilbur H. Story may ask for bids soon for miscellaneous extensions and improvements in the local water supply system.

Pennsylvania

MEADVILLE, PA.—Northwestern Rural Electric Co-operative association asks bids until July 23 for constructing a complete distribution system covering a distance of 128 miles.

PHILADELPHIA—Frankford ar-

senal, administration building, Bridge street, asks bids until July 30 for a universal milling machine, inventory 314-36-580; and until July 31 for a milling unit, inventory 314-37-1; and a drilling unit, inventory 314-37-2.

PHILADELPHIA — Frankford arsenal is asking bids until Aug. 3 for

thread milling machines, inventory 314-37-9; and automatic chucking and turning lathes, inventory 314-37-8.

PHILADELPHIA — United Engineers & Constructors Inc., 1401 Arch street, has been retained by Carnegie-Illinois Steel Corp. to design and supervise construction of a \$5,000,000

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FINE TOOL STEELS
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—Construction and Enterprise—

steam power station at the South Chicago, Ill., works. Station is to include three large boilers a turbogenerator, and three turbo blowers, replacing existing equipment.

SMITHFIELD, PA.—L. A. Taylor, clerk, village board of public affairs, asks bids until July 15 for furnishing a turbine pump, two water towers with combined capacity of 175,000 gallons, and a distribution system, contract 2. Harrop & Hopkins, 541 Wood street, Pittsburgh, is engineer.

TITUSVILLE, PA.—Private plans are being drawn for W. S. Borland, 163 East Bissell avenue, Oil City, Pa., and C. Sliker, Knox, Pa., owners, for installing air and gas type pressure plant for Shamburg field, here. Owners to buy gas engines,

air compressors and other equipment in this \$30,000 project.

Connecticut

HARTFORD, CONN.—Olds & Whipple Inc., 166 State street, may spend a total of \$80,000 for a new 1-story addition and electric power equipment. Mylchreest & Reynolds, 238 Palm street, is engineer and architect

New York

BINGHAMTON, N. Y.—City engineer J. A. Giles plans to purchase a 150,000 gallon steel water storage tank. Cost exceeds \$23,000. (Noted STEEL May 5).

BUFFALO — Iroquois Beverage

Corp., 230 Pratt street, expects to spend \$350,000 for additions and plant improvements, including installation of electric power equipment.

SALAMANCA, N. Y.—Nadolski Bros., Broad street, want to purchase machine shop and hoisting equipment and an air compressor.

WARSAW, N. Y.—City, suburb of Buffalo, has authorized construction of a \$30,000 water filtration plant.

New Jersey

DOVER, N. J.—Picatinny arsenal asks bids for a chrome-nickel steel tank until July 13, proposal 672-37-6.

Michigan

DETROIT—Kraft Brewing Co., 1800 East Forest street, Edmund J. Boell, secretary-treasurer, proposes to install conveying machinery in a \$150,000 program.

DETROIT—Long Mfg. Co., 2768 East Grand boulevard, maker of automobile radiators, expects to spend \$50,000 for constructing a new 2-story plant.

FLINT, MICH.—Chevrolet Motor Co. is taking bids on a power house addition here.

JACKSON, MICH.—Hinckley-Myers Co., 701 Water street, maker of garage tools and equipment, proposes to erect a 12,800 square foot addition to its plant.

PONTIAC, MICH.—American Forging & Socket Co. is having plans and specifications drawn for construction of a new power plant, W. S. Saunders is president.

Illinois

CHICAGO—Pheoll Mfg. Co., 5700 West Roosevelt road, producer of screws, nuts and bolts, plans to construct a 1-story addition and install electric power equipment.

CHICAGO—Clark Equipment Co., Buchanan, Mich., maker of electric steel castings and automobile trucks, plans to expand its plant here. Eugene B. Clark is president, and L. G. Emack, purchasing agent.

WINCHESTER, ILL.—Menard County Rural Electric Cooperative association proposes to erect \$37,000 worth of lines in Menard county.

Indiana

ANDERSON, IND.—Board of education, E. F. Miller, Anderson Bank building, architect, plans to construct a new steam power plant at the central heating and power station.

EVANSVILLE, Ind.—Durbin Steel & Malleable Castings Corp., 1015 East Columbia street, has been incorporated to manufacture castings and machinery. V. S. Durbin is resident agent.

SHELBYVILLE, IND.—Ray-Glo Inc., maker of stoves, furnaces and other equipment, has been incorporated by William F. Spencer, Robert S. Kearsney, and Edward D. Evans. Herbert C. Jones is resident agent.

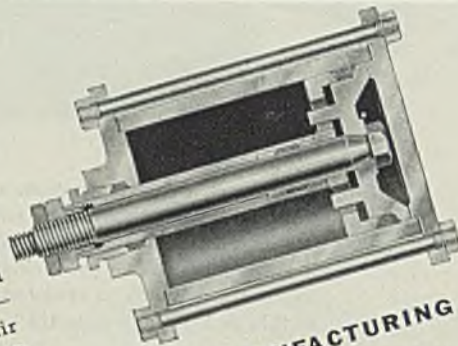
District of Columbia

WASHINGTON—Navy department, bureau of supplies and accounts, asks bids until July 14 for furnishing portable, pneumatic hammers and grinders, delivery on east and west coasts, schedule 8311.

WASHINGTON — Department of

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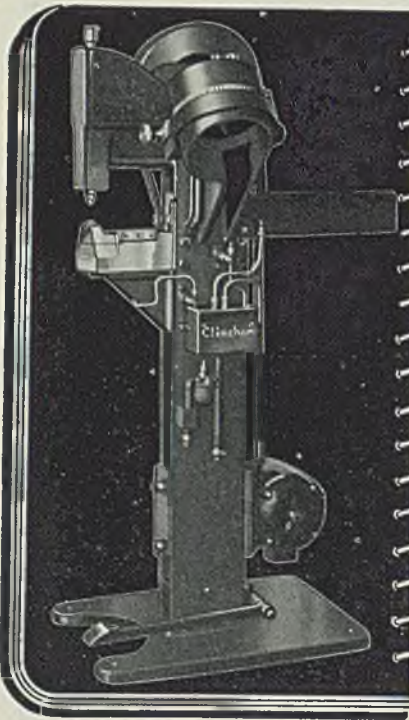
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commerce, division of sales & purchases, asks bids until July 17 for furnishing parts for repair and replacement for engine generator lighting plants, proposal 23100.

WASHINGTON—Navy department, bureau of supplies and accounts, asks bids until July 17 for 8 motor driven pumps and spares delivered Brooklyn, schedule 8349; 2 motor driven drilling machines for Charleston, S. C., schedule 8365; 1 vertical tubular boiler for Sewall's Point, schedule 8374; 1 tension machine for Washington, schedule 8357; 2 motor driven milling and stamping machines for Charleston, S. C., schedule 8356; 1 motor driven milling machine for Washington; schedule 8351; 1 motor driven knife grinder for Philadelphia, schedule 8353; 1 motor driven precision bench lathe, for Washington, schedule 8352; and 1 motor driven milling and tapping machine for Norfolk, Va., schedule 8364. Bids also will be asked until July 21 for the following motor driven equipment: horizontal shaper for Mare Island, schedule 8354; milling machine for San Diego, Calif., schedule 8360; a bench type lathe, San Diego, schedule 8359.

Maryland

BALTIMORE — City proposes to construct Patapsco pumping station at Curtis Bay.

Kentucky

LAWRENCEBURG, KY.—Dr. J. L. Toll, mayor, and S. F. Baxter, superintendent of city waterworks, have plans that may mature in August for a \$100,000 disposal plant and sewage system. H. P. Bell, 732 McCellen building, Lexington, Ky., is engineer.

MADISONVILLE, KY.—Municipality plans to construct a 300,000 gallon water tower on Lake street at a cost of \$15,000.

Alabama

MOBILE, ALA.—Quality Earths Inc., P. O. box 23, is in the market for a 100 to 150 horsepower diesel engine, and used pulverizing and drying machinery for use as fuller's earth manufacturing machinery.

Florida

JACKSONVILLE, FLA.—James E. Cotton, acting state PWA director, has appropriated \$3,000,000 for improvements in water systems in a number of towns.

MIAMI, FLA.—Atlantic Engineering Co., 58 Halcyon arcade No. 1, is in the market for 2 Sauerman type power drag scraper outfits; 125 volt, direct current, 3 to 5 kilowatt steam turbine generator unit; a heavy duty cable operated scarifier with teeth; a 50 to 75 cubic feet, 100 pounds pressure, portable gasoline driven air compressor; and an air operated jackhammer drill.

ORLANDO, FLA.—Atlantic Ice & Coal Corp., 37 North Thirteenth street, Chattanooga, Tenn., plans to install power equipment and conveying and loading devices in a new brewery here. Total cost is to be \$200,000, including a boiler house.

Mississippi

FAYETTE, MISS.—Board of aldermen, E. H. Reber clerk, asks bids until July 21 for furnishing and installing a diesel engine generating unit.

North Carolina

BLADENBORO, N. C.—Town seeks a PWA loan and grant for a \$38,000 waterworks.

CAMERON, N. C.—Town seeks a PWA loan and grant for a \$27,000 waterworks and sewage system.

CLAREMONT, N. C.—Mayor E. C. Little has applied to PWA for a loan and grant for waterworks and sewage systems estimated to cost \$38,000.

DENTON, N. C.—Mayor H. Harrison seeks a PWA loan and grant for waterworks and sewage systems estimated to cost \$86,000.

ELLENBORO, N. C.—Mayor O. R. Coffield has applied to PWA for a

loan and grant for a \$76,000 waterworks and sewage systems.

FAIR BLUFF, N. C.—Mayor H. Coleman seeks a PWA loan and grant for a \$76,000 sewage system and waterworks.

FOUR OAKS, N. C.—City Clerk B. Lassiter has applied to PWA for a loan and grant for an \$80,000 waterworks and sewage systems.

CREEDMOR, N. C.—Mayor R. H. Rogers seeks PWA loan and grant with which to finance construction of a \$69,000 waterworks.

GREENSBORO, N. C. — Andrew Joyner Jr., city manager, asks bids until July 21 for furnishing and in-

(Please turn to Page 97)

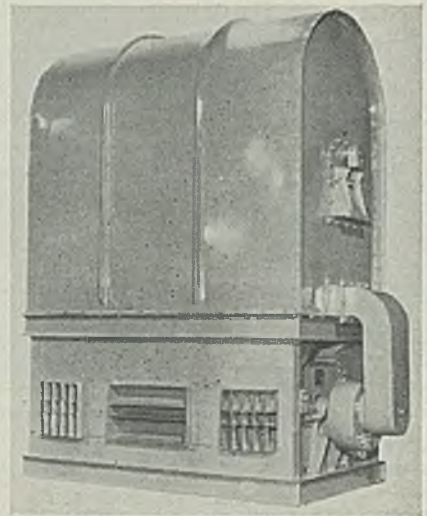
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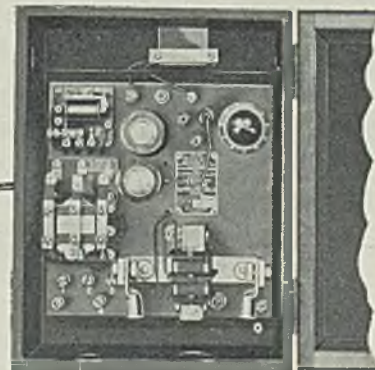
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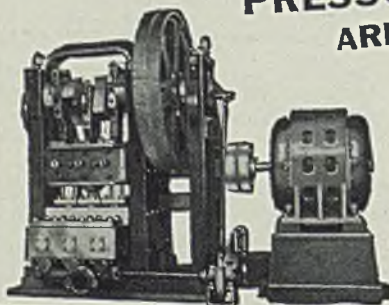
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COLUMBUS, OHIO

(Continued from Page 95)

stalling two 250 horsepower gas engine driven generating units, and other electrical equipment listed in section 2; and for furnishing and installing a heating system for the sewage treatment works, section 4.

LENOIR, N. C.—Mayor W. J. Lenoir has applied to PWA for a loan and grant of \$29,000 for improvements to waterworks.

LONG VIEW, N. C.—Town has voted bonds with which to finance a \$45,000 waterworks program.

MATTHEWS, N. C.—Mayor C. R. McLaughlin seeks PWA loan and grant for a \$36,000 waterworks.

MURPHY, N. C.—Mayor J. B. Grey has applied to PWA for loan and grant of \$40,000 for improvements to waterworks.

ORIENTAL, N. C.—Town has applied to PWA for loan and grant with which to finance construction of waterworks and sewage systems.

ROCKWEED, N. C.—Mayor R. J. Holts has applied for a PWA loan and grant for \$80,000 sewage system and waterworks.

WHITEVILLE, N. C.—Columbus county board of education asks bids until July 15 for erection of an electric light plant, and building and furnishing a school, Leslie N. Boney, 221 South Fifth street, Wilmington, N. C., is architect.

South Carolina

CHESTER, S. C.—Duke Power Co., E. C. Marshall, vice president, proposes to proceed with construction of approximately \$20,000 worth of rural lines in Chester county.

Tennessee

CLARKSVILLE, TENN.—City, W. D. Hudson mayor, will use TVA power if bond issue for distribution system passes.

COLUMBIA, TENN.—City considers use of TVA power. May vote bond issue. Eldridge Denham is mayor.

JACKSON, TENN.—Mayor A. B. Post proposes to ask PWA for loan and grant of \$575,000 to construct an electric distribution system, using TVA power.

JOHNSON CITY, TENN.—Marion Sellers, mayor, has electrical survey underway, and city may vote soon on distributing TVA power here.

KNOXVILLE, TENN.—Tennessee Valley Authority plans to ask bids for a pumping station for a \$450,000 interceptory sewer, here.

MURFREESBORO, TENN.—Middle Tennessee Membership Corp., Knox T. Hutchinson, president, will start work soon on construction of lines to distribute TVA power.

Virginia

WYTHEVILLE, VA.—R. P. Johnson, dealer, is in the market for a used 150 horsepower slide valve engine.

Missouri

KANSAS CITY, MO.—United States engineer, 232 Manufacturers Exchange building, asks bids until July 21 for drag-line excavators.

MONTICELLO, MO.—Lewis County Rural Electric Cooperative associa-

tion has been incorporated by H. W. Hammond, Canton, Mo., and B. L. Anderson, Monticello.

ST. LOUIS—Knapp-Monarch Co., maker of household appliances, 3501 Bent avenue, has leased plant of Dover Mfg. Co. at Dover, O.

ST. LOUIS—St. Louis Blow Pipe & Heater Co. Inc., maker of unit heaters, air conditioning equipment, and fabricators of sheet metal, is building a 2-story addition to the plant. C. N. Skinner, 1948-60 North Ninth street, is president.

ST. LOUIS—James R. Keane Corp., electrical equipment manufacturer, has let a contract for a \$150,000 addition to the plant. Some

new equipment may be purchased. J. R. Kearney, 4235 Clayton avenue, is president.

ST. LOUIS—Pioneer Trailer Coaches Inc. has been organized with Frank B. Caughlan, 5885 Delmar, as president.

ST. LOUIS—Emerson Electric Mfg. Co. will move present office quarters and use additional space for expansion of manufacturing facilities. H. J. Finch, 2018 Washington avenue, is chairman of the board.

Arkansas

LITTLE ROCK, ARK.—Terry
(Please turn to Page 99)



From the standpoint of hardness, uniformity, and low cost per ton of steel, plus low oil consumption, it will pay you to specify Houghton's No. 2 Soluble Quenching Oil.

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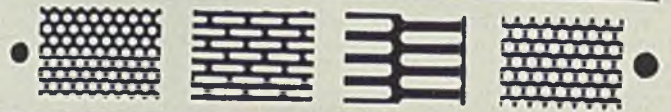


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(Concluded from Page 97)

Dairy Co., Scott street, plans to spend a total of \$50,000 for a new plant and electric power equipment.

Texas

HOUSTON, TEX.—G. L. Fugate, water department director, proposes to spend \$936,000 for improvement of water supply system, including installation of pumps and motors. Work may be financed by 45 per cent grant.

McALLEN, TEX. — Rado Refining Co. plans to double capacity of refinery in a \$40,000 program. Charles J. Holland is president.

SAN ANTONIO, TEX.—City has applied to PWA for \$11,000,000 with which to construct a power plant and distribution system. An allotment of \$2,770,000 has been partially approved.

Wisconsin

MILWAUKEE—Blackhawk Mfg. Co., 121 North Broadway, maker of hydraulic lift jacks, is remodeling old milling machine plant of the former Kemp Smith Co., 45 West Rogers street, West Milwaukee.

PORTAGE, WIS.—Portage Hosiery Co., William H. Ziock manager, proposes to install electric power equipment in a new 2-story addition to mill. Total cost \$70,000. Livermore & Samuelson, 2 South Carroll street, Madison, Wis., is architect.

SUPERIOR, WIS.—Superior Terminal & Dock Co. has been organized to size scrap metal on the Northern Pacific railway ore dock here, and may purchase six pairs of shears and a large derrick.

Minnesota

LITCHFIELD, MINN. — Litchfield Woolen Mills, E. E. Strouts, vice president in charge of production, plans to rebuild portion of plant damaged

by fire, and to install electric power equipment. Total cost \$65,000.

Kansas

ST. FRANCIS, KANS. — Common council has engaged E. T. Archer & Co., New England building, Kansas City, Mo., consulting engineer, to plan construction of an \$85,000 extension and improvement in the municipal light plant. Will purchase a new diesel generating unit.

Iowa

ROCKWEED CITY, IOWA—Common council considers constructing a new municipal electric plant at a cost of \$175,000. Young & Stanley, Muscatine, Iowa, is consulting engineer.

Pacific Coast

COULTERVILLE, CALIF. — Ed McMahon, superintendent, may be in charge of a 100-ton mill to be erected at the Malvina mine in Mariposa county.

KINGSBURG, CALIF.—Muscat Co-operative Winery association, C. W. Tremper manager, plans to construct a new plant addition and install electric power equipment, total cost being \$100,000.

SAN PEDRO, CALIF.—Van Camp Seafood Co. has applied for a permit to construct a \$3000 addition to the boiler room at 150 Cannery street, Terminal Island.

PORTLAND, OREG. — Portland Electric Co. plans to spend \$100,000 on rural lines totaling 135 miles in Multnomah, Clackamas, Marion, Yamhill, and Washington counties. F. T. Griffith is president of the company.

SALEM, OREG.—City will open bids July 17 for construction of an elevated steel tank of 100,000 gallons capacity, on a 70-foot tower.

OLYMPIA, WASH. — State has available from congressional action a \$6,448,000 grant, and a \$19,344,000

loan for the Skagit power plant.

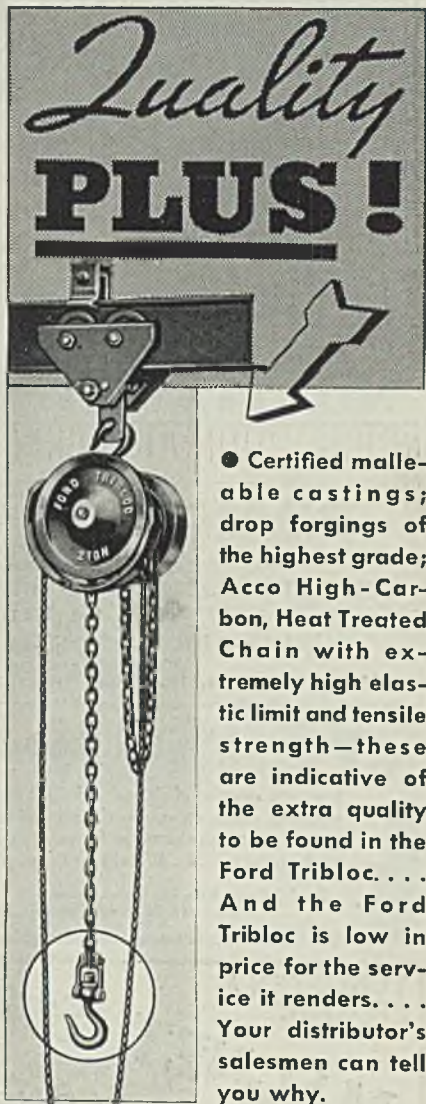
REPUBLIC, WASH.—Commercial club considers constructing 100-ton ore mill to serve mine properties in this district. H. C. White, W. R. Hall, and Alex McKay constitute committee in charge.

Canada

TORONTO, ONT.—Flexible Shaft Co. Ltd., 351 Carlaw avenue, maker of household electrical equipment, has acquired a section of the former Willys-Overland plant, and will convert it for manufacturing.


COMEAU BAY, QUE. — Ontario Paper Co. Ltd., Thorold, Ont., is in the market for two 25,000 kilowatt ampere, vertical 60 cycle generators.

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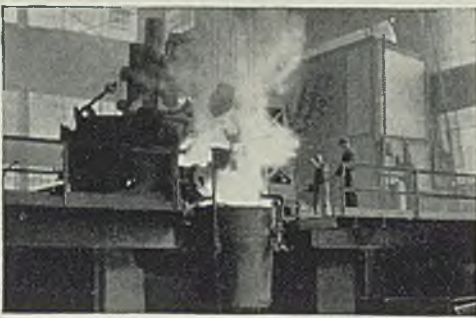


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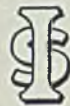
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