STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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Ryerson rushes steel to flood swept areas

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STEEL-SERVICE

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

THE insistence of Senator Wheeler upon the appearance of the presidents of the two largest steel companies at the basing point hearing indicates that the senator believes that the cost sheets of these companies (p. 14) are essential to the proper consideration of the anti-basing point bill. Whether or not private companies should divulge their costs to federal inestigators has been a point of issue on many occasions. From the experience of the past, it is doubtful whether information of this kind can be helpful in shaping legislation affecting industry. Too often cost data are utilized for punitive rather than constructive purposes.

♦ ♦ ♦

Reviving an Old Issue

Industry today has more than usual ground for suspecting the motives behind Senator Wheeler's demand. During the past few years the present administration on numerous occasions has showed that it favors the idea of establishing "yardsticks" under government supervision in order to find out the cost of doing business under private management. The TVA is supposed to be a classic example of a new deal "yardstick." A few days ago Secretary Ickes, in testifying before the senate committee hinted that it might be a good idea for the government to build a steel plant as a "yardstick" to determine the cost of making steel.

♦ ♦ ♦

Prejudice Does Not Help

Of course the "yardstick" idea is simply a ruse used by new dealers to cover up their efforts to introduce a form of socialism into this country. The record of the government armor plate plant, which Josephus Daniels put through in an attempt to bulldoze private industry two decades ago, should be a sufficient warning to the public that the government makes a mess of things whenever it tries to encroach upon the field of private industry. In the basing point matter, no useful purpose will be served as long as certain senators approach the problem in a spirit of animosity. An honest attempt to improve the present system might bring beneficial results, even by the dubious means of legislation. But the vindictive attitude displayed and the apparent determination to overthrow an established order will not help to solve the problem.

♦ ♦ ♦

Almost Back To Normal

Industry won plaudits for the remarkable manner in which it restored its mills, furnaces, shops and offices to an operating basis after the flood waters receded. In many districts, production and manufacturing facilities were ready to function (p. 16) before railroad cars were available and telephone communication was restored. Complete repair of flood damage will require considerable material and equipment. Hundreds of bridges must be rebuilt, and in some districts cranes, dock handling equipment, barges, etc. must be replaced. Early estimates indicate that steel requirements for rehabilitation in flood districts (p. 77) may mount to 100,000 tons. Later on, flood control projects may be developed, and it is to be hoped (p. 29) that engineering judgment rather than pork barrel patronage will prevail in this work.

♦ ♦ ♦

Wider Sheets and Plates

The size of flat rolled steel products seems to be bobbing up frequently in the current news of industry. Following reports in the last two issues of STEEL of record-size stainless steel plates, a correspondent now submits information (p. 16) concerning a plate of 18-8 steel measuring 120 x 188 inches, several plates of 16 per cent chromium each 122 x 306 inches and others of unusual dimensions. By coincidence, the new continuous hot and cold strip-sheet mill of the Great Lakes Steel Corp. was placed in operation in Detroit last Tuesday (p. 22), turning out material to a width of 90 inches. The frequency with which new maximums in width are being recorded is significant of a constantly increasing expansion in the application of flat rolled steel products.

E. L. Shaner

Wheeler Demands Irvin, Grace Testify on Basing Point Bill

WASHINGTON

I AM constrained to announce that I have directed a communication to William A. Irvin and Eugene G. Grace, presidents, respectively, of the United States Steel Corp. and the Bethlehem Steel Corp., explicitly requesting their appearance before this committee April 2 and 3."

Thus did Senator Burton K. Wheeler, Democrat of Montana and chairman of the interstate commerce committee of the senate, proceed Friday to top off the hearing of his committee on the Wheeler-Utterback anti-basing point bill.

Senator Wheeler, whose questioning of witnesses, principally steel executives, has indicated a determination to prosecute his campaign to make every iron and steel producing point a basing point, said further:

"The purpose of this hearing is to gather all factual material that we can pertaining to the present and past operation of the basing point and delivered price system used in the distribution of commodities . . . . At the beginning of the hearings I felt that Messrs. Grace and Irvin should testify and so requested, but I received word that it would be inconvenient for them to appear. It was suggested that certain of their vice presidents would be thoroughly conversant with the subject and could give the information we desired . . . . Vice presidents of both of these corporations have stated they have no authority to produce cost sheets . . . . This kind of testimony is not indicative of a helpful co-operative attitude. Neither does it serve to inform the committee as to facts which bear direct relationship to the legislative inquiry now before us. . . . Failing to get this we asked Walter S. Tower, executive secretary of the American Iron and Steel institute, for this information, without any result . . . . These two men (Irvin and Grace) are presidents of the two largest integrated producers of steel in the world. They are the superior corporate officers of two of the witnesses who failed to give this information to the committee. They also are officers of the Iron and Steel institute."

Prof. O. M. W. Sprague, a Harvard professor, an expert in world finance, former adviser to the Bank of England, and at one time an assistant secretary of the treasury, who broke with the President over new deal finances, told the senate committee the following Friday:

"I do not think that as an immediate measure of recovery the abrogation of the basing point system would accomplish very much, whatever might be its effect in the distant future . . . . There is great merit in the contention of the steel industry that because steel is used with other products in manufacturing various commodities, if it reduced the price the cost of the commodity would be little reduced . . . . Taking automobiles as an example, prices must be reduced on different commodities to stimulate demand . . . . A concerted decrease in commodity prices would hasten recovery . . . . It is highly improbable that any chaotic condition would result in the steel industry if the basing point system were abolished . . . . An interstate steel commission might be set up to deal with the basing point problem, but I am not certain this would be desirable . . . . The steel industry has not been particularly profitable recently and I would not think for a moment of investing in steel stocks under the present pricing policy of the industry . . . . The basing point system is only one way of maintaining prices and if it were broken down some other way would be found . . . . The industry must stimulate demand as well as control production."

Push Bill for Next Session

Last week, at the conclusion of the third week of testimony on the anti-basing point bill, it was increasingly evident that there was little chance of the bill becoming law this session. In fact, it may not even be reported out of the committee. But there is plenty of drive behind the bill and the next session of congress may see it expedited unless there is an overturn at the November election.

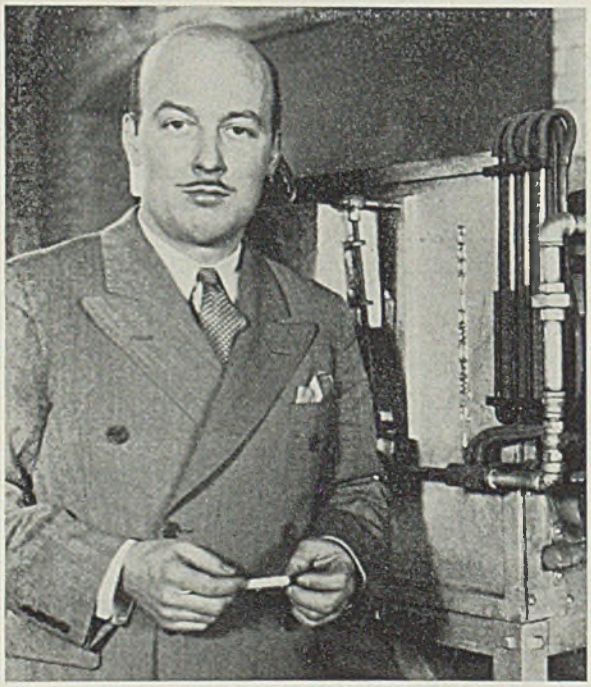
Up to now the steel industry has taken the brunt of the battle. Beginning Monday, the cement industry will be heard. However, the animus of the authorities and the committee is directed against the steel industry and the record is being made on it.

Paul Mackall, vice president in charge of sales of the Bethlehem Steel Corp., who returned recently from Japan, made some interesting observations to the committee in connection with steel production in that country and of foreign trade in general. He also opposed the Wheeler bill.

Mr. Mackall testified that foreign competition is growing serious in the United States. He stated that pig iron cannot compete on the east coast with foreign imports. It is laid down on the eastern seaboard, he said, cheaper than it can be produced in the United States.

Mr. Mackall testified that Japanese

Heads Iron and Steel Program at Great Lakes Exposition



"Romance of iron and steel" is being planned by Dr. A. A. Bates, associate professor of metallurgy, Case School of Applied Science, Cleveland, as a principal feature of the Great Lakes Exposition, which opens in Cleveland June 27. Doctor Bates will picture development of the iron and steel industry from prehistoric to modern times using models, dioramas and mammoth photographs

steel production is growing rapidly and he predicted that within a year Japan will not have to import any steel. He stated that in years gone by his company has exported considerable steel to Japan.

Answering questions of various members of the committee, the witness stated that the United States cannot sell any steel in foreign steel producing countries. Our steel, he said, goes only to nonproducing countries. It is barred by tariffs and low costs of production in the foreign producing countries. England is operating 100 per cent in its steel plants at this time, he said.

He testified that the United States now exports steel to the South American countries, China, Japan, and the Far East, but none to Europe.

Mr. Mackall testified that the Wheeler bill would mean the zoning of the steel business in this country. It would increase the number of basing points of the country and would wreck the price structure.

Answering questions of the committee, Mr. Mackall also stated that no price would compensate Bethlehem for putting steel on trucks. It is done in very rare cases, he said, to oblige customers, and at those times the charge is usually somewhat less than the all-rail freight rate would be, but it is not the practice of his company, he testified, to sell steel for truck delivery.

Speaking of the new strip mills, he stated that the new processes adopted from time to time in the steel industry do not necessarily mean the displacement of manpower. As a matter of fact, he pointed out that there are as many or more men now employed in the steel industry than there ever have been. He called Senator Wheeler's attention to the fact that through new methods the price of sheets has been reduced from $100 to $45.

Compares District Costs

George P. Gordon, general sales manager of the Lukens Steel Co., Coatesville, Pa., returned to testify further.

He stated that his company makes a net profit in eastern territory. The lowest net profit, he said, is in the Pittsburgh area. He expressed the opinion that the highest freight absorption charge of his company would be in the Chicago area. The Chicago price, he testified is not profitable for an individual sale. He said that the lowest net is $1.42 per 100 pounds and he later testified that this figure is under the cost of production.

Mr. Gordon testified that the costs at his mill are higher than those at Pittsburgh. He said that the use of scrap in his plant varies from 30 to 60 per cent.

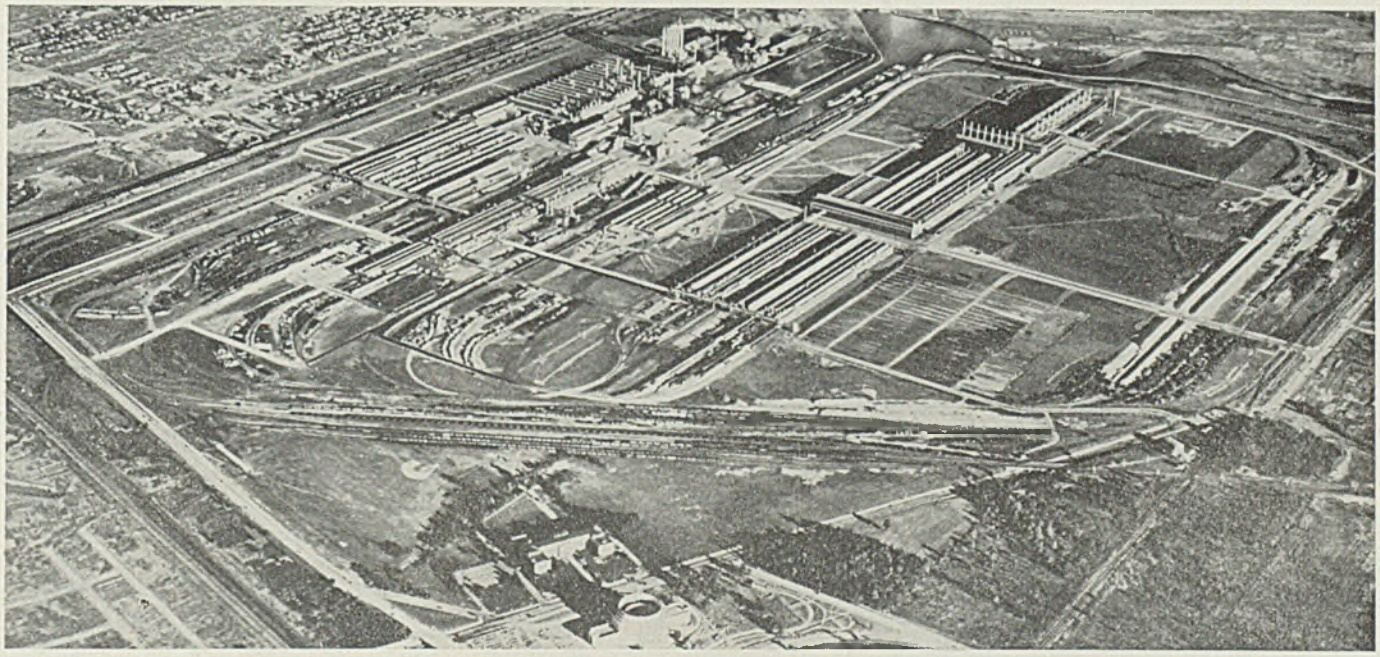
Section 29 of the Wheeler bill, stated Mr. Gordon, would put Lukens out of business. He told Senator Wheeler that his company wants to compete wherever there is " a demand for our product," and he does not believe that this could be done under the Wheeler bill.

Section 29, he said, will play into the hands of the large steel fabricators of the country and will put the small fabricators out of the field. It will also have a tendency to reduce prices. The lowering of prices, he pointed out, will force the mills eventually to reduce wages. There is competition in prices in the steel industry today, he insisted, in spite of statements to the contrary made by Senator Wheeler.

Mr. Gordon said that his company is not now operating at a profit. He

(*Please turn to Page 98*)

The Fords You Watch Go By Roll Out from Here



This aerial view of the Rouge plant of the Ford Motor Co. at Dearborn, Mich., made and copyrighted by James V. Piersol, aviation editor of the Detroit News, is considered by Ford officials to be the finest aerial photograph ever made of the Rouge plant. Beside the 1096 acres comprising the plant site, the view also discloses the new Ford rotunda in the foreground, and Rouge river and turning basin reaching out to the Detroit river. The Rouge river and Detroit river form the outlet from the Rouge plant for transportation of Ford products by water to all parts of the world. At the right are shown the railroad sidings serving great storage dumps of steel, scrap and sand. To the left, the first group of buildings includes the new steel mills at the top, the spring and upset and pressed steel buildings. Center are the glass factory and "B" building, which houses the famous final assembly line. Above these, bordering the Rouge river slip, are the cement plant, the vast coal, ore and limestone storage bins, the "high line" and the coke ovens and by-products plants. Further to the left are the power plant, the largest capacity high-pressure steam plant in the world, the foundry building, foundry machine shop building and the motor building

Steel Industry Quick To Overcome Flood Handicaps

PITTSBURGH

THE most miraculous industrial recovery in recent years from a major disaster has restored the steel industry in the Pittsburgh-Wheeling district to normal operating conditions that prevailed before the flood.

Herculean efforts through early last week on the part of steel mill and office employes saw normal shipments returned and the specifications of customers being efficiently and promptly served.

At no time was any steel producer in the Pittsburgh or Wheeling districts forced to allocate orders outside of its own company or divert unfilled tonnage to plants of competitors. In some cases, shipments were resumed by steel producers within a day after the flood's crest had passed.

Following on the receding waters, gangs of laborers cleaned out mill floors of the deposit of yellow-brown silt, electric equipment was quickly dried where necessary, and production schedules had snapped back to the 45 per cent mark for Pittsburgh and the 73 per cent level for the Wheeling district mills.

Office Forces Hampered

Temporarily, a few sales executives and representatives of allied metal-working industries took up temporary headquarters in Pittsburgh hotels, since the return to normalcy in some Pittsburgh office buildings was slower than in the mills. However, United States Steel Corp. subsidiary headquarters functioned unchanged in the Carnegie and Frick buildings, and Jones & Laughlin Steel Corp. personnel continued to operate out of its Third and Ross street headquarters.

The following facts, broken down by individual companies centering at Pittsburgh and Wheeling, show how rapidly the road back was attained:

Carnegie-Illinois Steel Corp. — Had by March 23 recovered to a 45 per cent rate of ingot operations in the Pittsburgh district and went on to make further advances.

The Homestead, Duquesne and Clairton divisions, all on the Monongahela river, came out of the flood quickly and resumed operations speedily. On a representative day early last week, Carnegie's operating chart showed that 31 open hearths were on at Homestead, 11 at Duquesne, 7 at Edgar Thomson, and 6 at the Clairton works, and the week finished at rates approximately the same.

All of these divisions were caring for orders in a prompt manner; in fact, no water even touched the Clairton works through the entire disaster and in turn did little damage to any part of Duquesne and Homestead.

The only two major works of the company affected at all were Edgar Thomson and Mingo Junction divisions. Edgar Thomson resumed with two blast furnaces March 24, a third March 25. Mingo Junction put mills on March 23, a blast furnace March 24, and attained normalcy March 26.

Ferromanganese shipments were being made on regular schedule by the company out of stocks at Sharpsburg, Pa. The Schoen wheel works, McKees Rocks, Pa., under several feet of water at one time, transferred its orders to Steel corporation subsidiaries in the Chicago district. No shortage of coal, coke, pig iron, hot metal or scrap occurred during the week, nor of freight car facilities for outbound shipments. At Youngstown there was no interruption, some 1015 tons being rolled in two shifts on the new 43-inch mill on March 20.

"Rapid recovery to normal in our plants in the Pittsburgh district following the worst disaster in Pittsburgh's history was due to the loyalty and co-operation of our employes," said B. F. Fairless, president of the company immediately after the flood stage had passed.

"With the exception of two plants of Carnegie, all of our other divisions were in working order March 22, and in many cases shipments were being made last Friday and Saturday (March 20 and 21) only one day after the flood crest.

"At no time have orders from steel buyers been refused and the company has been and still is in a position to serve the trade."

Jones & Laughlin Steel Corp. — Largest division, Aliquippa, Pa., was spared damage as open hearths, blast furnaces and important rolling mills at north end of mill, not threatened. Large seamless pipe mills were not touched by water. Contact by flood was confined to the tin mill, where some stocks were immersed, and to the wire division, but the latter was dried out and operating March 22.

Banked Furnaces Resume

At South Side, Pittsburgh, division, three Eliza blast furnaces were banked March 19-20, but two resumed early last week. No. 1 South shop, including steel fabricating division, was cleaned of silt deposits last week and prepared for normal operation.

Coal and coke stocks were unaffected, no car shortage existed at any time last week, and company's shipments are running some 30 per cent ahead of February, marking March as best month in the company's business this year.

No orders were diverted and customers' requirements are being handled promptly. The company was shipping normally last week, and included in outbound freight dispatched were large orders for cold-finished steel bars, tin plate, hot-rolled products and wire.

Allegheny Steel Co. — Bracken-

Going Up! That's Size of Stainless Steel Plates

THERE'S no stopping the stainless steel people when they really get going. For the past two weeks STEEL *has reported production of what were claimed to be record-size stainless steel plates. The race has now taken on all the aspects of a Kentucky derby, with a communication last week from P. A. E. Armstrong concerning stainless plates rolled by Lukens Steel Co., Coatesville, Pa., from steel produced by Latrobe Electric Steel Co., Latrobe, Pa.*

These giants are as follows: One of 18-8 *steel,* 120 *by* 188 *inches,* 3/16-*inch thick, shipping weight* 5350 *pounds; several of low-carbon* 16 *per cent chromium steel,* 122 *by* 306 *inches,* ⅜*-inch thick, each weighing* 4190 *pounds; of the same steel,* 93 *by* 354 *inches,, ⅜-inch thick, weighing* 3500 *pounds; also of the same steel,* 171 *by* 204 *inches, ⅜-inch thick, weighing* 6275 *pounds.*

These companies also have produced a large plate of Duo-metal (see STEEL, *Feb.* 24, *p.* 49), 127 *by* 140 *inches,* ⅞*-inch thick, weighing* 4500 *pounds. This had a low-carbon steel backing, with* 20 *per cent cladding of* 18-8 *stainless. It was formed hot after rolling and then annealed at* 2050 *degrees Fahr. All the above plates were shipped with a pickle finish.*

Any more starters in the great "platers" derby?

ridge, Pa., open-hearth and finishing mill departments resumed rapidly after the flood peak, March 19 and 20. Company commenced making shipments, March 21, had four of eight open hearths on March 23, and was operating all of its sheet mills same date.

Office building, closer to Allegheny river and on lower ground than the mill, was flooded with over three feet of water at one time, but all company records and papers were salvaged. Territory surrounding the plant was hard hit, with several deaths occurring in residential districts of Brackenridge, Tarentum and Etna; the company lent aid and cooperation to Red Cross and national guard.

"At no time was it necessary to divert any of the company's orders to other plants," said W. F. Detwiler, executive vice president, immediately following the flood.

Wheeling Steel Corp. — Many departments in Wheeling, W. Va., district were flooded, but return to normal was made quickly. Portsmouth, O., division was saved by earth and steel wall which kept waters out of plant, Norfolk & Western yards and other important divisions. Wheeling Steel put Steubenville, O., blast furnaces, blooming mill, bar mill, cold strip mill and one lap-weld furnace on March 23 and began five of 11 open hearths March 24.

River Mills Reopened

Yorkville, O., tin mills were operated partially during the flood and 18 tin mills were added to schedule March 24. Beech Bottom, W. Va., sheet mills were able to begin shipments March 22, and three long terne pots were started there March 23.

Martins Ferry, O., galvanizing departments, including sheet and ware galvanizing, went in operation March 23. Tub and bucket shops went on 100 per cent March 23 and ash can department resumed March 24. Cut nail division, South Wheeling, W. Va., operated throughout flood. Drum plant, Wheeling, W. Va., began March 22.

The company's other important division, Portsmouth, O., was closed early in the week in large part as a precautionary measure, but the plant was practically unaffected. Six of ten open hearths there resumed March 24.

Pittsburgh Steel Co.—Both Monessen, Pa., and Allenport, Pa., plants were unaffected by water. These divisions are both on the Monongahela river in a southerly direction from Pittsburgh, and at flood stage it was necessary only to shut down water intake pumps for about four hours. One blast furnace and seven open hearths continue in operation for the company. Shipments are normal and at an advanced stage. Company reports increasing business—March was the best month in specifications and shipments since June, 1934.

National Tube Co.—Banked the two blast furnaces it had active at McKeesport, Pa., for two days, March 18 and 19, but resumed blast March 20. Bessemers and open hearths there were slow in resuming. Christy Park works, McKeesport, Pa., was down through last week for lack of power, being dependent on Duquesne Light Co.

Ellwood Works, Ellwood City, Pa., was down for three days during flood stage for lack of gas, but has resumed normal schedule. National Tube last week scheduled all 12 of its Lorain, O., open-hearth furnaces, diverting some McKeesport division business there.

Weirton Steel Co.—Operated without interruption at the Weirton plant throughout the entire flood with 11 open-hearth furnaces and 2 blast furnaces on. A large ore bank separates most of the Weirton plant from the river, and the latter would have had to rise another 6 feet to have overflowed into mill floors. The Steubenville, O., division suffered some damage to tin plate stocks. Clarksburg, W. Va., mills not being near the river, did not experience any water damage.

McKeesport Tin Plate Co.—Resuming with hot mills at about 35 per cent of capacity today, March 30, after being down in most departments through last week, while electrical and other plant repairs were being made. Company had a major part of its tin plate finishing capacity on by March 25, and is operating full in this division beginning this week.

A stage of 4 to 5 feet of water within the McKeesport mill was experienced at one time ten days ago, but remarkable recuperation has been made. Shipments out of stock were being made immediately after flood had passed, and all customers' requirements were cared for.

Some Power Interruptions

Superior Steel Corp.—Works at Carnegie, Pa., were unaffected by water. Company experienced lack of power for a short time March 20, which caused two small hot mills to suspend, but orders were filled on larger steam mills. Company is operating at about 50 per cent, equal to operations prior to flood.

West Leechburg Steel Co., Leechburg, Pa.—Three strip mills were placed in operation late March 22, company adequately caring for specifications and shipments through last week with plant production at about 50-55 per cent, or the strip industry's average. No orders were diverted at any time.

Columbia Steel & Shafting Co., Carnegie, Pa.—Plants here were not damaged by the water, but some operations were curtailed through lack of electric power.

Mesta Machine Co., West Homestead, Pa.—Began reheating open-

Chicago Mills' Benefit Is Small as East Resumes

Chicago

THE rapidity with which eastern mills were able to resume operations and shipment of finished steel made unnecessary the transfer of business to Chicago district plants.

Some orders from the central west, which might have gone to Pittsburgh producers during the several days when the latters' plants were inundated and when the date of resuming production was problematical, were switched to Chicago mills. The tonnage involved in such business was relatively small, however.

In general, the benefit accruing to Chicago interests by virtue of the unfortunate experience of Pittsburgh and Wheeling district mills was insignificant.

Initiate Electric Furnace

FROM left to right, Herman Kluender, vice president, Detroit Alloy Steel Co.; Howard Colby, chairman of the board of Detroit Gray Iron Foundry Co. and Detroit Alloy Steel; and Hugh Martin, president, Detroit Gray Iron Foundry and Detroit Alloy Steel, snapped by the cameraman at the recent open house held by Detroit Gray Iron Foundry Co. on the occasion of its opening a new electric furnace unit

hearth furnaces early last week, and had production of steel for castings under way by March 27.

Spang, Chalfant & Co. Inc., Etna, Pa. and Ambridge, Pa.—Damage in large part was slight, and plant operations were resumed without difficulty.

United Engineering & Foundry Co., Pittsburgh, with plants at Vandergrift, Pa., and Pittsburgh—Last week was working on repairs to damaged facilities, including open-hearth furnaces at Vandergrift.

Pittsburgh Crucible Steel Co., Midland, Pa., works—No interruption to operations during flood. Water would have had to rise 18 inches more to interrupt production. An unchanged number of open-hearth furnaces and one blast furnace continued on through last week. LaBelle and Park works divisions were partially flooded.

Apollo Steel Co., Apollo, Pa.—Shipments of sheets are resuming from the plant here early this week.

Wyckoff Drawn Steel Co., Ambridge, Pa.—Resumed with full operations March 25, only delay having been lack of electric power. Shipments out of stock, which was untouched by flood waters, were made regularly through all of last week.

American Steel & Wire Co., Donora, Pa.—A 40-foot slag wall saved this mill from flooding. Operations were continued through the flood stage but were shut down March 21-23, resuming again early last week with one blast furnace and full rolling mill schedules. Shutdown was caused by lack of power from West Penn Power Co.

Follansbee Bros. Co., Pittsburgh—Follansbee, W. Va., works, including sheet and tin mills, were unaffected. Toronto, O., works was partially flooded.

American Bridge Co., Ambridge, Pa.—Shops were flooded at one time with 8 feet of water. Lack of power last week hindered rehabilitation. Numerous machine tools in shops must be torn down and rebuilt. Company able to handle requirements at Pencoyd, Pa., Elmira, N. Y., and Gary, Ind., plants.

Bethlehem Steel Co., Leetsdale, Pa., Fabricating division—This plant adjoins American Bridge Co.'s Ambridge, Pa., shops and conditions are similar as noted above. Orders are being handled at other Bethlehem Steel Co. shops.

Johnstown, Pa., Steelworks and Rolling Mill Division—Rehabilitation is going on, but company stated to STEEL last week: "We do not have any operating schedules to announce as yet."

Incidentally, that illustration on page 15 of STEEL for March 23 was erroneously identified as the Cambria plant of Bethlehem at Johnstown. It was so designated by the photographic service which took it, but it proved to be a Pittsburgh district works.

American Sheet & Tin Plate Co.—Vandergrift, Pa., works was flooded in some departments to 3-foot depth. Some sheet finishing mills operated last week. Hot mills are expected to resume this week. Laughlin and Wood works of the company are working in some departments last week.

Faced with a bill of damages estimated roundly at $100,000,000—although no estimates are obviously accurate as yet—the Pittsburgh district last week was in the midst of rehabilitation.

The sound of hammer and saw was heard day and night—long over the Golden Triangle, Pittsburgh's downtown retail and office center. Added to the cacophony of spluttering pumps—no office building was without at least one pump at the curb baling out basements and subcellars—the broad program of putting its house in order was in full swing in the smoky city.

Rush Orders to Warehouses

Steel warehouses were literally swamped with business, inquiries and rush requests for steel products needed in rebuilding. Galvanized sheets, nails, steel beams, channels, plates, bars, fence, pipe and cable all were in the most brisk call in years. The feverish haste to rebuild was reminiscent of postwar days.

Most of this warehouse steel, in addition to cement, paint and glass, is being shipped to downtown Pittsburgh office buildings, hotels and department stores where damage was the most grave. Many downtown theaters, banks and restaurants also went into this list. Incidentally, flooded bank vaults gave up millions in sodden securities, all to be dried. One Pittsburgh bank used 12 mangles to iron out currency, stocks and bonds.

Aside from these repairs, that there will be a vast amount of new building in the form of out-of-town replacement is a certainty. Pittsburgh city building inspectors and insurance representatives started on Monday of last week to canvass the flood area and mark buildings for condemnation.

A large number of small shops in

(*Please turn to Page* 99)

East Begins Buying Steel for Repairs

Philadelphia

EASTERN steel sellers, with plants in areas recently inundated by floods, report sharp improvement in delivery schedules in most cases. Unquestionably progress in the return to normal has been more rapid than most trade interests expected a week ago.

Mills are being dug out and put in repair, stocks in many instances are being reclaimed, and, among the larger companies affected, but which have units which escaped damage, tonnage is being diverted with a salutary effect on deliveries.

In the eastern producing area of Pennsylvania, three units were finally affected before waters began to recede, with operations at two almost totally suspended for the time being. This week is expected to see both of these plants back to almost normal operation, however, and as for the third, production already is practically normal.

However, nothwithstanding the rapidity with which steel producers and consumers alike are working themselves out of their recent difficulties resulting from high water, the extent of damage to their properties cannot yet be fully appraised, and even more difficult to estimate is the extent of steel which will be required for flood replacements in general.

Some trade observers believe that the damage to general property is much heavier than at first realized and that demand for steel and steel products of all kinds will be in constant increasing volume over the next month to six weeks, as rehabilitation gets more actively under way. Steel jobbers, while not as yet experiencing any appreciable demand from the flood-ridden areas, believe that this is only a matter of a short time.

Requirements from the railroads most affected by washouts have been confined principally to roadbed material, such as ballast, etc. The Pennsylvania railroad, whose lines were most affected, possibly will need little in the way of new rails, it is said, as this company has a substantial amount of unlaid track on hand. However, it will require some rail accessories.

Bridge replacements will undoubtedly be numerous as time goes on. Possibly the first bridge order for replacement involved 250 tons of plain beams for a state bridge near Mifflin, Pa. Structural companies have representatives in constant attendance at Harrisburg to assist in handling these emergency demands.

For the time being road steel tonnage will probably suffer, because of the likely diversion of tonnage from proposed new projects to road repairs. Federal government money will be available for new projects, but the state money required will probably be withdrawn or at least held up so that it can be applied to emergency work, it is believed.

Production

STEELMAKING last week recovered rapidly from the effects of general suspensions in the Pittsburgh and Wheeling areas, rising 8½ points to 58½ per cent, a new high for the year to date, and highest level since the middle of June, 1934, when the rate was 59 per cent.

Pittsburgh climbed 27½ points to 45½ per cent, a peak for this district so far, and Wheeling was up 18 points to 73 per cent. Crest of the flood reached Cincinnati last week, resulting in a decline of 21 points to 55 per cent. However, affected mills are expected to resume on a normal basis this week. Heavier schedules were also noted in Chicago, eastern Pennsylvania, Cleveland and New England, with other districts holding firm. Further details follow:

Youngstown—Unchanged at 74 per cent last week, and will probably open at 75 per cent this week, with prospects good for continued schedules at 75 or higher over the next six weeks.

Chicago—Increased ½ point to 64 per cent last week, a new high for this year, and the best rate since February, 1935. Most independent plants now are operating virtually at capacity, and the rate for the entire district is equivalent to 80 per cent on the basis of 1929 capacity. Blast furnace schedules are unchanged, 20 of 41 stacks continuing active.

Central eastern seaboard—Up ½ point to 38½ per cent, with an increase of two or three points expected in the next week to 10 days. At the worst of the high water, three plants in the district were affected, and it is believed these will be swinging back close to normal before the end of this week. During the past week two companies engaged in the production of flat rolled products, and not affected by floods, increased their output, with one now operating at the highest rate since 1930.

New England—Up 11 points to 67 per cent, with indications of a further increase to 78 per cent before end of this week.

Cleveland-Lorain—Up 3 points to 82 per cent, National Tube Co., Lorain, operating all of its 12 open hearths; Republic Steel Corp., 13 of its 14; and Otis Steel Co. 7 of its 8. National has three of its five blast furnaces in operation; Otis, its two stacks, while Republic has lighted its fourth unit.

Wheeling—Up 18 points to 72 per cent, last week, as all of the open-hearth departments in this district resumed schedules. Weirton Steel Co. operated 11 open-hearth furnaces throughout the flood stage; Wheeling Steel Corp. put on five open hearths at Steubenville, O., March 25, and six at Portsmouth, O., the same date.

Pittsburgh—Advanced sharply to 45-46 per cent last week, as all of the steel mills made swift recovery in open-hearth and blast furnace schedules. Carnegie-Illinois operated throughout the week at 45 per cent, Jones & Laughlin at 46 per cent, Pittsburgh Steel at 65 per cent, and varying rates which averaged between 50-55 per cent were reported in detail by others in the district.

Twenty out of 53 steelworks blast furnaces were in production last week, a loss of three from two weeks ago. These three furnaces remained on bank, but likely will resume this week, and the latter number was made up of two Isabella furnaces for Carnegie-Illinois and one Eliza furnace for Jones & Laughlin.

Birmingham, Ala.—Held at 69 per cent last week, with 15 open hearths in production. This rate is expected to hold for several weeks.

Detroit—Unchanged at 94 per cent, with 16 out of 17 furnaces continuing active among the two district producers.

Buffalo—Held at 47 per cent last week, with indications of a rise to 50 per cent for this week, as Republic Steel Corp. lights an additional furnace. With the opening of navigation, further increases are anticipated.

Cincinnati—Precautionary shutdown of one mill in the Ohio river district, because of high water, reduced steelmaking operations from 76 to 55 per cent last week, with 14 to 24 open hearths active. Four more open hearths will go on this week.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Mar 28	Change	Same week 1935	Same week 1934
Pittsburgh	45½	+27½	38	36
Chicago	64	+ ½	46	48½
Eastern Pa.	33½	+ ½	28	34½
Youngstown	74	None	52	54
Wheeling	73	+18	95	69
Cleveland	82	+ 3	67	72
Buffalo	47	None	35	52
Birmingham	69	None	55½	52
New England	67	+11	51	69
Detro't	94	None	88	100
Cincinnati	55	—21	†	†
Average	58½	+ 8½	45	49

†Not reported.

SHEET ACTIVITY SHOWS LOSS FOR FEBRUARY

Daily average sheet steel sales production and shipments, reported by the National Association of Flat Rolled Steel Manufacturers declined in February. Sales were off from 5639 net tons in January to 4767 tons in February; output, from 7139 tons to 6598; shipments, from 6691 to 6058. Totals for February: Sales, 138,244 tons; production, 191,359 tons; shipments, 175,702 tons. Total sheet capacity in the United States for February was approximately 500,000 tons, and the capacity on which the association's figures are based was 304,000 tons.

Meetings

PLAIN Washer Manufacturers' association will hold at French Lick Springs hotel, French Lick, Ind., April 6, the meeting that was scheduled to be held March 23 and was postponed on account of flood conditions in the Pittsburgh district. Business sessions will be held April 6 and a golf tournament April 7.

ST. LOUIS PURCHASING AGENTS EXTEND EXHIBIT TO 2 DAYS

St. Louis Purchasing Agents' association announces its sixth annual "members products exhibits" at the Jefferson hotel, April 16 and 17. Formerly this exhibit was held one day and one night only, but this year with more time available, plans are being made to make this the most successful exhibit to date. A speaker of national prominence will address the meeting. Plant superintendents, engineers and purchasing department representatives are invited to attend. Luncheon will be served April 16 and 17, and the banquet will be held April 16 in the gold room, Jefferson hotel.

SUPPLEMENT LISTS ALL 1936 SHOWS AND EXPOSITIONS

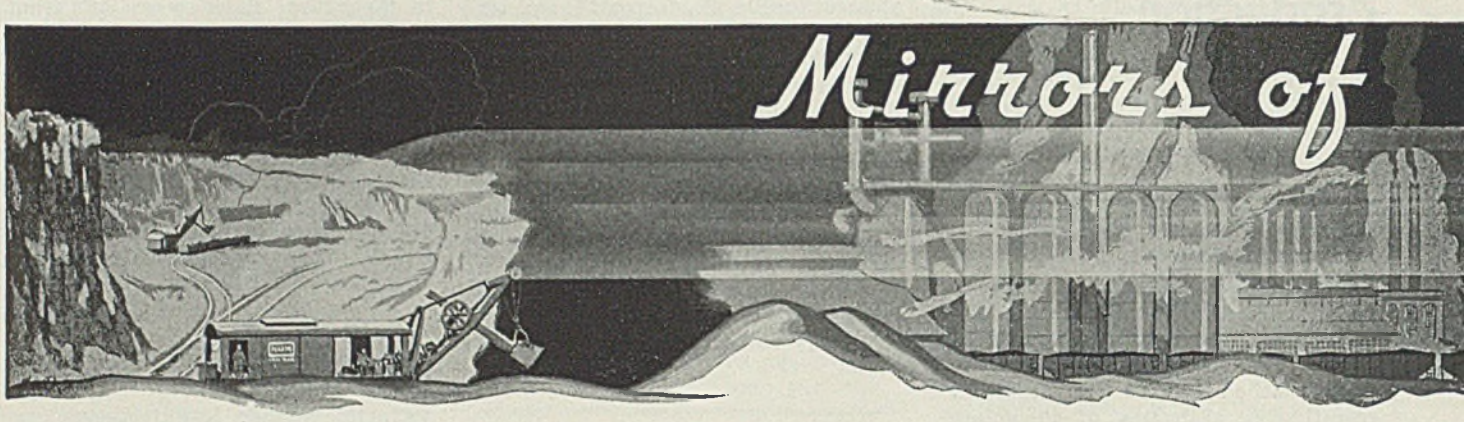
Exhibitors Advisory Council Inc., 330 West Forty-second street, New York, which for 11 years has actively fostered a movement to improve conditions relating to industrial and trade shows and expositions, regularly issuing reports and surveys on these activities, has prepared a special supplement containing a complete listing of shows and expositions to be held from March to December, 1936.

Several hundred shows covering practically every industry and trade group, dates and locations are given. Copies of the schedule may be obtained from council headquarters for $2 each.

The American Can Co., New York, and International Business Machines Corp., New York, recently have been elected to membership in the council.

SUPERIOR RETAINS DIRECTORS

Directors of Superior Steel Corp., Pittsburgh, meeting March 16, were re-elected.



DETROIT

ANOTHER increase in automobile production—the fifth consecutive weekly improvement since the low point of the week ended Feb. 22—indicates that March output of passenger cars and trucks for the United States only will be approximately 400,000 units.

This gives the first quarter a total of about 1,042,000 cars and trucks, which is practically a parity with 1,068,245 assembled in the first quarter of 1935. It is the more creditable a performance considering that the first quarter this year lacked the usual new model introduction stimulus.

Since automobile manufacturers are now reckoning their year from Nov. 1, a fair comparison would be the first five months of the model year of 1935 with the comparable months of 1936. From January to May inclusive last year, 1,910,598 units rolled off the assembly lines. In the first five months of the present model year, beginning Nov. 1 and ending March 31, production has totaled approximately 1,848,000 units.

Next Quarter Will Tell

While this is a neck-and-neck race, nevertheless it supplies no backing for the many predictions of automobile manufacturers, economists, and other authorities that this year automobile production would show an increase of at least 10 per cent and, more recently, that it might sweep it up to the amazing total of 5,000,000 units.

Apparently it is up to the next thre months to come through with a tremendous gain over the second quarter of 1935 if the prophets are not going to be let down. And, judging from sentiment in Detroit last week, the next 90 days are going to do the trick.

Last April, at 477,691 units, was the peak of 1935. For April this year to top this figure requires a weekly average increase of at least 20,000 units over March, and Detroit believes it will be done.

The fact is, retail sales have been surging upward at a spectacular rate over the past month, notwithstanding floods and unseasonable weather in many parts of the country. One of the largest producers reports its sales in the second ten-day period of March as being 40 per cent over the first ten days, and that period in turn was substantially better than the final ten days of February.

Buying Moving Northward

At the moment, Chevrolet is leading the procession. Assembling approximately 28,000 units last week, this prize money maker of General Motors is being pushed to capacity operations as rapidly as possible, and will probably hold there during April and May. Originally it expected to step up from 100,000 units in March to about 110,000 units in each of April and May, but the present program is to get up to 140,000 units for both April and May.

At this time the crest of automobile buying is moving northward with the coming of spring, but Chevrolet assembly plants in the North at this time are unable to cope with actual demands in their districts, and the result is that assembly plants in other districts are going full speed and shipping out of their territories.

Take the rest of the General Motors line. Olds, on 5-day week, has pushed up to 3500 units weekly. Its March total will be about 12,000 units, and this will be topped handily in April. In the first two months of 1936, Olds made 32,200 units, against 25,700 in the comparable period of last year, which had the benefit of the new model stimulus.

And Buick. At 3250 units a week, this unit of General Motors at Flint is making the welkin ring as in the good old days when the medium-priced cars were tops. In March it is making 14,250 cars, exclusive of Canada.

Pontiac is paralleling Buick at 3250 units a week, although relatively this rate is less propitious for Pontiac than for Buick, considering the respective price fields. Pontiac is the only General Motors unit that has not made as many cars this year as last.

Cadillac-LaSalle, dropping about 600 units off the line each week, is going good, and thus far in 1936 has more than doubled its last year's rate of production.

In the past ten days there has been a big swing of sentiment toward General Motors so far as stock market speculation is concerned, resulting in new highs for General Motors common. It is pointed out that this year every line is clicking, and there are some who let their optimism swell to the point of predicting that before the year is out General Motors common will be selling for more than Chrysler common.

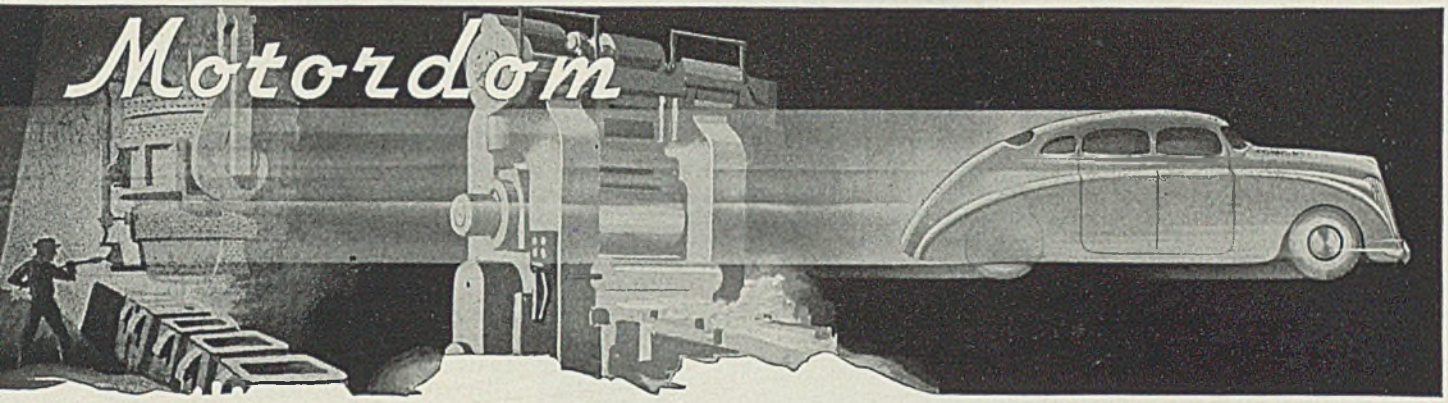
However, it would seem obvious that Chrysler would participate in any super-bullish automobile and stock market trend that would lift General Motors 30 to 40 points more, and that the present gap of about 30 points will be difficult to wipe out, even though it may be narrowed. In any event, the rides that Detroit is taking on both General Motors and Chrysler stock are reminiscent of the good old days of 1929.

Rivalry Is Hotter

With Chevrolet prodding all departments up to capacity, its rivalry with Ford is becoming accentuated daily.

Chevrolet's total of about 28,000 units last week was about 2000 greater than Ford's. For the model year to date, beginning last Nov. 1, Chevrolet has assembled approximately 530,000 units, including Canada and export, nosing out Ford by about 30,000 units.

However, with seven more months to go, a lead of 30,000 units is not entirely conclusive. No one need fool himself that the Sage of Dearborn is going to let any competitor top-



him so long as he has any additional strings to his bow.

Chrysler, meanwhile, is making it a hot three-cornered race. Plymouth's weekly assemblies are up almost to 12,000 units, Dodge to 7300, Chrysler to 1400, and DeSoto to 1200. In the lower rungs of its line, Chrysler is reported to have built up stocks at stragetic points, anticipating that it will be unable to meet demand from current production once spring buying starts in earnest.

Such independents as Hudson-Terraplane, making 3200 weekly, Packard at 1600 weekly, Studebaker at 2000 weekly, and Nash-Lafayette at 1500 weekly are also expanding and will contribute their proportion to a brisk April and May. In fact, they will probably contribute more than their proportion, inasmuch as the percentage of Chevrolet-Ford-Plymouth to total sales is slowly declining as the retail market broadens.

Look for Brisk Summer

As previously stated, April production last year was 477,691 units, May 364,662, and June 361,248—a total of 1,203,601. The present expectation is that the second quarter this year will top this total.

The outlook is that April and May will be strong production months—considerably stronger than March has been. It is possible that the momentum will be sufficient to make June seasonably good. By early June plans for paying the soldiers' bonus will have been formulated, and if payment is made in July, as now seems probable, June may be a brisk production month in anticipation of July deliveries.

So far as steel and other suppliers to the automobile industry are concerned, an active April and first half of May seem assured. This happy situation may carry over into the first half of June, provided soldier-bonus demand for automobiles is realized. This is based on the assumption that suppliers are, on the average, one month ahead of the assembly line. So far as steel is concerned, releases for April shipment bear out the high expectation.

The reasons most commonly advanced in Detroit for this showing are: The general feeling of recovery current throughout the country; the backing up of demand as a result of unseasonably cold weather in the first quarter; the improvement in the building industry; the return of more normal conditions in the used car market; the release of deferred replacements.

Speaking of the used car situation, an unofficial spokesman for one of the largest automobile manufacturers contends that the used car situation has been licked, and there will be no similar problem until the next depression—the date of which he refuses to forecast.

The dealers of this manufacturer are now turning over their used car stocks in 33 days, or at the rate of 12 times a year.

According to this authority, whatever tenseness remains in used cars is among sellers of low-price automobiles who stimulated sales artificially last fall by offering a new job for a 1935 car plus $100 to $125. Except for a slightly abnormal situation in what might be termed the high-price used cars, this spokesman contends that the problem has been liquidated. Used cars selling for $300 and less move rapidly; above that level they move slowly.

For one thing, building trades employes have been moderately heavy buyers of used cars. Wherever a new house or commercial building is under construction, there will be found each day the parked cars of carpenters, bricklayers and other artisans—and these cars are chiefly fresh off the used car lots and are deteriorating more rapidly from standing all day than from actual use.

Financing Made Easier

Automobile manufacturers believe that when the public realizes just what the reduced terms of $25 a month, including 6 per cent interest on the deferred obligation, mean, that this plan will prove a big sales stimulus.

For the average car delivering at not to exceed $900, the depreciation the first year should be about $300. In other words, at the end of the first year the owner of a $900 car could turn it in and replace it with a new one at the cost of his equity, plus 12 monthly installments of $25 each.

A payment of $25 a month averages 80 cents a day, and this 80 cents could be considered rental. Turning his car in every year the average driver would have no outlay for tires, battery, or heavy repairs. His transportation cost would be 80 cents a day, plus operating expenses. In other words, by setting aside 80 cents a day a man can keep

Automobile Production

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

	1934	1935	1936
Jan.	155,666	292,785	367,252
Feb.	230,256	335,667	*275,000
Mar.	338,434	429,793	*400,000
Apr.	352,975	477,691	.....
May	330,455	364,662	.....
June	306,477	361,248	.....
July	264,933	336,985	.....
Aug.	234,811	239,994	.....
Sept.	170,007	89,804	.....
Oct.	131,991	275,024	.....
Nov.	83,482	398,039	.....
Dec.	153,624	407,804	.....
Year	2,753,111	4,009,496	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

March 7	84,705
March 14	90,660
March 21	95,223
March 28	98,415

himself equipped with a car never more than a year old.

The authority previously quoted in regard to the prospective active second quarter in automobile production forecasts that in the model year beginning last Nov. 1, total production in the United States, Canada, and for export, will be 4,500,000 units.

In the comparable period a year previous production was 4,100,000 units, but since this includes two new model periods, a more comparable figure is 3,700,000 units. This indicates an increase of 800,000 for this year.

Progress on 1937 models continues slow so far as actual benefits to tool and die shops is concerned. It develops that the Chevrolet program will be pretty well matured by Fisher itself.

However, this much is certain—much more stainless steel will be mounted on 1937 bodies, especially for body beads, running board moldings, and hood hinges and hood handles.

At present Ford is the largest user of stainless steel, probably averaging slightly over three pounds per car. Chrysler averages a little over two pounds per car. For the entire industry the average is about two pounds. There is a possibility that this average may be doubled for 1937.

They Say in Detroit:

Little has been heard of it, but the export situation in automobiles is strong. Studebaker, for example, in February exported the most cars since October, 1928, and gives partial credit to the reciprocal trade agreements negotiated by Washington. . . . A sure sign of spring is the increasing demand for convertible coupes, which has become noticeable in the past ten days. . . . Another parts maker to diversify is the Hydraulic Brake Co., 84 West Hancock street, Detroit, which is allied with Bendix. It is soon to begin the production of an electric washing machine which enables the housewife to eliminate rinsing and wringing and not to touch clothes from the time they are put in the machine until they are to be hung up. The machine is touted to be one of the best of its kind. The company may be in the market for manufacturing equipment. . . . Graham has doubled its facilities for manufacturing the special worm gearing used to drive its supercharger; with its new equipment, supplied by the Michigan Tool Co., it now has capacity for 150 sets of gears daily. . . . Champion Spark Plug Co., Toledo, O., has booked an order for plugs for Chrysler estimated at 3,000,000, enough for over 400,000 cars.

Financial

SHAREHOLDERS of the Otis Steel Co., Detroit, Friday approved the financing program heretofore recommended by the board of directors and involving the sale of $13,000,000 of the new first mortgage 4½ per cent bonds to retire the present funded indebtedness of the company. The present board of directors was re-elected.

EXPECT J. & L. BONDS SOON

Jones & Laughlin Steel Corp., Pittsburgh, is expected shortly to proceed with the issuance of a $40,000,000 bond issue, of which $25,000,000 will be utilized for a continuous wide strip-sheet mill in Pittsburgh. The site of this mill, incidentally, was high enough to clear the recent flood.

LUDLUM CALLS PREFERRED

Stockholders of the Ludlum Steel Co., Watervliet, N. Y., on March 16 unanimously approved the management's program whereby all preferred stock is called for redemption May 4 at $110, plus accrued dividends of 61 cents. Holders of common stock as of April 2 receive rights to subscribe for additional common at $22 per share. Other amendments to the certificate of incorporation were approved.

DOW CALLS MEETING FOR RECAPITALIZATION

Dow Chemical Co., Midland, Mich., has called a special stockholders, meeting for April 21 for the purpose of doubling the authorized non-par common and preferred stock. Under the plan, the 30,000 shares of 7 per cent cumulative preferred outstanding would be changed to 60,000 shares of 5 per cent stock. The old stock would be exchanged for the new on a share for share basis, or redeemed April 15, 1936. Holders of common would be offered additional shares of the new preferred at $105. Proceeds would be used for plant betterments, extensions, and an increase of working capital.

¶Timken Roller Bearing Co., Canton, O., reports net profit of $7,483,602 for 1935, compared with net of $3,486,056 in 1934.

¶American Radiator & Standard Sanitary Corp., New York, showed net profit, after all charges, of $2,798,860 in 1935, against $1,455,227 in preceding year.

¶Doehler Die Casting Co., Toledo, O., net profit after depreciation, federal taxes and other charges of $623,818 in 1935, compared with $460,550 in 1934.

Range Boiler Report Near

Federal trade commission is expected Monday to report to congress on its survey of the basing point system employed by the range boiler industry. This survey was started several years ago but was suspended during NRA.

Tin Plate Suit Puzzles

Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O., declared last week that tin plate manufacturers had entered into no pact to discriminate against small users of tin plate, as alleged by a federal trade commission complaint against leading users of plate. (STEEL, March 23, page 25).

Steel Wages Top Average For All Industries

Yearly wages of steel employes have averaged consistently above average annual wages received by employes of all other manufacturing industries over the past 56 years, according to the American Iron and Steel institute from a compilation derived from census bureau records.

Average annual wages in the steel industry increased 340 per cent between 1879, the first year for which complete records are available, and 1929. In other words, an increase from $394 a year to $1742.

Yearly wages in all other industries rose 275 per cent from $345 to $1294.

During depression years average annual wage of steel employes was also well above average of other industries. In 1935 the annual steel wage was $1184 against $1087.

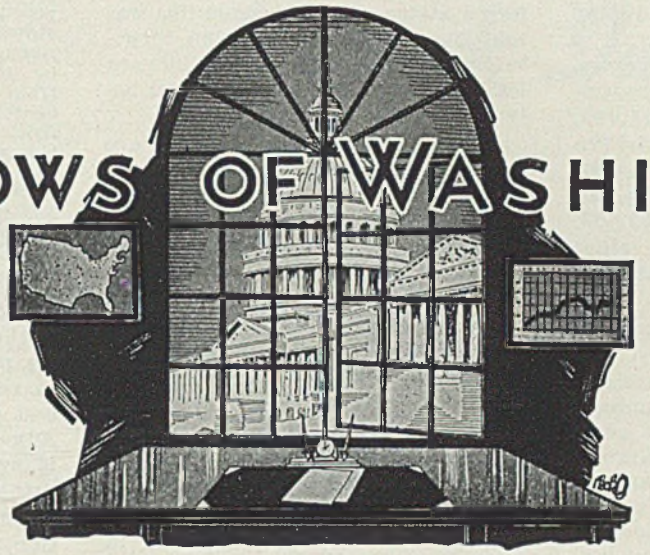
Great Lakes Starts New Continuous Strip Mill

George R. Fink, president of the National Steel Corp., Pittsburgh, pulled a whistle March 23 and gave the signal for the first slab to be relayed from the feeding ovens and started on its journey through the rolls of the new continuous hot and cold strip-sheet mill of the Great Lakes Steel Corp. at Ecorse, Mich.

The new mill, doubling the flat-rolled capacity of the Great Lakes corporation, which is a subsidiary of National, can roll hot and cold strip up to 90 inches, said to be the widest in the industry. The cold mills are expected to go into production in about a month, adding 60,000 tons of flat-rolled steel per month to the capacity of Great Lakes.

Now under construction at Ecorse are four 250-ton open-hearth steel furnaces, scheduled to be completed in October. They will increase the ingot capacity of the Great Lakes corporation to 1,500,000 tons.

WINDOWS OF WASHINGTON



WASHINGTON

CURIOUSLY enough, industry as a whole has not taken as much interest in the Healey bill—the rewritten Walsh government contract bill—as one would think. While some industries have been insistent in their opposition to this bill, others like the steel industry, for instance, do not seem to be thinking about it.

This is one of those bills that is likely to slip through the house and become law—it has already passed the senate—when no one is looking, and it is much more far reaching than is suspected by some of those who have not gone into it closely.

A subcommittee of the house judiciary committee held hearings on the Healey bill. Rewritten by the subcommittee of which Representative Healey is chairman, the hearings of this subcommittee developed some vigorous and unqualified opposition to the modified bill, which imposes hour and wage conditions in government contracts by department of labor fiat.

Discrimination Is Apparent

It has been pointed out that there are many legal objections to this bill. Also, there are a lot of practical objections as pointed out by witnesses appearing before the committee in opposition.

For instance, it was shown that processes of production of materials and articles are such that a plant cannot, under present conditions, follow one set of hours and one set of wages in turning out articles for delivery under a government contract and another set of hours and wages for production of the same articles for sale to the general public.

It was stated that bringing under federal control plants with contracts would place such plants at a disadvantage in their competition with plants that do not have contracts with the government and do not come under such regulation. It has also to be borne in mind that this bill affects subcontractors as well as the original contractor.

The importance of this bill has been played down in some quarters on the basis that it will not become law. However, it must be remembered that it has the complete backing of the A. F. of L. and this will go a long way—in election year—to make some members of the house vote for it.

Just at this time when the steel industry is supplying so much to the government in one form or another the bill should be of particular interest.

CHAIN STORE BILLS MAY AFFECT WIRE PRODUCTS

Steel manufacturers should also be interested in senate bill 3154, which is intended to prevent price discrimination in favor of chain stores, for the reason that this would apply to stores dealing in hardware, such as screen cloth, poultry netting, nails, wire and many other items, as well as to the grocery and drug chains. The bill was drawn so broadly that it would even have affected coal, although an amendment has been introduced to eliminate coal, as it is already regulated by the Guffey act.

The situation which led the independent grocers' stores to call for congressional action is not strictly the same in the hardware trade. For instance, the shopper may have several chain grocery stores, and perhaps an independent, in his neighborhood, but only one or two hardware stores, and these "independent". For the ordinary run of miscellaneous household hardware purchases, therefore, the small merchant has the local field practically to himself.

Chain hardware stores so far have not appeared in sufficient numbers to give the small independent dealer cause for alarm. Many of these are doing a prosperous business, because of the diversity of their supplies, and the fact that they are liberally patronized for ordinary requirements.

The chief complaint of small independent hardware merchants is against the mail order houses, which garner the larger size purchases — both from city and rural communities, and against the co-operative associations. Figures are not available, however, to show just how many small independent dealers have been put out of business by such competition, as other factors are involved.

The wire manufacturers — and especially those who sell wire products — have long realized that they have had a problem on their hands in the mail order houses. Wire imported at Baltimore by one of the leading mail houses has been transshipped as far as Texas. Another house imports wire and fabricates it in its own plants.

Must Meet Competition

When the Great Lakes are open for navigation, vessels with nails and wire come from Europe and unload at Chicago. One consignment of 8000 tons of nails, it is said, will be shipped this spring as soon as navigation on the St. Lawrence river is opened. It was largely because of this competition from foreign nails that the American producers recently had to cut their price $6 a ton.

The mail order houses are selling nails and wire at an equal or lower price than that paid by the independent hardware dealer to his jobber.

Imports of barbed wire increased from 9920 net tons in 1934 to 27,905 tons in 1935; nails from 7860 tons to 23,875 tons; wire fencing and netting from 16,205,030 feet to 21,506,444 feet — values from $55,215 to $100,785; screen cloth from 649,-

490 feet to 790,928 feet, and pipe from 5383 tons to 23,058 tons.

The co-ops show steady progress. In 1926 there were 1217 associations, with a membership of 247,000, and they did a business of $135,000,000. In 1933 there were 1648 associations, with 542,700 members; and a business volume of $140,000,000, the relatively small gain in values here being due to price fluctuations.

AIM TO GIVE SMALL COMPANIES TAX PREFERENCE

A tentative form of new taxes has been worked out by a subcommittee of the house ways and means committee, headed by Representative Hill. At least enough of a plan has been thrown into shape so that the full committee can begin hearings on March 30. Two sessions of hearings will be held each day, but no definite date for concluding the hearings has been announced.

The committee in its official announcement says that the hearings will be held on the proposed taxes on (1) undistributed corporate incomes (2) "windfalls" arising from impounded and unpaid processing taxes, and (3) processing of certain agricultural commodities as suggested by the President.

The subcommittee has definitely turned its thumbs down on a last minute proposal for a general manufacturers' excise tax, and instead the subcommittee decided to include modified processing levies in the tentative report that has been worked out, which would give a revenue for the first year of approximately $986,000,000.

There is the strongest sentiment among the members of the ways and means committee to leave processing taxes out of the proposed bill entirely if that can be done, and they were incorporated in the call for hearings just as a basis for the bill.

Estimates of Various Yields

Included in the estimate of $986,000,000 was the yield from the new graduated tax on undistributed corporate dividends, and from the new income tax on dividends of $591,000,000. The rough estimates of revenue yield from the various items incorporated in the committee's report were that $764,000,000 would be raised during the first year if the $35,000,000 was deducted for refunds and if processing taxes were eliminated. Processing taxes would increase the yield to $986,000,000.

In connection with the $35,000,000 refund mentioned above, Representative Hill announced that the subcommittee voted to refund $35,000,000 in processing taxes on floor stocks which were on hand Jan. 6 when the AAA terminated.

All corporations, under the proposed new setup, earning less than $20,000 actually are given a preferred status. The subcommittee was told that out of the 257,000 corporations which pay taxes, 214,000 earn less than $10,000 and 6958 earn between $10,000 and $20,000.

Members of the committee are therefore arguing that under the proposed setup 86 per cent of all corporations, mostly in the small earning class, receive preferred treatment under the plan.

CAMERON LIKENS SURPLUSES TO PERSONAL SAVINGS

Speaking of taxes, some of the most telling opposition to the proposal of the President to corral undistributed profits of corporations has originated in the Ford Sunday evening hour on the radio, in the addresses by W. J. Cameron, in charge of public relations for the Ford Motor Co. On March 22, answering the question "Isn't it true that if business surpluses had been spent when earned they would have prevented a depression," Mr. Cameron said:

> The answer is, "No." A popular and political error regards surpluses as piles of cash which may easily be shoveled out of business offices into the treasury at Washington. But many surpluses today are made up of property and productive assets, without any cash at all.
>
> Take the Ford Motor Co. for example: Approximately two-thirds of its surplus is represented by buildings, machinery and materials; that portion of it represented by immediately available working cash capital would suffice to operate the business for about 2½ months if normal expenditures continued and all income stopped.
>
> Americans find it hard to realize that as a nation we save hardly anything. What we save looks large in figures; it is small compared with the bulk of which it is the residue. In 1922 American business spent 96½ per cent of its income. In 1923 it spent 97½ per cent. In 1925 it spent 96½ per cent. In 1927 it spent 98½ per cent. In 1929, the so-called "big year," it spent 97 per cent.
>
> It must be evident that a reserve of from 2 to 3½ per cent would have no influence whatever either in bringing on or preventing a depression. No authority claims that business savings have been too large; every authority regards them as national insurance.
>
> In 1929, American families and individuals had saved 15 billion dollars; corporate savings for that year were 2 billions. Did it injure the country that American families had a nest egg of 15 billions? Should it have been taken away from them? Yet that is the argument against corporate savings which are gathered to be used. Had enjoyment been their purpose, they would not have been saved. As it is, the slowly gathered business savings of nine years preceding 1929 were more than spent in the three years immediately following. Had business and family savings not existed, things would have been seriously worse. Had they been larger, conditions would not have been nearly so bad.
>
> If it is now the wisdom of our government to abolish this form of national insurance, that is a matter for the people to consider. It involves every citizen. Those who in pathetic innocence would like to see the big ones "soaked" may not know it yet, but they would be next in line. The proposed tax law would seize industrial surpluses and force industry into borrowing; but the surpluses accumulated by the money-lenders as the profits from this forced borrowing are not to be touched by the proposed law. That fact alone should open many eyes. Why this antagonism to reserves that work? —to reserves that keep industry free of financial dictatorship?

MANGANESE PRODUCERS ON COUNCIL TO LIMIT IMPORTS

A new organization has been launched in Washington to be known as the raw materials national council. Its program is to obtain legislation to restrict imports to a quota basis and to license importers. J. Carson Adkerson, president of the American Manganese Producers' association, is president of the new organization.

The objectives of the new association, Mr. Adkerson states, include:

1. Repeal by congress or invalidation by the courts of the reciprocal trade agreement act of 1934 and renunciation of the trade agreements made since its enactment.
2. Revision of the tariffs to bring about tariff equality between raw material products of American forests, farms and mines and manufactured goods.
3. Enactment of legislation to restrict imports to quotas based on proved actual needs, to bar substitutes for domestic raw materials and to license importers of all raw materials, unfinished and finished products.
4. Enactment of legislation to encourage the use in industry of all products of American forests, farms and mines to provide a home market for the production from 50,000,000 acres of land not now needed to produce for foreign markets which no longer exist.
5. Enactment of legislation to encourage all employers of labor to give preference to native-born and naturalized citizens, thus placing a premium upon American citizenship.

ORDER REPRIEVING BERRY COUNCIL SENT TO PRESIDENT

April Fool's Day was expected to see the complete extinction of NRA, as the remnant that was left after the Supreme Court blast of last May automatically expires on that day.

But Maj. George L. Berry, who set up his council for industrial progress and has been styled co-ordinator for industrial co-operation, apparently will receive a reprieve, as it is understood that an executive order has been drawn up and forwarded to the President, on his southern trip, extending the life of Berry's organization.

It has been expected that the Berry organization would pass out of the picture April 1. In fact, Secretary of Commerce Roper had made plans to move his shipping board into the Department of Commerce building, occupying part of the space of the defunct NRA.

Being publicity minded, Major Berry in a series of newspaper releases has had published seven reports of his council, dealing with national industry policy; maximum

work week, general wage and child labor; fair trade practices; internal and external competition; antitrust laws, including the federal trade commission; financial aid to small enterprises; and competition with private enterprise. The flavor of these reports is strictly pro-labor, which is no surprise considering the predominance of labor representation on the Berry council.

In connection with the liquidation of NRA, the president Friday issued an executive order creating a committee for industrial analysis under the department of commerce, to continue the unfinished work of NRA.

This committee consists of the secretaries of commerce, labor and agriculture, and will have working under it a division of industrial economics to which some present NRA employes will be transferred.

PWA has appropriated $100,000 for this work.

Tower Hits Anti-Pollution Bills

STEEL is represented among basic industries opposing various stream pollution bills now pending in the senate at Washington.

Walter S. Tower, executive secretary of the American Iron and Steel institute, New York, registered the protest of steel makers. He said in part:

In the steel industry the use of large quantities of water is indispensable. Unless it is available, manufacturing processes in the industry cannot function. On the basis of information furnished us, we estimate that between 3,000,000,000 and 4,000,000,000 gallons of water are consumed daily in the iron and steel industry of the United States, or the equivalent of a stream of water three-quarters the size of the Potomac river at a point 2½ miles above Chain Bridge, Washington. This comparison is based on figures for representative units in the steel industry and on figures derived from water supply paper 726 of the geological survey of the United States department of the interior.

The principal sources of water used in the steel industry are streams and lakes which either are navigable or are tributary to navigable waters. It would appear impracticable to dispose of such a huge quantity of water as must be used in the steel industry in any way except by returning it to such streams or lakes. If the steel industry were required to remove all foreign matter from this water before so returning it, the investment necessary to install proper equipment would amount to many millions of dollars. These facts will give some idea of the magnitude and seriousness of the problems which would be presented to this industry if any such proposed legislation were enacted. Particularly, it would work a serious hardship upon many small companies in the industry, employing, in the aggregate, thousands of men.

Men of Industry

ALFRED KAUFFMANN has been elected president of the Link-Belt Co., Chicago, succeeding George B. Torrence, resigned. Mr. Kauffmann has been identified with Link-Belt for over 35 years, starting work as a draftsman. He served as president from 1924 to 1932. In the latter year Mr. Torrence succeeded him to the presidency, and for the past four years Mr. Kauffmann had been vice president in charge of operations in the Chicago district. Mr. Torrence terminated 25 years' association with Link-Belt.

♦ ♦ ♦

R. E. Ryerson, export manager, has been appointed general sales manager in charge of the wholesale, industrial products and export sales division, of the Tide Water Oil Co., 17 Battery place, New York. He has traveled much in South America and Europe, and prior to joining the Tide Water organization 11 years ago was connected with a major company and stationed in South America.

R. E. Ryerson

A. J. DuPont has been appointed assistant export manager. For several years Mr. DuPont has been connected with export department activities and has made several trips abroad, visiting Australia, New Zealand and the Continent.

D. E. Hoffman, who has been connected with Tide Water's wholesale lubricating oil division for more than 15 years, and is well known in the wholesale trade, has been appointed manager of the wholesale marketing department.

H. G. Mullen has been appointed manager of the industrial products department. Mr. Mullen has been connected with this activity for many years and is well known in the industrial field.

♦ ♦ ♦

Philip A. Singleton, Philadelphia, and Jack K. Williams, Chicago, have been added to the sales force of the Reliance Electric & Engineering Corp., Cleveland.

♦ ♦ ♦

L. T. Miller, former purchasing agent for the Detroit Steel Products Co., Detroit, has formed the Lou Miller Steel Co., with offices in the Keystone building, 5466 Missouri avenue at Grand river.

♦ ♦ ♦

H. S. Thayer, 136 Milnor avenue, Syracuse, N. Y., has been appointed representative by the Foote Bros. Gear & Machine Corp., Chicago, covering the central and northeastern part of New York state.

♦ ♦ ♦

Harold R. Goodwin, widely-known in the Detroit territory where he has been engaged in the sale of plumbing materials for 20 years, has joined the Youngstown Sheet & Tube Co. sales organization at Detroit.

Mr. Goodwin was associated with the Murray W. Sales Co., Detroit, plumbing jobber, from 1917 to 1924, and with the Kimball-Eisenberg Co., engaged in the same field, from 1924 until a few weeks ago.

♦ ♦ ♦

R. A. Griswold, who joined the sales organization of the Bantam Ball Bearing Co. South Bend, Ind., in October, 1935, has been assigned the Connecticut and Massachusetts territory, with headquarters at Hartford, Conn. Mr. Griswold has been identified with the anti-friction bearing industry for many years, having been with the Rivett Lathe & Grinder Co., also the Van Norman Machine Co., handling the sale of race grinders, and subsequently joining the New Departure Mfg. Co., promoting the sale of ball bearings from its eastern offices.

♦ ♦ ♦

C. W. Dietrich Jr. has been appointed sales engineer for the Torrington Co., Torrington, Conn., and the Bantam Ball Bearing Co., South Bend, Ind., to handle their ball bearings, roller bearings, swedging machines and specialties in the New York territory, with headquarters at 200 Fifth avenue, New York. Mr. Dietrich, a graduate in mechanical engineering at Cornell university, formerly was engaged in engineering and sales capacities with the Auto-

matic Refrigerating Co., Hyatt Roller Bearing division of General Motors Corp., and James T. Gordon Co.

♦ ♦ ♦

E. T. Bennington, formerly connected with the Cleveland Tramrail Co., Cleveland, has joined the Chicago office of the Harnischfeger Corp., as a sales engineer specializing in cranes and hoists.

♦ ♦ ♦

Myron C. Taylor, chairman, United States Steel Corp., 71 Broadway, New York, has been named chairman of the commerce and industry division of the Citizens Family Welfare Campaign committee, New York, for the sixth consecutive year.

♦ ♦ ♦

Albert B. Hoffman has been elected president of the Blackmer Rotary Pump Co., Grand Rapids, Mich. He formerly had been chairman of the board of Detroit Sulphite Pulp & Paper Co., and vice president of the Detroit Trust Co. Mr. Hoffman is an engineer with wide experience in manufacturing, sales and business administration.

♦ ♦ ♦

C. V. Pollard has been appointed general works manager in charge of manufacturing operations at Detroit and Grand Rapids, Mich., for the Kelvinator Corp., Detroit.

Before his connection with Kelvinator, Mr. Pollard was divisional superintendent for Chrysler Corp. for seven years, and superintendent for Budd Wheel Co., for two years.

♦ ♦ ♦

Frank Hodson, consulting metallurgist, and formerly president of the Electric Furnace Construction Co. and also of Empire Steel Castings Inc., has been made assistant to president, and chief metallurgist of the Burden Iron Co., Troy, N. Y., which as noted in STEEL for March 9, page 17, has been reorganized and will engage in light weight alloy and stainless steel lines as well as its regular products.

J. C. Gibbons, formerly with Duraloy Co., Scott-Witter Steel Corp., Crucible Steel Co. of America, and H. Boker & Co. Inc., has been named general sales manager.

Alfred Musso, East Orange, N. J., metallurgist, is the new president of the company.

♦ ♦ ♦

Paul Watkins has been made vice president and secretary of the Philadelphia Range Boiler & Tank Co., Philadelphia, succeeding Walter Price, whose interest in the company has been acquired by Ira L. Couch, president.

♦ ♦ ♦

Ernest F. Talmage has been engaged by National Tube Co., Pittsburgh, as a special representative in promoting the sales of seamless alloy tubes in the refining field and for general industrial purposes. He assumed his new duties March 16.

Harry Winne

Made manager of the mining and steel mill section of the industrial department of General Electric Co., Schenectady, N. Y., as noted in STEEL for March 16

Mr. Talmage comes to the National organization with a background of considerable experience with special steels, having been previously associated for a number of years with the Crucible Steel Co., and Timken Steel & Tube Co.

♦ ♦ ♦

R. J. Murphy, district representative of the Elgin Softener Corp., at Pittsburgh, has been made division manager, with headquarters in the Hippodrome building, Cleveland.

Paul F. Sparrow has been appointed district representative at Pittsburgh, with headquarters in the Investment building.

Died:

M W. O'BRIEN, 64, president, South Bend Lathe Works, South Bend, Ind., at West Palm Beach, Fla., March 20. With his brother, John, Mr. O'Brien established the South Bend Lathe Works in 1906. At his death he was treasurer of the board of lay trustees of the University of Notre Dame.

♦ ♦ ♦

Frank J. Sherman, 66, until two years ago president of the Atlas Drop Forge Co., Lansing, Mich., in Detroit, March 23.

♦ ♦ ♦

William Forrest Richardson, manager at Seattle, for John A. Roebling's Sons Co., in that city, March 16. He was associated with the company for the past 35 years.

♦ ♦ ♦

Benjamin I. Davis, 75, managing editor of *The Amalgamated Journal*, Pittsburgh, in that city, March 22.

♦ ♦ ♦

Frank W. Kanter, 56, president, Walter Machine Screw Co., Detroit, in Grosse Pointe, Mich., March 12.

♦ ♦ ♦

William Henry Reedy, 74, founder of the Reedy Foundry Co., Chicago, and its active head until 1921, in Oak Park, Ill., March 22.

♦ ♦ ♦

Karl Dodge, 44, for some years associated in Philadelphia with the Link-Belt Co., Chicago, and a son of the late John Mapes Dodge, a founder of the company, in Philadelphia, March 22.

♦ ♦ ♦

Rollin Carroll Welch Lewis, 87, an employe of the Yale & Towne Mfg. Co., Stamford, Conn., for 38 years and superintendent of its bank lock department until his retirement in 1922, in Stamford, March 23. Mr. Lewis did much to advance the manufacturing facilities of the Yale & Towne company. He invented a safety device to be attached to power presses, and the idea of its use and its application was distributed throughout the country free of charge.

♦ ♦ ♦

Frank C. Whitney, 69, former executive of the Air Reduction Co., New York, and well-known in the oxyacetylene welding and cutting field, in Middleboro, Mass., March 22. He was apparatus sales manager of the Air Reduction Co. until his retirement in 1931, and at one time was also advertising manager. Born in St. Paul, he became associated in 1909 with the late Augustine Davis, a pioneer in the development of acetylene generators and welding apparatus. He was sales manager of Mr. Davis' company until 1922, when it was merged with the Air Reduction Co.

♦ ♦ ♦

Raymond Dill, 55, treasurer, Allis-Chalmers Mfg. Co., Milwaukee, for the past 13 years, in that city, March 17. Mr. Dill was graduated in 1901 in electrical engineering from Ohio State university. His first connection was with Westinghouse Electric Co. In 1905 he joined the Allis-Chalmers organization, at the Bullock works in Cincinnati, and in 1908 was transferred to the electrical division in Milwaukee. After a few years he entered the treasurer's department, where he advanced rapidly, serving as assistant treasurer. In 1923, he was elected treasurer, and later secretary and treasurer.

♦ ♦ ♦

William P. Kelly, 52, controller for the International Harvester Co.,

Chicago, in Highland Park, Ill., March 23. He had been identified with the company for the past 20 years.

♦ ♦ ♦

Clarence J. Olmstead, 66, formerly assistant to the president of the Westinghouse Air Brake Co., Wilmerding, Pa., at Miami, Fla., March 23. He retired five years ago and recently had been making his home in Florida.

♦ ♦ ♦

Willard E. Hauser, of Grant Smith & Co., in Minneapolis, March 16. He was active in large contracting projects for many years, his firm having built the Seattle Cedar river pipe line, Port of Tacoma terminals and many other large structures.

♦ ♦ ♦

Lucas Wallner, 41, president and owner of the Hoyer Engineering Co., Milwaukee, general machine shop operator, in Milwaukee, March 22. He was born in Austria and came to America in 1903. He purchased the Hoyer company in 1923.

♦ ♦ ♦

Harry R. Corcoran, 36, associated for many years with the Electric Controller & Mfg. Co., Cleveland, in Cleveland, March 22. A graduate of Case School of Applied Science in 1920, Mr. Corcoran specialized in electrical engineering. He was a brother of Alfred M. Corcoran and Charles L. Corcoran, vice presidents of the Central National bank, Cleveland.

♦ ♦ ♦

Charles S. Lockwood, 85, retired consulting engineer of the Hyatt Roller Bearing Co., division of the General Motors Corp., at Harrison, N. J., in Newark, N. J., March 20. Mr. Lockwood had been with the Hyatt company for 61 years, and remained active until last year. The company held more than 100 patents in Mr. Lockwood's name, which were developed by him in the interest of the firm. He was born in Phillipsburg, N. J.

Award Expo Contracts

Construction work and improvements costing nearly $2,000,000 got under way last week at the Great Lakes Exposition grounds on the lake front at Cleveland. The exposition will be held from June 27 to Oct. 4, and will include exhibits by many iron, steel and related industries.

Three miles of fencing was split last week between the Chain Link Corp. and the Betz-Pierce Co., the former booking 9500 feet of solid corrugated fencing, and the latter the remainder in open wire fencing. A $100,000 bridge and a $50,000 underpass also were placed.

1935 Pig Iron Output up 32 Per Cent

PRODUCTION of pig iron and ferroalloys in the United States in 1935 increased 32.4 per cent over 1934, according to a statistical bulletin by the American Iron and Steel institute. The 1934 total was 20.9 per cent higher than in 1833. Total production in 1935 was 21,372,699 gross tons, compared with 16,138,573 gross tons in 1934. Of this, 20,780,760 gross tons were pig iron and 591,939 gross tons were ferroalloys.

Ohio regained first place as a pig iron producer after being second to Pennsylvania in 1934. Previous to 1934 Ohio had been in first place for two years. Ohio's 1935 production was 5,634,530 gross tons, Pennsylvania's 5,479,792 gross tons. These two states produced more than half the total output for the year, 1935.

In contrast to the preceding year, when first half brought the largest output, last half of 1935 was more productive than first half. First-half output of basic, bessemer, malleable and foundry iron was 9,696,302 gross tons and second half 11,011,839 gross tons. Ferroalloy production in first half was 257,790 gross tons and in second half 334,149 gross tons.

The relation of merchant to non-merchant iron was practically the same as in 1934, non-merchant iron totaling 17,178,842 gross tons and merchant iron 3,601,918 gross tons. Ferroalloy production for sale was 420,045 gross tons and for maker's use 171,894 gross tons.

(All Figures Are Gross Tons)

PRODUCTION OF PIG IRON AND FERROALLOYS

Pig Iron	1931	1932	1933	1934	1935
Pennsylvania	5,037,672	2,103,180	3,728,839	4,244,566	5,479,792
Ohio	4,120,610	2,387,028	3,918,723	4,207,944	5,634,530
Indiana, Mich.	2,327,839	1,034,801	1,469,783	2,184,546	2,898,478
Illinois	1,964,735	919,280	1,012,676	1,269,154	2,003,388
Alabama	1,640,851	652,898	900,170	1,171,650	1,297,960
Mass., New York	1,149,677	624,141	665,928	1,053,257	1,415,755
Md., Va., W. Va., Ky., Tenn.	1,419,987	680,774	1,143,600	1,318,964	1,781,171
Minn., Iowa, Colo., Utah	296,408	147,562	161,000	226,808	269,686
Total	17,957,779	8,549,664	13,000,719	15,676,889	20,780,760
Ferroalloys					
Pennsylvania	195,552	85,194	163,798	164,776	219,947
New York, New Jersey	125,597	85,875	98,857	140,711	195,281
Ohio, Ill., Iowa, Colo.	89,352	41,510	63,386	116,402	113,147
Va., W. Va., Ala., Tenn.	58,074	19,210	18,842	39,795	63,564
Total	468,575	231,789	344,883	461,684	591,939
Grand total	18,426,354	8,781,453	13,345,602	16,138,573	21,372,699

PIG IRON MADE FOR SALE IN 1935

States	Basic	Bess. and low phos.	Foundry	Malleable	Forge	All other	Total
New York	123,469	42,218	265,662	238,449	.....	1,684	671,482
Pennsylvania	261,678	153,654	126,257	76,848	5,294	.....	623,731
Md., Va., W. Va., Ky., Ala., Tenn.	57,062	26,080	655,595	.....	.....	21,785	760,522
Ohio	330,697	22,634	234,141	444,326	.....	.....	1,031,798
Indiana, Illinois	109,297	7,683	22,154	258,508	.....	.....	397,642
Mich., Minn., Iowa, Colo., Utah	78	.....	98,757	10,843	.....	7,065	116,743
Total	882,281	252,269	1,402,566	1,028,974	5,294	30,534	3,601,918

PRODUCTION OF PIG IRON AND FERROALLOYS IN 1935

(For sale and for Maker's Use)

Pig Iron	For sale	For maker's use	Total
Basic	882,281	12,736,172	13,618,453
Bessemer and low phosphorus	252,269	3,986,423	4,238,692
Foundry	1,402,566	242,686	1,645,252
Malleable	1,028,974	176,770	1,205,744
Forge or mill	5,294	31	5,325
White and mottled, direct castings, etc.	30,534	36,760	67,294
Total	3,601,918	17,178,842	20,780,760
Ferroalloys			
Ferromanganese and spiegel	124,566	164,713	289,279
Ferrosilicon	256,217	6,645	262,862
Other ferroalloys	39,262	536	39,798
Total	420,045	171,894	591,939
Grand total	4,021,963	17,350,736	21,372,699

Equipment Manufacturer Develops Low-Price Steel House

DEVELOPMENT of a factory-built, engineered home with six rooms and a bath, to sell for less than $4000 is announced by Richard Binkowski, business manager of the houses division, Harnischfeger Corp., Milwaukee.

The new house will be known as the "Twentieth Century Home." It will be priced to sell on a monthly payment plan of $35 a month or less, including interest, taxes, reduction of principal, insurance and service charges.

The Harnischfeger Corp., founded in 1884, has always manufactured and sold electric traveling cranes and electric hoists. It is capitalized at $7,700,000. For several years past, the West Allis plant has not been in operation. It has been completely reconditioned and re-equipped to manufacture "Twentieth Century Homes."

Ten Steel Houses a Week

Production, at the start, will be about 10 houses a week, the factory working on an 8-hour-a-day basis.

The framework of the house is fabricated from steel sections bolted and welded together. This type of construction is recognized as fire-safe and vermin, rodent and termite-proof.

The exterior wall assembly consists of weather and fire-resistant building board which serves to insulate against heat, cold and dampness. The exterior finish consists of special weather-resisting color-process coatings, which, when applied over the building board and asphaltic coatings, insure positive protection against wind, moisture and weathering.

Floors, walls and ceiling of the entire home are completely insulated. The base of the house is constructed of five framed sections made with 12-inch electrically welded steel channels, firmly doweled and bolted together. Each frame section is reinforced with five 6-inch cross channels, affording rigidity and great strength.

Many Features Provided

The underside of the base is completely covered by galvanized metal sheets. In addition to adding structural strength to the base, these sheets, thoroughly insulated by 1 inch of insulation material, also serve to seal hermetically the floor sections against cold and dampness.

The house, without a basement, is designed to be erected on 14 concrete piers, 12 x 12 inches x 4 feet 6 inches, poured to a depth of 4 feet below the grade line. The conventional basement-type home, slightly higher in cost, is erected on concrete block foundation.

The hip roof is built in 12 sections, each constructed of steel rafters to which 1 x 6-inch tongued and grooved roof boards are securely fastened, thus allowing for the nailing of the fire-resisting composition asphalt shingles. The home may be had with or without basement, and with two different types of roof—either hip or flat.

The doors throughout the inside of the home are of the honeycomb core construction, with flush veneer sides. This same type of door is used on ocean liners because of lightness, durability and proof against warping.

The house is heated by an up-to-date air conditioning forced warm air system. There is a separate hot-water system with hot-water storage tank. The heater room also contains a double tray laundry tub. The house is completely wired and equipped with modern electric lighting fixtures.

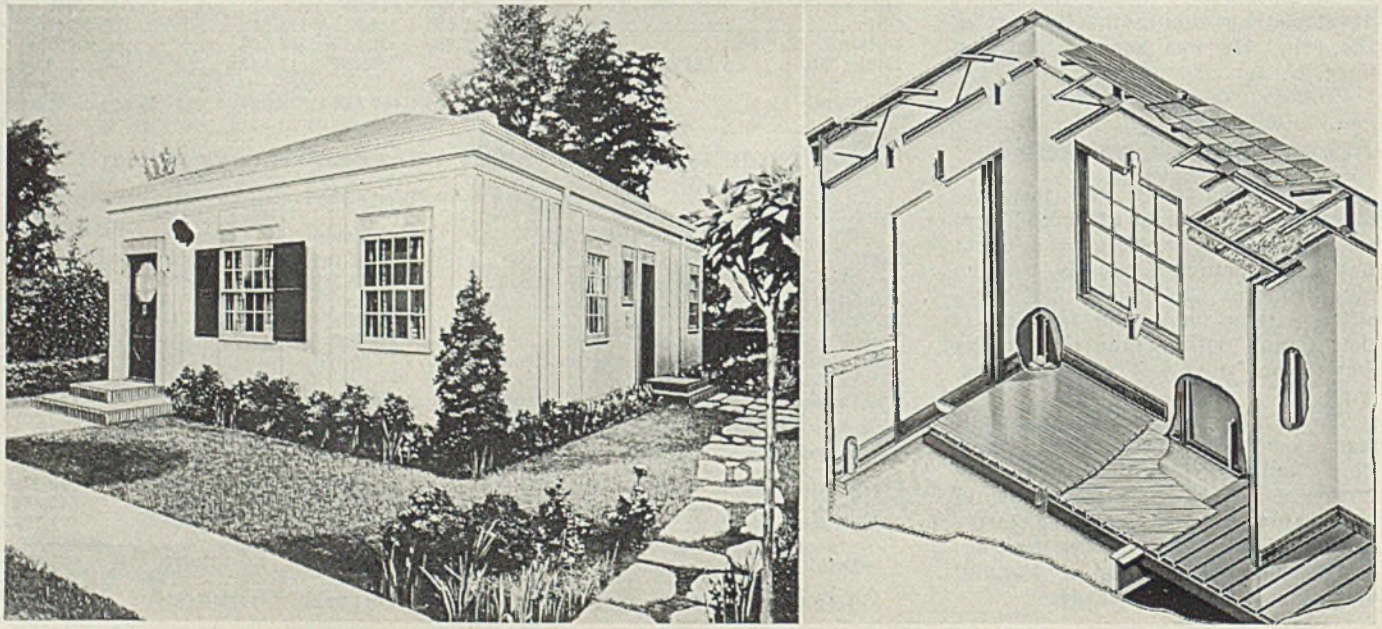
Officials of the company are: W. Harnischfeger, president; R. Binkowski, business manager; A. M. Locke, sales manager; Thor Hansen, production manager, Roy O. Papenthien, consulting architect.

Activities of Steel Users and Makers

EFFECTIVE March 14, Foote Bros. Gear & Machine Corp. took over all activities and assets of Foote Bros. Gear & Machine Co., Chicago, marking the completion of a period of reorganization and consolidation of activities which was started in August, 1932. During this time the new management effected many changes in the physical structure which resulted in considerable reductions in operating costs. The major achievement was the consolidation of the two Chicago plants, then known as the Curtis street plant and the Plamondon plant. The obsolete equipment of both plants was discarded and the balance from the Curtis plant moved to the Plamondon plant.

Foote Bros. executives responsible for this change as well as the coordination of many other sales and operating activities will continue in their present positions in the new

(*Please turn to Page* 99)



Editorial

Nation Should Heed Lessons Taught by 1936 Floods

INDUSTRY deserves the highest commendation for the manner in which it is working its way out of the difficulties caused by the recent floods. As was to be expected, officers and employes rose nobly to the challenge of the emergency. In many cases, operations were resumed in an incredibly short time after the water receded. Numerous plants were ready to function long before transportation and communication facilities had been restored.

The varied experiences in the flooded areas should yield some lessons for future guidance. For instance, responsible public officials and industrial leaders may find it profitable to study the electric power situation in the light of what happened in many flooded districts. Industrial and commercial concerns which generate their own electricity, in most cases, fared better than those depending upon purchased current. In Pittsburgh, mills and furnaces inundated during the height of the flood were functioning again several days before their main offices, situated in dry areas in the business section of the city, were available for use.

Flexibility in Power Distribution Systems Is Need Emphasized by Flood Experience

This does not imply any criticism of the commercial electric light and power systems. They performed miracles and did everything humanly possible under the circumstances. Nevertheless—due partly to the meddling of the federal government in attempting to discourage "bigness" and interconnected facilities among public utilities—the existing distribution system is not as flexible as it should be.

Fortunately current from the Great Lakes regions actually was diverted toward Pittsburgh so that the afflicted area did receive considerable help from neighboring systems. But as in the recent case of a power failure in New York city, the borrowing of current was accomplished in spite of implied government policies which are intended to invalidate such practice.

It would seem that one valuable lesson to be learned from the flood is that the new deal should drop its campaign of vindictiveness against power companies and should help those which are worthy to work toward a plan of interconnecting facilities which will insure the flexibility required for emergencies.

Another lesson may be derived from the recent experience with protective devices against floods. The wall protecting Portsmouth, O., is credited with having saved that industrial city from severe damage by the flooded Ohio river. The three-mile wall is said to have cost $750,000. In three floods since its erection, it has averted damage easily amounting to several millions of dollars. Many communities, where conditions are similar to those in this Ohio city, can well afford to study its experience.

Flood Preventative Measures Should Be Divorced from Pork Barrel Patronage

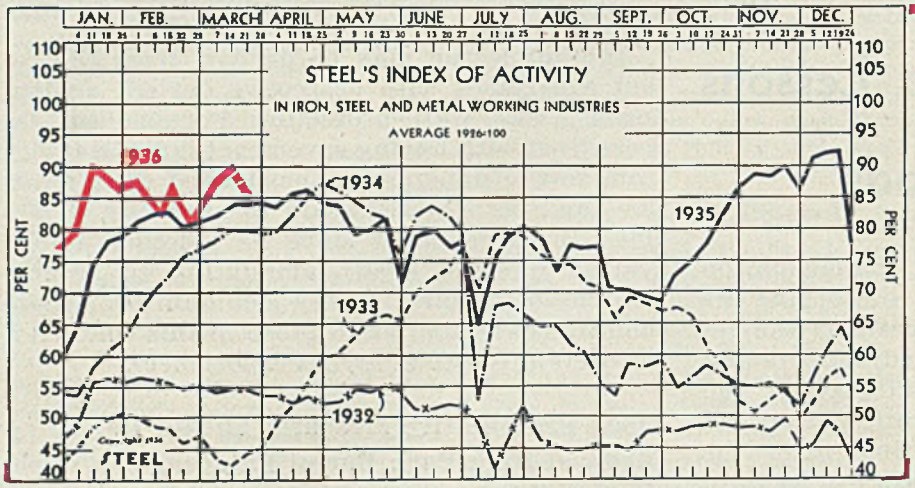
Again, the problem of flood prevention can be reviewed profitably in the light of recent experience. In several districts, new water conservation reservoirs were given their initial tests. The Pymatuming reservoir, built to hold back waters of the Shenango river for the use of valley industries in the dry summer months, was filled for the first time. If, as seems probable, it saved Sharon and other industrial cities from excessive damage, that fact should be utilized to advantage in planning flood prevention for other sections.

Possibly the recent disaster will stimulate a new school of thought in regard to flood preventive measures. The new deal, which deserves credit for its interest in reforestation and in dams for conservation, may be making a mistake in relying too heavily upon the large, spectacular dams. Morris L. Cooke presented a convincing argument Tuesday when he told federal authorities that this country needs small dams—dams which hold the rain "where it falls." Apparently he favors small reservoirs, and many of them, rather than large lakes formed behind gigantic dams. In the latter, the current of large streams carries silt into the artificial lakes, impairing their usefulness and robbing their watersheds of their best soil. The small dams confine water before it becomes unmanageable. Anyone who has examined the water control systems of Europe will appreciate the merit of this argument.

Sound judgment will be needed to plan for flood protection and prevention. Some politicians will utilize the recent disaster to further grandiose schemes for spending the taxpayers' money. No one will begrudge liberal expenditures if the funds are employed intelligently.

However, industry, which will pay a good share of the bill, should fight to see that the money is used according to sound engineering practice and not for the purpose of satisfying the political demand for pork barrel patronage.

THE BUSINESS TREND



STEEL's *index of activity in the iron, steel and metalworking industries declined 3.8 points to 85.9 in the week ending March 21:*

Week ending	1936	1935	1934	1933
Jan. 11	90.2	73.8	58.1	48.6
Jan. 18	89.3	78.1	60.9	49.3
Jan. 25	86.0	79.5	62.3	50.8
Feb. 1	86.5	81.8	66.9	49.9
Feb. 8	83.8	82.7	70.7	48.7
Feb. 15	85.9	82.8	72.4	48.3
Feb. 22	81.8	80.5	75.5	46.0
Feb. 29	83.4	81.1	76.8	47.4
Mar. 7	87.7	82.0	78.6	43.4
Mar. 14	89.7†	84.0	79.9	42.7
Mar. 21	85.9*	84.0	79.7	44.6

†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.*

Floods Push Business Gains Into Month of April

DUE to serious interruptions to industrial operations, transportation and communication in the northeastern industrial section of the United States, the upward trend in activity has been halted.

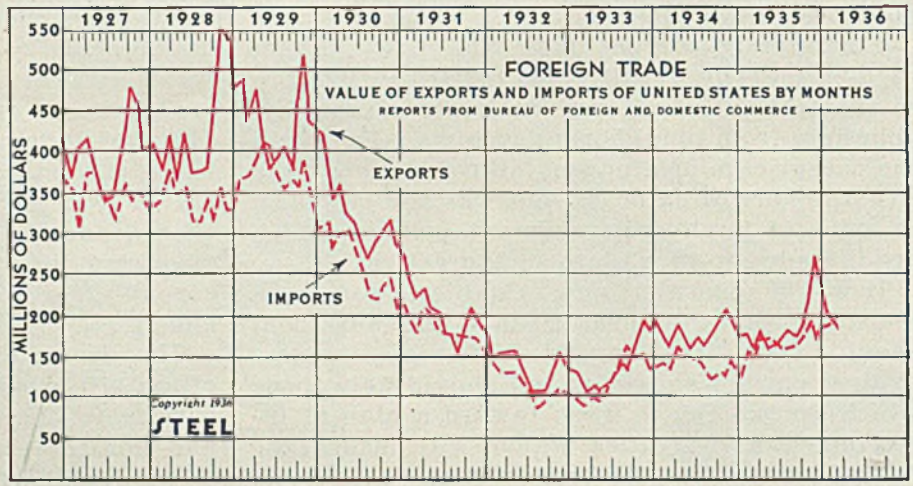
Before the floods descended, STEEL's index had climbed from 83.4 in the final week of February to 89.7 in the second week of March and was on its way to passing the 90 mark and probably touching the previous postdepression high of 91.9 before the end of March. But the deluge altered this picture overnight.

Steelworks operations, which started the third week at a rate of over 60 per cent of capacity, were curtailed so sharply in the last three days of the week that the average for the week was lowered to 50 per cent. The flood cut revenue freight traffic to an estimated weekly total of only 557,000 cars. It also put numerous power generating stations out of commission. This fact, coupled with the "borrowing" of power by distributing systems in the flood area from neighboring unaffected systems, made it impossible for the Edison Electric institute to present its usual carefully compiled report of power output on Wednesday. Instead it issued an estimate of 1,860,000,000 kilowatt-hours. This compares with 1,900,000,000 in the previous week, and indicates that the power transferred into the stricken areas reduced to a surprisingly small extent the loss in power output due to the flood.

Automobile production facilities were not directly affected. Output mounted to 95,223 units, which is the largest weekly total since the second week of January. The flood probably will

Dollars (000 omitted)

	1936		1935	
	Exports	Imports	Exports	Imports
Jan.	197,950	187,440	176,223	166,993
Feb.	182,630	192,821	162,999	152,491
Mar.	.....	.....	185,603	177,279
Apr.	.....	.....	164,350	170,567
May	.....	.....	165,457	170,207
June	.....	.....	170,193	156,756
July	.....	.....	173,371	177,698
Aug.	.....	.....	172,194	169,030
Sept.	.....	.....	198,189	161,653
Oct.	.....	.....	221,215	189,240
Nov.	.....	.....	269,400	168,955
Dec.	.....	.....	223,737	186,648



help rather than injure the demand for motor cars.

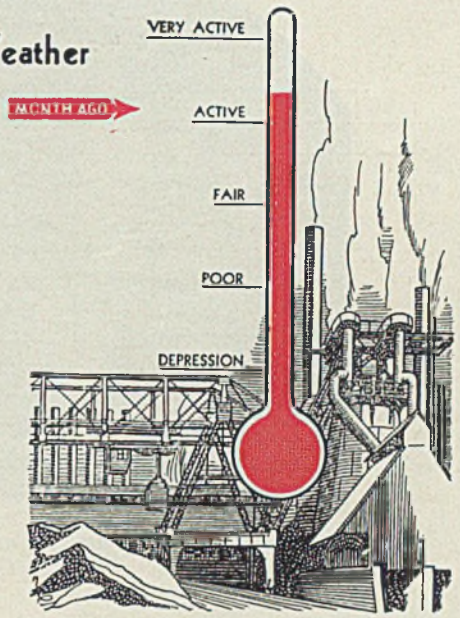
The net effect of the curtailment in steel operations, freight traffic and power output and the moderate rise in automobile production upon STEEL's index of activity was a drop from 89.7 in the preflood week to 85.9 in the week ending March 21. It is likely that the influence of the disaster also will be reflected in the index for the week ending March 28.

Thus it appears that for the second time since Jan. 1, nature has acted to retard an incipient wave of business expansion. The first postponement was caused by prolonged severe weather in January. In the present instance, the floods of March are pushing over into April a sizable volume of activity which otherwise would have fallen in the month of March.

Barring other unpredictable interruptions, the business trend should show a decided bulge in the early weeks of the fourth month. Steel operations and freight traffic are bound to show a rebound from the restrictions of late March. Power output will be moderately higher and automobile assemblies should continue at the present gratifying rate or better.

In addition to some impetus from flood rehabilitation work, business undoubtedly will receive an increasing measure of support from the expanding building industry. More activity in the heavy equipment field also will be a favorable factor in spring business.

Industrial Weather



TREND:
Upward

Where Business Stands

Monthly Averages, 1935=100

	Feb., 1936	Jan., 1936	Feb., 1935
Steel Ingot Output	110.5	105.1	107.7
Pig Iron Output	109.9	113.4	99.9
Freight Movement	103.4	97.1	95.9
Building Construction	99.5	129.1	46.1
Automobile Output	86.1	111.9	101.5
Wholesale Prices	.....	100.3	98.0

The Barometer of Business

Industrial Indicators

	Feb., 1936	Jan., 1936	Feb., 1935
Pig iron output (Daily average, tons)	63,411	65,461	57,675
Machine Tool Index	107.1	102.6	61.5
Finished Steel Shipments..	676,315	721,414	583,137
Ingot output (Daily average, tons)	118,712	112,942	115,740
Dodge Bldg., awards in 37 states (sq. ft.)	20,856,700	27,053,300	9,670,300
Automobile output	*300,000	380,554	353,781
Coal output, tons	41,290,000	39,330,000	34,423,000
Business failures; number	856	1,077	955
Business failures; liabilities	$14,089,000	$18,104,000	$15,217,000
Cement production, Bbls.	.....	3,630,000	3,053,000
Cotton consumption, bales	517,000	591,000	478,291
Car loadings (weekly average)	627,024	588,278	581,400

*Estimate

Financial Indicators

	Feb., 1936	Jan., 1936	Feb., 1935
25 Industrial stocks	$198.47	$196.26	$145.69
25 Rail stocks	$38.67	$34.22	$25.76
40 Bonds	$87.95	$85.76	$82.51
Bank clear'gs (000 omitted)	.....	$23,473,574	$19,040,988
Commercial paper rate (N. Y., per cent)	.....	¾	1
*Commercial loans (000 omitted)	$7,959,000	$7,999,000	$7,598,000
Federal Reserve ratio, per cent	78.2	78.2	72.4
†Railroad earnings	$35,874,738	$16,040,165	$21,348,557
Stock sales, N. Y. stock exchange	60,871,262	67,211,035	14,404,225
Bond sales, par value	.....	$172,543,300	$224,268,000

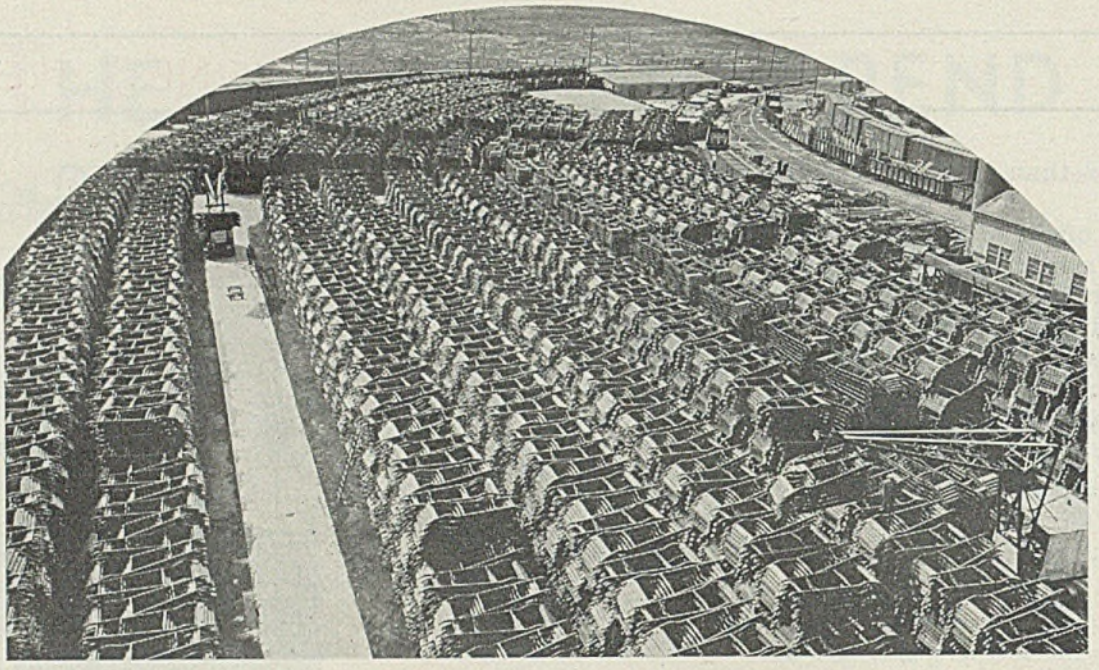
*Leading member banks Federal Reserve System.
†January, December and January respectively.

Foreign Trade

	Feb., 1936	Jan., 1936	Feb., 1935
Exports	$182,630,000	$197,950,000	$163,006,000
Imports	$192,821,000	$187,440,000	$152,537,000
Gold exports	$23,637,000	$338,000	$46,000
Gold imports	$7,002,000	$45,981,000	$122,817,000

Commodity Prices

	Feb., 1936	Jan., 1936	Feb., 1935
STEEL's composite average of 25 iron and steel prices	$33.48	$33.34	$32.54
Bradstreet's index	.....	$10.02	$9.79
Wheat, cash (bushel)	$1.15	$1.19	$1.13
Corn, cash (bushel)	83c	83c	$1.02
Petroleum, crude (Bbl.)	.....	$1.08	98c



Large volume of production means little unless sufficient cost allowance is made for profit margins. Careful attention to labor costs is important

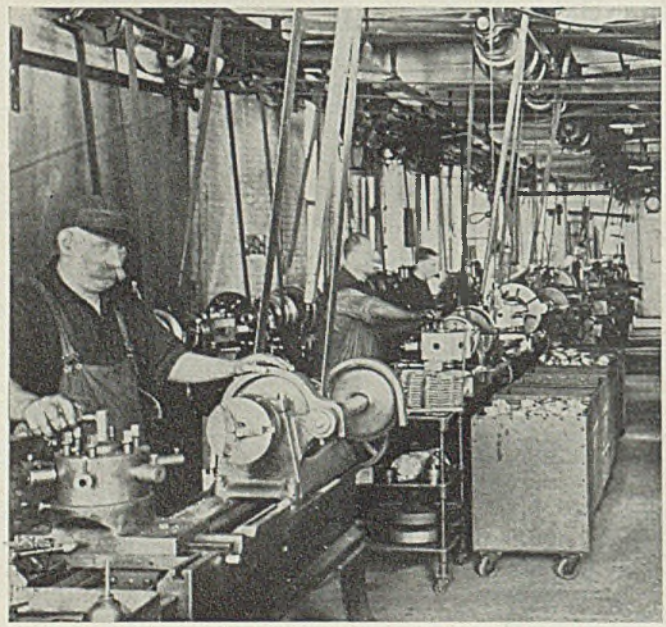
Correct Time-Study Procedure Vital

BY F. W. SHUMARD

Dean, National School of Time Study
Norwalk, Conn.

NEVER before in the metal-working industry has the question of manufacturing costs become such a vital issue as in today's accelerating tempo of business. Large volume and high quality of production mean nothing unless their cost allows a profit margin. Profit margins cannot be secured nor maintained unless satisfactory costs, when obtained, are controlled at minimum levels.

Periodic cost statements usually reflect the fact the horse either is still in the stable or has been stolen. A cost statement must do more than this. It should suggest the means by which needless excursions of the animal can be stopped, or controlled within permissible boundaries. Cost control not only prevents wandering, but closes the barn door before the loss occurs.



YEARS ago, the foreman determined the time allowances for all work in his department. As a matter of traditional policy workmen generally protested against the rates set

Prime costs are made up of two parts — material and labor — and these items are generally half and half; that is 50 per cent for purchased or raw materials and a like percentage for labor. Presupposing that materials are bought at minimum prices, then corrective measures must be directed toward labor costs for prime cost reduction.

Time is a definite index from which labor costs are projected. If the time for direct and indirect work can be shortened, then costs will be porportionately lowered. Time savings need not be gained by speeding-up processes. On the contrary, easier ways of performing tasks can be found, thus using more effectively the available, potential energy of each worker involved.

It is not stating a new principle to say that the best known way of measuring and standardizing the effectiveness of the man or machine is through proper time-study procedure. Although this is an accepted fact, seldom does management attach enough importance to the methods employed by their time-study men. Management officials demand the best talent obtainable for their planning, estimating, account-

Time savings need not be gained by speeding-up processes. More effective use should be made of each worker's potential energy

in Management's Battle on Costs

ing, engineering, supervision and all other personnel members for the successful manufacture of their products, but in many plants the unskilled time-study man enjoys an immunity not granted to other key men.

A time study not only represents the operator-allowance for a given task, but it also evaluates all brains which contributed to the establishment of that task. Therefore, it is evident that no matter how capable are the contributors, the value of their joint endeavors is partly destroyed by improper time-study findings; hence, unfavorable showings when converted to figures on the cost statements. A few cents saved by a purchasing agent in the careful buying of materials can easily be offset by the several seconds of unnecessary time allowed by the time-study man on a rate or standard applying to those same materials.

A few years ago the foreman determined the time allowances for all work in his department. The method used was to assign an alleged expert operator to complete as soon as possible a given quantity of work previously deposited at the machine. After cautioning the demonstrator about working hard, not losing any time, and the like, the foreman would note the hour of the clock on the wall and later return when the job had been partially or completely finished. The rate finally granted was seldom right and even though it was loosely figured, the workmen affected by it generally protested as a matter of traditional policy in order to make the foreman feel the rate was unattainable except by superhuman effort.

Today, in that same shop, a so-called expert time-study man sets the rates and although he uses a stop watch in place of the clock on the wall, his methods of arriving at time allowances are not unlike the methods used by the foreman just mentioned. The future outlook of that plant cannot be bright unless the profit margins of its products are long. Even in that event, other plants will soon be attracted to those products like bees to a flower, and the resultant competition will prove burdensome to the less alert organization.

The successful competitor is one

SKILLED, well-paid labor; modern equipment and proper time-study method is an unbeatable combination for attaining low production costs

who uses skilled, well-paid labor, modern equipment and proper time-study methods—a combination yielding low costs.

An operation should be set up and properly demonstrated before time-study observations are begun. Machine speeds and feeds should be correct, all tools and other equipment in use, and the operation functioning for best results before time measurement. Many cost leakages occur because such practices are not faithfully observed.

Correct time-study procedure breaks down all manual and machine elements into subdivisions of operational work. These individually recognized elements are then timed separately and each is treated as though it were the only element being done in the operation. The fact that minimum, average and maximum times may be figured from operator performance is not sufficient; these three classifications can be obtained from any operator whether he is fast or slow. Mathematical factors should be attached to watch readings which will correctly evaluate and convert them into terms of productive effectiveness. Time postings without these accompanying symbols of significance have no value in industrial work.

Fatigue Allowances

Individual rest factors should be prescribed for each manual element so that it becomes a distinct substandard and therefore subject to individual cost consideration. Fatigue allowances are not granted to machine elements, but are assigned to those elements being done while the machine is producing unassisted by the operator. The practice of granting a blanket fatigue factor to the overall timing of an operation results in an inaccurate final time allowance. To specify a blanket rest allowance of 15 per cent when but 12 per cent is determined by other methods is a time leakage, hence a dollar leakage.

Correctly made time studies recognize all circumstances attending the material, man or machine. Among them are: Externals, internals, variables, incidentals, counts, constants, changeables, rating, fatigue, setups, preparation, machine to manual ratios, attention, interference and many others. These factors, if present, are not *guessed* at, but are properly included. Definite evaluation and fixation of such factors in operational elements displace the usual practice employed by the untrained engineer who blandly adds a final, arbitrarily selected percentage and calls it "For Inherent Delays" or some other important sounding phrase in order to hide his ignorance.

There are still many management officials who believe that almost any man of average intelligence can be hired and after two weeks' experience with the stop watch, can become fully satisfactory for time measurement work. The ill effects resulting from such erroneous beliefs are often responsible for unfavorable cost statements.

The capable manager is one who knows that low costs and control are products of correct time-study procedure. He also knows that the mere ability to compile accurate standards is not alone enough; the engineer must be able to sell and keep them sold to labor.

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IN RECENT years the importance of adequate time-study as a means toward lowering costs has been glossed over, and perhaps with good reason; but with the quickening pace of current business, the question again is thrown into prominence. The accompanying article is not intended to prescribe a detailed approach to and solution of industrial personnel problems, but to emphasize to management the importance of correct application of time studies.

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One of the most fertile fields for cost reduction is the analysis, measurement and standardization of all indirect personnel work. Not only are prodigious savings possible on overhead work, but an index can be established for each indirect task to set up ratios of indirect to direct hours. After such indices are determined, they are used to maintain proper direct and indirect labor ratios when production volume fluctuates, thus forming another pivotal factor in cost control.

Investigates Corrosion Properties of Tin Plate

Corrosion-resisting properties of tin are the reason for its use as a coating metal over steel in the form of tin plate. In several of its uses, tin plate is exposed to corrosive conditions, and in some of them the tin itself is attacked. A review by T. P. Hoar of the mechanism of the corrosion of tin plate under conditions such as those obtaining in the cans used for packing foodstuffs has just been published by the International Tin Research and Development council as technical publication Series A, No. 30.

The corrosion of tin and of steel, separately and together, is considered. Two main types of attack occur with tin, depending upon whether the protective oxide film formed by the exposure to the air is completely removed or merely partially penetrated. The attack on steel by acid liquids depends very much upon the presence of traces of inhibitors such as proteins and tin ions and accelerators, such as sulphide, and also whether air is present.

Couple Effect Studied

In tinplate, tin and steel form an electrolytic couple which in recent years has been closely investigated, and it has been established that the tin or the steel can be cathode in the tin-steel couple under suitable conditions. If the tin dissolved forms stable complexes with the anions of the attacking medium, tin will normally become anodic to the steel. As regards corrosion, steel has peculiarities which have only been discovered recently and these have also to be taken into account.

Another factor is the layer of tin-iron compound always present between the steel and its tin coating and is the subject of investigations which are still proceeding. Several factors which tend to reduce corrosion in sealed food cans and use of lacquers for some purposes are dealt with. Among the practical remedies for tinplate corrosion are coating with lacquer or with electrodeposited tin and improvement of the steel base.

Copies of the paper reporting this research may be obtained without charge by addressing L. J. Tavener, United States representative, International Tin Research and Development council, 149 Broadway, New York.

Tungsten Carbide Products Discussed in Manual

Henry Disston & Sons Inc., Philadelphia, has prepared a 16-page manual "Disston Carboloy Products," which deals with the selection and care of tungsten carbide fitted saws, knives and tools, other than tools used in the metalworking industries. The manual, of 5 x 7¾-inch page size, perforated for ring binder filing, enumerates the various uses for these products; the fitting, grinding and sharpening of the tools; and comparative cost figures. Copies of the manual may be obtained by addressing the company.

Cost Savings Afforded by Alloy Anchorage

Of Punches and Dies

—*Courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.*

Pouring the alloy around the preheated assembly of a large die

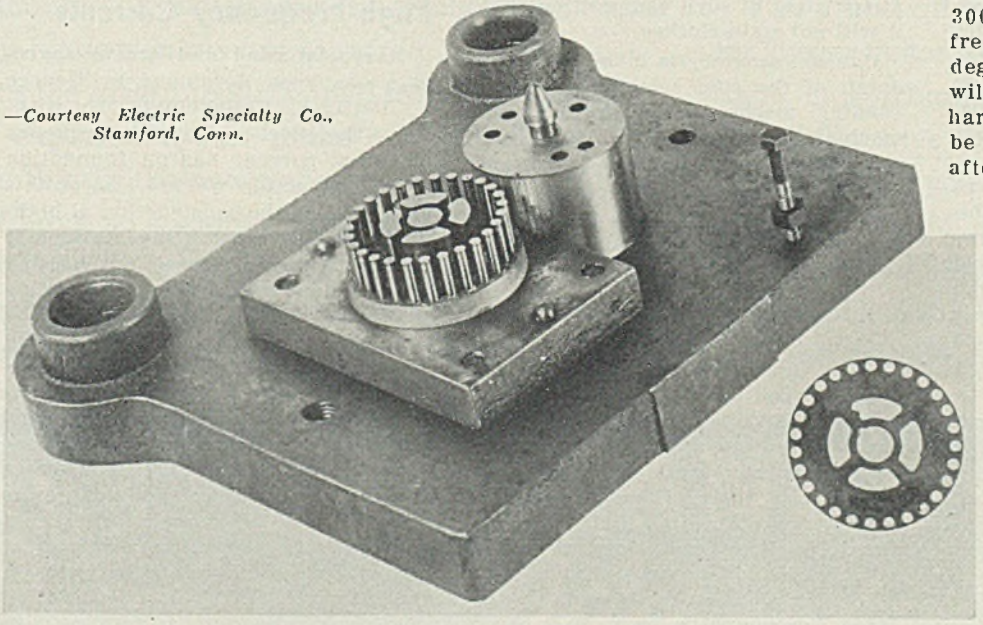
COMPLICATED punches and dies have always involved expensive labor and consequent high costs in their assembly. The time and skilled labor required to stone and realign punches to correct slight distortions due to changes during the hardening process often have made the cost prohibitive. In addition to this, wear or breakage of one small part may ruin the entire die. The task of fitting inserts by filing and milling sometimes involved days of skilled labor.

Much of this expense can be eliminated by machining the punches and dies of a complicated assembly in separate sections and mounting them in a shoe or die block, cementing them in place with a low melting point alloy in accordance with a definite technique. An alloy known as Cerromatrix has been developed by the Cerro de Pasco Copper Corp., New York, for just this purpose. This alloy of bismuth, lead, tin and antimony, is claimed to reduce substantially the cost of many complicated punches and dies by eliminating intricate holding devices, and by providing a rapid and accurate method for locating blanking, piercing and trimming punches in relation to dies, without the need for machining non-working surfaces to close dimensions. The accompanying illustrations show the types of work which can be done.

Punch assemblies are located by fitting them into the punch plate; they are then fastened to an auxiliary holding plate by means of screws. The regular punch holder is clamped to the auxiliary plate and the entire assembly is withdrawn from the punch plate. The assembly is then inverted, preheated from below, to prevent drawing the temper of the hardened parts, and the alloy is poured as shown in an accompanying illustration.

The alloy has a tensile strength of 13,000 pounds per square inch, a brinell hardness of 19 and an elongation of less than 1 per cent. It is sufficiently hard to hold punch and die parts permanently in their proper locations. It melts at 248 degrees Fahr.; the pouring range is from 300 to 350 degrees Fahr. and its freezing range is from 260 to 216 degrees Fahr. These temperatures will cause no drawing effect on the hardness of the die. The alloy should be allowed to stand for 12 hours after pouring as it hardens with age.

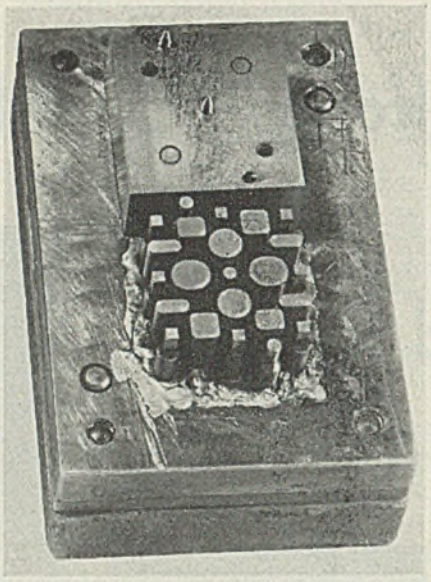
—*Courtesy Electric Specialty Co., Stamford, Conn.*



TYPICAL assembly of small punches cemented in place with the alloy. Note how the alloy was built up in this case

While this alloy expands approximately 0.002-inch per inch on cooling, the designer must keep in mind that it forms no mechanical binding and in no way "wets" the steel of the punch or die, or the casting of the die shoe or punch holder. Therefore, it is necessary to provide a mechanical anchorage, both from the alloy to the piece to be held and from the alloy to the die shoe, punch plate or holding medium. A few cuts here and there with a chisel or with any convenient undercutting end mill are usually sufficient. One vital precaution must be noted when pouring the alloy — die blocks and punches must rest firmly against a solid steel or iron foundation. No alloy must be allowed to flow beneath either die block or punch.

The alloy is not limited to the above uses. It has been successfully used as a material for molds for pressing cold-formed plastic compounds. A growing use of this and related alloys is in short-run forming dies for use on light-gage sheet metals. In such cases the dies themselves are made entirely of the alloy, casting them around a sample of the pressed sheet to be formed. The cost of producing such dies of steel, taken in relation to the short runs required, would be prohibitive. Other interesting applications are the formation of stripper plates by casting the alloy around the punch, models for engraving machines, split chucks and forming blocks for tube bending machines, and the like.



—*Courtesy Lamicoid Fabricators Inc., Chicago*

A typical assembly of small punches cemented in place and ready for use

New and Interesting Applications of Die Castings Shown at Exposition

REMARABLE progress made by the die casting industry in recent years, as a result of improved die casting alloys, dies and die casting methods, is reflected in the exposition opened March 17 by the American Die Casting institute in the quarters of the Metal Products Exhibits Inc., at 45 Rockefeller Plaza, New York. This exposition, participated in by the 26 members of the institute, is to be continued over a period of the next five to six weeks.

The strength which now can be obtained with zinc alloys is illustrated by numerous die castings. One of them is an automobile windshield frame 39 inches long, 9 inches high and weighing 30 pounds. Another is a zinc alloy frame for a pipe cutter for use on pipe sections of larger diameters.

Typical of many difficult zinc alloy die castings shown is a switch box and weight holder frame, about 15 inches in overall length, it has a wall thickness of 3/16-inch; between upper and lower flanges are 24 fins which are 1/16-inch thick, 1 inch wide and 5 inches long. The flanges are provided with a series of 48 holes.

A considerable number of assemblies shown are made largely of die cast parts. An interesting feature of a washing machine in the exposition is that it has an agitator die cast from a zinc alloy of such composition that it will not stain clothes.

Unusual accuracy is involved in the detail of the coin selection and the vending mechanism of a cigarette machine.

In as delicate a product as a carburetor, it is shown, the parts, even though made at different die casting plants, are interchangeable and fit together perfectly.

Tool Parts Are Die Cast

Many other mechanical devices shown, including paper cup dispensers, food mixers, are made largely of die castings. The exhibit shows further that die castings are being used to an increasing extent as part of machine tools. Change gears in a good many machine tools now are zinc base alloy die castings. A bandsaw machine in the exhibit has zinc alloy die cast gears; a zinc alloy, geared, self-indexing miter gage with the graduations cast in; and also a thin-section, zinc alloy, die cast saw guard in place of the usual guard which is stamped and formed from sheet steel.

Increasing use of zinc alloy die castings in the field of hardware and plumbing goods is typified by die cast household hardware, night latches, padlocks, casement window handles and door closing devices. Pipe fittings with threads cast in place are among the plumbing goods shown.

Intricacy No Obstacle

One of the most remarkable pieces shown is a spark plug shield for an airplane motor. This is a zinc alloy die casting with chromium plated finish. The shield has a wall thickness of 0.018-inch and diameter of ¾-inch. In comparison, the heaviest section shown is one of 2⅞ x 2¾-inches, in the upright member of the windshield of a convertible automobile. Of great interest also is a representative collection of typical automobile radiator grilles which are zinc alloy die castings. Some of these have overall height in excess of 30 inches and are up to 17 inches wide.

While zinc alloy die castings are in the majority at this show, many aluminum die castings are on view. These include motor boat propellers, propeller housings, kitchen mixer colanders, instrument frames, outdoor meter boxes, parts of food preparation and canning machines. Some interesting magnesium alloy die castings are shown, including some intricate parts of gyroscopes.

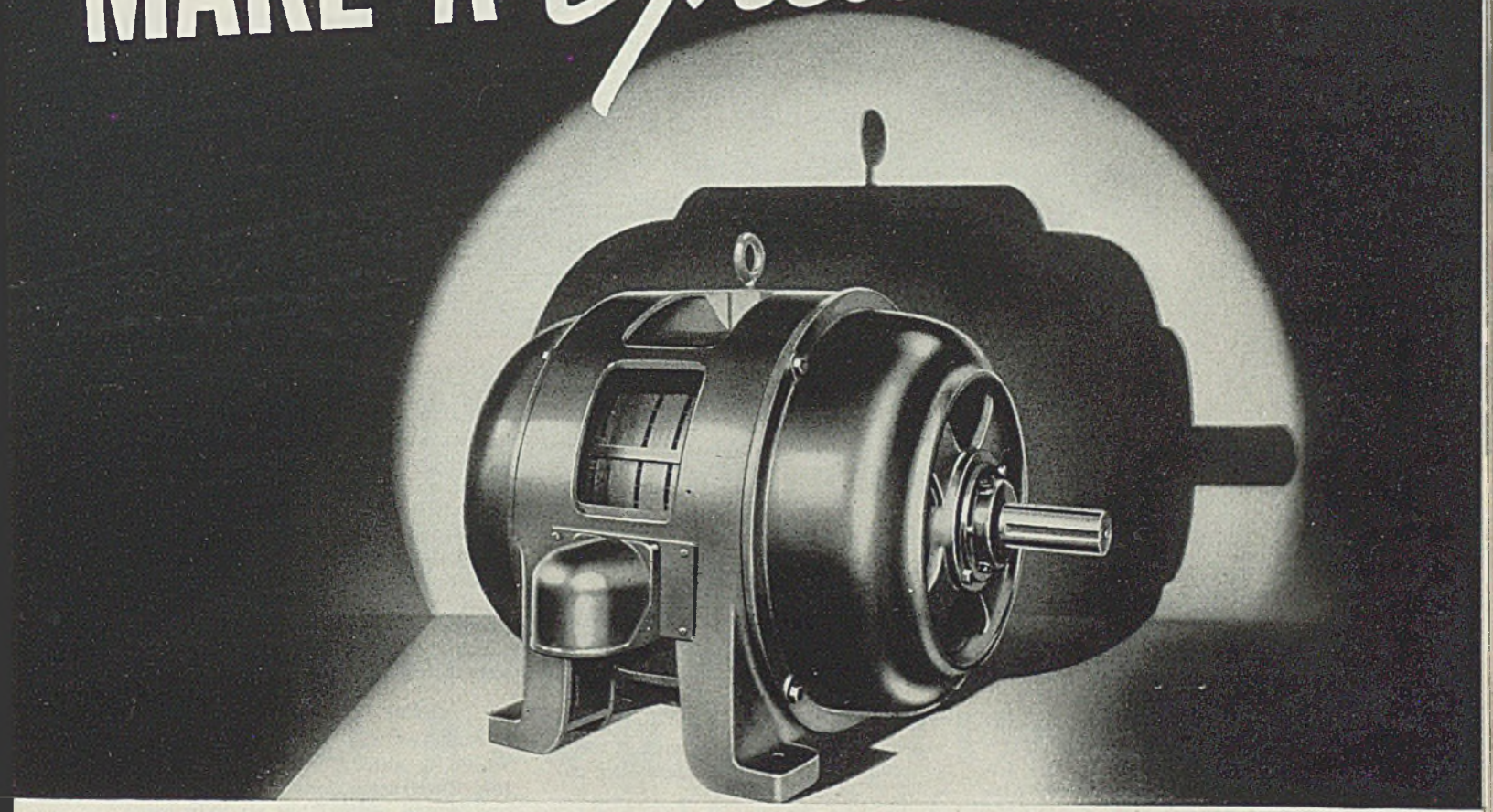
A feature of the exposition is the extent to which die castings take decorative treatment, through chromium plating and through the application of color finishes.

Aggregate Will Withstand High-Frequency Currents

A special sand and gravel aggregate has been developed by George F. Pettinos, Philadelphia, to withstand the effect which high-frequency electrical current has on foundation and construction work. Use of this aggregate in the construction of high-power radio transmitting stations is said to have eliminated the heating of the foundations caused by induction.

Elimination of the heating is said to be due mainly to the fact that induction is not set up by the high-frequency current on the minute particles of magnetic mineral found more or less common to all concrete aggregates. This development, it is believed, will be a contributing factor toward the possible commercial use of higher frequency currents in the future.

LITTLE THINGS MAKE A *Great* MOTOR



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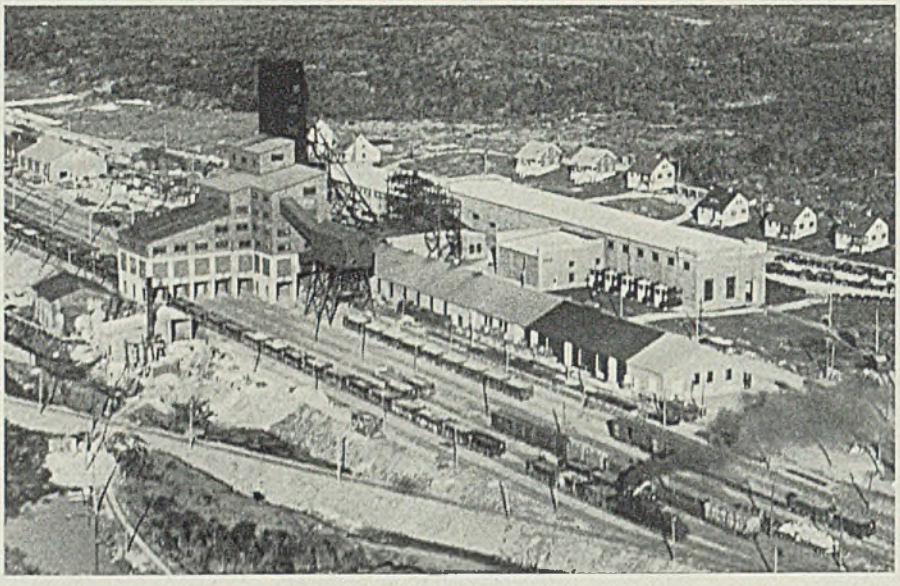

Aerial view of the Frood nickel mine in the Sudbury district of Ontario

Light-Weight Skips Improve Efficiency of Nickel Mine

By T. H. WICKENDEN

NOTABLE economies of operation have been effected at the Frood nickel mine of the International Nickel Co., Sudbury district, Ontario, through the recent installation of light-weight skips. Originally built of carbon steel and redesigned in nickel steel, these skips have an increased load capacity of 1½ tons per load. This amounts to an improvement of more than 16 per cent with no change in the size of the hoisting cables or power consumption.

Nickel ore is heavy, and corrosive conditions exist in the mine shafts, hence these skips must be ruggedly built. The standard skip constructed of carbon steel weighed 15,000 pounds empty, and had a hoisting capacity of 19,000 pounds of ore. Through the use of nickel alloy steels, the new skips weigh 12,000 pounds each and have a hoisting capacity of 22,000 pounds. Similar equipment is being installed in the company's Creighton mine and lighter weight nickel steel hoists are being provided for both mines.

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THE accompanying article is reproduced from a recent issue of Nickel Steel Topics published by the International Nickel Co. Inc., New York. The author, T. H. Wickenden, is assistant manager of the company's development and research department

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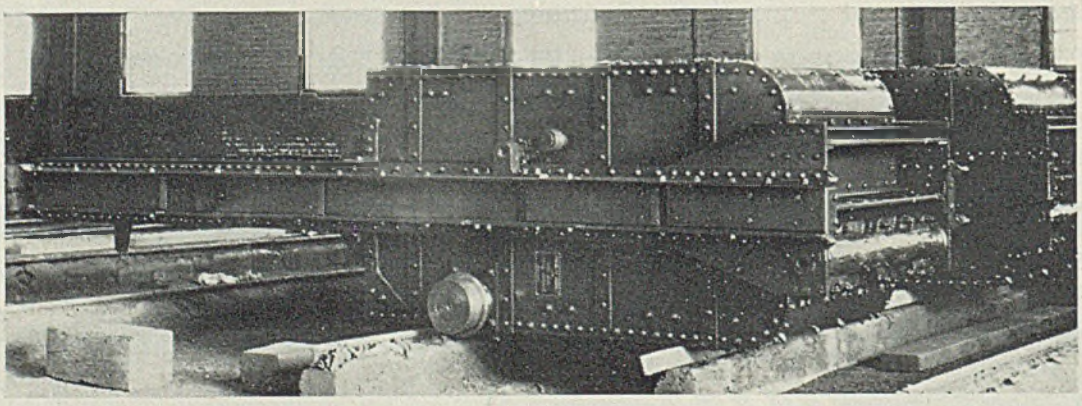
Approximately 10,000 tons of ore per 18-hour day is being hoisted at the Frood mine alone, the ore being lifted from pockets at the bottom of the shaft 3000 feet below ground to a rock house 100 feet above ground, the total vertical distance through which the material is lifted amounting to well over half a mile.

Pay Load Increased

Each of the new skips, one of which is shown in the accompanying illustration, carries 11 tons of ore, which means that six skip loads would fill a modern ore freight car. As a skip travels at the rate of 2600 feet per minute and makes 15½ trips per hour, the pay load mileage in the Frood mine is 165 miles per working day. This compares with the 25 mile average per 24-hour day for loaded freight cars on railroads, and indicates that the increase obtained in pay load capacity through reduction in deadweight is even more important to mine operating efficiency than to surface transportation.

The new skips and cages were designed and fabricated by the Dominion Bridge Co. Ltd., Montreal. The



THIS skip made of nickel steels weighs 12,000 pounds; the carbon steel skip replaced weighed 15,000 pounds. Carrying capacity is increased 16 per cent

COLD REDUCED TIN PLATE

. . the Acid-Resistant Plate that Canners Prefer

Canners prefer better containers—more effective resistance to acid, and a better surface "sealed" by tin. The cold reduction method of producing tin plate was developed to meet these demands.

All Inland Tin Plate is cold reduced. It can be supplied very low in phosphorus and silicon—elements conducive to acid corrosion. Microscopic examination will show that Inland tin coating is a longer enduring barrier against the attacks of acids. Its smooth, bright surface assures beautiful containers. It will withstand most severe drawing operations. Its accuracy to gage and size speeds production by reducing throw-outs and delays.

It is a better tin plate—and costs no more. Why not specify Inland Tin Plate on your next order.

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PLATES • STRUCTURALS • PILING • BARS • RIVETS • BILLETS

INLAND STEEL CO.

General Offices: 38 South Dearborn Street, Chicago, Illinois

Grinding Facts"

describes modern machining 46 different operations . . .

Grinders

OPERATION:
SURFACE GRINDING.

MACHINE:
GALLMEYER AND LIVINGSTON NO. 35 HYDRAULIC SURFACE GRINDER.

MATERIAL:
S. A. E. 1020 STEEL.

TABLE SPEED:
115 FEET PER MINUTE.

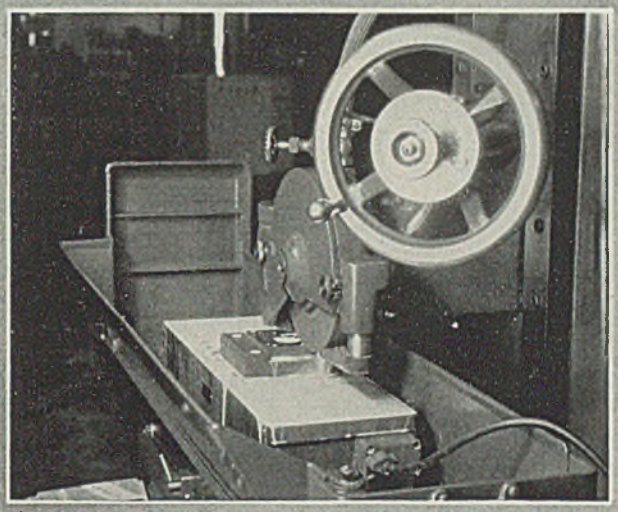
DEPTH OF CUT:
.003 INCH.

CROSS FEED:
.125 INCH AT EACH END OF TABLE STROKE.

WHEEL:
1 INCH FACE. 2 INCH BORE. 10 INCH DIAMETER.

COOLANT:
1 PART SUNOCO TO 30 PARTS WATER.

Sunoco lessens grinding rejects



Courtesy of Gallmeyer and Livingston Company, Grand Rapids, Michigan

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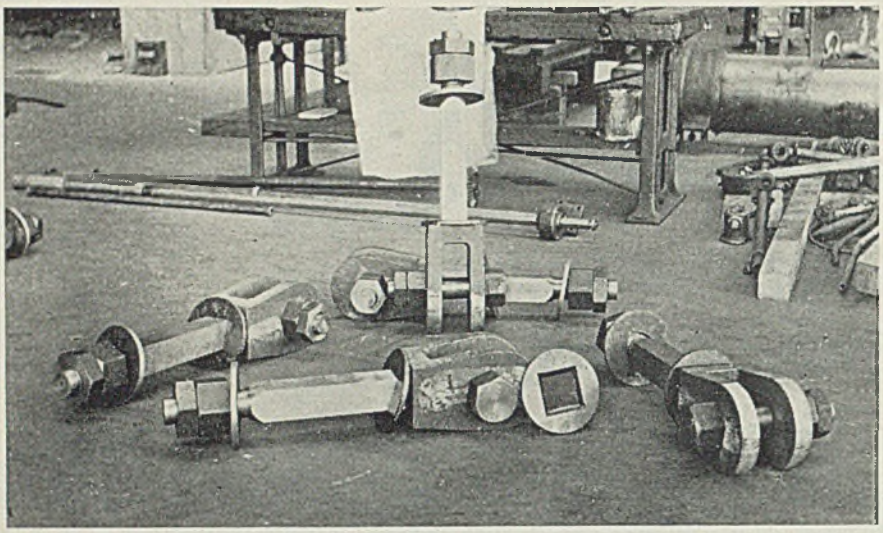

Here is shown a group of eyebar forgings constituting a part of the light-weight skip equipment. These forgings are made from 2.4 per cent nickel steel

idea of light weight equipment was stimulated by the staff at the Copper Cliff mines and the development and research department of the International Nickel Co. co-operated in the selection of materials.

In the construction of the new alloy steel equipment, no radical innovations were made in the general design from that which had proved successful in the past with carbon steel. However, all of the highly stressed members, in the form of angles, channels, plates, bars, and other rolled shapes, were made in lighter sections of 3.5 per cent nickel steel, effecting a 25 to 33 1/3 per cent weight saving over carbon steel. Sections of all forged parts were reduced a similar amount by the use of 2.5 per cent nickel railway forging steel.

High Strength Sought

The A.S.T.M. specification for steel for building construction, issued in 1933, calls for a tensile strength of 55,000 to 65,000 pounds per square inch; a minimum yield point of 50 per cent of the tensile strength, or 30,000 pounds per square inch; and a minimum elongation in 8 inches of 22 per cent.

In designing for the nickel steel, the following properties were desired: Tensile strength, 85,000 to 100,000 pounds per square inch; yield point, 55,000 pounds per square inch minimum; and elongation in 2 inches, 18 per cent minimum.

It was decided that these properties could be obtained best with the following composition, which corresponds to S.A.E. 2320 except for carbon limitations: Carbon 0.18-0.24; manganese 0.30-0.60; phosphorus 0.040 maximum; sulphur 0.050 maximum; and nickel 3.50-3.75 per cent.

Following are some typical properties obtained on tests of the rolled material:

Open-Hearth Nickel Steel Plates, 3/16, 5/16 and 3/8-Inch Thick

Average of four tests: Yield point, 60,090 pounds per square inch; ultimate strength, 92,730 pounds per square inch; elongation in 2 inches, 18.5 per cent; reduction of area, 49.2 per cent.

Open-Hearth Nickel Steel Shapes

Average of three tests: Yield point, 58,360 pounds per square inch; ultimate strength, 90,970 pounds per square inch; elongation in 2 inches, 19.2 per cent; reduction of area, 52.3 per cent.

Nickel Steel Angle Bars

Average of five tests: Yield point, 60,900 pounds per square inch; ultimate strength, 91,280 pounds per square inch; elongation in 2 inches; 19.57 per cent; reduction of area, 52.9 per cent.

Plain Carbon Structural Shapes

Average of eight tests: Yield point, 37,556 pounds per square inch; ultimate strength, 63,110 pounds per square inch; elongation in 2 inches, 27.57 per cent.

All forgings were made by Canada Foundries & Forgings Ltd., Welland, Ont., and were ordered in accordance with the International Nickel company's recommended railway specification No. 2 for normalized and tempered low-carbon nickel steel forgings. Various chain plates, brackets, draw bolts, nuts, locking levers, etc., were made of this material. Reports on tests of full-sized prolongations, normalized and tempered with the forgings, showed:

2.5 *Per Cent Nickel Steel Forgings*

Average of seven tests: Yield point, 66,650 pounds per square inch; ultimate strength, 85,857 pounds per square inch; elongation in 2 inches, 31.4 per cent; reduction of area, 62.4 per cent.

The trunnion shaft was changed from a solid bar to a thick-walled seamless steel tubing of 3.5 per cent nickel steel, S.A.E. 2320. Sling chains were specified in 3 per cent nickel steel and were made by the Weldless Chain Co.

Cast steel parts were similarly reduced in section by being made of 2 per cent nickel steel in accordance with International Nickel Co. recommended railroad specification No. 4.

All rivets used on these structures were specified in S.A.E. 2115 (1.5 per cent nickel, low-carbon steel), which corresponds to International Nickel recommended railroad specification No. 9 for high-strength river material. It is reported by the fabricators that these rivets drove as easily as lower strength rivets of carbon steel.

Expense Justified

The Dominion Bridge Co. has reported that the nickel structural members offered no more difficulty in fabrication than similar parts of structural carbon steel. Most of the parts were used in the as-rolled condition although some of the more important members which had been bent at the forge shop were given a normalize and draw treatment similar to that specified for the forgings. This probably was not necessary but the expense involved was small and the simple heat treatment insured having the steel in the best possible condition.

Extensive atmospheric corrosion tests on various steels have demonstrated that the 3.5 per cent nickel steel shows a considerable increase in life over plain carbon steel. With the increased resistance of the nickel steel to the corrosive conditions present in the mines, it is anticipated that the life of these parts will be extended, from this standpoint, in addition to the advantages previously enumerated.

The delivered costs of the finished skips and cages were only slightly higher than those of the previously used carbon steel equipment. In spite of the fact that the nickel steels employed are more costly than unalloyed steel in accordance with the published alloy steel extras, this has been partly offset by the lowered weight of the finished nickel steel parts and lower freight charges. Naturally, the ultimate savings effected by the use of the alloy steel parts will be considerable, because of the increased amount of material handled in operation and the probable extended life of the equipment through the employment of superior materials.


HOT ROLLED
Sheet and Strip
12 gauge to ½" inclusive up to 72" wide
13-14 gauge " " up to 66" wide
15-16 gauge " " up to 60" wide
18 gauge " " up to 48" wide
in cut lengths or coils, produced on the most modern equipment under conditions which assure highest quality.
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SHEETS STRIP
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599

Methods and Materials

Machines Feature Built-In Lighting

BECAUSE good lighting conserves human energy and thereby increases efficiency of operators of machines, it now has become the designer's responsibility to see that means for proper illumination are specified before his layout leaves the drawing board. That the trend is definitely in the direction of built-in lighting in the design of machinery is indicated by numerous new types of equipment introduced recently.

The type of lighting equipment selected for specific application obviously will depend on the machine and the nature of its functions. In some cases, it is desirable to utilize a fixture capable of being adjusted to direct illumination on more than one spot at different intervals. To meet this requirement of flexibility, a machine lamp marketed by the Fostoria Pressed Steel Co., Fostoria, O., and shown in Fig. 1, employs two arms with ball and socket joints.

The base arm is 11 inches long and the extension arm measures 10⅝ inches. By means of a glareless shade, uniform lighting of 50 foot-candles or more is focused on the point where it is needed. This light was developed for builders of machines, whose choice in the matter of positioning the fixture where it most effectively will serve the operator is, of course, governed by an intimate knowledge of operating requirements.

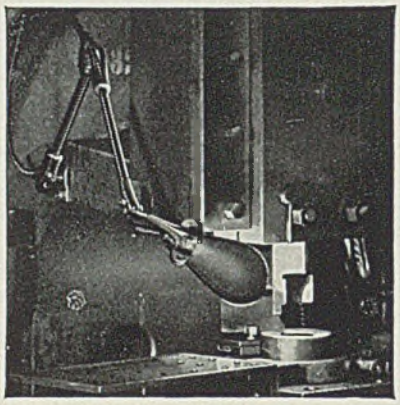


Fig. 1—Flexibility, a desirable feature for machine lamp fixtures, is obtained by employing two arms with ball and socket joints

In the heavier classes of machinery and equipment, the machine tool provides a noteworthy example of the possibilities of built-in illumination. Lathes, such as the one shown in Fig. 2, built by the Porter-Cable Machine Co., Cincinnati, afford an example. Grinders and other types of machines are rapidly adopting built-in lighting. The advantages are manifold, from a sales aspect as well as from a performance point of view.

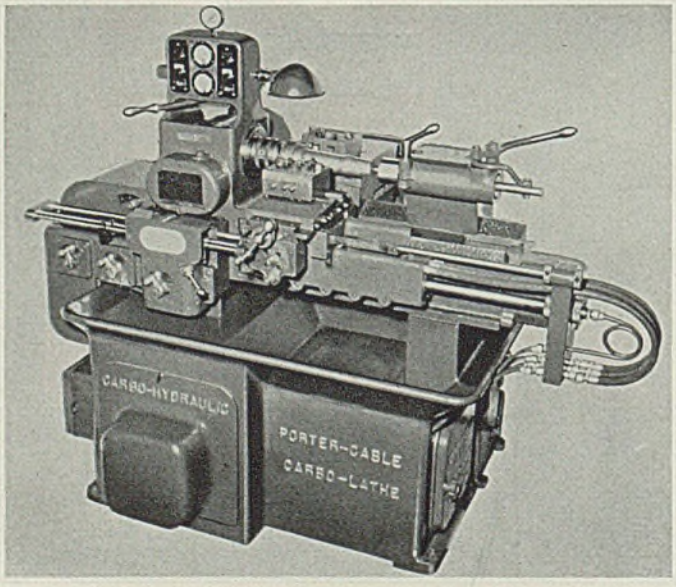


Fig. 2—Machine tools such as this are being designed with built-in lighting systems to facilitate operation

\$ \$ \$

Electric Immersion Units Heat Lubricating Oils

A large manufacturing plant faced the problem of preheating lubricating oils from 60 degrees Fahr. to 180 degrees Fahr. and circulating them at the rate of 60 gallons an hour. The production schedule of the plant required that the heating be continuous for 12 hours a day.

To meet these requirements, a circular tank was built and four heavy-duty electric immersion units were installed in it. The oil is circulated through the tank and the electric heaters bring it up to the desired temperature. Electricity is claimed particularly desirable for jobs of this nature because it is safe, fumeless and easily controlled. On this particular job, the immersion units have been giving satisfactory service for many months.

\$ \$ \$

Develops Alloy for Wire In Resistance Standards

An alloy of copper, manganese and aluminum has been found by the national bureau of standards, Washington, to be superior in several respects to manganin as a resistance alloy for the wire-wound standards which maintain the unit of electrical resistance in the national standardizing laboratories. Manganin, an alloy of copper, manganese and nickel, generally is used. For use in the construction of precision standards, alloys must be very stable in resistance. In addition to stability, they should have low temperature coefficients of resistance and small thermo-electric powers against copper.

The best proportions of the three metals in the new, superior alloy were found to be approximately:

WARNING!

To Heat Treating Departments of Plants Damaged by Floods

In cleaning up and checking your supplies after flood waters recede, *extreme care* must be taken in inspection of carburizers, heat-treating salts, quenching oils and cutting oils.

CARBURIZERS AND HEAT-TREATING SALTS

Salts, cyanides and solid carburizers will lose their effectiveness when dampened, and of course would be dangerous to use under heat. Pots should be scrupulously cleaned before refiring. Damaged stocks should be discarded.

QUENCHING OILS

Where water has contaminated quenching oil it may be heated up to 180° F. and the water evaporated off. If mud and silt have entered the system, it is wise to empty tanks, clean them, and refill. We have learned of tanks of Houghton's No. 2 Soluble Quenching Oil which have remained unchanged for 25 years, but which now have to be replenished because of flood damage or loss.

CUTTING OILS

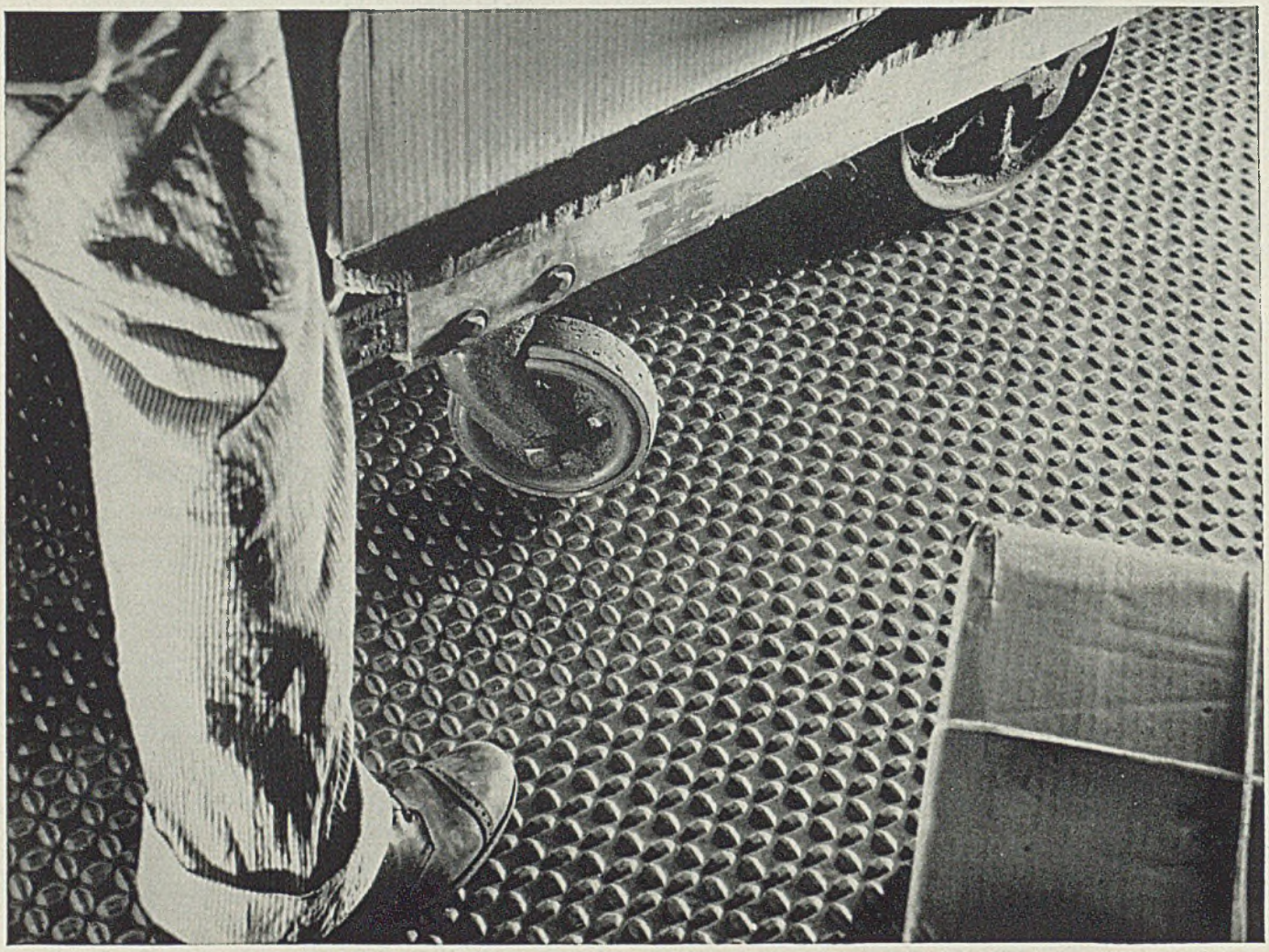
Straight or soluble cutting oils kept in underground storage tanks in the flood areas should be carefully checked against contamination by mud or silt, and replaced if found to contain any foreign matter. This will avoid any danger to pumps, clogging of systems and work being ruined by abrasive materials.

Write for Emergency Bulletin on Cleaning, Rust Preventives and Leather Belt Repairing.

E. F. HOUGHTON & CO.

240 W. Somerset Street, Philadelphia, Penna.

Wheels roll easily on this non-skid floor plate



. . . another reason why it's a good seller

Multigrip floor plate offers a good half dozen advantages—at no extra cost. The design and spacing of the lugs make Multigrip safe, and easy to stand or walk on. It resists skids from all angles. Easy to clean—there are no pockets in which dirt might catch. It drains quickly and completely. It cuts economically and hence is well adapted for use on both small or large areas. Write for details of the profit-opportunity that is yours with Multigrip.

MULTIGRIP FLOOR PLATE

Carnegie-Illinois Steel Corporation • Pittsburgh • Chicago

Pacific Coast Distributors
Columbia Steel Company, San Francisco

Export Distributors
United States Steel Products Co., New York

UNITED STATES STEEL

Copper, 85.0; manganese, 9.5; and aluminum, 5.5 per cent. When properly baked, coils of wire made of this material have smaller temperature coefficients of resistance and smaller thermoelectric powers against copper, than manganin. This alloy appears to be as stable in resistance as is manganin, but it undergoes a large change in resistance with baking, and the baking time and temperature must be carefully controlled.

Use of copper-manganese-aluminum resistance alloys is not new, as Therlo is an alloy of this type. However, the best composition has not been determined before, nor have detailed data been available. A complete description of the method of preparation and data obtained for these alloys is presented in the February issue of the *Journal of Research* published by the national bureau of standards.

$ $ $

Segmental Grinding Wheel Has Light Chuck

A new segmental grinding wheel and chuck, shown in the accompanying illustration, are announced by the Sterling Grinding Wheel Co., Tiffin, O. Whereas this company's chucks always have been of light weight so as to be easy on the bearings of grinding machines, the new chuck is even lighter than the company's standard chuck. It has several added features which make for efficiency and economy.

With the new chuck each segment is mounted separately, the grooved segment fitting itself into its proper position and each segment is tightened with a twist of a socket wrench and remains solid throughout its life. After wearing down the segments, they can be set out and still more life obtained, leaving only a fraction of an inch to be discarded.

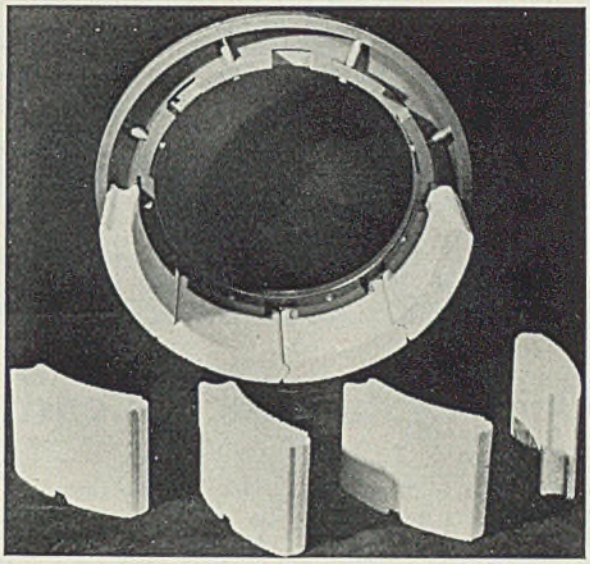
The new unit has been developed for production surface grinders with solid type segments or solid ring wheels without consumption of time in sulphurizing.

$ $ $

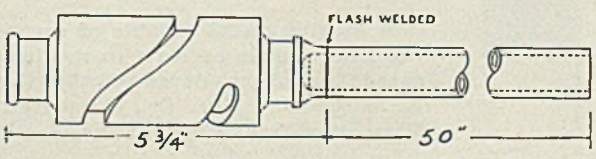
Welding Used in Making Automobile Steering Shaft

Progress in welding practice is producing important design changes which offer fertile ideas which other engineers may consider profitably. One instance that has come to light recently is an ingenious method of eliminating machining in the production of an automobile steering mechanism, shown in the accompanying illustration. By the adoption of welding, it is now possible to produce this part on a mass production scale at high speed and low cost, obtaining in addition maximum strength.

The cam which operates the steering knuckles and drag links is turned out of a piece of steel not much longer than the finished length of 5¾ inches. To complete the assembly, the steering shaft is cut to length, about 50 inches, from tube stock 0.885-inch in diameter. Then the cams and shafts are welded together in a flash welder at the rate of 200 per hour. This method is said to produce a shaft that is actually stronger than one turned at higher cost from a single piece of material. The welding machine was built by the Thomson-Gibb Electric Welding Co., Lynn, Mass.



UNUSUALLY light chuck features this Sterling segmental grinding wheel. Segments are mounted separately and may be set out to compensate for wear



Welding eliminates machining in production of this automobile steering shaft

Internal Combustion Engine Governors Of Stainless Steel and Aluminum

ALL parts in the intake passage of an internal combustion engine governor are exposed to moisture from condensation, fumes and other destructive agents. Inasmuch as these parts must regulate the governor to a very fine degree, it is essential that they withstand corrosion.

Hoof Products Co., Chicago, has solved this problem by building its governors of corrosion-resisting materials. All of the important units are of stainless steel while the body, cover and housing are aluminum die castings. Stainless steel is employed in such key parts as the butterfly shaft, butterfly and the ball bearings.

Another novel feature of these governors is the use of a cantilever spring in place of light coil springs which are commonly used. The number of leaves in these springs varies but all are made of ⅜-inch wide, tempered, round edge, spring steel, varying in thickness from 0.10 to 0.035-inch. By controlling the length and thickness of the leaves within close limits it is possible to furnish springs of an exact calibration. Special instruments designed by the company are employed in calibrating and testing the springs and in measuring the torque created by the pressures in the intake manifold. This measured torque is duplicated in the spring.

The Hoof governors are made in two types. In the seal type, the adjustment as well as the cover are sealed to prevent readjustment by unauthorized persons. The key type is adjusted with a key which not only seals the cover but locks the adjustment, preventing readjustment excepting by the holder of the key.

A feature of these governors is that in the event of failure, such as breakage of a spring, the governor automatically closes and shuts down the engine; there is no possibility in such circumstances of the butterfly opening and allowing the motor to tear itself to pieces.

These governors are small and compact so as to fit between the carburetor and intake manifold of a gasoline engine. They are used on automotive motors, gas-electric locomotives, generating units, arc welders, contractors' machinery and many other motor-equipped units. They are used extensively in the oil fields and also with gas carburetors.

Compact, Streamlined Domestic Boiler Units Feature Steel Construction

THE streamline vogue and the modern tendency to make available the maximum of living space in residences promises to bring about the further utilization of steel in household equipment. A manifestation of this trend is presented by the new National-Williams boiler-burner unit, recently developed by the National Radiator Corp., Johnstown, Pa. This unit has been designed to satisfy the public taste which is now demanding basement equipment that will lend itself to decorative schemes for game rooms, dens and general recreation rooms.

The units are being made in three sizes, with larger sizes now being developed, according to the manufacturer. The boiler shell of the smallest unit requires approximately 350 pounds of steel for its construction, while the largest size requires approximately 550 pounds. This material consists of steel plates, tubes and other accessories to complete the boiler proper, and does not include the oil burner or the steel jacket. The jackets require approximately 75 pounds of steel for the smallest unit and 100 pounds for the largest size. The largest unit is only 62 inches long, 39 inches high and 23 inches wide. It has a net load rating of 450 square feet, and a net hot water rating of 720 square feet. This size has 26.5 square feet of heating surface.

The plates used in the fabrication of the shells are of grade "A" flange welding steel, made in accordance with A.S.M.E. power boiler construction code material specifications S-2. The flues used are 2 inches in diameter and rolled of 11-gage charcoal iron. All of the materials used are carefully selected standard products or made to suit the manufacturer's own specifications. The boilers are welded by the electric arc process using heavy-coated shielded electrodes.

High Ratings Developed

Although small, the boilers develop high ratings because of the ample heating surface and the large water content per square foot of heating surface; the boiler shell is of the Scotch marine fire-tube type. The effectiveness of the boiler is increased due to a large portion of the combustion chamber being water-backed and also because of the flue travel, which compels the gases to pass three times the length of the boiler before reaching the stack.

From the nozzle of the burner, the gases are projected through a cylindrical combustion chamber (see Fig. 1), at the far end of which they are baffled so as to reverse their direction and pass between the top of the chamber and the under side of the boiler. Because the heated gases pass on both sides of the combustion chamber it becomes incandescent almost immediately after combustion occurs, so that the oil is completely consumed before reaching any boiler surface. Before reaching the stack, the motion of the gases is slowed down by turbulators, made of twisted strips of heavy gage steel, which impart a swirling, scouring motion.

Mechanism Readily Accessible

The boiler is mounted so that all working parts are outside of the boiler, away from the destructive effects of heat and corrosion, and are readily accessible. A specially designed access-door, which eliminates the use of bolts, nuts and gaskets permits entry to the combustion chamber. An observation port is attached to this access-door to permit inspection of the flame and proper adjustments to the burner under normal conditions of combustion. The window is protected by a counterweighted metal shutter which automatically closes when an asbestos covered handle is released. The boiler shell is wrapped with lead-wool insulation, reinforced by metal lath and wire; all exposed surfaces at both ends of the boiler, including the access door have been insulated.

The burner is especially designed for handling the small amounts of fuel required for domestic heating and to operate effectively at any rate of output. As an added refinement, the unit is equipped with submerged heating coils, to provide an all-year-round supply of hot water for domestic use, regardless of whether the building requires heat or not.

The jacket was designed especially for this unit by Lurelle Guild, industrial designer. It is finished in Chinese red baked enamel with a black and aluminum trim. All controls are enclosed within the jacket. The streamlined front jacket panel, as well as the rear panel, can be readily removed for inspection, providing access to burner and controls.

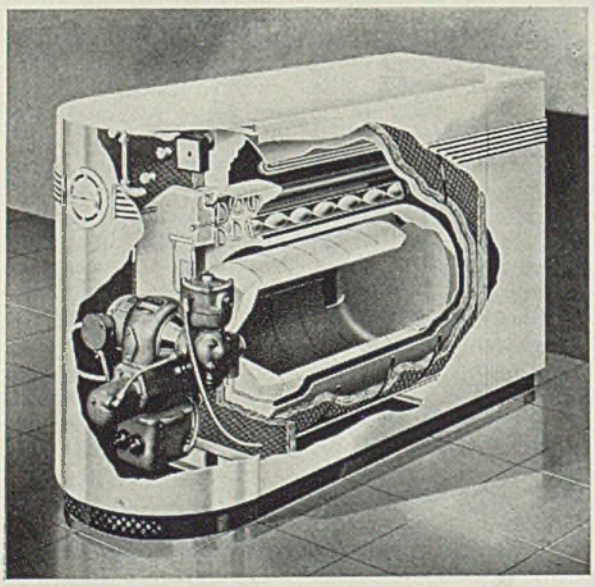


FIG. 1 — Cutaway view showing boiler shell, refractory combustion chamber insulation, burner, observation port and jacket

Heavy Pressure Bearing Alloy Developed

A bearing metal capable of carrying heavy loads at slow to medium speeds has been developed by the A. W. Cadman Mfg.. Co., Pittsburgh. This alloy, known as Nicuite, has a

An Open Letter

. . . to Foundry Owners and Executives

SEND your Key Men to the 1936 Foundry Show! The up-to-date, practical information to be obtained there is vitally important to the advancement of your business.

As a Matter of Business: Authorities on every phase of foundry practice will discuss TODAY'S problems of production, materials handling, plant control. Your men will have a rare opportunity to inspect and compare new developments in machinery, equipment and supplies, and consider your special problems from a new point of view, away from office routine and interruption. What they see and hear will be reflected in better foundry practice.

As a Matter of Cost: One new idea, gained from convention contacts, will more than pay the cost of your entire representation. Don't forget that you are sending your men to enroll in a foundry short course, conducted in a business-like manner for the promotion of Foundry Progress.

As a Matter of Common Sense: Give your Key Men the advantage of a few days in an atmosphere of enthusiasm, aggressiveness and progress. They will return home with a new outlook on their daily problems, full of new and original ideas, better fitted to improve themselves and their work. Every dollar spent at the 1936 Foundry Show will pay rich dividends of knowledge, experience and loyalty.

Instruct your Key Men to GO WITH A PURPOSE!

40th Annual CONVENTION FOUNDRY and ALLIED INDUSTRIES EXPOSITION

Convention Hall

DETROIT

May 4th-9th

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American Foundrymen's Association

222 West Adams Street, Chicago

yield point in compression which lies between 24,000 and 25,000 pounds per square inch. This indicates a safe bearing pressure of 4000 pounds per square inch with a factor of safety of five. Other physical characteristics of this alloy are: Tensile strength, 55,000 pounds per square inch; yield point, 48,000 pounds per square inch; percentage elongation in 2 inches, 6-8 per cent, and brinell hardness, 100-120.

While this alloy was developed specifically for heavy loads at slow to medium speeds, permissible bearing speeds are dependent on the proper selection and application of lubricants. The alloy is intended particularly for housing nuts, slippers, slides and similar parts for steel rolling mills.

Casts First of Four 200-Ton Four-High Mill Housings

A 200-ton steel casting, the housing for a new four-high rolling mill, was pulled from the sand last week by a 250-ton crane at the Riverside plant of Otis Steel Co., Cleveland. The huge casting, which had been cooling for about three weeks, measures 26½ feet high, 14 feet wide and 3 feet thick; it is one of four which Otis is making for United Engineering & Foundry Co., Pittsburgh.

An extension to one of the buildings at the Otis plant was required to accommodate the pits in which the molds were made. After the patterns had been removed from the sand, it was necessary to dry out the latter with gas burners for a period of about a week before pouring the metal. Ladles of 150-ton capacity were used for the pouring.

After cleaning, the housing castings, which are of plain carbon steel, will be annealed in one of the present molding pits. While it is not known definitely, it is believed these housings are for the new 100-inch continuous strip-sheet mill now being erected in the Pittsburgh district.

Announces New Series of Automotive Valve Steels

A new series of heat and corrosion-resisting automotive valve steels, designated as Silcrome X, is being introduced by the Ludlum Steel Co., Watervliet, N. Y. This series, according to the manufacturer, sets higher standards of resistance to red heat and corrosion, and includes a number of valve steels finely graduated in their metallurgical composition to fit the individual characteristics of present-day engines. Types for passenger cars, trucks, airplanes, motorcycles and marine engines are available in the new steels.

Welding, etc. . . .

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.

Predicting Service Life

A RECENT accelerated life test of a welded structure revealed an unsatisfactory indicated service life. The cause was not difficult to find. Stress concentrations due to fillets of improper contour, undercutting, and unfinished ends of welds accounted for the premature failure. It would not have cost 3 per cent more in labor and material to have avoided these defects.

The situation with reference to prediction of service life of welded structures is complicated and largely unsatisfactory. The important complication is that the traditional methods of static tension testing are presumed by many engineers to indicate what the service life will be. Nothing could be more dangerous than to act on such assumption. The proof is so simple that there is no need for controversy.

Thus, in a lap weld, properly made between two pieces of steel plate ½-inch thick, static tension loading will show the joint to be stronger than the pieces joined. Application of 75 per cent of the yield point stress 500 times in the same testing machine will give a much different answer. And, repeated application of the load is the factor with which we have to deal in service. One application of static tension loading yields a result from which service life cannot be predicted, or even inferred.

Data upon which service life prediction can be made may or may not be expensive to obtain, but in any case they are less expensive than service failures.

Emergency Boat

FLOODS over the country have brought out an unusual crop of stories about resourceful welders. With small boats at a premium, welders made them by welding together all sorts of junk. One wise operator down in an Ohio river town, seeing that the water would go over a string of gondola freight cars, cut the body of one loose and welded the seams tight with his torch. He and his neighbors poled the "barge" over to their homes when it floated, so that they had a haven of safety in case their homes became endangered by the advancing waters.

That freight car body is now high and dry, 1000 feet from a railroad and a mile from the river.

Miracle Men

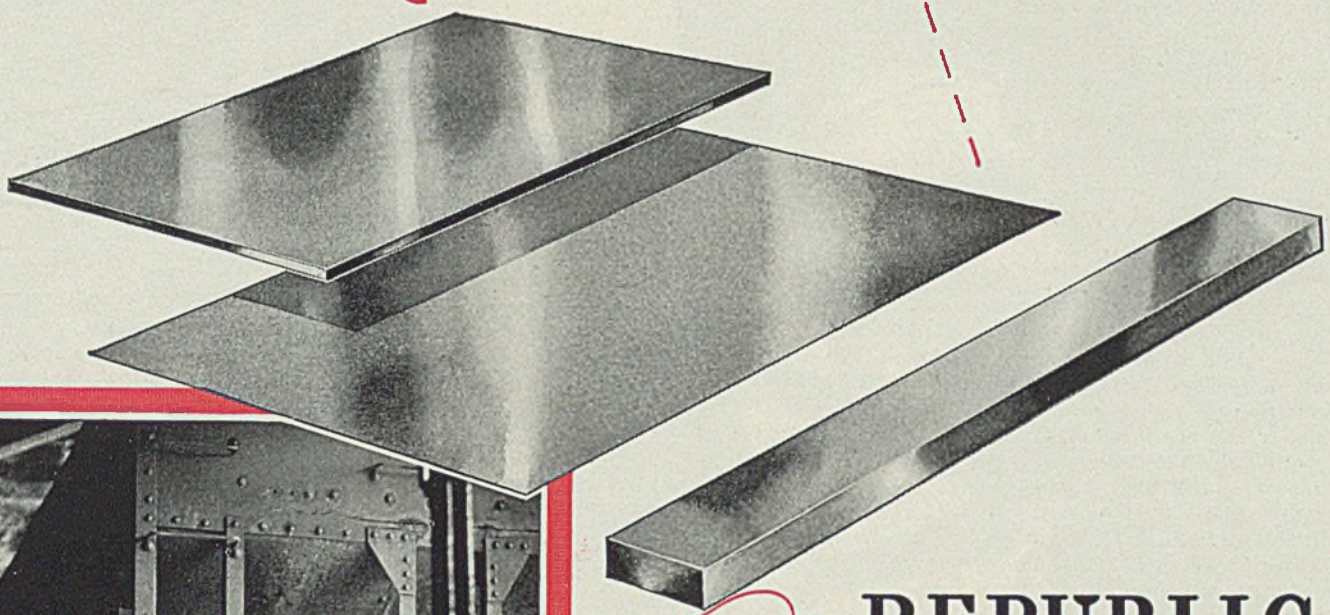
IN WELDING enterprises, as in other industrial activities, the search goes on for miracle men. Many business concerns seem to believe that all their problems would be solved if they could only find the miracle man for their job. The point is frequently overemphasized. Of course, to do any big job a man needs experience, fortitude and initiative.

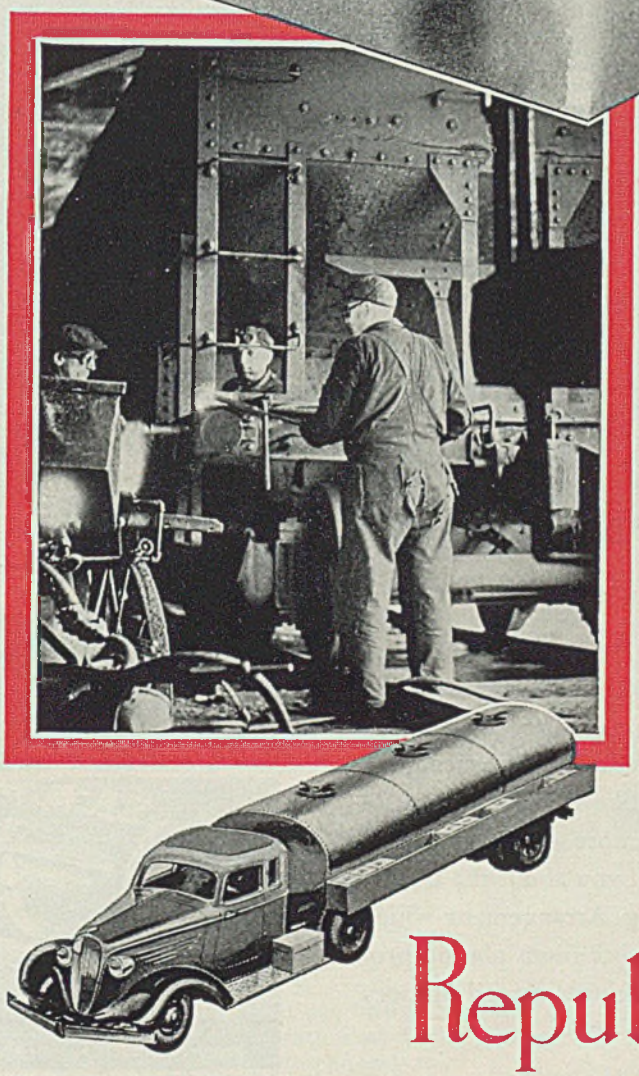
It is often overlooked that many of the men employed at the present time started out with all these desirable traits. What has happened to them? Why are they unable to meet the new conditions? These are embarrassing questions to many organizations. The facts as to why men bog down in an organization are unpleasant but it often costs less to face those unpleasant facts than it does to rub out a large number of men of experience and start over with a new crowd.

The boundaries of sociology do not need to be crossed to justify a program of maintenance of men to the same degree as machinery, equipment and buildings are maintained. This does not involve coddling, but is a simple business proposition of saving men in whom the enterprise has a considerable investment.

YOU CAN DESIGN FOR THE SAME STRENGTH

...YET CUT OUT 40% OF THE WEIGHT..





REPUBLIC
Double Strength Steels

Republic Double Strength Steels are in tune with modern times. Efficiency, more than anything else, is paving the way toward industrial recovery.

And these are efficient steels. Their twice-the-usual tensile strength cuts down dead weight without sacrifice of strength. Their bending and forming qualities are on a par with ordinary steel. Their increased corrosion-resistance insures a service life as long as, or even longer than that of ordinary steel in the increased section necessary to provide the same strength.

These steels are showing remarkable operating economies in trucks, buses and railroad equipment. Isn't there a logical place for them in the equipment your plant makes—where light weight would effect freight savings—where its use would require less dead load bracing—where space limitations in a new design do not permit the use of full size sections of ordinary steel?

Tell us your needs—our metallurgists are solving these problems every day.

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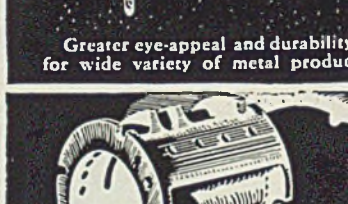
Chromium Plating

THWARTS THE RAVAGES OF TIME

Greater eye-appeal and durability for wide variety of metal produc



Chromium plating fortifies rotar grinder cylinders against abrasive w

Production tools of many type

IN THE fight against wear and corrosion ...on many industrial fronts...a powerful and effective weapon chromium plating has proved to be.

Where is it being used? On machinery parts ranging from cams to lathe beds...on production tools ranging from files to heavy dies for drawing nickel tubing...on an endless variety of metal products from collar buttons to bar fittings! It is being applied to copper, brass, cast-iron, steel, die cast zinc and other metals.

Most manufacturers have only scratched the surface of the cost-cutting, product-improving opportunities offered by chromium plating. We would like to cooperate with you in uncovering more of these opportunities...and to tell you about the United Chromium Licensing Arrangement which makes available the chromium plating process and a valuable engineering and advisory service.

UNITED CHROMIUM

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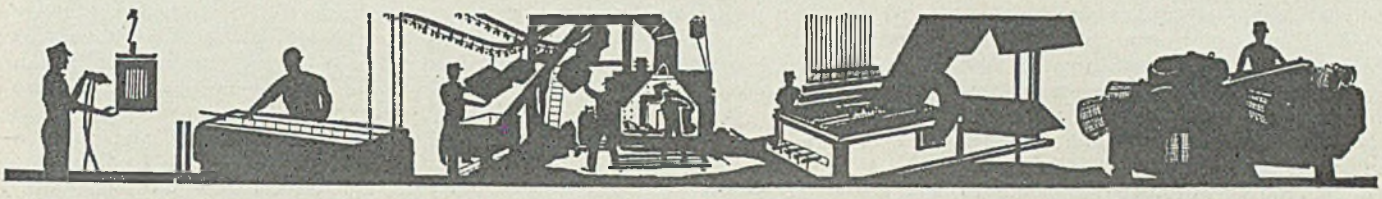
Surface Treatment and Finishing



Selection, Application and Use of Finishes for Metals

II—The Metallic Coatings

ALTHOUGH finishes for metal products embrace the use of many varieties of material and processes they can be subdivided readily into four principal classes: The metallic coatings, the organic coatings, surface conversion treatments, and vitreous enamel coatings.

In the use of the metallic coatings, one is limited to about ten metals and combinations thereof which can be used economically for the decoration and protection of ferrous parts. For most purposes, coatings of these metals are applied by hot dipping, electroplating, cementation or metal spray, although some metallic coatings are produced by other methods such as sputtering, silvering, precipitation and by firing an organic coating containing a metal or metallic salt.

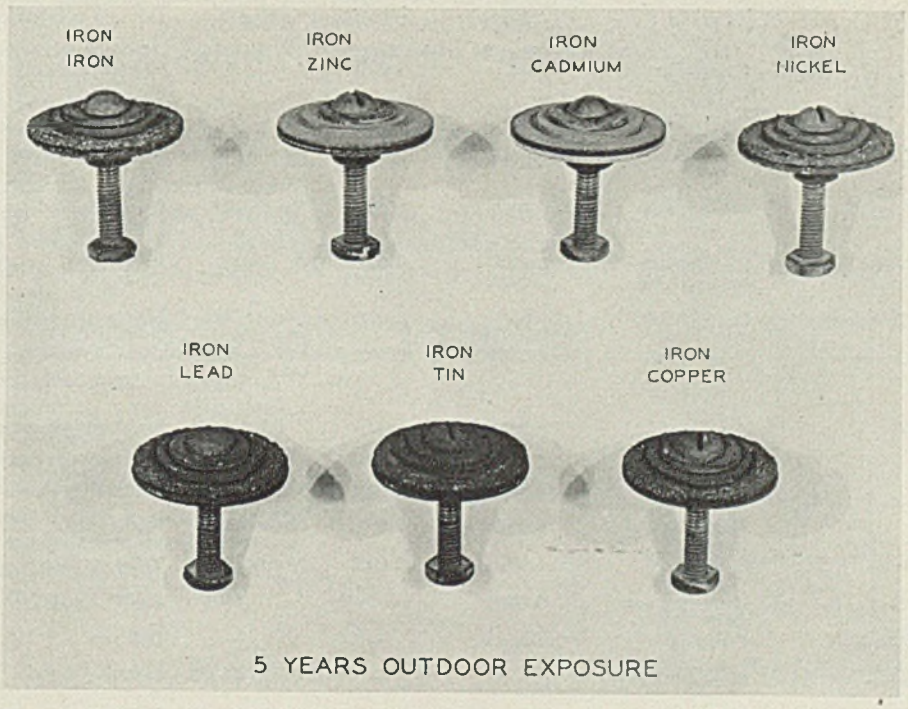
The purpose of the finish usually will indicate which protective metal should be used. For convenience in making rough comparisons between coatings the accompanying table has been prepared, listing the more prominent characteristics of the more commonly used metallic coatings. Other metals, such as cobalt, tungsten and rhodium, are applied as coatings but their use is highly specific. In the table the metal spray method of application has been indicated only for zinc as this is the most important metal applied by this process. Practically any metal which can be obtained in the form of wire can be and is applied by metal spray but most metal spraying of other metals than zinc is used for purposes other than finishing.

Use of metallic coatings always should involve consideration of the weight of coating (or thickness) to be employed. The specification of a finish as "zinc plate" or "nickel plate" does not assure resistance to corrosion or wear unless the thickness is specified as a requirement. In addition to thickness, the adherence of the coating and its porosity should be controlled as far as possible by employing the proper cleaning and pickling process to obtain best adherance and by using the proper control of plating bath in conjunction with the best available plating technique to produce dense and pore free coatings.

Zinc Coatings

OF ALL the metals used for protective coatings on steel, perhaps the most important is zinc. Until the rather recent development of zinc-base die castings, about two-thirds of all the zinc produced in this country was used in protective coatings on ferrous metals.

Coatings of zinc protect ferrous metals from corrosion because of the inherent difference in the electrochemical behavior of zinc and iron as indicated by their relative position in the electromotive series. When exposed to corrosive influences, the zinc of a coating will corrode (be converted to oxide, chloride, carbonate, etc.) in favor of the iron and will prevent the iron from reacting until the zinc is completely converted to corrosion products. In fact the zinc does not have to cover completely the ferrous metal it is protecting. Bare areas as large as 1/32-inch in diameter may be exposed in some environments and still be protected by the adjacent zinc coating. The absence of corrosion from the cut edges of exposed galvanized sheets and cut ends of galvanized



Protective effects of zinc and cadmium on iron are illustrated by these couples, each comprising two washers and the metals indicated, clamped together and insulated from contact with other metals. Practically no iron corrosion has occurred in the iron-zinc and iron-cadmium couples while some of the other metals used as protective coatings have caused excessive rusting of their associated iron washers

sheets and cut ends of galvanized wires are examples of this type of protection.

Of all the metals usually used for protection of steel only zinc and cadmium protect by sacrificing themselves (see accompanying illustration). It is for this reason that minute pinholes in coatings of zinc and cadmium are not of as much importance as in the case of the other metallic coatings. Although pinholes may furnish corridors of access of the corroding influence to some in contact with the base metal, the protective influence of zinc or cadmium coatings will protect the base metal at such areas. Even in the case of zinc and cadmium, however, a pinhole-free coating is desirable so that a continuous coating protection is obtained long before the electrochemical protection starts.

The method by which zinc protects steel from corrosion would indicate that, in general, the corrosion resistance afforded by zinc coatings would be in direct proportion to the amount of zinc applied per unit area of surface and such has been proved to be the case by numerous exposure tests. Furthermore, exposure tests also show that this relation is substantially true for zinc coatings containing zinc-iron alloys in which case the weight per unit area of the entire coating including the alloys, can be used as the basis for a reasonably accurate estimate of its protective life.

Various Application Methods

Zinc can be applied by immersion of the part to be coated in the molten metal, by electroplating, by sherardizing or by metallic spray.

The hot dipping method is usually used for outdoor and marine hardware where heavy coatings are desired. The amount of zinc which can be applied depends partly on the operating technique — bath temperature, time of immersion and other factors, but is also influenced somewhat by the part itself, heavy parts taking a heavier coating than lighter parts which more quickly reach the bath temperature on immersion. In the case of wires and sheets, the thickness of coating is often limited by bending or forming operations subsequent to finishing which would crack the zinc coating and cause it to peel.

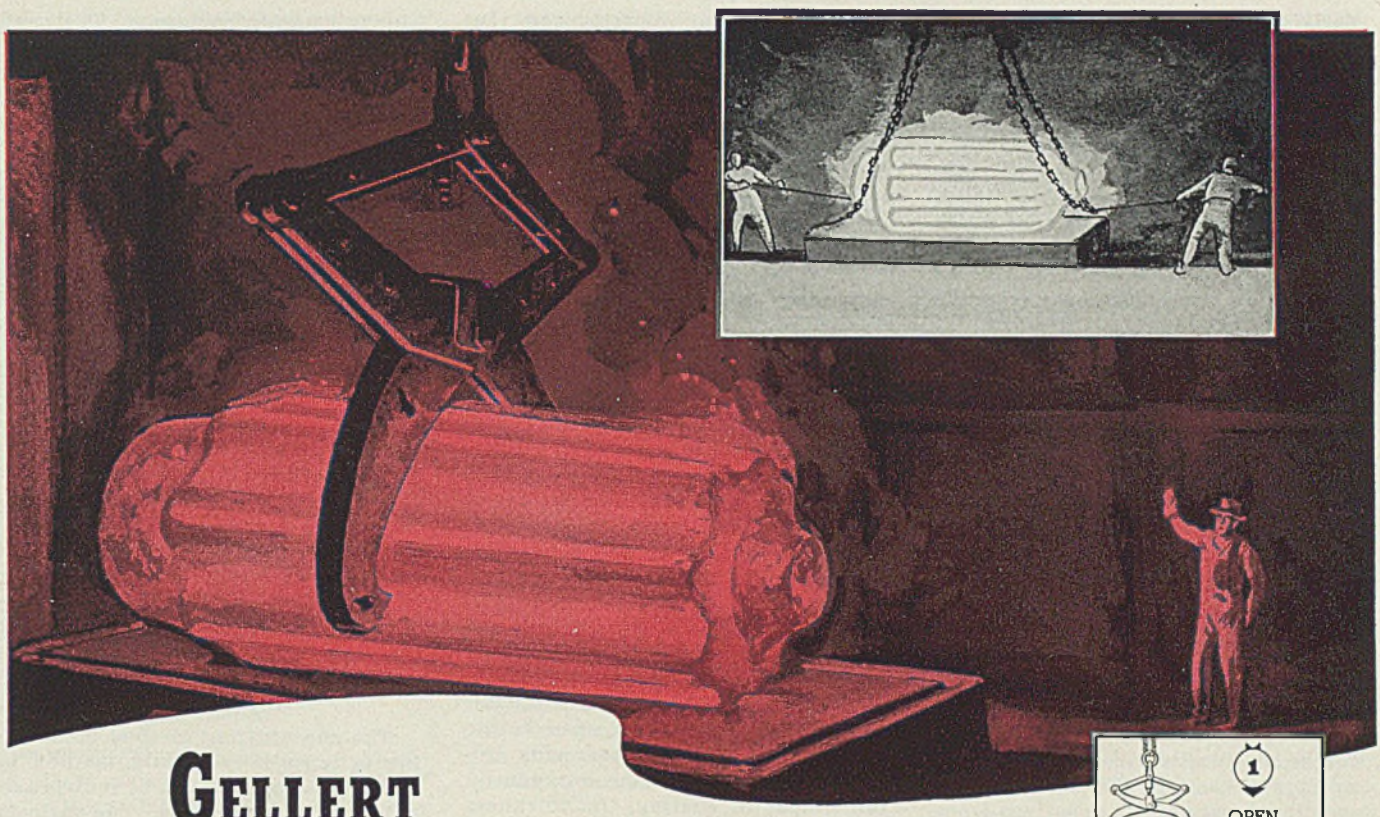
Zinc coatings comparable in we ght of coating to hot-dipped coats are produced by plating at high current density in a zinc sulphate bath. An example of this is Bethanized wire (Bethlehem Steel Corp.) which is finished with such coatings up to a thickness of 0.005-inch and can be bent around its own diameter without cracking the finish. Another method of obtaining heavy zinc coatings, which was recently patened, employs electrodeposited zinc over a hot galvanized surface.

Extremely heavy coatings, such as 1/32-inch or 1/16-inch thick, of zinc can be applied by metal spray and have been used on structures after they are erected. This method of application is expensive, however, and its use does not appear to be warranted except in extraordinary cases. Adhesion difficulties are often experienced with heavy sprayed coatings unless the base metal is adequ-

Common Metallic Coatings

		Usual thickness in inches			Appearance		
Metal	Method of Application	For long indoor life See note A	For short indoor life See note A	For outdoor service See note A	Initial	Change with age, exposure and use	Principal uses
Zinc	Hot dipping	Not usually used	Not usually used	0.001 to 0.005	Bright metallic gray spangled	Tarnishes and darkens	Structural and marine hardware, galvanized sheet, steel fencing, pails, pipe and small tanks.
	Electroplating Acid sulphate	0.0005	0.00015	See Note B	Dull-bluish gray to frosty white	Tarnishes—finger-prints and stains easily	Indoor machine parts and hardware.
	Cyanide	0.0005	0.00015	See Note B	Dull gray to bright	Tarnishes—finger-prints and stains easily	Indoor machine parts and hardware.
	Heavy acid sulphate	See Note B	See Note B	0.0015	Dull-bluish gray	Tarnishes	Line and fence wire.
	Sherardizing	0.0005	0.0002	0.001-0.003	Dull-dark gray	Darkens to red brown color	Indoor machine parts and hardware where appearance is not important.
	Metal spray	Not usually used	Not usually used	1/32 to 1/16	Bright metallic gray-rough	Tarnishes and darkens	Outdoor structures finished after fabrication.
Cadmium	Electroplating	0.0005	0.00015	See Note B	Dull to bright silver gray	Tarnishes and darkens somewhat slower than zinc.	Automobile, radio and sheltered marine hardware.
Nickel	Electroplating	0.0005	0.0002	Not usually used	Can be obtained bright or dull. Yellowish tint.	Tarnishes and darkens	Indoor hardware and novelties—as a base for chromium plating.
Nickel-chromium	Electroplating	0.0005	0.0002	0.001	High luster bluish tint	No change	Automobile hardware and fittings.
	Electroplating	0.00002	0.00002	0.00002			Metallic objects used in houses, offices, stores, etc.
Chromium	Electroplating	0.0005 0.001-0.005*	0.00002	Not usually used	High luster bluish tint	No change	For wear resistance—printing plates, *gages, etc.
Copper	Electroplating	0.001	0.0002	Not usually used	Dull red	Tarnishes rapidly	Inside hardware and fittings, usually buffed, grained, oxidized and lacquered. As a base coat for nickel and nickel-chromium coatings.
Tin	Hot dipped	0.001	Not usually used	0.001-0.005	Bright metallic gray-yellowish tint	Tarnishes slowly	Refrigerator trays—milk cans.
	Hot dipped and rolled or wiped	0.0003	0.0001	0.001	Bright metallic gray-yellowish tint	Tarnishes slowly	Tin cans, music wire springs.
	Electroplated	0.0005	0.0001	Not usually used	Dull-frosty white	Tarnishes	Hardware—as a base coat for silver plating.
	Electroplated and fused	0.0005	0.0002	Not usually used	Bright metal yellowish tint	Tarnishes slowly	Hardware
Brass	Electroplated	Not usually used	0.0002	Not usually used	Yellow-metallic	Tarnishes	Indoor hardware and fittings—usually lacquered.
Lead or terneplate	Hot dipped and rolled	0.001	Not usually used	0.001	Dull dark gray	Darkens	To resist acids.
Aluminum	Calorizing	0.030-0.060	—	—	Dull gray	No change	For resistance to high temperatures—oven linings, fire tubes.
Silver	Electroplating	—	—	—	Dull-frosty white	Tarnishes	For low electrical contact resistance.
Solder	Hot dipping	—	—	—	Dull gray	Tarnishes and darkens	To facilitate soldering.
Gold	Electroplating	—	—	—	Dull yellow	No change	Jewelry. For low electrical contact resistance.

Note A The exposure environments listed do not indicate the same life for all the finishes but should be related to the principal uses as indicated.
Note B For outdoor service hot dipped or other heavy zinc coatings are usually employed. For semi-protected exposures or short outdoor life electroplated coatings of zinc and cadmium are used. The thickness of coat in such cases depends on the purpose for which the finish is used.



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AUTOMATIC TONGS BY HEPPENSTALL

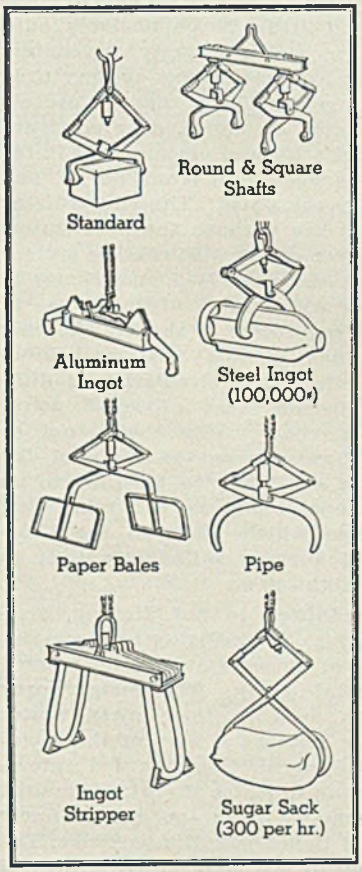
Speed . . . Safety . . . Certainty

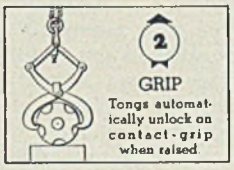
Handling white-hot ingots weighing 100,000 lbs. . .
Moving sacked sugar at the rate 300 an hour . . .
These two big handling problems are as far apart as the poles . . . yet both have been completely solved with Gellert Automatic Tongs, made exclusively by Heppenstall.

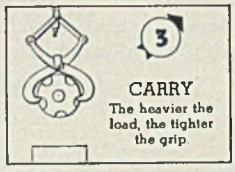
Gellert tongs are safer . . . quicker . . . surer. They take the craneman's helpers out of the danger zone. They grip and lift the burden before a chain could be hand hitched on the load.

Drop them on the burden . . . they automatically close. Lift them . . . and they grip. Deposit the burden . . . they lock open, ready for the next job. It's as simple as that!

Gellert tongs are handling ingots, die blocks, ferrous and non-ferrous blooms, billets, and shapes, pipe, paper bales, sacked sugar . . . the list is almost endless. They probably can solve some handling problem that is bothering you. One of our representatives will study your problem, make recommendations, if you wish. No obligation . . . just write.







Bring your *Handling Problems to*

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ately prepared by sand, grit or shot blasting.

Due to its nature, hot galvanizing is a relatively expensive process, even for small parts such as bolts which are handled in bulk during finishing. Such threaded parts must be centrifuged carefully after being dipped in order to remove excess zinc which tends to fill the roots of the threads. There are many cases where threads have to be recut after hot galvanizing in order to permit assembly of parts. In such cases it is best to recut only the female thread and depend on the zinc coating on the male thread to provide the corrosion protection for both. It should be kept in mind, of course, that the corrosion protection afforded to the threaded sections of such parts depends not on how much zinc is applied, but on how much is left after rethreading.

Two Plating Baths Used

Electroplated zinc coatings are applied from both acid and alkaline baths. The coatings resulting from the two methods are equivalent in corrosion protection for equal weights of coating. There is a difference in appearance, the coatings from the acid sulphate bath being bluish and usually lighter in color than the somewhat more yellowish coatings electrodeposited from zinc cyanide baths.

The dull appearance of zinc coatings, even when applied to polished surfaces, has effectively restricted their use to corrosion protection. Bright zinc coatings have been made commercially available recently, however, which may change this picture materially. It is claimed that the modern "bright zinc" coatings will tarnish at a much slower rate than the conventional deposits and that they are free from mercury which has been used in the past for whitening zinc. The use of mercury or mercury salts for whitening zinc greatly accelerates the rate of tarnish if the mercury remains as a constituent of the final coating, although the initial appearance of the coatings is attractive.

The zinc cyanide bath offers an important advantage over the sulphate bath in that the throwing power, or ability to deposit in recessed areas, is much better. This should be taken advantage of by specifying cyanide-zinc coatings for machine screws and such parts, where considerably more protection can be obtained without distorting threads than if sulphate-zinc is used.

As in the case of hot galvanized coatings, the thickness of electroplated zinc varies over a part and these variations are dependent on the throwing power of the plating bath used, the geometry of the part and on the location of the anodes with respect to the part while in the plating bath. Since the corrosion protection afforded by zinc depends on the weight of coating, the thickness of coat at the thinnest spot determines the effective corrosion resistance afforded to the part.

For a convenient method of specifying electroplated zinc finished on steel, the reader is referred to specification A164-35T of the American Society for Testing Materials.

The sherardizing process is another method of producing zinc coatings and it, in its turn, has advantages and disadvantages. This process consists essentially of heating the parts to be finished in intimate contact with zinc dust in a closed and slowly rotating container. The parts are usually heated to 850 degrees Fahr., at which temperature the zinc sublimes and alloys with the iron parts. The coating produced is not pure zinc but a series of zinc-iron alloys varying in composition from alloys rich in iron near the finish-base metal interface to alloys poor in iron and rich in zinc at the external surface of the finish. Tests have indicated that such coatings are approximately equivalent in corrosion resistance weight for weight, to electroplated or hot galvanized coatings.

Sherardized coatings are usually dark in color and are used where appearance is not an important feature. Exposure to corroding influences will sometimes result in a reddish appearance due to rusting of the iron in the coating itself. Such color changes have, at times, been erroneously taken as an indication that the coating has failed.

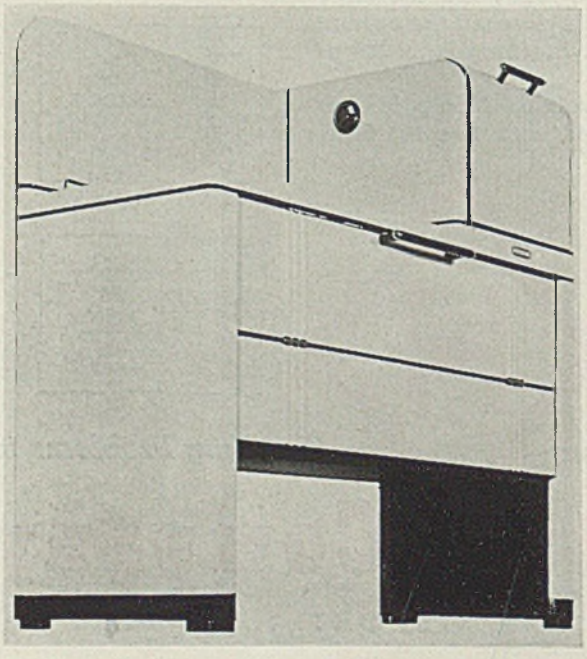
Process Is Self Cleaning

The sherardizing method of finishing is essentially a bulk method in that the parts need not be individually handled for finishing. The parts to be finished must, of course, be sturdy enough not to be damaged by the tumbling action at the sherardizing temperature. Furthermore, due to the high temperature used, small amounts of oil, grease and dirt may be left on parts to be sherardized without impairing the quality of the coating. This "self-cleaning" ability of the sherardizing process is interesting from a cost standpoint.

Sherardizing is particularly suitable for castings likely to contain surface holes or defects or for sturdy welded assemblies in that the process is dry and, therefore, does not leave residual acids and plating salts in the crevices which will later "purge" and discolor the finish. The sherardizing process has perhaps the best throwing power of any zinc coating process in that the vaporized zinc comes in contact with practically all areas of a part regardless of shape. The only exceptions to this are small blind holes where gas circulation is difficult. In the case of small screw threads, sherardizing should not be used, however, as the roots of the threads are likely to be filled to an objectionable extent with zinc dust particles which stick to the sherardized surface sufficiently well to cause tight fits.

In addition to hot dipping, electroplating, sherardizing and combinations of these, zinc can be applied by metal spray. The metal spray process used in the United States usually employs a wire of the metal to be sprayed which is fed into a spray gun in which the wire is melted and expelled from the gun in finely divided liquid metallic particles. The melting of the wire is accomplished

Does Things to Oil Stove



EYE appeal is emphasized in this redesigned oil-burning cook stove now being manufactured by Perfection Stove Co., Cleveland. Design was evolved by Wilbur Henry Adams, also of Cleveland. Finished in porcelain enameled steel sheets, the unit has concealed oil tank, elbow-high oven, air cell insulation and concealed burners. Rounded corners and elimination of former legs are other features

by either an oxyacetelyene flame or electric arc and the molten particles are given a high velocity by a blast of compressed gas. In order to obtain adhesion, metal parts to be finished by metal spray are usually sand, grit or shot (cracked shot) blasted before being sprayed. The nature of this process is such that there is no limit to the thickness of metal which can be applied and for this reason the process has been more widely used to build up parts and to fill holes than as a finishing procedure.

Zinc has been applied by this method to such structures as railroad bridges after construction. Although expensive to apply, it may be possible to obtain a useful finish life of 50 years or more with practically no painting maintenance in such cases. Considering the cost of at least ten cleaning and repainting operations which would be necessary during this period, the high initial cost may well be justified.

Cadmium

CADMIUM, when used as a finishing metal, is applied principally by electroplating. This metal, like zinc, affords corrosion protection to ferrous metals at its own expense. Cadmium is much more resistant to salt spray tests than zinc and for this reason has been preferred for protecting marine hardware against corrosion. In appearance, electroplated cadmium coatings are lighter than zinc coatings and do not tarnish as rapidly as zinc coatings. It is usually agreed that cadmium coatings have more sales appeal from an appearance standpoint than zinc coatings. Both cadmium and zinc can be applied as bright deposits and are often lacquered to retard tarnishing and fingerprinting during stocking, assembly and service life.

Comparison of Properties

For indoor use, cadmium and zinc coatings of equal weight are about on a par with respect to corrosion protection on iron or steel. For outdoor industrial exposure heavier cadmium coatings than zinc must be used to realize equivalent corrosion protection. Cadmium is somewhat softer than zinc although both of these metals are too soft for use where wear resistance is much of a factor.

With respect to throwing power, or the ability to coat a part with uniform thickness regardless of shape, cadmium is much better than sulphate-zinc and about equivalent to cyanide-zinc.

Until recently, the cost differential between cadmium and zinc electroplated coatings of equal thickness was not large although the zinc coatings were less expensive due to the difference in cost of the two metals. The use of cadmium as a component of bearing metals has changed the picture considerably, however, as it has had the effect of appreciably increasing the price of cadmium. The principal source of cadmium is from the refining of zinc where it is present up to 0.5 per cent in some zinc ores, and the use of this metal in low melting and bearing alloys is apparently employing a large percentage of the available supply at present. Until current supply conditions stabilize, it is difficult to predict any reliable cost relations between the two coatings.

For long outdoor life, best commercial practice calls for minimum 0.0005-inch of cadmium, although 0.0002-inch coatings are used in many cases either for reasons of economy or because the use of thicker coatings is not warranted due to the relatively short service life of the product. In the case of cadmium, as with zinc, the corrosion protection is in a direct ratio to the amount of coating employed. For a convenient method of specifying cadmium coatings, the reader is referred to American Society for Testing Materials' specification A165-35T.

To be continued.

A.S.T.M. 1935 Proceedings In Two Massive Volumes

A.S.T.M. Proceedings, 1935, in two parts, 1488 and 769 pages; published by American Society for Testing Materials, Philadelphia; supplied by STEEL, Cleveland, for $5.50 each in paper, $6 each in cloth and $7 each in half leather, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The first part contains committee reports, with appended papers and the new and revised A.S.T.M. tentative standards. The second part gives all technical papers, including the Marburg lecture.

Forty standing committee reports are presented and there are 136 tentative specifications, either newly published or revised in 1935. The section devoted to ferrous metals contains extensive reports covering standardization and research on steel products, wrought and cast iron, corrosion, magnetic properties, iron-chromium and related alloys, fatigue and effect of temperature.

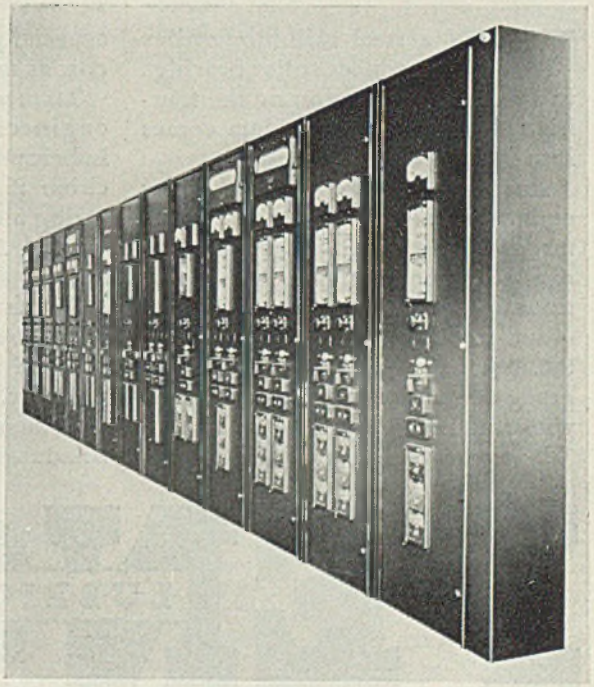
Nonferrous metal reports relate to copper wire, corrosion, electrical heating and resistance alloys, cast and wrought copper and alloys, die-cast metals and screen wire cloth. Data are presented on corrosion tests of nonferrous metals and exposure tests of die-cast metals.

Technical papers in Part II number 37, with written and oral discussion. The Marburg lecture, on "Aircraft: Materials and Testing," is included. The symposium on spectrographic analysis includes six technical papers. They describe methods in current use as applied to various materials, steel, platinum, magnesium, graphite, electrodes and others.

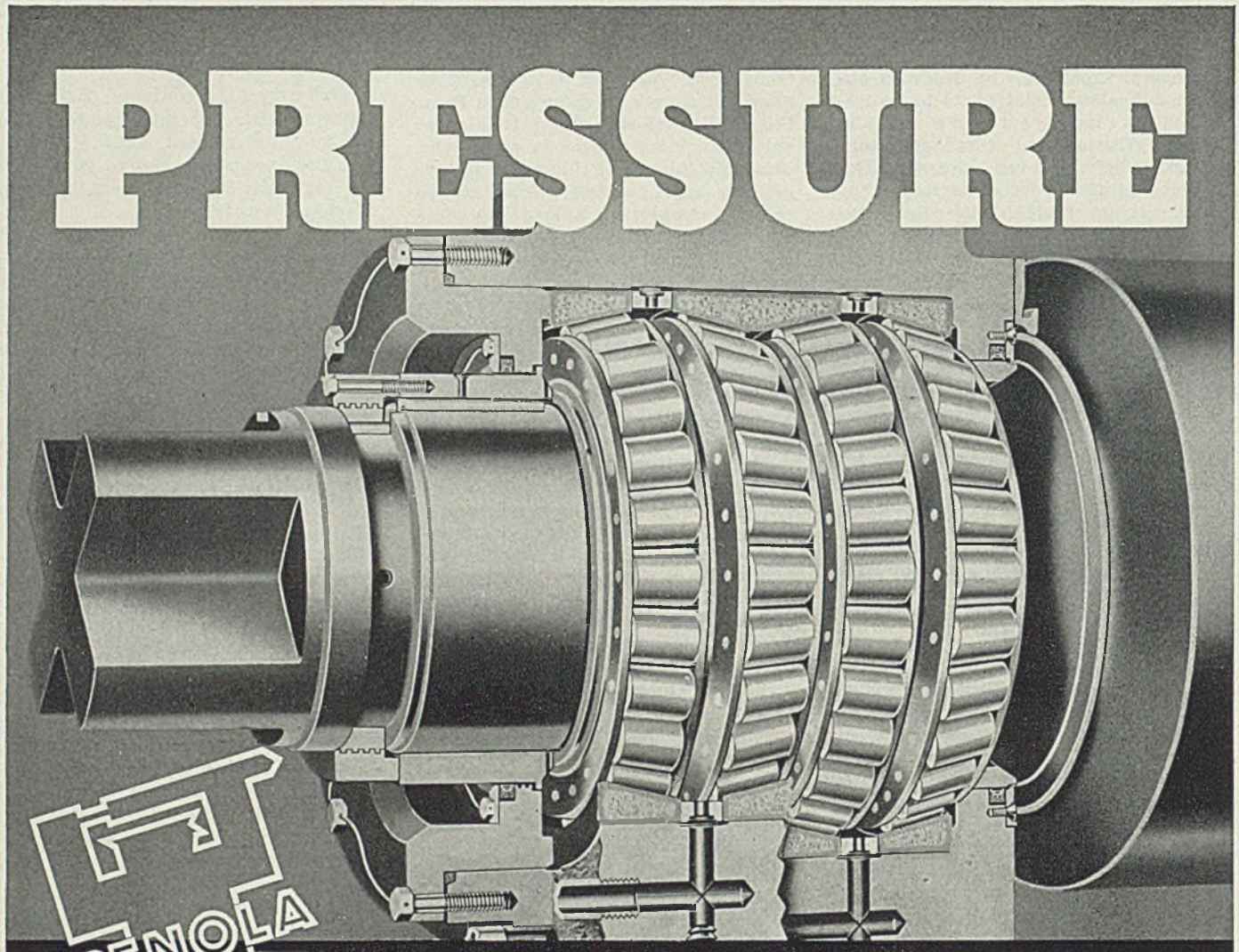
Other papers cover life of rear axle gears, high-speed fatigue tests, influence of time on creep of steels and relation between tension, static and dynamic tests.

Switchboards Are Streamlined

NEW switchboards made by General Electric Co., Schenectady, N. Y., are streamlined to harmonize with buildings and machines of modern design. Devices are built-in, instead of hung on the face of the panels. The new switchboards are of steel, with instruments recessed so that they project about an inch from the front of the panel. They are clean lined, attractive and simple to install



PRESSURE



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WHEN a steel mill modernizes and introduces roller bearings to speed up production on the four-high stands, a new problem comes into the picture.

It is human nature to give the new equipment all it will stand, which means that pressures on the roll necks may go up under shock load conditions to 5,000 pounds per square inch —and testing machines prove that 8,000 pounds breaks down the best grade of ordinary grease thickened with suitable "soaps."

Not enough factor of safety here, especially when each bearing may cost as much as $10,000!

To meet this very problem Penola engineers have developed Ladex Lubricant, which on the testing machine maintains satisfactory lubricating film even where the pressures exceed 25,000 pounds per square inch.

Watch your lubrication if you don't want your new roller bearings destroyed under excessive heat and pressure.

Remember that 85% of all continuous-mill roller bearings operating today are Penola lubricated. Indeed Penola makes and sells more steel mill greases than any other company in the world!

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BY E. A. CAUSEY
Special Representative, Finishes Division,
E. I. du Pont de Nemours & Co., Wilmington, Del.

PLANT managers and other purchasers of machinery are frequently confronted with the problem of whether to renew existing equipment at considerable cost, or whether to repair and make replacements, or whether to modernize in appearance, at least, through the use of an efficient finish at a minimum outlay, equipment which is functioning satisfactorily. There are many elements necessarily requiring serious consideration when such a problem arises.

There are business conditions and the advisability of further capital expenditures at the time; whether the increased outlay will bring such increased return as to justify additional investment, or whether existing equipment can or cannot be brought sufficiently up to date to fulfill its purpose adequately. Finally, the question resolves itself into one of modernization or maintenance, or probably both, since they are closely allied.

Every plant manager knows that during the last five or six years there have been notable changes in the methods of maintenance. He knows that these changes have made for modernization whether they have directly affected the machinery or merely the interior walls of the building.

Finishes Are Investigated

Many years ago Du Pont chemists came to a realization of the value of finishes in industrial production and in plant maintenance and modernization. In those days there was no finish which seemed to fulfill the purpose adequately. Research chemists began experimenting lasting over a period of approximately six years and entailing an expenditure of thousands of dollars.

It was known that a finish giving satisfaction in a plant where conditions are normal would not necessarily be suitable where extremes of moisture, acid or gaseous fumes, or high degrees of heat prevailed. A finish had to be perfected that would "stand up" under any factory condition; that was durable and flexible, and that would not fall prey to rough usage and chip and crack or deteriorate under the most severe treatment.

Binders Are Selected

Consequently, research centered largely around types of binders that included all available synthetic film-forming materials. Thousands of resins were investigated and tested during those years of preparation, from which a limited number were selected as having the most promising properties as vehicles for the new finish. The vehicle or binder materials used in these finishes are of the synthetic resin type, but they bear no relationship whatsoever to a great number of synthetic resins used in the production of paints and varnishes which must be dissolved in or mixed with oils to make a workable vehicle.

Certain common properties, such as durability, fast dry, toughness and retention of elasticity, tie all these resins together. However, in covering a wide range of other physical properties it is possible to produce various types of finishes for specific uses without departing from the properties of durability and toughness.

These resins range from tough, rubbery, gum solids, from which the faster and the harder drying types of enamel-like finishes are made, to the rather heavy, viscous fluids of an oil type. From one are made high-temperature baking finishes as used on electric refrigerators, and the other provides the vehicle for the high solids, easy-brushing paint-type finishes.

As experiments and tests were made in the laboratory and as field tests were made under practical working conditions, another extremely important yardstick to measure scientifically the value of these finishes was used. This was the exposure farm. As each step in the final selection of the vehicles and the products made from them was taken, there preceded many months of exposure tests to predetermine durability and other properties carefully.

The Du Pont company maintains exposure farms in various sections of the country to evaluate accurately its new finishes under different climatic conditions. At these farms are approximately 55,000 panels, from clapboard built up to resemble the side of a house, to structural steel members and steel panels.

Finish Is Widely Used

Presented in concrete form, the breadth and scope of this development may be gathered, insofar as it applies to metal as a finish, when it is known that today it is used on automobiles, new and refinished; railway coaches, trolleys and buses; commercial vehicles and trucks, aircraft, electric refrigerators and ice boxes, electric ranges, metal advertising signs, metal furniture and cabinets, gasoline stations and oil refinery maintenance painting marine finishes, structural steel and the general metal protective field including steel bridges, interior finishes for industrial plants and finishes for machinery where rough and severe treatment, oils, greases and gases are factors to be considered.

No maintenance engineer needs to be reminded of the value of keeping a coat of finish on the machinery of the plant any more than he needs to be told of the advantages of light-reflecting finishes on the interior walls and ceilings. Plants have been modernized through the use of finishes and through revisions and replace-

ments. Machinery can be modernized in the same way—at least modernized in appearance.

Finishes on a machine do not make it operate any more efficiently, but they do add to its appearance and, in consequence, modernize it in a sense. A well-kept finish keeps a machine from looking antiquated and out-of-date.

Depressions Give Time, Incentives For Supplying New Fields

BY MARTIN H. KIDDER
Industrial Relations Director, American Foundry Equipment Co., Mishawaka, Ind.

PERIODS of depression slow the production pace of industry and at the same time provide company officials with added incentives to improve products and methods and either redevelop their old markets or go into new fields. When the rate of production is increasing rapidly, the rate of development of new markets and products often is reduced.

Modernization of plant facilities and production methods should be carried on through depression and prosperity. New methods and materials are being developed continuously without respect to economic cycles. Modernization should never be classified as a time to repair or build.

Must Modernize To Lead

If we want to be leaders in our phase of industry, we must set the pace through modernization. Business executives who lead their own companies and the industry out of a depression, many times become the leaders of their generation. A study of the history of companies headed by this type of man shows that these companies frequently remain foremost until other executives meet a business lull and fail to carry on the traditions of the former leaders of the companies.

An analysis of business depressions has shown that always one or more major industries has developed from these slumps. This is true of the automobile and radio industries. Today, air conditioning is contributing to our business rise.

During periods of extreme depression, immediate redevelopment of old markets, even through the application of new methods and more efficient designs, is difficult and many times impossible. Opening a new field is a way out of business stagnation and may prove to be a profitable one.

In developing a new line of products and creating and supplying new markets, the profit motive is a safe rule by which to be guided. Every industry is looking for ways and means of reducing costs and increasing profits.

Similar to the case in the development period of many industries, the writer's company was handicapped for a short time during the early stages of the business slump, since our main products of manufacture have been applied to the major foundries. Our sandblast line of equipment was at a standstill because no new installations were being made, repairs were few and future prospects were slim.

New Method Is Developed

Visualizing the need for development in abrasive cleaning, officials of the company decided that a period of depression was an opportune time to study intensively and strive for improved engineering developments. Executives turned their attention to future developments more than at any previous time, as other business of the company did not detract from a thorough study of "what might be done."

With the firm belief that the metalworking industry was interested in any equipment that would increase production while reducing fabricating costs, our company went ahead in development of the then-revolutionary method of abrasive cleaning, which is known today as Wheelabrating.

Evolution of the principle of the Wheelabrator and the design of the equipment makes it possible to reduce the cost of obtaining clean castings, billets, steel sheets, tubes, shapes, and the like, and in descaling forgings, removing paint, enamel and other coatings which were defective in production so that the castings or metal parts could be finished over again.

The abrasive used in this process can be cleaned and recirculated after performing one of the previously mentioned functions. An air compressor, necessary to the operation of other abrasive equipment, is eliminated by the Wheelabrator. A much smaller motor is required for the new equipment than the old, with a subsequent reduction in power cost. These new developments, born in the depression, which are used in this equipment reduce the cleaning time and the amount of floor space needed. Going hand in hand with reduced costs on several operations in cleaning, an improved finish also can be produced.

Simplified Practice Changes Announced by Committee

The standing committee in charge of simplified practice recommendation R3-28 for metal lath has submitted a revision of the recommendation with the request that the division of simplified practice, national bureau of standards, Washington, refer it to all interests for their consideration and approval. Copies of the proposed revision, in mimeograph form, may be obtained gratis from the bureau.

Simplified practice recommendation R71-28 for turnbuckles has once more been reaffirmed without change.

Stainless Steel Trailer

FINE FURNITURE DESERVES A FINE CONVEYANCE, Leonard J. Wilcocks, of Philadelphia, believes. Hence his trailer, shown above, is entirely of stainless steel sheets, believed to be the first application of stainless for this type of equipment. Herman Kirstein, of Philadelphia, who built it, used Republic Steel Corp.'s Enduro 18-8, No. 4 finish

WHY is Weirton important to all users of Structurals?

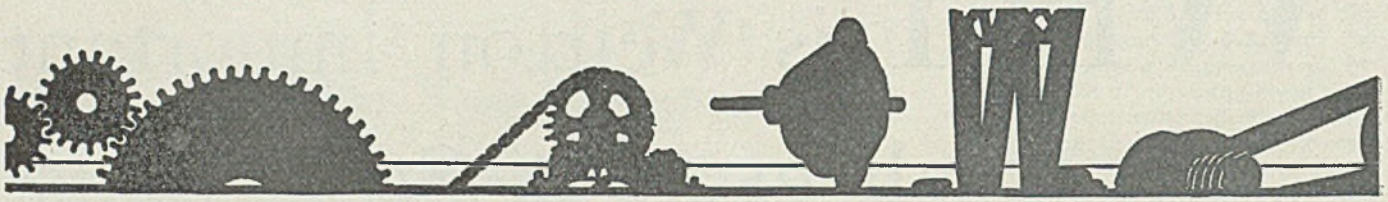
BECAUSE Structural Steel is important to Weirton

CAPACITY for large volume production gives structural steel a place of major importance among the products of Weirton Steel Company. Obviously, the company must maintain uniform quality and a high degree of utility in Weirton structural sections if such production facilities are to be justified. That is why users find Weirton structurals straight, true to section and of the proper foot weight. That is why these products may be depended on for satisfaction in fabrication and erection, and for dependable service. We will welcome your inquiry.

WEIRTON STEEL COMPANY
Weirton · West Virginia
DIVISION OF NATIONAL STEEL CORPORATION

Weirton Structurals

Power Drives



Long Life

PROPERLY designed drives pay in satisfaction, in operation, freedom from trouble and in low cost. This is well illustrated in the experience of a Wisconsin plant with a drive installed 28 years ago and still running as smoothly and satisfactorily as it did when installed in 1908.

This silent chain drive connects a 100-horsepower motor at 500 revolutions per minute to a lineshaft at 105 revolutions per minute on 8-foot centers and operates under heavy, continuous load. Plant records show that during this time this drive has had about 178,200 hours of service and traveled 3,033,000 miles, which is equal to over 120 times around the earth at the equator. It is still going strong, doing better than 6000 hours per year. The first cost of this installation has been only $16.27 per year and the only attention has been an annual change of oil in the enclosed chain case.

Such records are not accidental. They result from proper engineering as to rating and installation and regular and systematic maintenance. Neglect of any of these points would have shortened the life. Misalignment or an over-rated drive to achieve lower first cost might have reduced this life to 5 years or less instead of the 28 or more that it is giving and, in addition, might have been responsible for untold grief and dissatisfaction.

Skimping on size, improper installation, and neglect in lubrication are responsible for most drive trouble. And none of these is necessary.

* * *

Consultation Pays

A MIDWESTERN plant about 11 years ago employed a consulting engineer to plan and supervise the installation of 10 new drives on special equipment which it was adding for the manufacture of a new product. All the chain drives installed are still operating with no extra maintenance or repair.

About 4 years ago a number of additional machines were installed. A new manager and new engineer decided to save the consulting fee by ordering the drives direct from the manufacturer. The center distance, number of teeth, pitch and other necessary data were taken from the installation and the equipment ordered from the catalog without any mention of duplicating the existing drives.

In about 3 years the drives began to give trouble. Apparently something was "phony," to have one set of drives operating without a murmur for ten years and another set, supposed to be a duplicate, out of order in three years. To strengthen the claim for a refund the consulting engineer was summoned.

The first thing discovered was that the sprocket and gear were not aligned properly and caused a twisting, weaving motion in the chain, resulting in excessive wear of the pins and bushings. In addition, no provision had been made for end float in the motor shaft, which in this case aggravated the misalignment. Also, the extra allowances made by the engineer for service and operating conditions were such that a special chain had been used instead of a wider standard chain, thus increasing the chain cost somewhat but decreasing pinion and sprocket cost.

That this was a special chain had not been noticed but would have been discovered if the order had specified duplicating the previous installations. Even that, however, would not have compensated for the improper installation. Also, if more information had been given to the manufacturer when ordering the new drives and his advice solicited, the error in rating might have been discovered earlier and corrected at much less expense.

* * *

Drive Protection

PUT in a drive which is able to stall the motor and then set the electrical protective devices to prevent burning out the motor." That is the formula one plant engineer uses to avoid serious drive trouble in a plant operating under heavy loads and severe service conditions with some of the equipment subject to stalling because of overloading.

Before this practice was adopted, whenever a machine would slow down because of overload the motor would plug along and often burned or seriously injured a belt by slippage before the load increased beyond the overload point on the motor. By making the drive of higher rating than the motor, the overload quickly slows down the motor so that overload relays or circuit breakers operate and shut off the current.

Rating a drive too close to the load provides no protection in case of overload. The only protection to a belt, chain, or gear is its strength. The motor under overload heats and burns out if the load continues long enough, but by proper protective devices (the type depending upon the control, type of motor, and service) the increase in current, as a result of the overload, automatically cuts itself off and so protects the motor.

Mechanical elements (except where protected by a shear pin hub) cannot automatically cut themselves out of service and so must fail if they are the weakest link. However, if the motor is not properly protected it is far better to let the less expensive and more easily replaceable mechanical part of the drive fail. But with proper engineering the latter is seldom necessary.

* * *

Oil may be contaminated by using the same container for handling different grades; also, by leaving the container exposed to atmospheric dust.

* * *

Do not turn over the job of belt maintenance to any but carefully trained men. Careless or improper application of fasteners is responsible for most belt trouble and maintenance expense.

* * *

Flexible belts of special tannage require the use of special flexible belt cements to prevent a stiff spot at the joint when made endless.

MACKINTOSH-HEMPHILL IS OPERATING AND ACCEPTING ORDERS

Our Steel Foundries at Midland, Pa. (Steel and Alloy Steel Rolls and Castings) were not affected by flood waters in any manner, and operations were suspended only a few days through lack of electrical power. This plant is now operating at normal capacity.

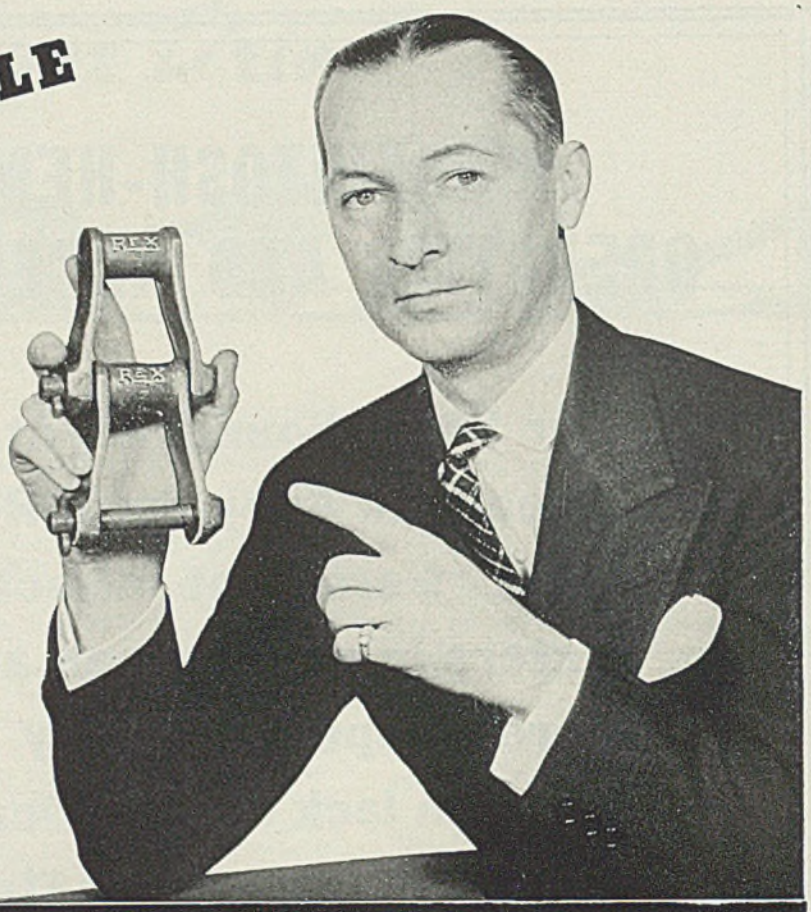
Our Garrison Plant in Pittsburgh (Chilled Iron and Grain-Type Rolls and Castings) was inundated, but the entire Foundry and Roll and Machine Shops have been completely reconditioned and normal operations resumed. All of our capacity is available for our customers' requirements.

MACKINTOSH-HEMPHILL COMPANY

Pittsburgh, Pa.

HOW TO HANDLE IT

WHEN THE LOAD GETS TOO HEAVY



Rex Z-Metal Solves Your Problem on the Same Sprockets

● In the stepping-up of production, a manufacturing plant producing pressed steel products found certain elements of its handling system overtaxed. To rebuild them would have caused shutdown, delay and cost.

Rex Z-Metal Chain proved to be the answer.

On the same sprockets, the old chain was replaced by Rex Z-Metal Chain of the same number, of exactly the same pattern, made of a metal that is more than 30% stronger than good malleable iron, and much more resistant to wear and corrosion. Rex Z-Metal Chain is made in all standard malleable chain sizes. Ask the next Rex man you see about it.

Waiting to be sent to you is a new book, "HOW TO HANDLE IT," that shows in brief graphic form how Rex Chain and Rex Conveyors have met the handling problems in some twenty-odd industries.

CHAIN BELT COMPANY

1660 W. Bruce Street, Milwaukee, Wisconsin

REX

Chain and Belt Conveying

Progress in Steelmaking

Permits Direct Quenching

A special atmosphere for the protection of steel while being heated for hardening is a development of considerable importance. This must be done without surface decarburization of scale formation. The atmosphere is prepared by reacting together gas-air mixture outside the limits of flammability. The resulting gases allow the metal to be quenched directly in oil with only a slight discoloration of the original metal surface.

♦ ♦ ♦

Insulation Is Considered

Blast furnacemen are considering the application of insulation as a means for eliminating the occurrence of disintegration from sections of the stack lining. Users of light weight refractories find that disintegration and spalling tendencies found in this type of brick are greatly reduced by backing up with brick possessing maximum insulation value.

♦ ♦ ♦

Markets New Type Thimble

One of the features of a newly marketed thimble for wire rope slings is that there is no seizing to cover up the rope in the thimble. The same size of thimble is used on both ends of the sling, and yet either thimble passes freely through the other thus making it possible to use the sling for both choker and basket hitches. By using first one end and then the other on the crane hook, two wearing points in the body of the sling are provided. When two sizes of thimbles are required, there can be only one wearing point.

♦ ♦ ♦

Assures Complete Juncture

Welding plates of high-alloy steel to a backing of plain steel now is accomplished by a recently developed technique that avoids the formation of oxide between the plates before rolling. The plate of high-alloy steel, such as stainless steel, is cleaned chemically and immediately immersed in an electroplating bath and coated with a film of pure electrolytic iron. If required the backing metal also is coated with pure iron. The plates now can be welded without an interposing film of oxide and a complete juncture of the high-alloy steel and the backing plate is assured.

♦ ♦ ♦

Cleans Metallic Surfaces

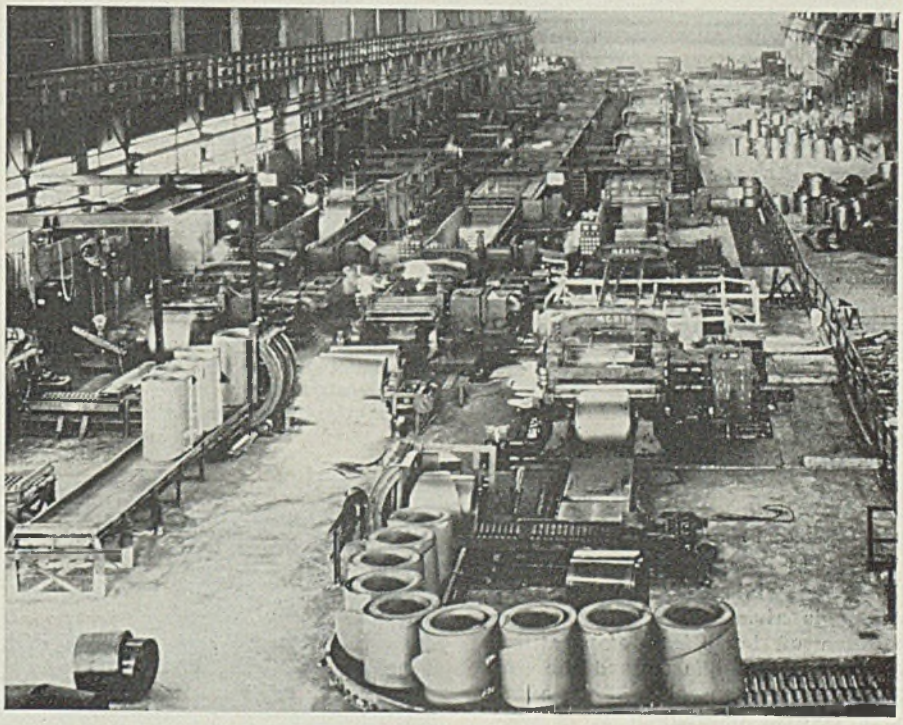
Preparing metal for painting as well as cleaning surfaces that already have been painted is facilitated by the application of a newly developed cleaner and neutralizer. The solution, which is harmless to metal, paint, hands and clothing, absorbs and destroys oil, dirt and grease.

♦ ♦ ♦

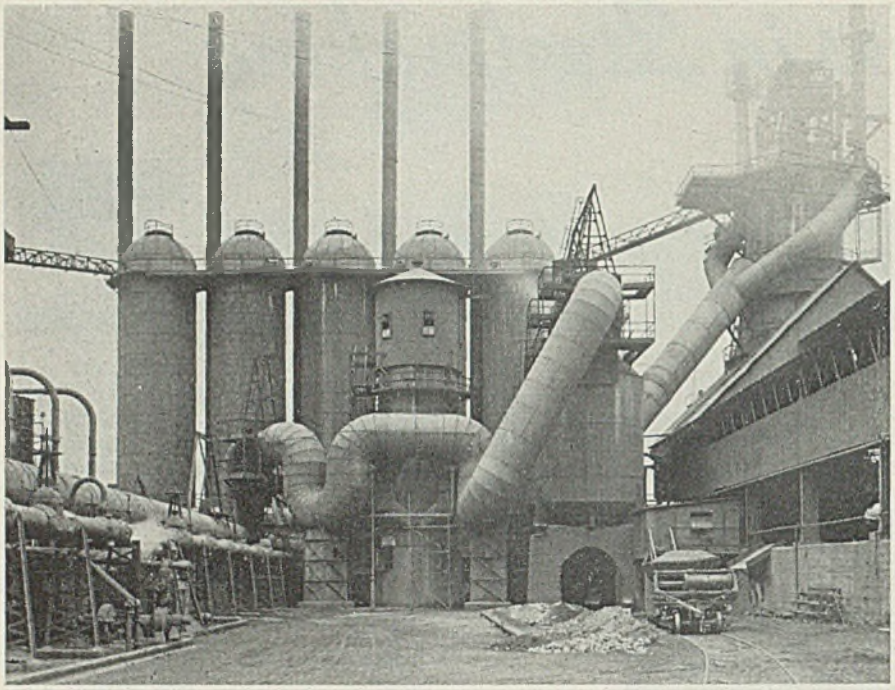
Chain Made of Alloy Steel

Sling chain including all fittings such as hooks and end, center and joining links now is being manufactured of alloy steel. The completed chain, which is heat treated, is made of short narrow links for the purpose of reducing to a minimum the danger of bending or gouging when used around sharp corners.

Completes Installation of Third Pickling Unit



Three modern continuous pickling units for broad strip steel now are operated by the Inland Steel Co., Indiana Harbor, Ind. Installation of third unit shown at the right in the accompanying illustration was completed recently. Each of the units is 240 feet long and consists of four 60-foot steel tanks lined with Goodrich triflex rubber lining and protective sheathing of acid-resisting brick. All scrubbers, ducts, exhausters and sewers are also rubber-lined as a protection against corrosion



Merchant stack which is equipped with an automatic control for regulating the temperature of the hot blast

Hot Blast Temperature Is Controlled Automatically

BY G. P. LONERGAN
Sales Engineer, Bristol Co., Waterbury, Conn.

BLAST furnace operation is affected by many variables. A good share of these is within the control of the furnace superintendent and his helpers, while others, such as the chemical and some of the physical properties of the raw materials that go into the furnace, are outside the realm of control at least from a practical standpoint.

However, most blast furnace variables can be controlled and when this is done the sources of trouble are reduced to a minimum.

About 60 per cent by weight of all of materials that go into the process is air. Because of the importance of hot-blast temperature, the modern trend is toward the use of automatic control. With automatic control equipment it is possible to obtain close temperature regulation without the assistance of operators. As a matter of fact the temperature has been maintained as closely as plus and minus 4 degrees Fahr. By this method the whole operation is taken care of mechanically, thus eliminating neglect, misjudgment, and inability, which often attend manual control.

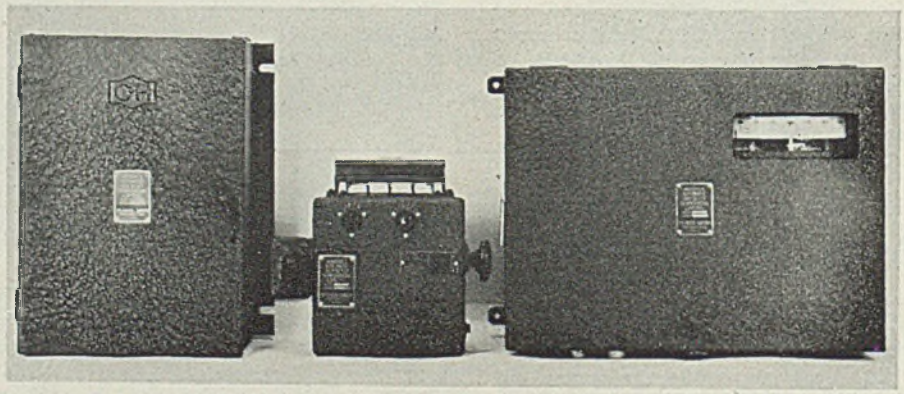
Some of the benefits of automatic control of hot-blast temperature follow:

1. Since uniform hot-blast temperature is an acknowledged requirement, the automatic method of regulation assures, in general, smoother furnace operation.
2. Hot-blast temperature is one of the factors that governs the temperature of the smelting zone. Since the reactions at this point depend upon temperature, hot-blast temperature plays an important part in determining the chemical composition of the pig iron. Therefore, other conditions being equal automatic control is a positive means of maintaining constant quality iron.
3. Automatic control eliminates constant manual supervision and enables the furnace tender to perform other duties without the danger of his neglecting the hot-blast temperature. In some cases where furnaces are grouped conveniently the number of men required may be reduced.
4. Automatic control of hot-blast temperature reduces the strains and stresses set up in blowpipes, tuyere stocks, and bustle pipe lining as a result of fluctuating temperature, and which cause slow deterioration and breaks.

Mixing Valve Automatic

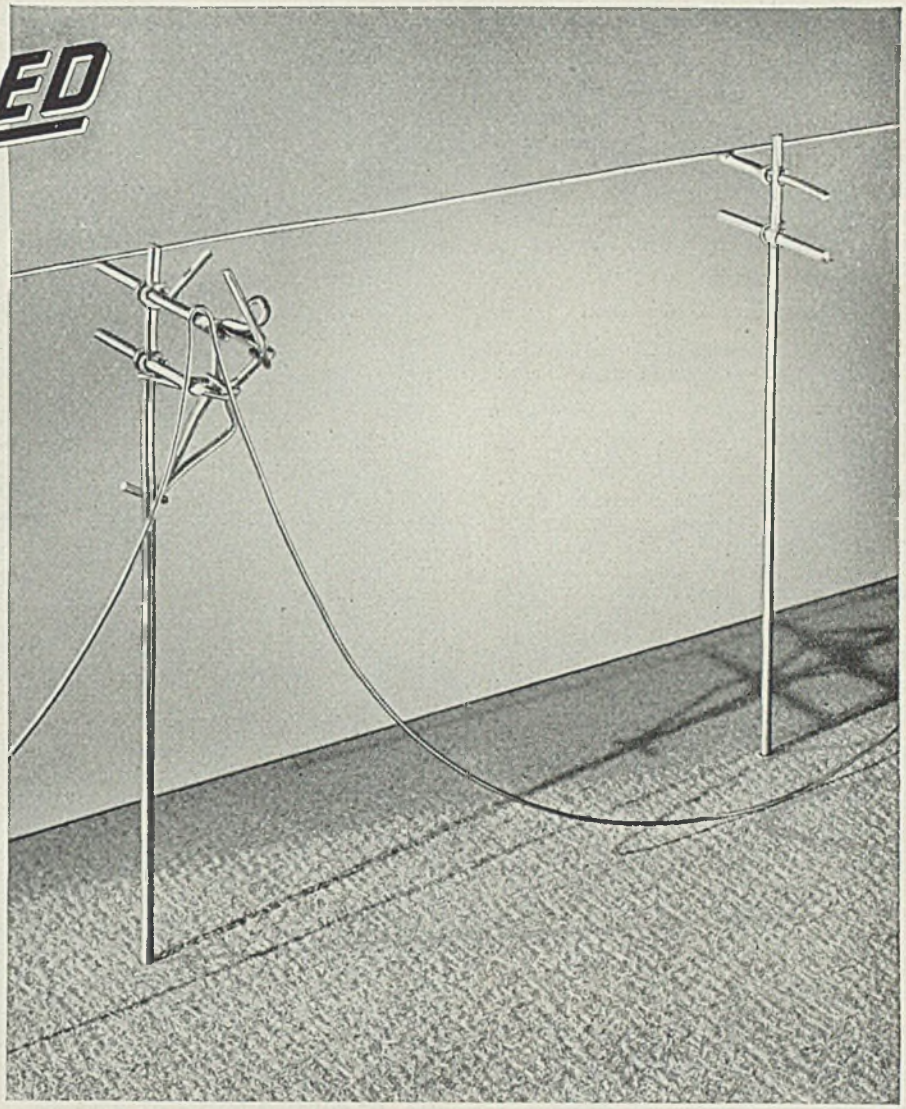
The control system has been developed especially for regulating the temperature of the hot blast admitted to the stock. This is accomplished by automatic manipulation of the regular mixing valve in the bypass between the cold-blast and hot-blast mains. The apparatus includes an electrical valve operator, a controlling pyrometer, and a group of adjustable interrupters whereby the mean velocity of the valve motor is adapted to operating requirements. There are also the necessary magnetic contactors for controlling the motor, and a manual control station by which the valve may be put under hand control at any time. An added feature is found in a "fast-opening attachment," whereby at the time of stove changes the mixing valve may be run open at full speed without waiting for the controller to take command.

For best results it is necessary that the controller be capable of



Panel equipment for controlling the temperature of hot blast automatically

BETHANIZED WIRE



Wiregraph by Alexander Calder, made of Bethanized Wire

VALUES

NEVER BEFORE OBTAINABLE IN ZINC-COATED WIRE

BETHANIZED WIRE is zinc-coated wire of a new kind. It is bringing marked advantages and savings wherever zinc-coated wire is used.

In telephone and telegraph wires, for example, Bethanized Wire is better protected from the elements because of its tight, heavy coating of purest zinc. In many installations, heavily coated Bethanized Wire offers an economical solution to problems which otherwise would involve more expensive metals.

The Bethanized coating is the purest zinc ever produced commercially. It is uniform. It can be applied in far heavier weights—two, three or more times heavier than standard hot-dip coatings. Even in these heavy weights there is no scaling or flaking in splicing, or under the severest service or manufacturing operations, because of the ductility of the Bethanized coating and the tightness with which it adheres to the steel base.

If you are using zinc-coated wire, or would like to be using it, as a more economical or more advantageous material, Bethanized Wire may reveal the way to new economies, or a better product. Bethlehem metallurgists will gladly give you more detailed information about Bethanized Wire and its possibilities.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

closing the mixing valve in small progressive steps after a stove change rather than operating the valve in a continual see-saw fashion. The controller should be equipped with a neutral zone between the high and low contact so that the valve will not normally run toward the open position except when the temperature exceeds that covered by the neutral zone.

Performance Outlined

The performance of the apparatus may be briefly outlined as follows:

(A) With correct temperature, the mixing valve remains at rest.

(B) With moderate changes of temperature (not over 20 degrees Fahr.) on either side of the neutral, the mixing valve is operated by short impulses, giving the equivalent of a relatively low speed, in a direction to correct the temperature deviation.

(C) With large temperature variations, the valve is operated by long impulses in a direction to correct the condition.

(D) Manual control in either direction may be superimposed at any time. The manual control station will remain in the position set, unless deliberately returned to its intermediate position, until the valve reaches its open or closed limit, when it automatically returns to neutral. Automatic control is effective only with the manual station in its neutral position.

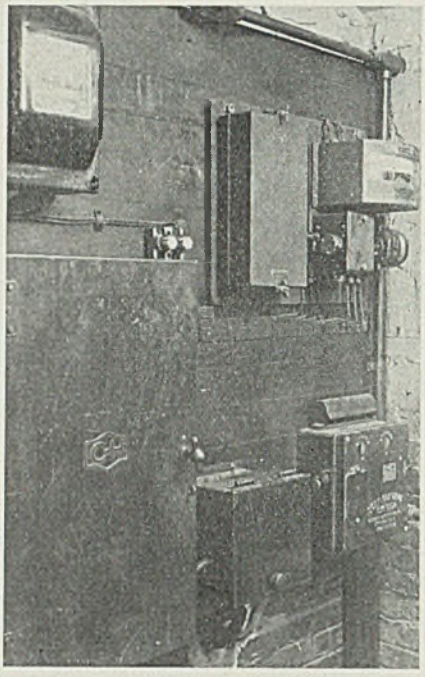
(E) Upon the valve reaching either of its limits of travel, the motor is declutched from the valve, the corresponding magnetic contactor is opened, the hand control station (if in use) is returned to its intermediate position, thus providing a 3-fold lockout against overrunning of the valve. At the same time a visual indication of the position of the valve is given by lights at the manual station.

(F) The fast opening attachment is actuated by a push-button switch (of which there may be as many as desired, accessible to the stove tender) which immediately starts the valve running toward its open position at full speed, without regard to the indication of the pyrometer-controller, which action continues until either the valve reaches its open limit or manual control is superimposed, when the control at once reverts to normal.

(G) By means of a switch at the manual station, automatic control may be suspended at any time and the system placed under hand control.

Metals Institute Meets in London

A NEW test for estimating the deeping-drawing quality of aluminum was described in a paper presented before the twenty-eighth annual general meeting of the British



Automatic equipment installed seven years ago for controlling hot blast temperature

Institute of Metals in London, March 11-12. According to the authors, Dr. A. G. C. Gwyer, chief metallurgist, and P. C. Varley, physicist, research laboratories, British Aluminum Co. Ltd., Warrington, Lancashire, the test is applicable to normal commercial purity metal in various tempers.

Essentially, the test consists of two drawing operations, of which the first, or cupping operation does not alone distinguish clearly between different grades and tempers of the metal. Addition of a re-drawing operation, however, makes the test much more sensitive and distinguishes clearly between the drawing properties of the various grades. Application of the test to aluminum of commercial purity is said to have shown that the various medium tempers have surprisingly good drawing properties and might well be used more extensively for this purpose.

W. R. Barclay, London, was elected president of the institute. In assuming the office, he presented an address on "The Development Movement in Nonferrous Metallurgical Industry," in which he described the working of international organizations which have been set up in recent years to stimulate research and intensify the use of certain metals, such as nickel, aluminum, tin and copper.

President Barclay pointed out that in some cases, at the origin of such organizations, the aim was purely to advertise the products, but it was found that a true exposition of the real merits of these products was required, and also that a considerable amount of scientific research work, to improve methods of production, transformation and use of these metals, had been found to be essential.

At the present time, such international organizations have at their disposal means of effecting scientific research in the most effecient manner possible, and from the scientific and technical points of view, these organizations have rendered considerable service to the progress and development of certain basic metals.

Spot Welded Channels and Plates Form Bridge Deck

H. H. Robertson Co., Pittsburgh, has developed a heavy-duty bridge deck unit, consisting of a heavy flat plate which lays on the stringer flanges of the bridge floor system. This flat steel plate is stiffened by inverted hot-rolled steel channels, spaced on 6-inch centers and electrically spot welded through the horizontal flange to the deck plate. The standard width of each unit is four cells or 2 feet and any length up to 24 feet may be obtained. Both the flat plate and channel elements may be varied in thickness as the load and span conditions vary in design requirements.

Three different methods of fastening the floor units to the supporting stringers may be used. These are recommended by the manufacturer, in the following order:

1. By fusion welding of the flat plate element to the flange of the supporting stringer.
2. By drilling the plates and stringer flanges after assembly and fastening with drive screws or drive rivets.
3. By prefabricating both units and flanges of the stringers and bolting or riveting in the conventional manner.

After the deck units are in place, the intercell trough material, which may be concrete or any desired composition material, is added at any conenient time in the construction schedule, thus providing a temporory wearing surface. The actual wearing surface is placed last. A 12-page booklet describing the development and citing load tests, etc., is available from the Robertson company.

Use for Flexible Tubing

Flexible steel tubing has been adapted by the Eagle Mfg. Co., Wellsburg, W. Va., as a detachable spout for a line of oil and gasoline containers. The spouts mount conveniently on the can in the carrying position and their use eliminates the need for a funnel when pouring oil or gasoline into a crankcase or tank. The safe handling of inflammable liquids is facilitated by this device.

THE WHISKERED GHOSTS OF YESTERDAY

hover 'round his plans

BW PRINTS

EASIER TO READ

EASIER TO CHECK

BETTER FOR SHOP USE—NOT BLEACHED BY CUTTER COOLANTS

● This man is a modern executive. He would not think of returning to the methods of the 1840's. Yet the print in his hand is a *blue print*—contemporary of the whale-oil lamp and covered wagon. 'Round it hover the ghosts of old-time inefficiency . . . eyestrain . . . mistakes in reading and checking.

Today, you can have truly *modern* reproductions of your plans—Bruning BLACK AND WHITE Prints. By an amazingly simple process, these black-line positive prints are made directly from the tracing, without the use of a negative. In your own blue-print room, you can produce BW Prints FASTER than blue prints—for BW Prints need no washing or drying.

A BW Developing Machine, for use in conjunction with your blue-print machine, costs as little as $57.50. Thousands of businesses—both large and small—now use BW. Get the facts for yourself—mail the coupon today.

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—Leading the field today in sensitized papers, reproduction processes, drawing material and drafting room equipment

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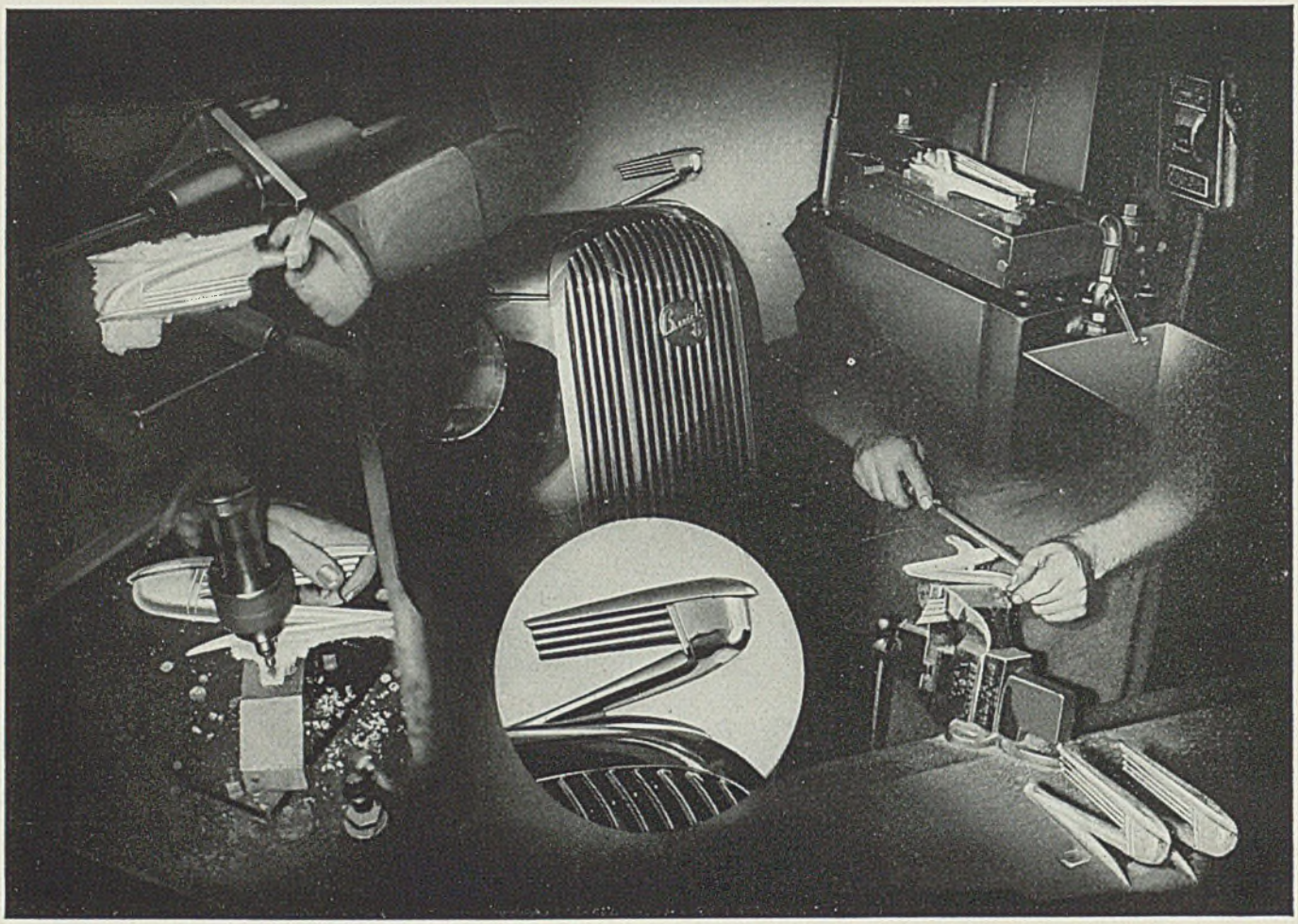
ZINC ALLOY DIE CASTINGS



STRUCTURAL AS WELL AS ORNAMENTAL

Radiator ornaments have always been ZINC Alloy Die Castings because complicated shapes, ornamental details and smooth, easily finished surfaces are easily produced by this method of fabrication.

Fully appreciating these manufacturing advantages, automotive engineers have always worked in close cooperation with die casters to develop new applications in the design of cars. The improved properties of the new ZINC Alloys gave them added advantages, with the result that ZINC Alloy Die Castings are now being used in structural applications as well as the ornamental and mechanical functions they have filled in the past.

Both the Society of Automotive Engineers and the American Society for Testing Materials have approved ZINC Alloys for Die Casting corresponding to new alloys developed by The New Jersey Zinc Company and based on Horse Head Special ZINC.

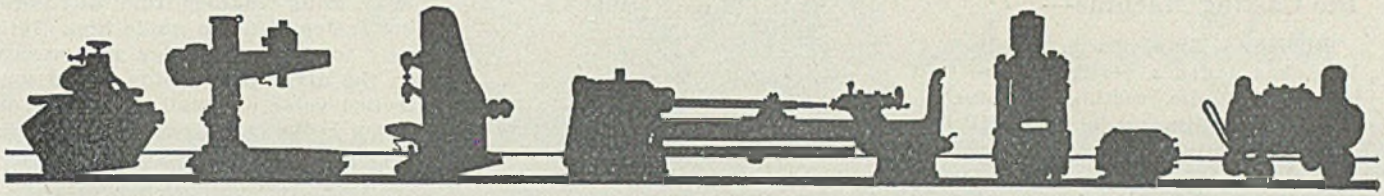
The Research was done and
The Alloys were developed with
HORSE HEAD SPECIAL ZINC
(99.99+% Uniform Quality)

Most Die Castings are specified with this metal

THE NEW JERSEY ZINC COMPANY

160 FRONT STREET (New Jersey Zinc) NEW YORK CITY

New Equipment



Recording Voltmeter—

General Electric Co., Schenectady, N. Y., is announcing a strip-chart recording voltmeter known as type CD-23 and CD-24. It has a range of 0 to 150 volts, and a single record-roll drive speed of three inches per hour. Gear units of other ratings, however, can be applied if desired. This instrument retains the refinements of the standard line of switchboard and portable recording instruments at a price reduction made possible by certain design simplifications.

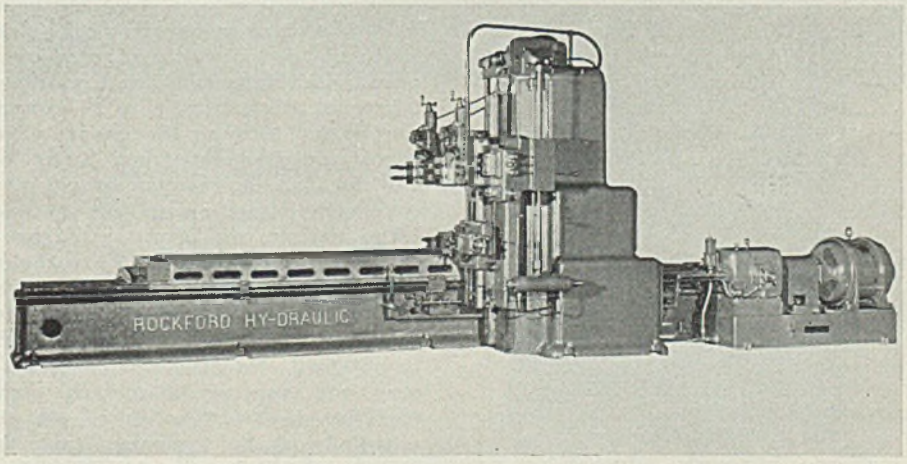
♦ ♦ ♦

Hydraulic Planer—

Rockford Machine Tool Co., 2500 Kishwaukee street, Rockford, Ill., has brought out a new hydraulic planer. The "power house" for the machine can be seen at the right-hand end of the bed in the accompanying illustration. This comprises the main driving motor directly connected to the hydraulic unit which furnishes power for reciprocating the table. Hydraulic pressure also is employed for feeding all heads. The feeds, like the cutting speeds, can be adjusted instantly to any desired amount whatever, within the capacity of the machine.

The double length box section has heavy ribbing throughout. Table also is box section and never overhangs the bed. The massive column in the center of the machine supports the crossrail and contains the electrical and hydraulic control panels. Mounted on the top of this column is the motor-driven mechanism which provides rapid traverse to all heads and power elevation for the rail.

Operating controls have been centralized and conveniently located. A pendant contains pushbutton controls which establish the direction of rapid traverse for the rail head, a master motor switch, and a rod by means of which the machine can be stopped instantly.

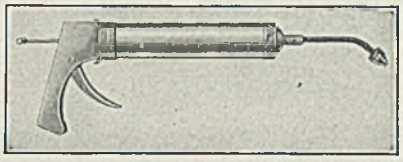


Hydraulic operation features new planer built by Rockford Machine Tool Co.

♦ ♦ ♦

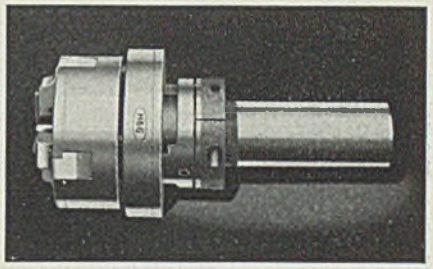
Lubrication Gun—

Keystone Lubricating Co., 2100 Lippincott avenue, Philadelphia, is announcing a new low pressure gun designed for the correct application of grease to ball and roller bearings.



Keystone low pressure grease gun

Over-lubrication is claimed to be impossible with this device, shown herewith. Maximum discharge pressure developed is 2½ ounces per square inch, sufficient to force into a ball or roller bearing the correct amount of grease. The nozzle provides for relief of back pressure. Capacity of the gun is one pound of grease.



Eastern insert chaser die head

♦ ♦ ♦

Insert Chaser Die Heads—

Eastern Machine Screw Corp., Truman and Barclay streets, New Haven, Conn., has developed a line of insert chaser die heads for the purpose of cutting taper pipe threads. The die head is designed to cause the chasers to recede at a definite rate. When the proper length of thread is cut the die head instantly opens, withdrawing the chasers from the work.

Taper action is obtained by means of a rotating opening cam placed between the back plate of the head and the knurled adjusting nut on the shank of the die head. This cam is adjustable for position and together with adjustment of a work plunger, determines the length of taper thread. Fine adjustment for pitch diameter is obtained by a knurled adjusting nut. These die heads, one of which is shown herewith, also may be equipped with a chamfering and reaming tool, thus providing a finish to the end of the pipe while the thread is being cut.

♦ ♦ ♦

Electrode Holder—

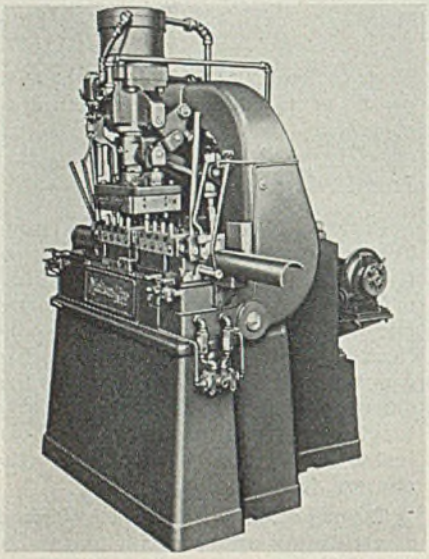
Craftweld Equipment Corp., 250 West Fifty-fourth street, New York, is marketing electrode holders, K-5 and K-10, with grooved jaws for gripping the electrode at various angles. Other features include a one-piece conductor from cable to electrode, vulcanized fibre handle that is knurled and ventilated, and an oil tempered spring that insures a powerful grip on the electrode. These

units are available with or without fibre guard and in any desired length of handle and spring lever.

♦ ♦ ♦

Die Casting Machine—

Madison - Kipp Corp., Madison, Wis., has added a vertical model to its line of die casting machines. Shown herewith, model 7, as it is known, is fully pneumatic in operation. The traveling table is equipped with two sets of multiple cavity lower die halves and the ram has one mating upper die half. While castings are being made in the left-hand die, the right-hand die is open so that the operator is free to place a full set of inserts conveniently and quickly. Subsequently the ram is raised, the table indexed so that the right-hand dies come into casting position under the ram, and the left-hand die is moved into the clear.



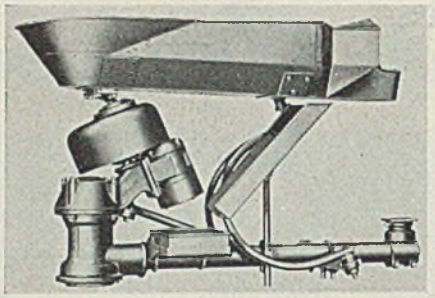
Madison-Kipp vertical die caster

While a new casting shot is being made, casting in the left-hand die are ejected. Only when the machine is locked in casting position can castings be shot.

♦ ♦ ♦

Gyratory Screening Unit For Sandslingers—

Beardsley & Piper Co., Chicago, is offering a new gyratory screening unit for tractor, stationary, portable and motive junior type sandslingers made before 1935 (It is standard equipment on later models). The development is readily interchangeable with the reciprocating screen units with which these earlier machines were originally equipped. Since this new unit, shown herewith, is accurately balanced and also because of the unique screening action which is both circular, forward and backward the manufacturer claims



Beardsley & Piper gyratory screening unit for sandslingers

that machines employing this mechanism show a decided improvement in work as well as increased production.

♦ ♦ ♦

Glass Air Filters—

Owens-Illinois Glass Co., Toledo, O., recently announced new type glass air filters for internal combustion engines, air compressors, warm air furnaces and ventilating units. They consist primarily of a series of bonded mats of flexible glass fibres confined on the intake and discharge faces by expanded metal grilles and enclosed by a fiber-board frame. The mass of glass fibers, coated with an odorless, fireproof, nonevaporating and noncorrosive chemical, physically catch and hold all manner of dust particles.

♦ ♦ ♦

Remote Valve Control—

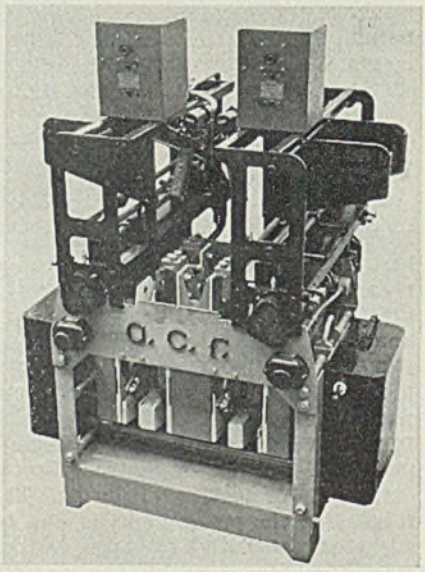
Foxboro Co., Foxboro, Mass., recently developed a remote valve control to supplement automatic control systems. This device, shown herewith, when mounted on a centrally-located panel enables the operator to adjust manually the degree of opening of an out-of-the-way, inaccessible valve without moving from his station. He can reset a valve several hundred feet away to control temperature, pressure, flow or liquid level, using readings from his recording instruments to guide him. It is easy to make a change in pressure on the diaphragm motor of the controlled valve as small as ¼ inch of water or less. The valve control is finished in lacquered cast bronze trimmed with buff nickel.

Foxboro remote valve control

♦ ♦ ♦

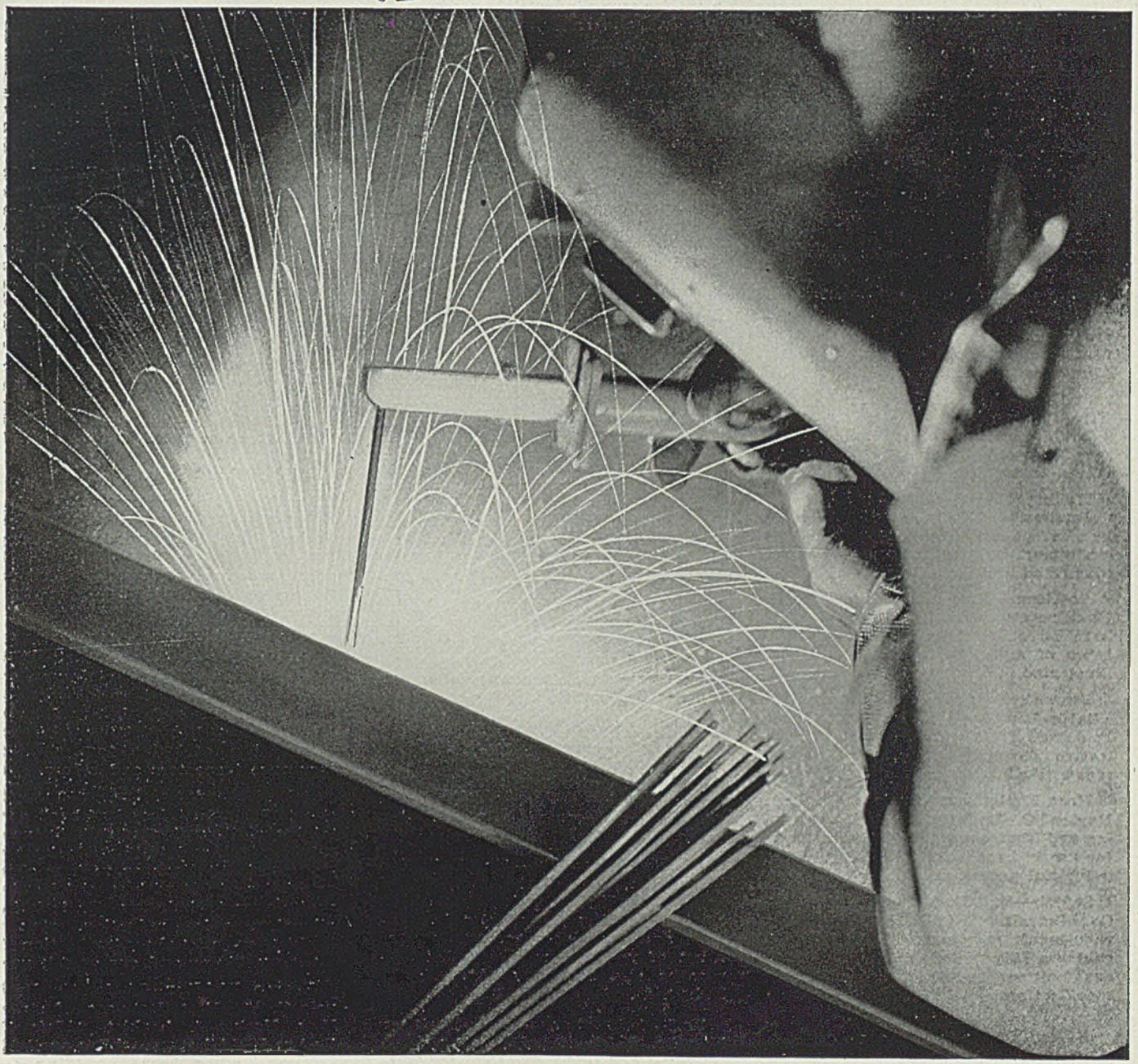
Automatic Metal Heater—

American Car & Foundry Co., 30 Church street, New York, is introducing a fully automatic metal heater for heating where the stock is cut to length, piled into a hopper and automatically fed between the electrodes. When brought to the proper temperature electric eyes cut off the current, releasing the piece which drops on a vertical chute and is delivered to the operator alongside of an upsetting machine. Hoppers hold 700 pieces of ½-inch diameter stock, and a correspondingly smaller number of larger diameters. Any length of stock from 4 to 24 inches can be fed through the hopper that takes any diameter from ¼ up to 1¼ inches. A remote control arrangement placed on or near the upsetter permits the operator to regulate the heating of pieces without leaving his post. The electric eye or photoelectric controller can be set so that any desired temperature can be obtained. No adjustment is necessary for varying diameters, and variation in length of heat can be accomplished by loosening four or eight nuts and moving the electrodes in either direction.



A. C. F. Berwick automatic metal heater employs electric eye

Roebling — the custom-made wire for exacting welders



A WELDING WIRE absolutely uniform in quality and free of non-metallic impurities . . . made by Roebling's special *custom* methods.

Available for both electric and gas welding, in standard straight lengths or in coils. Write for full information, prices, or samples.

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ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

New Trade Publications

Control Equipment — McCaskey Register Co., Alliance, O. Bulletin A-603 on its tool room control and consequent savings.

Lockers—All-Steel-Equip Co. Inc., Aurora, Ill. A catalog illustrating and describing its line of lockers in all sizes and styles.

Motors—Wagner Electric Corp., 6400 Plymouth avenue, St. Louis. Bulletin SD-549, giving service instructions on its capacitor-start induction-run motors.

Turret—Monarch Machine Tool Co., Sydney, O. Bulletin S-2 on its rear necking, chamfering and forming turret, an insert for its looseleaf catalog.

Steel Office Equipment—Shaw-Walker Co., Muskegon, Mich. A buyers' guide covering its line of office furniture and equipment, of steel; 480 pages, with indexes; illustrated.

Stellite—Haynes Stellite Co., 205 East Forty-second street, New York. A booklet on stellited valves, attributing increased life and economy to valves so treated.

Rolling Doors—Kinnear Mfg. Co., Columbus, O. Bulletin 16D13 on its line of doors and door-operating equipment, both rolling and swinging; illustrated and fully described in text.

Agitators—Patterson Foundry & Machine Co., East Liverpool, O. Bulletin No. 355, describing its various types of agitators for industrial use, illustrated.

Protective Covering—Hanson-Van Winkle-Munning Co., Matawan, N. J. Bulletin KR 101 on Kote-Rax, a protective covering for coating plating racks, illustrated.

Heat Exchanger—Duriron Co. Inc., Dayton, O. Bulletin No. 173, describing and illustrating its heat exchanger, for use in heating solutions in various industrial processes.

Switch—Bull Dog Electric Products Co., Detroit. A bulletin on its new vacu-break safety switch in stylined cabinets, illustrated and with various features described and tables of specifications.

Chain Drives—Link-Belt Co., Indianapolis. Book No. 1725, devoted to its Silverstreak silent chain drives, available through warehouses and distributors, for drives from ½ to 60 horsepower.

Industrial Buildings—Austin Co., Cleveland. A bulletin in its fourth edition, discussing single and multi-story construction for industrial plants, from standpoint of cost and efficiency.

Dust Collector—American Foundry Equipment Co., Mishawaka, Ind. Folder No. 222, describing and illustrating its dustube collector, giving features of design and types of dusts and other materials collected by its use.

Ovens and Dryers—Gehnrich Corp., Long Island City, N. Y. Catalog No. 101, on industrial ovens and dryers, profusely illustrated to show wide applications of the company's equipment for many industrial processes.

Coating—Watson-Standards Co., 225 Galveston avenue, Pittsburgh. A booklet and a circular on Plicote, a material for coating and lining metal parts and containers for corrosion resistance to acids, alkalies and other chemical fluids.

Shop Notes—Simonds Saw & Steel Co., Fitchburg, Mass. A monthly publication, *Shop Notes*, started with the March issue, containing useful information for executives in metal-working plants, without promotion of Simonds products.

Clad Metals—Latrobe Electric Steel Co., Latrobe, Pa. A bulletin on its duo-metals, describing methods of welding two types of steel to give desired characteristics of surface; illustrated by photomicrographs of sections through welded area.

Expansion Bolts—Rawlplug Co. Inc., 98 LaFayette street, New York. Booklet on "Architectural and Engineering Data on Expansion Bolts and Devices for Holding to Masonry"; looseleaf, with charts, tables, data and specifications.

Smoke Recorders—Leeds & Northrup Co., 4900 Stenton avenue, Philadelphia. Catalog N-93, on its Micromax smoke-density recorders; indicating and recording at any convenient point; rugged in construction, automatic in operation.

Speed Transmission—Oilgear Co., 1301 West Bruce street, Milwaukee. Bulletin 60,000 on its fluid power variable speed transmission as simplified and redesigned, giving increased capacities and reductions in size and cost.

Welding Products—Air Reduction Sales Co., 60 East Forty-second street, New York. Catalog No. 101, on electric welding products, rods, supplies and machines; presents tables, chart of voltages, recommended amperages and summary of causes of bad welds.

Vari-Pitch Sheave—Allis-Chalmers Mfg. Co., Milwaukee. Bulletin 1261 on its vari-pitch texrope sheave for variable speed texrope drives, showing stationary and motion-controlled types and straightline automatic ball bearing motor base, permitting complete adjustment while in operation.

Switches—Delta-Star Electric Co., 2400 Fulton street, Chicago. A bulletin describing two types of group-operated pole-top disconnecting switches, with engineering data, dimensions, weights, manual and motor-operating mechanisms, steel mounting frames and insulator data.

Seamless Flexible Metal Tubing—American Brass Co., American Metal Hose Branch, Waterbury, Conn. Bulletin 1936-1, describing, illustrating and giving engineering data on its seamless flexible metal tubing; illustrated to show many applications.

Heating Specialties—H. O. Swoboda Inc., 4301 Main street, Pittsburgh. Bulletin No. 348 on electric heaters for stress relieving piping and nozzles; No. 300 electrically heated coating and saturation tanks; No. 310 on asphalt pipe coating tanks heated by tubular electric immersion units.

Channel Valve—Ingersoll-Rand Co., Phillipsburg, N. J. A bulletin on its channel valve for use in air and gas compressors, utilizing a minimum of moving parts, giving large openings and consequent advantages; the bulletin utilizes a unique method of showing assembly of the valve.

Pyrometers—Pyrometer Instrument Co., 103 Lafayette street, New York. Bulletins No. 60 and 60A on its improved surface and needle pyrometer, a combination instrument to meet varied needs, four elements being provided, to be attached to a single indicator.

Spray Nozzles—Chain Belt Co., 1600 West Bruce street, Milwaukee. Bulletin No. 278 describing and illustrating its flat spray nozzles for spraying and cleaning various products in manufacturing operations; Illustrations show efficient applications of the spray.

Boilers—L. J. Wing Mfg. Co., 154 West Fourteenth street, New York. Pocket-size booklet containing an engineer's analysis of certain typical boiler problems and what to do, well illustrated and containing technical information of value to operators, insurance inspectors and others.

Felt—Felters Co. Inc., 210 South street, Boston. A looseleaf book containing a discussion of felt, its uses, specifications and tests made by two separate institutions on various characteristics of felt with special bearing on its uses in industry, for isolating vibration, noise reduction, etc.; a booklet on a study of vibration in plant machinery and one on felt uses.

Bronze Welding—Linde Air Products Co., 30 East Forty-second street, New York. A booklet, "How To Bronze Weld," summarizing available information on bronze welding and bronze surfacing; advantages of speed and economy are brought out and ability of bronze welding to accomplish jobs difficult or impossible, such as joining dissimilar metals.

Blow-off Valves—Edward Valve & Mfg. Co. Inc., East Chicago. Ind. Catalog No. 11-D, devoted to four series of blow-off valves in Ferac metal, cast and forged steel, straightway and angle types, for all American standard pressures; illustrated; a table of secondary pressure ratings for steel valves on boiler water lines below water level, indicating service values complying with recent A.S.M.E. boiler code rulings.

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WITH UNION COLD DRAWN STEELS

You DON'T NEED TO MACHINE A FINISH LIKE THIS . . . .

● One of the important quality features of Union Cold Drawn Steels is their high grade, cold worked finish, a source of economy to every user.

Profit-wise manufacturers retain this finish wherever possible in the completed parts. It needs no machining to obtain brightness and smoothness, as these requirements are already developed to the standards of good machining practice. Nor is machining necessary to obtain close accuracy to size and cross section since these quality details have also been taken care of by the Union Cold Drawing process.

Good finish and close accuracy to size and shape are found only in cold worked steel. Furnace operations give steel a rough surface and a coating of scale. Union Cold Drawing is the most economical method of overcoming these defects and in the process it makes the steel more machinable and improves its physical properties.

Avoid the use of any rough stock for those purposes where Union Cold Drawn Steels, with their cold worked finish and many other advantages, will reduce your operations and thus lower your costs.

UNION DRAWN STEEL CO., MASSILLON, OHIO

Manufacturers of Efficiency Steels

SUBSIDIARY OF

REPUBLIC STEEL CORPORATION

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● Speed up your operations and reduce costs by applying this readily machinable steel for parts that must withstand severe stresses and strains in service. While practically as free cutting as Bessemer screw steel (S.A.E. 1112), it is invariably recommended to replace such steels as S.A.E. 1020, S.A.E. X1314 and S.A.E. X1315. A good steel for machined parts where swaging or other cold forming operations are also required.

Union Hymo represents refinements in chemistry and processing based on Union Drawn's long experience with problems of machinability and heat treatments. Where parts must be carburized, it uniformly develops a very hard, wear-resisting case and a tough, ductile core, responding rapidly to that treatment at temperatures which avoid tendencies toward warpage and distortion. Rejections are minimized, thus preserving the savings made in the machine shop and heat-treating department.

Union Hymo is an outstanding accomplishment in steel manufacture. It so capably meets the pressing needs for lower costs that many manufacturers give it first consideration for all quality parts.

UNION DRAWN STEEL CO., MASSILLON, OHIO

Manufacturers of Efficiency Steels

SUBSIDIARY OF

Union Cold Drawn Steels

Rush for Steel Carries Rate to Year's High

Mills at 58½ Per Cent, Completing First Quarter; Little Speculative Buying

STEEL specifications came to a peak last week, with a rush of orders to mills to complete first quarter contracts, raising steelworks operations to 58½ per cent, 8½ points above the week of the floods, and a new high for the year.

In the Pittsburgh-Wheeling districts normal finishing capacity was quickly restored, but so heavy were releases for sheets and strip that those mills are assured capacity operations through April. Producers of these products in other districts also were unable to meet their own deadline of April 1 on first-quarter shipments. As a result of this bulge, orders for light finished steel products in March were 30 to 40 per cent larger than in February.

In sheets, strip, wire, and some other products, the higher prices in effect with the second quarter constituted an important factor, though there is evidence in the high rate of activity among consumers that there was relatively little speculative buying.

Only moderate interest thus far is manifest in second quarter requirements, and it is becoming clear that the automotive industry will be the determining factor in setting the pace in steel through April, May, and June. Rolling of rails and car materials apparently will be heavier than in the first three months. Tractor and implement expectations are for steady and uniformly high averages for April and May.

Estimates of steel requirements for rehabilitation in flood districts range up to 100,000 tons. In Pennsylvania 29 large bridges were destroyed, six others damaged beyond use; and in Maine 120 bridges were washed out. Inquiries already are appearing for structural shapes for rebuilding some structures.

Automobile production made its fifth consecutive weekly gain, up 3000 units to 98,500. March output was approximately 400,000 cars and trucks; and the first quarter's, 1,042,000, close to 1,068,245 in the period last year. In the five months since new models were introduced 1,848,000 cars have been produced, compared with 1,910,598 in the first five months of last year's models.

Considerable railroad steel tonnage is yet to be placed. Early action is anticipated on 7577 freight cars pending for the Erie, Chesapeake & Ohio and Nickel Plate, while the Erie probably will award 19,265 tons of rails this week. Norfolk & Western purchased 20,000 tons of rails, 4600 tons of fastenings; Wheeling & Lake Erie, 2500 tons of rails. Seaboard Air Line is inquiring for 125 freight cars; Delaware & Hudson, 50. Southern Pacific is inquiring for 20,800 tons of shapes for relocating eight bridges in Central Valley, California.

About 10,000 tons of steel will be required for two cargo ships to be built for the Matson Navigation Co., San Francisco. Structural shape awards in the week fell off slightly to 10,988 tons. Home construction is more active than in several years, and small industrial projects are increasing in number, but little office or apartment building is under way.

A strong situation prevails in raw materials. Scrap is coming out more freely but prices are firm, and STEEL's scrap composite is up 4 cents to $14.50. Considerable contracting has been done in pig iron for second quarter at an advance of $1 a ton. Beehive foundry coke is up 25 cents a ton. As higher prices will be in effect on wire April 1, STEEL's finished steel composite is up 20 cents to $52.20. The iron and steel index has advanced 8 cents to $33.13.

STEEL's London correspondent cables that British steelworks are operating at capacity, and falling behind in deliveries.

Pittsburgh district steelworks operations last week were up 27½ points to 45½ per cent; Wheeling 18 to 73; Cleveland 3 to 82; Chicago ½-point to 64; eastern Pennsylvania ½ to 38½; New England 11 to 67. Cincinnati was down 21 to 55, as precautionary measures were taken against floods. Other districts were unchanged.

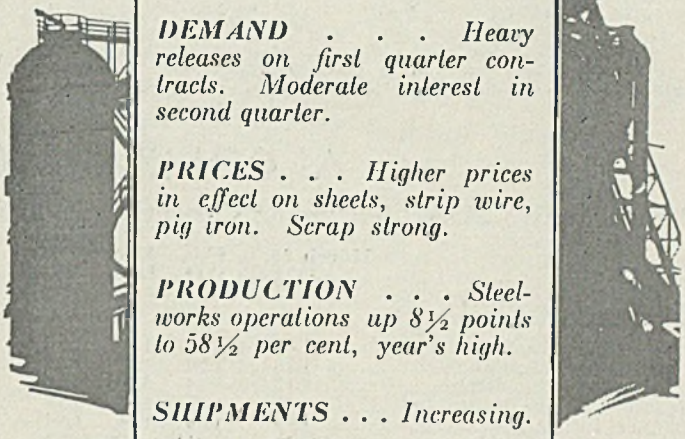
MARKET IN TABLOID

DEMAND . . . Heavy releases on first quarter contracts. Moderate interest in second quarter.

PRICES . . . Higher prices in effect on sheets, strip wire, pig iron. Scrap strong.

PRODUCTION . . . Steelworks operations up 8½ points to 58½ per cent, year's high.

SHIPMENTS . . . Increasing.



COMPOSITE MARKET AVERAGES

	March 28	March 21	March 14	One Month Ago Feb., 1936	Three Months Ago Dec., 1935	One Year Ago March, 1935	Five Years Ago March, 1931
Iron and Steel	$33.13	$33.05	$33.04	$33.48	$33.31	$32.36	$31.65
Finished Steel	52.20	52.00	52.00	53.70	53.70	54.00	49.42
Steelworks Scrap	14.50	14.46	14.46	13.83	13.17	10.75	10.38

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

A COMPARISON OF PRICES

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

Finished Material

	March 28, 1936	Feb. 1936	Dec. 1935	March 1935
Steel bars, Pittsburgh	1.85c	1.85	1.85	1.80
Steel bars, Chicago	1.90	1.90	1.90	1.85
Steel bars, Philadelphia	2.16	2.16	2.16	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.40	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pitts.	2.10	2.40	2.40	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	30.00	30.00	28.00
Sheet bars, open-hearth, Pitts.	28.00	30.00	30.00	28.00
Billets, open-hearth, Pittsburgh	28.00	29.00	29.00	27.00
Wire rods, Pittsburgh	40.00	40.00	38.00	38.00

Pig Iron

	March 28, 1936	Feb. 1936	Dec. 1935	March 1935
Bessemer, del. Pittsburgh	$20.8132	20.8132	20.8132	19.76
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.76
No. 2 fdry., del. Pittsburgh	20.3132	20.3132	20.3132	19.26
No. 2 fdry., Chicago	19.50	19.50	19.50	18.50
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	20.2007	20.2007	20.2007	19.13
No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.63
Malleable Valley	19.50	19.50	19.50	18.56
Malleable, Chicago	19.50	19.50	19.50	18.50
Lake Sup. charcoal, del. Chi.	25.2528	25.2528	25.2528	24.04
Ferromanganese, del. Pitts.	80.13	80.13	90.13	89.79
Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.63

Scrap

Heavy melting steel, Pittsburgh	$15.75	14.80	14.05	12.40
Heavy melt. steel, No. 2, east. Pa.	12.75	12.00	11.25	9.15
Heavy melting steel, Chicago	14.75	14.30	13.35	10.45
Rails for rolling, Chicago	15.75	15.50	14.50	11.55
Railroad steel specialties, Chicago	16.25	15.75	14.25	11.55

Coke

Connellsville, furnace, ovens	$3.50	3.50	3.55	3.60
Connellsville, foundry, ovens	4.25	4.25	4.10	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

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

Prices Subject to Quantity Extras and Deductions

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
Detroit, del.	2.05c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	2.06c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	1.95c-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.	2.11c-2.16c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Base, 3 to 25 tons)

(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't'd nails	2.10c
Galv. nails, 15 gage and coarser	4.10c
do. finer than 15 ga.	4.60c

(Per pound)

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; Birmingham 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.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

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, Chicago, Massilon, Canton, Bethlehem 2.45c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
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
9250 carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

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

Hot strip to 23⅛-in. Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, del.	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold strip, Pitts. Cleveland	2.60c
Detroit, del.	2.81c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 20-45 lbs.	$28.00
45-50 lbs.	$25.00
50-60 lbs.	$26.00
70-75 lbs.	$24.50
80-90 lbs.	$26.00
100 lbs.	$27.00
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, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage and Machine

½ x 6 and smaller	70-10-5 off
Do. larger	70-10 off
Tire bolts	55 off

Plow Bolts

All sizes	70-10 off

Stove Bolts

In packages with nuts attached 72½-10 off; in packages with nuts separate 72½-10-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	65-5 off
Elevator bolts	65-5 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-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., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-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

In.	Blk.	Galv.
Steel		
¼ and ⅜	60	44½
½	64½	55
¾	67½	59
1—3	69½	61½
Iron		
½	31½	15
¾	36½	20½
1—1¼	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	
⅛, butt weld	56
¼ and ⅜, butt weld	59
½, 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	

⅛—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	1¾	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, inclusive, 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 Stnd. fitgs., Birm. base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo & Youngstown	$28.00
Philadelphia	34.67
Duluth	30.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Chi., Cleve., Young.	28.00

Wire Rods

Pitts., Cleve., No. 4 to 5	$38.00
Do., No. 5 to 15/32-inch	40.00
Do., over 15/32 to 47/64-inch	42.00

Chicago up $1; Worcester up $2

Skelp

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
Connel. 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.	9.00
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. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	6.75c

Per lb. 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
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	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
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	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
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	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
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	20.07	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus $1.21 switching charges			67c, 81c and
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.62	.....	19.50	.....
St. Paul from Duluth	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		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	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, Ga.,	$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	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

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	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
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.50
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. Pittsb'gh	80.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicoman., 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
Ferrovanadium, 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 Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead New York N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Mar. 21	9.25	9.37½	8.95	47.87½	46.55	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 23	9.25	9.37½	8.95	47.87½	46.50	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 24	9.25	9.37½	8.95	47.70	46.37½	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 25	9.25	9.37½	8.95	47.50	46.25	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 26	9.25	9.37½	8.95	47.50	46.40	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 27	9.25	9.37½	8.95	47.37½	46.62½	4.60	4.45	4.90	*19.00	13.50	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 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.62½
Copper hot rolled	16.50
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	16.87½
Seamless copper	17.00
Rods	
High yellow brass	13.12½
Copper, hot rolled	13.50
Anodes	
Copper untrimmed	14.00
Wire	
Yellow brass (high)	15.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	6.00- 6.25
Cleveland	6.75- 7.00
Chicago	6.12½-6.37½
St. Louis	6.00- 6.50
Heavy Copper and Wire	
New York, No. 1	7.50-7.62½
Chicago, No. 1	7.12½-7.62½
Cleveland	7.00- 7.25
St. Louis, No. 1	7.25- 7.75
Composition Brass Borings	
New York	5.25- 5.75
Light Copper	
New York	6.25- 6.50
Chicago	5.62½-6.12½
Cleveland	6.25- 6.50
St. Louis	5.75- 6.25
Light Brass	
Chicago	3.62½-3.87½
Cleveland	3.50- 3.75
St. Louis	3.50- 4.00
Lead	
New York	3.50- 3.75
Cleveland	3.50- 3.75
Chicago	3.37½-3.62½
St. Louis	3.50- 4.00
Zinc	
New York	2.25- 2.50
Cleveland	2.50- 2.75
St. Louis	2.50- 3.00
Aluminum	
Borings, Cleveland	9.00- 9.50
Mixed, cast, Cleve	13.00-13.25
Mixed, cast, St. L.	12.75-13.25
Clips, soft, Cleve.	14.87½-15.00

SECONDARY METALS

Brass ingot, 85-5-5-5	9.50
Stand. No. 12 alum.	16.75-17.25

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	10.00-11.50
Boston, dock, expt.	11.00
Boston, domestic	9.00- 9.50
Buffalo, No. 1	13.50-14.00
Buffalo, No. 2	12.25-12.75
Chicago, No. 1	14.50-15.00
Cleveland, No. 1	15.00-15.50
Cleveland, No. 2	14.00-14.50
Detroit, No. 1	11.50-12.00
Detroit, No. 2	10.50-11.00
Eastern Pa., No. 1	13.00-14.00
Eastern Pa., No. 2	12.50-13.00
Federal, Ill.	11.50-12.00
Granite City, R. R.	12.50-13.00
Granite City, No. 2	10.75-11.25
N. Y., deal. No. 2	8.50- 9.00
N. Y., deal. barge (No. 1 for export)	9.50
Pitts., No. 1 (R. R.)	16.00-16.50
Pitts., No. 1 (dlr.)	15.50-16.00
Pittsburgh, No. 2	14.50-15.00
St. Louis	11.50-12.00
Toronto, dealers	7.50
Valleys, No. 1	16.00-16.50

COMPRESSED SHEETS

Buffalo, dealers	12.25-12.75
Chicago, factory	13.75-14.25
Chicago, dealer	12.75-13.25
Cleveland	14.75-15.25
Detroit	12.50-13.00
E. Pa., new mat.	13.00-13.50
Pittsburgh	15.50-16.00
St. Louis	9.00- 9.50
Valleys	15.25-15.75

BUNDLED SHEETS

Buffalo	11.00-11.50
Cincinnati, del.	9.00- 9.50
Cleveland	11.00-11.50
Pittsburgh	14.50-15.00
St. Louis	7.25- 7.75
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	10.00-10.50
Cincinnati	8.50- 9.00
Detroit	8.75- 9.25
St. Louis	6.50- 7.00

STEEL RAILS, SHORT

Birmingham	12.50-13.00
Buffalo	15.25-15.75
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	17.50-18.00
Cincinnati, del.	15.00-15.50
Detroit	15.00-15.50
Pitts., open-hearth, 3 ft. and less	17.25-17.75
St. Louis, 2 ft. & less	14.25-14.75

STEEL RAILS, SCRAP

Boston	9.00- 9.50
Chicago	14.50-15.00
Pittsburgh	16.25-16.75
St. Louis	13.25-13.75
Buffalo	13.50-14.00
Toronto, dealers	8.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	6.25- 6.50
Buffalo	11.00-11.50
Chicago	8.50- 9.00
Cincinnati, dealers	8.50- 9.00
Detroit, net	9.00- 9.50
Eastern Pa.	11.50
N. Y., deal. fdry.	7.50- 7.75
St. Louis	7.50- 8.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	14.75-15.25
Chicago, springs	16.00-16.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.25-17.75
St. Louis	14.00-14.50

ANGLE BARS—STEEL

Chicago	16.00-16.50
St. Louis	14.00-14.50
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	16.00-16.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	15.00-15.50
Cleveland, billet, bloom crops	17.50-18.00
Eastern Pa., crops	17.00-17.50
Pittsburgh, billet, bloom crops	18.00-18.50
Pittsburgh, sheet bar crops	17.50-18.00

FROGS, SWITCHES

Chicago	14.50-15.00
St. Louis, cut	13.25-13.75

SHOVELING STEEL

Chicago	14.50-15.00
Federal, Ill.	11.50-12.00
Granite City, Ill.	10.75-11.25
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	7.25- 7.50
Buffalo, No. 1	12.25-12.75
Buffalo, No. 2	13.50-14.00
Chicago, No. 1, net	13.00-13.50
Chicago, No. 2	14.50-15.00
Cincinnati, No. 2	12.00-12.50
Eastern Pa.	14.00
St. Louis, No. 1	11.00-11.50
St. Louis, No. 2	12.50-13.00
Toronto, No. 1. dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	12.50
New York, dealers	7.75

BUSHELING

Buffalo, No. 1	12.25-12.75
Chicago, No. 1	13.50-14.00
Cinci., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	6.00- 6.50
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1, new	11.00-11.50
Valleys, new, No. 1	15.25-15.75
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Boston, dealers	4.00- 4.25
Buffalo	7.00- 7.50
Chicago	7.75- 8.25
Cincinnati, dealers	6.50- 7.00
Cleveland	8.50- 9.00
Detroit	6.75- 7.25
Eastern Pa.	8.50
New York, dealers	5.00- 5.25
Pittsburgh	10.50-11.00
St. Louis	4.50- 5.00
Toronto, dealers	4.00
Valleys	11.50-12.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	8.25- 8.75
Cincinnati, dealers	6.50- 7.00
Cleveland	9.00- 9.50
Detroit	7.50- 8.00
Eastern Pa.	6.50
New York, dealers	3.25- 3.75
Pittsburgh	8.75- 9.25
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham, plain	5.00- 6.00
Boston, chemical	7.25- 7.75
Boston, dealers	3.50- 4.00
Buffalo	8.50- 8.75
Chicago	7.50- 8.00
Cincinnati, dealers	6.50- 7.00
Cleveland	9.00- 9.50
Detroit	7.50- 8.00
E. Pa., chemical	11.00-13.00
New York, dealers	4.50- 5.00
St. Louis	4.00- 4.50
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers	8.50- 9.00
Chicago, net	8.50- 9.00

RAILROAD GRATE BARS

Buffalo	10.50-11.00
Chicago, net	9.00- 9.50
Cincinnati	7.50- 8.00
Eastern Pa.	11.00-11.50
New York, dealers	7.00- 7.50
St. Louis	7.50- 8.00

FORGE FLASHINGS

Boston, dealers	7.75- 8.00
Buffalo	12.25-12.75
Cleveland	13.50-14.00
Detroit	10.50-11.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston, dealers	6.00- 7.00
Chicago, heavy	16.00-16.50
Eastern Pa.	12.50-13.00

ARCH BARS, TRANSOMS

St. Louis	13.50-14.00

AXLE TURNINGS

Boston, dealers	7.00- 7.25
Buffalo	10.50-11.00
Chicago, elec. fur.	14.00-14.50
Eastern Pa.	11.50
St. Louis	9.00- 9.50
Toronto	4.50

STEEL CAR AXLES

Birmingham	12.00-13.00
Boston, ship. point.	11.00-11.25
Buffalo	15.25-15.75
Chicago, net	15.50-16.00
Eastern Pa.	17.00
St. Louis	13.50-14.00
Toronto	8.50

SHAFTING

Boston, ship point.	13.75-14.00
Eastern Pa.	19.00-19.50
New York, dealers	14.25-14.75
St. Louis	13.50-14.00

CAR WHEELS

Birmingham	11.00-12.50
Boston, iron deal.	8.75- 9.00
Buffalo, iron	13.50-14.00
Buffalo, steel	15.25-15.75
Chicago, iron	14.50-15.00
Chicago, rolled steel	16.00-16.50
Cincinnati, iron	12.00-12.50
Eastern Pa., iron	15.00-15.50
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.25-17.75
St. Louis, iron	11.50-12.00
St. Louis, steel	14.75-15.25
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	11.00-12.00
Boston, No. 1 mach.	9.00- 9.25
Boston, No. 2	9.25- 9.75
Boston, tex. con.	11.50-12.00
Buffalo, cupola	13.00-13.50
Buffalo, mach.	13.75-14.25
Chicago, agri. net	10.50-11.00
Chicago, auto	12.00-12.50
Chicago, mach. net	13.50-14.00
Chicago, railr'd net	12.00-12.50
Cinci., mach. cup	11.50-12.00
Cleveland, mach.	16.00-16.50
Detroit, auto, net	12.50-13.00
Eastern Pa., cupola	14.00-14.50
E. Pa., mixed yard	13.00
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	7.50- 9.00
St. Louis, No. 1	11.50-12.00
St. L., No. 1 mach.	13.00-13.50
Toronto, No. 1, mach., net	9.00

HEAVY CAST

Boston, del.	8.25- 8.50
Buffalo, break.	11.25-11.75
Cleveland, break	12.50-13.00
Detroit, No. 1 mach. net	12.50-13.00
Detroit, break.	11.00-11.50
Detroit, auto net	12.50-13.00
Eastern Pa.	13.50
N. Y., break. deal.	9.50- 9.75
Pittsburgh	13.25-13.75

MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	15.00-16.00
Buffalo	15.75-16.25
Chicago, R. R.	18.00-18.50
Cincinnati, agri. del.	13.50-14.00
Cleveland, rail	17.75-18.00
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	17.50
Pittsburgh, rail	18.50-19.00
St. Louis, R. R.	15.25-15.75
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	12.00-13.00
Boston, dealers	9.00- 9.50
Buffalo	13.50-14.00
Chicago	15.50-16.00
Eastern Pa.	15.00-15.50
New York, dealer	9.75-10.25
St. Louis	14.25-14.75

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	15.00-15.50
Chicago	16.50-17.00
Eastern Pa.	16.00-16.50
Pittsburgh (heavy)	17.25-17.75
Pittsburgh (light)	16.50-17.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

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.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 52-55%	26.00
So. African, 52%	26.50
So. Afr., 49-51%	25.50
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.00c
Boston††	3.10c
Buffalo	3.00c
Chattanooga	3.36c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.11c-3.26c
New Orleans	3.35c
New York‡ (d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.50c
San Francisco	3.25c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.36c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.25c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.36c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.37c
Philadelphia*	2.98c
Pittsburgh (h)	3.15c
Portland (i)	3.50c
San Francisco	3.25c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c
PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.35c
San Francisco	3.25c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.75c
Milwaukee	3.16c
New Orleans	3.55c
New York‡(d)	3.31c
Portland	3.35c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Fracisco	3.35c
Seattle	3.70c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York‡(d)	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.10c
San Francisco	4.00c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York‡(d)	4.30c
Philadelphia*†	4.40c
Pitts.**(h)	4.15-4.45c
Portland	4.50c
San Francisco	4.50c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c
BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅛-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York‡(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston††	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York‡(d)	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c
COLD FIN. STEEL	
Baltimore (c)	3.73c
Boston	3.90c
Buffalo (h)	3.55c
Chattanooga*	4.13c
Chicago (h)	3.50c
Cincinnati	3.72c
Cleveland (h)	3.50c
Detroit	3.79c
Los Ang. (f) (d)	5.85c
Milwaukee	3.61c
New Orleans	4.30c
New York‡(d)	3.81c
Philadelphia	3.76c
Pittsburgh	3.50c
Portland (f) (d)	6.15c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.15c
St. Louis	3.75c
St. Paul	4.02c
Tulsa	4.65c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	2.85c
Detroit	3.18c
New York‡(d)	3.36c
St. Louis	3.45c

TOOL STEELS

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

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; † New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Mar. 26

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

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
			Quoted in dollars	**Quoted in gold pounds sterling
PIG IRON	£ s d		at current value	£ s d
Foundry, 2.50-3.00 Silicon	$15.47	3 2 6	$14.14	1 15 0
Basic bessemer	15.47	3 2 6*	12.13	1 10 0
Hematite, Phos. .03-.05	17.61	3 11 0	.....	.....
SEMIFINISHED STEEL				
Billets	$28.92	5 17 6	$18.99	2 7 0
Wire rods, No. 5 gage	44.39	8 19 0	36.39	4 10 0
FINISHED STEEL				
Standard rails	$40.92	8 5 0	$44.17	5 10 0
Merchant bars	1.71c	7 15 0	1.13c to 1.18c	3 2 6 to 3 5 0
Structural shapes	1.66c	7 10 0	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.79c	8 1 3	1.55c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.17c	9 15 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.60c	11 15 0	2.29c	6 5 0
Bands and strips	1.93c	8 15 0	1.42c	4 0 0
Plain wire, base	2.17c	9 15 0	1.92c	5 5 0
Galvanized wire, base	2.53c	11 10 0	2.15c	5 17 6
Wire nails, base	2.62c	12 0 0	1.74c	4 15 0
Tin plate, box 108 lbs.	$ 4.65	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	$17.36	3 10 0(a)	$17.26	260	$13.56	400	$25.44	63
Basic bessemer pig iron	17.36	3 10 0(a)	12.62	190	11.67	350	28.06(b)	69.50
Furnace coke	4.96	1 0 0	6.31	95	4.14	122	6.47	19
Billets	28.92	5 17 6	28.55	430	18.81	555	38.97	96.50
Standard rails	1.82c	8 5 0	2.02c	671	1.68c	1,100	2.41c	132
Merchant bars	2.00c	9 1 0	1.68c	560	.99c	650	2.01c	110
Structural shapes	1.93c	8 15 0	1.65c	550	.99c	650	1.95c	107
Plates, †¼-in. or 5 mm.	2.00c	9 1 3	2.10c	700	1.22c	800	2.32c	127
Sheets, black	2.53c	11 10 0§	1.80c	600‡	1.34c	875‡	2.63c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.98c	13 10 0	2.85c	950	2.30c	1,500	6.77c	370
Plain wire	3.75c	9 15 0	2.70c	900	1.76c	1,150	3.16c	173
Bands and strips	2.16c	9 16 0	1.95c	650	1.22c	800	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price, British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.00 per cent over paper sterling.

Bars

Bar Prices, Page 78

Pittsburgh — Specifications and shipments for bars were being handled efficiently by producers in this district last week, a number of bar mills operating at a normal rate. Requirements of consumers in outside districts, such as Detroit, were being filled and the market the past week has witnessed heavier specifying against expiring first-quarter contracts. Merchant steel bars are quoted 1.85c, Pittsburgh, for lots of 3 to 25 tons.

Cleveland—Larger orders for steel and alloy steel bars have developed from automobile manufacturers and forge shops, and producers appear confident of a heavier volume from this source for second quarter. Current demand from road machinery builders in this district is second only to automotive, and agricultural implements represent a close third.

Chicago—Bar specifications are tending downward slightly following attainment of the best volume so far this year. This tendency is regarded as only temporary since consumption in most industries is well maintained and is increasing in some directions. Automotive demand has shown further gains and shipments to tractor and farm implement manufacturers hold at their recent peak.

New York—Buying of steel bars is well sustained, the feature of the moment being inquiries by railroads for their quarterly requirements.

Philadelphia—Commercial bar tonnage is moving fairly well. Incidentally, sellers, with plants in districts recently inundated report much improved schedules, with a number of them now again able to make definite promises as to delivery. However, it will likely take another fortnight or so, possibly longer in certain instances, before schedules become completely normal. New price differentials on commercial bars are now being generally quoted.

Plates

Plate Prices, Page 78

Pittsburgh—Inquiries for plate repairs had begun to appear late last week. Army engineers at Pittsburgh asked bids on requirements for Emsworth, Pa., lock and dam, washed away by Ohio river flood waters. Delivery was asked in 45 days. Numerous barges in the Pittsburgh district either damaged or lost by the disaster will be repaired or replaced. Plates hold fimly at 1.80c, base, Pittsburgh.

Cleveland—Plate orders are in light volume, and are mainly for boilers, rubber molds and machinery parts. Some additional railroad tonnage is expected shortly. Some improvement in demand for gasoline station tanks also is anticipated. Leading producers are quoting 1.80c, Pittsburgh, or 1.99½c, delivered, Cleveland, on plates.

Chicago—Outstanding in plate inquiries is the diversion tunnel lining at Fort Peck dam, Wiota, Mont., involving 7350 tons, on which bids close April 20. Heaviest plate orders are coming from structural fabricators which recently have been taking larger shipments. Additional plate business for freight car building and repairs is in prospect, while recent shipments of such material have been in fair volume.

New York—Prospective buying of steel plates indicates activity shortly. New York Central will open bids March 31 on its requirements of plates, shapes bars and other miscellaneous steel for second quarter. About 10,000 tons of hull steel will be required for two cargo boats, each

500 feet long, for Matson Navigation Co., San Francisco, bids May 4. Shipbuilders on the Atlantic as well as the Pacific coast are figuring. Oil companies have programs of expansion, including many domestic fuel oil tanks.

Seattle — Inquiry is increasing, mainly for boiler and tank jobs involving relatively small tonnages, but fabricators report awards are dragging.

Philadelphia—Plate demand has improved, partly attributed to diversion of business from districts recently inundated by floods, but many demands appear normal for this season of the year, with the situation enlivened by the release of some accumulated tonnage held up by prolonged winter weather. Central Iron & Steel Co., Harrisburg, Pa., has booked 500 tons of routine requirements for the Norfolk & Western, with the Jones & Laughlin Steel Corp., Pittsburgh, receiving a similar amount. The Defoe shipyards, Bay City, Mich., has been awarded construction of the lighthouse tender HOLLIHOCK, requiring 300 tons of plates and approximately 150 tons of bars and shapes. Plates are holding 1.90c, Coatesville, Pa., or 1.99½c, Philadelphia.

San Francisco — Interest is centered around bids on 700 tons for the Eagle Mountain pumping plant for the metropolitan water district, Los Angeles. Only two small lettings were noted. Awards so far this year aggregate 48,075 tons, compared with 13,487 tons for the same period a year ago.

Contracts Placed

200 tons, tanks for Horluck Brewing Co., Seattle, and miscellaneous marine tanks, to Nelson Boiler & Tank Co., Tacoma, Wash.

130 tons, tank, Collegeville, Pa., to Pittsburgh Des Moines Steel Co., Pittsburgh.

110 tons, 3 to 8-inch welded steel pipe, Palos Verdes, Calif., to Los Angeles fabricator.

100 tons, 6 and 8-inch welded steel pipe, treasury department, Fresno, Calif., to unnamed interest.

100 tons or more, repairs to government dredges, to Commercial Iron Works, Portland, Oreg.

Unstated tonnage, three 84,000-gallon, four 42,000-gallon and four 12,000-gallon tanks for Producers Refining Inc., Chicago, to Graver Tank & Mfg. Co., East Chicago, Ind.

Contracts Pending

7350 tons, No. 1 diversion tunnel lining, Fort Peck dam, Wiota, Mont.; bids April 20.

2000 tons, if awarded all steel, or 235 tons, 48-inch supply water line for Tacoma, Wash.; Steel Tank & Pipe Co., Portland, Oreg., low.

700 tons, Eagle Mountain pumping plant, metropolitan water district, Los Angeles; L. E. Dixon Co., Los Angeles, low on general contract.

100 tons or more, rebuilding lighthouse tender, ROSE; Todd Dry Docks Inc., Seattle, low.

100 tons or more, two steel hulls for Coulee, Wash., dam project; bids to reclamation bureau, Denver, April 7.

Unstated tonnage, requirements to build Emsworth, Pa., lock; inquiry by Pittsburgh federal engineers' office, with delivery specified within 45 days. Closing expected early this week.

Semifinished

Semifinished Prices, Page 79

Specifications covering sheet bars, rerolling billets, and wire rods show a tendency to increase, in view of the heavier requirements of nonintegrated mills, whose production this week will be heavier than a week ago. Tin plate mill requirements are heavier, and the outlook is bright for sheet bars in view of the fact that many sheet finishing mills will be booked up through April. On a Pittsburgh base, billets, blooms, sheet bars and slabs are quoted $28; forging billets, $35; and No. 4 and 5 wire rods, $38.

Sheets

Sheet Prices, Page 78

Pittsburgh—A heavy influx of specifications last week against first quarter contracts assures capacity operations in this district's sheet mills throughout the month of April. In some cases, sheet mills could even be booked into May. Producers in this district, such as American Sheet & Tin Plate Co., Allegheny Steel Co., Apollo Steel Co., and others, are on normal shipping schedules and through last week were adequately caring for customers' needs.

Cleveland — Specifications on first quarter contracts, and orders on quotations that were outstanding prior to the recent issuance of base prices and quantity differentials for second quarter, have been so heavy that mills are unable to get out all the tonnage by April 1. Therefore, there will be a continuance of such shipments, in some instances as late as April 15. A few contracts have been booked for second quarter. Prices apparently have been a secondary consideration as demand has increased strongly with the gain in automobile production. Sheet mills in this district are operating at capacity. No slackening is noted in production of household equipment.

Chicago—Sheet shipments are materially in excess of incoming business since consumers who specified heavily a short time ago are expected to be out of the market for a brief period pending the assimilation of tonnage now being received. Few contracts are being entered for second quarter, but produces have sufficient backlogs to provide active support to operations for a brief period ahead. Sheet consumption is well maintained in practically all directions, with requirements of the automotive industry still expanding. Prices on new business are reported as firm.

New York — New sheet tonnage continues restricted due to the substantial specifications placed on former quotations. Jobbers are specifying more liberally in expectation of a growing demand over the next month or so for flood replacements.

Philadelphia—Sellers with producing units in the East and not affected by floods have experienced improvement in tonnage, due possibly in part to some diversion from other mills. Undoubtedly some tonnage is being placed at this time in expectation of special requirements arising in the flood areas. New price schedules are now generally in effect.

Buffalo—Sheet production is steady at 75 per cent. Pressure for shipments is noted.

Mansfield—Empire Sheet & Tin Plate Co. has announced prices for second quarter, extending the official base prices on sheets, and adopting the quantity differentials as applied by other producers. This interest also has reaffirmed first quarter prices for tin plate, tin mill black plate, and terne plate.

Cincinnati—Sheet mill deliveries were unaffected by flood stage of the Ohio river. The leading interest will have no break in near-capacity schedules with advent of the second quarter. Prices are steady.

St. Louis — Sheet requirements continue at a high level. Specifications are in large volume, particularly from makers of stoves, farm implements, refrigerators and other household appliances. The general manufacturing trade is accounting for liberal tonnages.

Quicksilver

New York—Quicksilver prices are unchanged in a quiet market here. Light small-lot buying has occurred in some quarters. Small lots are quoted $78 to $79, a virgin flask.

Transportation

Track Material Prices, Page 79

Placing of 20,000 tons of rails by the Norfolk & Western and 2500 tons by the Wheeling & Lake Erie formed the most important feature of railroad participation in the market last week. Prospective construction of 111 miles of main track by the Santa Fe, from Las Animas, Colo., to Boise City, Okla., offers an unusual rail and accessory tonnage. Construction is to be started as soon as contracts can be let. St. Louis is inquiring for 600 tons of 100-pound rail for approaches to the municipal bridge.

Norfolk & Western has awarded 150 tons of track bolts to Oliver Iron & Steel Corp., Pittsburgh, Pittsburgh Screw & Bolt Corp., Pittsburgh, and Republic Steel Corp., Cleveland. The Virginian has awarded 800 kegs of track bolts to the Pittsburgh Screw & Bolt Corp. and Republic. Seaboard Air Line is inquiring for 1000 kegs of track bolts. The Pennsylvania will require some track accessories for flood repairs.

Norfolk & Western will make distribution in about a week or ten days of 11,000 tons of steel for construction of 1000 coal cars in its own shops. This road has placed over 2000 tons of plates, shapes and bars for second quarter routine needs with Central Iron & Steel Co., Harrisburg, Pa., and Jones & Laughlin Steel Corp., Pittsburgh.

Awards on 3000 refrigerator cars for the Pacific Fruit Express are expected soon, bids now being figured.

Pittsburgh Plate Glass Co., Pittsburgh, recently awarded H. K. Porter Co., Pittsburgh, a fire-less locomotive to be used at the former's Barberton, O. division. Timken Roller Bearing Co., Canton, O., has been given the order for all driving axle bearings.

Car Orders Placed

Charles Lenning & Co. Inc., Philadelphia, one 50-ton and one 30-ton tank cars, to General American Transportation Corp., Chicago.

Delaware & Hudson, 50 composite hoppers of 50 tons capacity, to own shops, Oneonta, N. Y.

Rail Orders Placed

Norfolk & Western, 20,000 tons; 15,000 to Carnegie-Illinois Steel Corp., Pittsburgh, 5000 tons to Bethlehem Steel Corp., Bethlehem, Pa.; 4450 tons of tieplates divided by these companies.

Wheeling & Lake Erie, 2500 tons rails and tonnage of fastenings, to Carnegie-Illinois Steel Corp., Pittsburgh.

Car Orders Pending

Nickel Plate, 777 steel freight cars: 500 fifty-ton box cars, 200 fifty-ton gondolas, 25 seventy-ton gondolas, 50 fifty-ton flat cars and two special 100-ton flat cars.

Seaboard Air Line, 125 phosphate cars, 70 tons capacity; bids asked.

Rail Orders Pending

St. Louis, municipal bridge approach, 600 tons 100-pound rail; bids April 10.

Buses Booked

A. C. F. Motors Co., New York; Twelve 30-passenger street coaches for Columbus Railway, Power & Light Co., Columbus, O.; five 30-passenger street coaches for Transit Co. of Harrisburg, Harrisburg, Pa.; four 35-passenger street coaches for Eastern Massachusetts Street Railway, Boston; three 30-passenger street coaches for Masteo Co. Inc., New Britain, Conn.

Twin Coach Corp., Kent, O.: Twelve 37-passenger coaches for People's Motorbus Co., St. Louis; ten 23-passenger coaches for Honolulu Rapid Transit Co., Honolulu, T. H.; two 23-passenger coaches for Capital Transit Co., Washington; eight 23-passenger coaches for Georgia Power Co., Atlanta, Ga.; six 23-passenger coaches for Northern Texas Traction Co., Fort Worth, Tex.; four 23-passenger coaches for Kahului Railroad Co., Maui, T. H.

Pipe

Pipe Prices, Page 79

Pittsburgh — Producing capacity here has not been greatly damaged by the recent flood waters. Pipe mills of Jones & Laughlin, Pittsburgh Steel and some of the National Tube divisions were not touched at any time. Other companies last week were rapidly emerging from damage, and the average of production was close to 40 per cent for tubular products. Buying of oil country goods is a current market feature, also small sizes of lap and butt weld for rehabilitation.

Cleveland—Awards of cast pipe for public works projects in Ohio are small, but more numerous, and inquiries indicate further expansion as weather improves. Miscellaneous orders for steel pipe are fair.

Chicago—Cast pipe business continues to improve gradually. While most orders are for WPA projects, the approach of more favorable weather is stimulating shipments, as well as the closing on projects which have been pending. Bookings usually involve small individual lots, and large tonnages also are lacking among new inquiries. Chicago has closed on 115 tons of offset bends.

New York—Buying of cast pipe has been confined during the past week to requirements placed by the procurement division, treasury department. This business aggregated 860 tons. Pending tonnage aggregates about 1000 tons. Considerable new tonnage is expected to come out soon. Prices are firm and unchanged.

Philadelphia — Commercial pipe business is expanding, reflecting better construction. Heavy tonnages are pending for three federal housing projects, the largest being a $12,000,000 development at Greenpoint, N. Y.

Buffalo—Demand for pipe has been improved by the damage done to municipal waterworks by recent floods. Large reconstruction programs are planned, and many new projects are under consideration.

St. Louis—Inquiry for cast pipe is active. Belleville, Ill. has completed plans for a $434,545 sewage disposal plant. Bethlehem Steel Corp. has been formally awarded the contract for 8000 tons of 60-inch welded steel pipe for the St. Louis waterworks, including all couplings.

Birmingham, Ala. — Cast pipe shops are fairly active, anticipating necessity for greater production as spring weather permits work. Producers are hopeful of getting considerable business in the building of gasoline pipe lines from the Port of Birmingham on Warrior river, to Atlanta, Ga., more than 275 miles in length.

San Francisco — Cast pipe awards totaled less than 750 tons. Bids have been opened on 600 tons for Ogden, Utah. Pasadena, Calif., will take bids April 3 for 498 tons of 6 and 8-inch pipe.

Seattle — Demand for cast pipe is slow, although several municipalities are planning improvements as soon as funds are available. Universal Pipe Co. has been awarded about 400 tons at Chehalis and Kent, Wash., and Multnomah home district, Oregon.

Cast Pipe Placed

660 tons, procurement division, treasury department, New York, to United States Pipe & Foundry Co., Burlington, N. J., and Florence Pipe Foundry & Machine Co., Florence, N. J.

400 tons, various sizes, Chehalis and Kent, Wash., and Multnomah county, Oregon, to Universal Pipe Co., Seattle.

300 tons, water system, Cardington, O., to James B. Clow & Sons, Chicago.

245 tons, Nephi, Utah, to unnamed interest.

225 tons, water system, Bloomdale, O., to James B. Clow & Sons, Chicago.

200 tons, procurement division, treasury department, New York, to United States Pipe & Foundry Co., Burlington, N. J.

118 tons, treasury department, Los Angeles, 4 to 8-inch class 250, to unnamed interest.

115 tons, 6 to 12-inch, treasury department, Santa Barbara, Calif., to unnamed interest.

115 tons, offset bonds, Chicago, to Hansell-Elcock Co., Chicago.

110 tons, 4 to 6-inch, Sunset, Utah, to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, water system Waterville, O., to James B. Clow & Sons, Chicago.

Steel Pipe Placed

Unstated tonnage, 7000 feet of water pipe for installation at Jerome street, McKeesport, Pa., to National Tube Co., Pittsburgh.

Cast Pipe Pending

600 tons, Ogden, Utah; bids opened.

498 tons, 6 and 8-inch, Pasadena, Calif.; bids April 3.

480 tons, for Goshen, N. Y.; general contract to W. G. Fritz, South Orange, N. J.

250 tons, procurement division, treasury department, New York.

Strip Steel

Strip Prices, Page 79

Pittsburgh—This district's leading strip steel producers were all back on normal schedules by last week. The market has been active and many buyers have been entering tonnages before application of second-quarter quantity differentials. Hot-rolled strip is quoted 1.85c, base Pittsburgh, and cold-rolled, 2.60c, Pittsburgh or Cleveland. The former base applies for 1 to 25 tons, and the latter, 3 to 25 tons.

Cleveland—Strip mills in this district have full schedules for several weeks, with heavier specifications from automobile and parts manufacturers. Some orders have been taken for rush shipment as a consequence of inability of certain producers in the flood districts to give immediate delivery. Large orders for shovels for use in those districts also have resulted in some fair size orders for strip from shovel manufacturers.

Chicago—Strip mills continue busy in shipping the large tonnage specified a short time ago. New business is relatively quiet and producers anticipate a quiet situation after the opening of second quarter. Few customers are interested in contracting for their entire requirements of the next three months, though a favorable rate of consumption is anticipated.

Boston—Practically all mills last week stopped taking any more cold-rolled strip steel at 2.65c, base, Worcester. At the same time, most consumers specified enough tonnage to take care of their requirements through April and part of May.

New York—Demand for narrow steel strip is light as most consumers have covered at recent concessions for nearby requirements. Specifications are heavier at the moment, due to consumers in the New England flooded districts resuming operations.

Philadelphia—Sellers of narrow strip see little activity ahead over the next month or two. Most buyers have covered at recent concessions, and further, the practice of slitting sheets is becoming increasingly prevalent, with a result that demand for narrow strip at best is no longer of former volume. New quantity differentials are now generally in effect.

Cold Finished

Cold Finished Prices, Page 79

Pittsburgh—Three of the larger manufacturers of cold-finished steel bars in this district were shipping promptly last week. Most of the outbound material is being supplied out of stock. The market is firm at 2.10c,

base, Pittsburgh, for carbon cold-drawn and 2.95c, Pittsburgh, on alloy quality.

Shapes

Structural Shape Prices, Page 78

New York—Highway departments of the various flood ravaged states have begun to compile preliminary information as to repair and replacement programs which loom ahead of them due to the destructive effects of the high waters. The figures so far available indicate heavy damages to bridges but they cannot be construed as indicating the amount of steel bridge construction involved, due to the fact that many of the bridges washed out were not of steel.

For instance, 120 bridges were washed out in Maine, whose replacement will require $2,500,000. Included are 14 large bridges over the Saco, Androscoggin, and Kennebec rivers, 191 to 1250 feet long. Vermont lost only a few small bridges.

New Hampshire estimates the damage to its bridges at $1,700,000, 26 bridges in that state being damaged. New York state's bridge damage is estimated at $1,720,000, not including county, town and municipal bridges. However, comparatively few bridges in New York state actually were destroyed. Damage in New Jersey is comparatively light. Rhode Island and Delaware report there were no bridge losses.

Connecticut sustained comparatively heavy bridge casualties; the highway department in that state, incidentally, has postponed indefinitely the placing of contracts for the proposed Connecticut river bridge at Middletown, Conn., until it has made a study of the essential repair and replacement work resulting from the floods.

No report yet has been made public on the scope of the bridge repair and construction work required in Pennsylvania as a result of floods, but it is expected the program in that state will be heavy. Diversion of highway funds to relief work in New Jersey is cutting down public work in that state; another development is the cancellation of two PWA projects, a hospital and a school at Newark, N. J., aggregating more than $5,000,000.

Structural lettings show a substantial increase, while the volume of pending work in the metropolitan area alone was increased by more than 5000 tons.

Pittsburgh—Inquiry has been issued for 917 tons for a plate girder bridge, Mahoning township, Lawrence county, and 345 tons for a deck plate girder and deck truss underpass bridge, Montgomery-Philadelphia counties. Bids will be taken at Harrisburg, Pa., April 3, for these two contracts, and on April 9 the state will close on a 338-ton steel viaduct in Butler county. A number of railroads are inquiring for material to be used in repairing and replacing bridges.

Cleveland—Demand for small lots of structural shapes for industrial work at present is heavier than purchases for public projects. Holmes Construction Co., Wooster, O., will award 1200 tons of shapes and 215 tons of reinforcing bars this week

Shape Awards Compared

	Tons
Week ended March 28	10,988
Week ended March 21	12,787
Week ended March 14	27,762
This week, 1935	9,140
Weekly average, 1935	17,081
Weekly average, 1936	21,102
Weekly average, February	23,355
Total to date, 1935	202,099
Total to date, 1936	274,337

for the state bridge over Black river, near Lorain, O. The state has canceled a call for bids April 17 on 700 tons for a grade elimination at Bedford, O., though the project may be revived later.

Chicago—While releases of plain material from fabricators have been in the best volume so far this year, new awards of fabricated shapes have continued small. The largest order is 1700 tons for a Kansas City, Mo., viaduct. Inquiries are headed by 5000 tons of piling for the Chicago river diversion project. An unstated tonnage of plates and shapes also is involved. For the Chicago outer drive development, 15,000 tons still is pending.

Philadelphia—Outstanding award was 1500 tons for two local schools by Ralph Herzog, general contractor. The first in the way of flood replacements involved 250 tons of plain beams for a bridge near Mifflin, Pa. Similar work is expected to follow soon. Several fair sized tonnages are active. Shapes are 1.90c, Bethlehem, Pa., or 2.01½c, Philadelphia.

San Francisco — Structural shapes are active, awards aggregating 1905 tons, bringing the total this year to 36,425 tons, compared with 16,347 tons in the corresponding period in 1935. Included among the larger lots were 600 tons for the Snake river bridge near Lorenzo, Idaho. Bids will be opened March 31 for relocation of Southern Pacific tracks in the Central Valley project, California, involving eight bridges and requiring 20,843 tons.

Seattle — New projects are lacking, but some sizable tonnages are to be placed as quickly as federal officials approve tenders. Inland Steel Co. was awarded 160 tons of sheet steel piling for a WPA weir project in Skagit county, Washington. Revised specifications for the stadium for the Washington state college, Pullman, eliminate most of the original 425 tons of shapes.

Shape Contracts Placed

1700 tons, Twenty-third street viaduct, Kansas City, Mo., to Wisconsin Bridge & Iron Co., Milwaukee.

1065 tons, engineering building, Olds Motor Works, Lansing, Mich., to R. C. Mahon Co., Detroit.

500 tons, plant, Lever Bros., Hammond, Ind., to Wisconsin Bridge & Iron Co., Milwaukee; in addition to 700 tons reported last week.

400 tons, bridge, Crowley county, Kansas, to Kansas City Structural Steel Co., Kansas City, Mo.

380 tons, S. S. Kresge Co. store, Grand Rapids, Mich., to R. C. Mahon Co., Detroit.

370 tons, New York Central railroad bridge, 184th street and Fordham road, Bronx, N. Y., to Ingalls Iron Works Co., Birmingham, Ala.

365 tons, second story framing for warehouse, Alton, Ill., to Rogers Structural Steel Co., Corry, Pa.

360 tons, factory building, 255 McKibben street, Brooklyn, N. Y., to Simon Holland & Son Inc., Brooklyn.

350 tons, building for Owens-Illinois Glass Co., Toledo, O., to Rogers Structural Steel Co., Corry, Pa.

315 tons, bridge, St. Clair county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

300 tons, piling, United States bureau of reclamation, Denver, to Inland Steel Co., Chicago.

250 tons, plain beams for state flood replacements at Mifflin, Pa., to the Bethlehem Steel Corp., Bethlehem, Pa.

280 tons, bridge, Norton county, Kansas, to Omaha Steel Works, Omaha, Nebr.

275 tons, state bridge, Shawano county, Wisconsin, to Wisconsin Bridge & Iron Co., Milwaukee.

260 tons, bridge section, Armington, Ill., to Vincennes Bridge Co., Vincennes, Ind.

250 tons, store addition, John Mullins & Son, Jamaica, N. Y., to Harris Structural Steel Co., New York.

250 tons, toll building, Triborough bridge, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

235 tons, bridge, Portland, Mich., to American Bridge Co., Pittsburgh.

225 tons, concentrator building, International Smelting& Refining Co., Mountain City, Nev., to Worden-Allen Co., Milwaukee.

220 tons, bath house, 145th street, New York, to Belmont Iron Works, Eddystone, Pa., through procurement division, treasury department, New York.

210 tons, Ballentine warehouse, Newark.

N. J., to H. R. Goeller Inc., Hillside, N. J.

205 tons, bridge, Russell county, Kansas, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

200 tons, wool combing building, North Smithfield, R. I., to New England Structural Co., Everett, Mass.

200 tons, medical and surgical building, Cranston, R. I., to Providence Steel & Iron Co., Providence, R. I., through Tucker Construction Co., Providence.

175 tons, highway bridge in Green county, Illinois, to Fort Pitt Bridge Works Co., Pittsburgh.

160 tons, sheet piling, WPA weir project, Skagit county, Washington, to Inland Steel Co., Chicago.

155 tons, bridge, Montrose county, Colorado, to Minneapolis Moline Power Implement Co., Minneapolis.

145 tons, bridge, Brown county, Kansas, to St. Joseph Structural Steel Co., St. Joseph, Mo.

135 tons, garage, Wilmington, Del., to Morris-Wheeler & Co. Inc., Philadelphia.

130 tons, alteration at Fort Schuyler, New York, to Harris Structural Steel Co., New York, through procurement division, treasury department, New York.

130 tons, section 103VF, Wabash county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

120 tons, overcrossing, American Falls, Idaho, to unnamed interest.

120 tons, bridge section, Macoupin county, Illinois, to Worden-Allen Co., Milwaukee.

120 tons, underpass, Red river county, Texas, to Austin Bros., Dallas, Tex.

115 tons, Singer Sewing Machine Co office building, Detroit, to R. C. Mahon Co., Detroit.

113 tons, Owyhee River bridge, near Rome, Malheur county, Oregon, to unnamed interest.

105 tons, bridge, Covington & Forrest counties, Mississippi, to Nashville Bridge Co., Nashville, Tenn.

100 tons, United States post office building, Rome, N. Y., to Utica Structural Steel Corp., Utica, N. Y.

Shape Contracts Pending

20,843 tons, eight bridges for relocating Southern Pacific tracks in Central Valley project, California; bids March 31.

5000 tons, piling, Chicago river diversion project, Chicago.

1500 tons, New York transit commission, six bridges across New York Central tracks, New York.

1375 tons, state bridges, Illinois.

1000 tons, approach to St. Louis municipal bridge; C. E. Smith & Co., St. Louis, engineer; bids April 10.

917 tons, plate girder and reinforced cement concrete bridge, Mahoning township, Lawrence county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 3.

800 tons, building for APW Paper Co., Albany, N. Y.; new bids asked.

625 tons, state bridges, Texas.

600 tons, Home for Jewish Aged, Brooklyn, N. Y.

540 tons, berth 155, Wilmington, Calif.; general contract to Wm. P. Neil Co. Ltd., Los Angeles.

500 tons, school, Nashua, N. H.; Groisser & Shlager, Boston, low.

425 tons, stadium, Washington State college, Pullman, Wash.; Howard S. Wright & Co., Seattle, low.

400 tons, LaSalle academy building, Second street, New York.

400 tons, warehouse, John Mullins & Son, Jamaica, N. Y.

345 tons, deck plate girder and deck truss underpass bridge, Cheltonham township, Montgomery-Philadelphia counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 3.

338 tons, steel viaduct, Jackson and Lancaster townships, Butler county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 9.

320 tons, Eagle Mountain pumping plant, metropolitan water district, Los Angeles; L. E. Dixon Co., Los Angeles, low on general contract.

222 tons, bridge and overcrossing at Winnemucca, Nev.; bids April 8.

200 tons, three state bridges, Grafton and Montpelier, Vt.

157 tons, 2250-foot reinforced concrete and plate girder overpass bridge, Mercer county, Pennsylvania; County Construction Co., Pittsburgh, contractor. Included 89 tons of plain steel bars.

144 tons, infirmary, Cranston, R. I.; new bids to be asked.

120 tons, ward building, Robert Koch hospital, St. Louis; H. B. Deal & Co., general contractor.

100 tons, state highway bridge, Kinkora, N. J.

Unstated, modern bus terminal on site adjoining 1010 Liberty avenue, Pittsburgh; contemplated by Greyhound Lines Inc., with expenditure estimated at about $200,000.

Unstated, building, Patterson Machine & Foundry Co., East Liverpool, O.

Reinforcing

Reinforcing Bar Prices, Page 79

New York—Lettings aggregate only a few hundred tons, mainly in small lots. New projects up for bids involve a total of about 1000 tons. New billet bars continue to be quoted at 2.20c to 2.40c base delivered, New York, to which the $2 a ton trucking charge usually is added for delivery. On small tonnages the market is firm at the 2.40c figure.

Pittsburgh—The state highway department, Harrisburg, Pa., is taking bids April 3 on a total of 288 tons of bars. The state also will ask bids April 9 on 262 tons. Mills are having an unusually heavy call for material to be supplied to jobbers' stocks.

Cleveland—Of the 28 Ohio state projects, involving 2200 tons of reinforcing bars, on the letting of March 17, only five have developed into actual orders, for about 300 tons. The state list advertised for March 31 contains comparatively little bar tonnage, but another substantial letting is scheduled for April 13. While new billet steel bars are fairly firm, rail steel has been offered at concessions of $8 to $10 a ton. Bar sellers are endeavoring to strengthen the market.

Chicago—Awards have consisted almost wholly of small lots, the total being less than that placed earlier in the quarter. Releases against old contracts are increasing and moderately heavy shipments are scheduled for the next 30 days. Inquiries are awaited for additional bridge and grade crossing work in Illinois, while some orders still are pending for the Chicago sanitary district. Prices are steadier.

Philadelphia—Two school jobs involving 650 tons feature business here. Bids were opened a few days ago on a high school at Scranton, Pa., involving 1200 tons of bars, and also 1230 tons of shapes. However, no early action is expected. Flood replacements will make increasing demands as time goes on, but for present many of these will be at the expense of new road jobs which have been under contemplation.

San Francisco—The largest award in the week went to Truscon Steel Co., 503 tons for a court house at Salinas, Calif. Bookings totaled 1592 tons and brought the aggregate for the year to 71,405 tons, compared with 33,939 tons in the same period a year ago. Bids have just been opened by the bureau of reclamation at Denver for 979 tons for Odair, Wash., and on two projects for the Columbia basin, Oregon, calling for 287 tons and 268 tons.

Seattle — The market remains firm although little new work has developed. Several important projects are awaiting approval of federal officials. Bethlehem Steel Corp., was awarded 650 tons for the University of Washington's chemistry building.

Behind the Scenes with STEEL

Index to Materials

SELECTION of materials is a matter uppermost in the minds of many manufacturers these days. What type of steel shall we use? What type of casting? How about nonferrous alloys? Can we use plastics advantageously?—all questions which puzzle designers and engineers engaged in perfecting new products and equipment, as well as in revamping old designs.

One good answer is to consult a directory of materials. In STEEL'S Yearbook of Industry issue was published an extensive directory of trade names of alloy and special analysis irons and steels which served to assist many a troubled engineer. The latest listing of materials is the fourth edition of a directory compiled by *Machine Design*, a Penton Publication, and included in this publication's March issue. A noteworthy contribution to metals technology, it includes 32 pages and lists some 291 iron and steel and nonferrous alloys, in addition to 105 plastics and nonmetallic materials. Complete data are included for each listing regarding producer, analysis, properties and uses. *Machine Design's* Associate Editor H. B. Veith ably superintended the job.

If you could use it, we can arrange to supply you with a copy of this directory for 25 cents, postpaid. Simply address your request to STEEL, Readers Service Department, 1213 West Third street, Cleveland.

* * *

More for Your Oughday

THIS issue marks the close of the first quarter of 1936. A few quick calculations and we find that STEEL has given you 1594 pages in 13 issues, compared with 1284 pages in the similar period in 1935 and 1080 pages for the first quarter of 1934. Your 59-cent dollar is going farther and farther in terms of a STEEL subscription.

* * *

Add Floods

FROM the mud-caked streets of Pittsburgh comes further word on some of the lighter aspects of the great flood of 1936—not that there was anything funny about it to those on scene at the time. National guardsmen took complete charge of the city following the disaster and the greatest trouble they had was not with drenched inhabitants but with thousands of goggle-eyed sightseers, reporters and cameramen.

Some of the reporters who lacked press passes resorted to the subterfuge of showing telegraph company collect message authorization cards which to many of the callow youths of the N.G. looked official enough for press passes.

Incidentally, we are told W. R. Dunlap, public relations chief for Carnegie-Illinois, whipped into his colonel's uniform and took charge of the 106th and 107th companies of the Pennsylvania National Guard.

No radios, no doorbells, no refrigerators, no trolleys, no telephones, no newspapers, no lights and a general aroma of decaying vegetables made life anything but happy for a few days.

Advertisers were quick to capitalize upon a market opportunity for maintenance and repair materials and equipment. See page 45 of this issue for how E. F. Houghton & Co. jumped into the breach.

* * *

Slow Starter

TAKING a fiendish delight in carping over trifles, we call attention to the advertisement on page 57 of last week's issue of STEEL, with the heading "Many a Race Is Won by Starting Right." Below this heading is a large picture of a handsome curly-haired track star about to take off in a dash for the glory of dear old Siwash.

So far, so good; but what we can't figure out is how our handsome athlete is ever going to get started in a hurry, let alone win the race, in view of the fact his spiked shoes appear to be resting daintily on a perfectly flat and smooth surface. When we used to stumble over the 100-yard dash, it was always most essential to have the rear foot braced in a starting hole or against a starting block, to get that added push at the takeoff. And even then we usually came in about 14th.

We're quite sure our friend in the picture will never get away to a flying start the way he's set. Too bad, because he looks capable of doing it.

* * *

Vox Populi

DAWDLING over the "Letters to the Editor" column in a newspaper the other night, hoping to find the answer to life and its many problems, we came across the following words of wisdom which seem to pack a lot of punch in a short space. Over the signature of E.J.M., they read: *"The most dangerous thing that has happened to America of late is the feeling that to be unemployed is heroic, to be successful a crime, and to be a WPA worker a great but pitiful American."*

—SHRDLU

Reinforcing Steel Awards

503 tons, court house, Salinas, Calif., to Truscon Steel Co., San Francisco.

375 tons, Northeast high school, Philadelphia, to Concrete Steel Co., New York, through Ralph Herzog, general tractor, Philadelphia.

Concrete Awards Compared

	Tons
Week ended March 28	1,738
Week ended March 21	1,630
Week ended March 14	6,385
This week, 1935	6,505
Weekly average, 1935	6,862
Weekly average, 1936	8,084
Weekly average, February	8,992
Total to date, 1935	65,744
Total to date, 1936	105,107

275 tons, public school, B and Stetson streets, Philadelphia, to Truscon Steel Co., Youngstown, O., through Ralph Herzog, general contractor, Philadelphia.
188 tons, bridges in Valencia, Eddy, Lincoln and Bernalillo counties, New Mexico, to unnamed interest.
185 tons, treasury department, schedule 5580, Los Angeles, to unnamed interest.
112 tons, bridge, Otero county, New Mexico, to unnamed interest.
100 tons, toll house, Triboro bridge, New York, to Truscon Steel Co., Youngstown, O., through Cauldwell-Wingate Co., New York.

Reinforcing Steel Pending

1400 tons, Eagle Mountain pumping plant, metropolitan water district, Los Angeles; L. E. Dixon Co., Los Angeles, low on general contract.
1230 tons, high school, Scranton, Pa., bids recently opened exceeded appropriations; 1200 tons of reinforcing bars also required.
1220 tons, Naples canal retaining wall, Longbeach, Calif.; bids March 31.
979 tons, invitation 38,229-A at Denver, bureau of reclamation, for Odair, Wash.; bids opened.
500 tons, portable grandstands for municipal stadium, Philadelphia; bids opened.
350 tons, New York Central grading and esplanade job, Ninety-fourth to Ninety-eighth streets, New York.
263 tons, Pennsylvania state highway work; bids to Harrisburg, Pa., April 9, as follows: 161 tons, Butler county; 43 tons, Lehigh and Northampton counties; 39 tons, York county; 19 tons, Lehigh and Berks counties.
200 tons, sewer contract No. 4, Queens, N. Y.
184 tons, reinforced cement concrete bridge, Mahoning township, Lawrence county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 3.
165 tons, state grade crossing elimination, Towaco, N. J.; bids April 6.
163 tons, bridge and crossing, Winnemucca, Nev.; bids April 8.
108 tons, fair grounds, Phoenix, Ariz.; bids opened.

Wire

Wire Prices, Page 79

Pittsburgh—Plants of the Pittsburgh Steel Co., Jones & Laughlin Steel Corp. and American Steel & Wire Co., leading producers of wire products in this district, were operating at normal last week. The nail market is quoted $2.10 per keg, base, Pittsburgh; plain wire 2.40c; and spring wire, 3.05c. The latter two prices represent the revised second-quarter market.

Cleveland—A strong improvement is noted in demand for wire and fencing from agricultural areas. Demand for manufacturers' wire is steady.

Chicago—While new business in wire and wire products is relatively light, shipments continue heavy as a result of recent active buying. Principal gains in consumption of manufacturers' wire have occurred in the automotive industry, though operations among other principal users are holding well. Merchant products are moving better in farm districts.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh—Davison Coke & Iron Co.'s Neville Island, Pa., merchant furnace was again in blast last week, and requirements of the trade were being met. Additionally, many of the steelworks blast furnaces whose output has been in merchant grades, resumed. Shenango Furnace Co., Pittsburgh, will resume blast in its Sharpsville, Pa., furnace within the next few weeks.

Cleveland — Pig iron shipments rose to the high point of the first quarter last week as producers worked to complete contracts before April 1, when higher prices will prevail. Demand from motorcar and jobbing foundries increased sharply.

Chicago—Shipments have improved further, and while new business is increasing, consumers are slow to contract far ahead. Stocks

have been reduced substantially the past 90 days, but most melters are content to order for 30 days' requirements rather than to cover for the entire quarter. Foundry operations are well sustained, with the average melt moderately heavier than that of a month ago. Automotive foundries have increased operations substantially the past 30 days. Prices are firm.

Boston—Second quarter buying has not reached any sizable proportions, due to the fact that many foundries continue to carry large stocks. Market continues at $20.50, Everett, Mass., for 1.75 to 2.25 per cent silicon foundry grade. Some Continental iron is sold here at the domestic base, with occasional waiving of silicon differentials.

New York—With prices well stabilized, fresh buying continued to be confined largely to spot needs. Volume is still adversely affected by reduced operations at certain plants in lower New England areas recently inundated by water. However, the situation in this respect is improving.

Philadelphia—While the melt is slowly resuming normal following floods at various plants, sellers continue to feel in point of tonnage the effects of the recent inundation. Meanwhile, orders are confined largely to carlots. By March 31 shipments against all tonnage contracted for prior to last November will be made; either that, or cancelled, and the cancelled tonnage is expected to be negligible.

Buffalo—Movement of iron again is normal after nearly two weeks of extreme difficulty in handling, due to a 36-inch snowfall. March sales were 10 per cent greater than those of February.

Cincinnati—All tonnage on old orders, at a price $1 below present quotations, was taken out, the time limit being fixed at March 31. Heavy shipments resulted, and will be reflected in the April movement. Melters are slow to enter commitments for full second quarter. The melt was virtually unaffected by flood conditions.

St. Louis—Outstanding features of the market are further gradual expansion in the melt, heavy shipments on contracts, and fairly heavy and diversified buying of small lots for prompt shipment. Inquiry for second quarter has increased, and sellers expect to close on a considerable volume of business during the next few weeks. Implement plants are operating night shifts, and have business sufficient to maintain the present rate into early summer. Jobbing foundries are picking up a liberal volume of orders.

Birmingham, Ala.—Spot orders are numerous, and shipments are steady. Twelve blast furnaces are in operation, and producers believe output this month will exceed any month for several years. Base prices are firm.

Toronto, Ont.—New buying is appearing in better volume, and deliveries again are going forward with the advent of milder weather. Current demand is largely for foundry and malleable grades, although 500 tons of basic was booked during the week. Prices are firm.

Scrap

Scrap Prices, Page 81

Pittsburgh—Although the flood of ten days ago made for absence of consumers' buying, it is significant to note that at no time were embargoes issued by mills in this district. Likewise in the Wheeling-Weirton district, scrap shipments were on a steady basis. The market reverts to a purchase a day or so prior to the flood, which was a $16.25 commitment for yard scrap by a down-river mill. Interest centers this week on a sale by the Pennsylvania April 1, covering 12,900 tons of No. 1 steel, 3200 tons of cast iron wheels, 3600 tons of iron arch bars, 2988 tons of Nos. 3 and 4 rails, 1475 tons of malleable and 1000 tons of No. 1 cast.

Cleveland—Pittsburgh melters are calling for immediate shipments of scrap on contracts and dealers in this district find the situation strong. Supplies from outside are more easily obtained. Prices are holding strongly at current levels.

Chicago—In the absence of orders heavy melting steel is unchanged at $14.50 to $15. This range is strong, however, since sellers are paying $14.75 and $15 to cover orders. Railroad material brings $15.25 or better. Shipments continue heavy, but supplies are plentiful at top prices. Prices of other grades are unchanged but generally strong.

Boston—Volume of scrap shipments, now that the winter weather is at an end, has increased materially, without easing of the market. In fact, dealers buying prices are up 75 cents to $1 on axle turnings, and 50 cents on shafting. The current price on No. 1 heavy melting steel at Boston docks for export is $11, an advance of 25 cents to 50 cents. The biggest advance, however, has been in textile cast scrap which now is quoted at $11.50 to $12 delivered at consuming plants in this district; an advance of $3.

New York—Despite the fact that iron and steel scrap is being shipped in much larger volume, prices continue to move upward. Despite the

feeling that prevailed a couple of months ago that higher prices would discourage further export buying, the export market continues active.

Philadelphia—The trend in scrap prices continues upward, with increases in several grades, largely among the specialties. Some sellers of No. 1 steel assert they have refused tonnage at $14, delivered, consuming plant, because of the tonnage requested at this price.

Buffalo—Again there are conflicting stories as to what is happening in steel and iron scrap in this area. Latest reports are that 15,000 tons additional of heavy melting steel have been sold to local melters at $13.50 for No. 1. Dealers with the largest holdings discount these reports, claim the actual condition is that perhaps 15,000 to 20,000 tons of material have been sold in a purchasing movement spread over several weeks and shared by numerous dealers.

Detroit—Iron and steel scrap market is temporarily weaker. This is due partly to a noteworthy increase in the amount of scrap offered by automobile and parts manufacturers, and to holdups, especially from the Youngstown district. The underlying tone, however, is strong. Many grades are off 25 to 50 cents, No. 1 steel now being $11.50 to $12. Hydraulic compressed bundles remain strong and unchanged at $12.50 to $13.

Cincinnati—The iron and steel scrap market is quiet. Shipments to unaffected points have continued by rail. Prices are unchanged but without test.

St. Louis—Buying of iron and steel scrap continues in small volume. Prices are about steady, reductions offsetting advances. There is a shortage of railroad specialties, and dealers are bidding strenuously for these grades.

Birmingham, Ala. — Though considerable iron and steel scrap is moving, dealers say the market is not as active as it might be. No export business is being done from this section, prices offered at ports not being met. Quotations are firm.

Seattle — The market is firm but dealers are preparing for a possible downward trend. Japan has stopped buying although commitments have recently been heavy and some speculative buying has been done. In the meantime prices are strong at $10.25 to $10.50 for No. 1 melting with rails about $1 higher. The local mills are buying as needs develop.

Toronto, Ont.—General conditions in iron and steel scrap are unchanged. Demand for steel scrap is holding at a good level and dealers are making large shipments of heavy melting steel and turnings to the Hamilton district. Foundries are taking iron grades in larger tonnages than formerly. Prices are not changed but some dealers are showing an upward spread of 50 cents per ton.

Warehouse

Warehouse Prices, Page 82

Pittsburgh — Heavy inquiry for galvanized sheets, steel beams, channels, bars, plates, nails and fencing has come before jobbers. Most supply houses are able to make quick deliveries on this type of material, which is going into industrial and residential rehabilitation from the recent flood disaster. Prices are unchanged, and there have been no reports of premiums paid for recent shipments.

Chicago—Business shows a small increase over the February rate and continues well ahead of the volume a year ago. Seasonal commodities, principally those used for building construction and repairs, are more active. Prices on several grades of

special sheets have been reduced, with commoner products unchanged.

Cleveland — Warehouse business has held fairly steady for several weeks. A moderate increase in the number of orders the past few days is attributed to flood conditions which temporarily interfered with some shipments in affected districts.

New York—Demand for finished rolled steel products out of warehouse has shown some improvement the past week, but current volume is only slightly better than that during February, so that the big improvement expected in March has not yet materialized. Prices are unchanged.

Philadelphia—Jobbers report little tonnage from up-state for flood replacements to date, but expect a sharp increase within the next two or three weeks or as soon as requirements can be more fully gaged. Prices are unchanged.

Detroit—Without noteworthy business from die, tool, and conveyor manufacturers, warehouse business in iron and steel in March was excellent. Indications are this will carry over through April. Prices are steady.

Cincinnati—Demand is unabated, indicating the recent seasonal increase in orders was not spasmodic. Prices are unchanged. Deliveries were unaffected by flood conditions. One interest, hardest hit, arranged for deliveries from stocks outside this city.

St. Louis—Demand for practically all lines of iron and steel out of warehouse is brisk. Fencing material has taken a decided turn for the better, and movement of galvanized roofing to the country has also broadened. Rails are showing some softness, but are in active demand. Sizable orders are reported from the stove, machinery and household appliance makers.

Seattle — Spring buying is increasing, items for tank work and general repair moving in larger volume. Jobbers in the Seattle district are protesting against price concessions on sheets, bars, plates and shapes in effect for several weeks at Portland and disturbing the situation here.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Second quarter contracting for bolts, nuts and rivets is moderately active, and specifications are slightly heavier. Jobbers are adding to stocks and experience some improvement in orders. Railroad requirements are heavier than a year ago, and are expected to increase further during second quarter. Bolt and nut prices are steadier and producers believe much of the unsettlement in these commodities will be removed. A thorough test of prices is expected next quarter. Rivet quotations are steady.

Nonferrous Metals

Nonferrous Metal Prices, Page 80

New York — Nonferrous metal prices held steady last week despite generally light demand. Substantial backlogs of orders on sellers' books combined with steady shipments contributed to firm markets.

Copper—Some sellers remained virtually out of the market at asking levels of 9.50c, Connecticut, while all business was transacted at 9.25c for electrolytic. Sales made a favorable showing, averaging over 1000 tons per day so far this month. Fabricators advanced copper and brass pipe and water service tubing ½ to 1 cent and scrap allowances ¼-cent per pound, effective March 27.

Lead—Sales were light to moderate, all made on the firm basis of 4.45c, East St. Louis. Increased buying is expected during the week ending April 4.

Zinc—Prices held firm at 4.90c, East St. Louis, for prime western despite light sales. No market change is anticipated until unfilled orders on sellers' books are reduced further.

Tin—Demand was dull on most days and prices eased slightly. Straits spot closed around 47.50c, New York. Tin plate operations are gradually recovering from forced shutdowns due to recent flood conditions in the Pittsburgh area.

Antimony—Prices held unchanged in a dull market at 13.50c, duty paid New York, for Chinese spot and 13.12½c, New York, for American spot.

Metallurgical Coke

Coke Prices, Page 79

Shipments of coke have been complicated in the flood districts but large deliveries via the three rivers in the Pittsburgh district are once more approaching normal. In beehive coke, the market is $3.50 to $3.65 for standard furnace, f.o.b. Connellsville, Pa., ovens, but the common foundry grade on the same basis has advanced to a range of $4.25 to $4.35, as compared to $4 to $4.25 recently. Medium sulphur foundry coke is unchanged at $4.50, and the range on premium foundry

coke holds unchanged at $5.35 to $5.50.

Deliveries of foundry coke in the Chicago area in March was slightly less than in February, due to less severe weather. April price is expected to be an extension of the March schedule.

Iron Ore

Iron Ore Prices, Page 81

Cleveland — Important producers of Lake Superior iron ore submitted 1935 prices March 25 to the Ford Motor Co. in response to its inquiry for 490,000 tons. If the 1935 price schedule prevails this will be the eighth consecutive year it has remained in effect. The Ford company may not purchase for several days. In the meantime, there is little tonnage in the open market.

Stocks at lower lake ports and furnaces March 1 were 3,749,278 tons less than March 1, 1935, according to the following report from the Lake Superior Iron Ore association:

	Tons
Consumed in January	2,951,568
Consumed in February	2,632,306
Decrease in February	319,262
Consumed in February, 1935	2,467,269
On hand at furnaces March 1, 1936	20,904,359
On Lake Erie docks March 1, 1936	4,904,168
Total at furnaces and Lake Erie docks March 1, 1936	25,808,527
Total March 1, 1935	29,557,805

The shipping season is not likely to start before April 20, as 23 to 28 inches of ice is reported in Whitefish bay, Lake Superior. Interlake Steamship Co., a Pickands, Mather & Co., subsidiary, is reported to have sold the steamer JUPITER, 5200 tons capacity, to Great Lakes Silica Corp., Cleveland. An agreement has been made between Inland Steel Co., and Pioneer Steamship Co. for the sale to Inland of the PHILLIP D. BLOCK, 10,800 tons capacity. Oglebay, Norton & Co. has purchased two self-unloaders from the Valley Camp Steamship Co., for its vessel subsidiary, the Columbia Transportation Co. These are the JOHN MCCARTNEY KENNEDY and the D. E. CALLENDER, 4400 tons and 4600 tons capacity, respectively.

New York—Tungsten ore prices are moving upward. Chinese wolframite now is quoted at $16 to $16.50 a short ton unit, duty paid, for spot shipment. Domestic scheelite has been advanced from $15.50 to $16.00. As has been the case for some time, the market on imported scheelite is entirely nominal.

Philadelphia—Five thousand tons of chrome ore came to this port during the week ended March 21, 3000 tons arriving from Cuba and 2000 tons from Portuguese Africa. Also arriving last week were 296 tons of ferromanganese from the Netherlands, and 25 tons of pig iron from British India.

Tin Plate

Tin Plate Prices, Page 78

Pittsburgh—Stocks of finished tin plate in mill warehouses built up in anticipation of spring requirements are heavy. Specifications from can-makers are in a good volume. American Sheet & Tin Plate Co.'s New Castle, Pa., tin plate works was unaffected during the flood; Wheeling Steel Corp. resumed with 18 Yorkville tin mills March 24, and McKeesport Tin Plate Co. is putting on hot mills March 30. Prices are firm.

Ferroalloys

Ferroalloy Prices, Page 80

New York—With consuming plants in the flood areas recovering production, ferromanganese specifications are better. Sellers look for shipments to reach a new peak within the next three or four weeks. Approximately 300 tons of ferromanganese came into Philadelphia from the Netherlands recently. The market is steady at $75, duty paid, seaboard. Domestic spiegeleisen, 19 to 21 per cent, also is unchanged at $26, Palmerton, Pa., on lots of up to 50 tons, and $24 on 50 tons and over.

Coke By-Products

Coke By-Product Prices, Page 79

New York—Shipments of coke oven by-products were cut down by the floods in western Pennsylvania. In some cases considerable material on hand was washed away. Production rapidly is being resumed, and shipments practically normal. Prices are firm.

Refractories

Refractories Prices, Page 80

Pittsburgh—Manufacturers of refractory brick have been swamped with inquiries, all for rush shipment. Steel and glass plants and other users, have even gone so far as to accept shipments on wet silica brick, so insistent have they been for immediate repair requirements. Refractory brick makers themselves

have a difficult problem internally. Many kilns were completely covered with water and to dry these is a long job. Prices on refractories are unchanged.

Steel in Europe

Foreign Steel Prices, Page 82

London — (*By Cable*) — Foundry pig iron supplies continue scarce in Great Britain, and some furnaces are booked through June. Some makers are quoting 5s extra on second half delivery. Most steelworks, operating practically at capacity, are extending delivery periods and many are in arrears. Export demand is expanding but makers are less keenly interested. Domestic trade in tubes is active but exports are hampered by Continental competition, the same condition applying to sheets. Rail mills are booking heavy domestic orders.

The Continent reports export trade is quieter, owing to political disturbances. India is buying galvanized sheets.

Wheeler for Irvin, Grace To Testify on Basing Points

(*Continued from Page* 15)

said that the basing point method is open and free, but under the bill price cutting would be destructive.

Federal Trade Commissioner R. E. Freer practically endorsed the Wheeler bill for the commission. He told of the investigations which the commission has made into the basing point situation, with results well known to the steel industry.

"It is a matter of policy for congress to determine," said the commissioner, "whether the employment of the basing point system shall be specifically banned by statute.

"However, it may be said that such enactment would avoid the delay, expense and uncertainty of protracted and expensive litigation in each individual case in numerous industries.

"It would inform all members of each industry as to precisely what rule of law is to be applied. We believe that S. 4055 (the Wheeler anti-basing point bill) is drafted in proper form to attain that end."

Mr. Freer presented certain facts and conclusions bearing on the subject matter of the bill developed by the commission through various investigations, mostly made at the direction of congress. They included steel, pig iron, cement, lumber and sugar.

The commissioner testified that the commission has noted in other industries the existence "of similar conditions which it is the evident purpose of this bill to correct." He named among these range boilers, bolts, nuts and rivets, cast iron soil pipe, and others.

The witness stated:

"There is propaganda that by increasing the number of basing points there is a tendency to eliminate the legal and economic objections to these systems. The addition of new basing points may lessen the discrimination among buyers of diverse sections.

"But so long as the system requires each producer when selling in a territory governed by a basing point other than his own to add the freight from such other basing point rather than from his own, it is obvious that the situation as to price competition has not been altered. Obviously there can only be one basing point applicable in a given case; otherwise the delivered prices would not be identical as they are.

"Since each basing point reciprocally governs the delivered price at all places of delivery to which it is the nearest basing point freight wise, the delivered prices of each producer will be identical at any given place of delivery. * * *

"Delivery service is ordinarily rendered by public carriers. Even though an occasional buyer provides his own carriage facilities he still is required to buy at a delivered price.

"Under the full functioning of the delivered price system the buyers must forego any advantage to themselves which they might obtain if they were free to buy at the place of production or shipment and to control the delivery."

Frost Educates Committee

Frank Frost, president, Superior Steel Corp., who testified that his plant employs 1100 to 1200 men, stated that his plant was the first in the United States to produce strip steel.

It was apparent that he made an excellent impression on the committee. He went into great detail regarding integrated and nonintegrated mills, in that connection explained prices of finished and unfinished products, and gave the committee an education in marketing.

Mr. Frost told of wage conditions before, during and after the steel code became effective, and said that it was necessary, after the new code wages became effective, to increase the price of steel to take care of the wage increase.

The witness said that if the Wheeler bill should become law the small steel producers of the country would be placed in a much worse situation than they are now—and that, he explained, would be so if the basing point system were done away with in any way.

The small steel mills of the country, such as his own, he explained are certainly the backbone of their communities. Mr. Frost said that wage reductions at this time would be harmful and he suggested that no legislation should be passed now that would make such a reduction necessary. He insisted that the Wheeler bill would do just that thing.

Mr. Frost told the committee that there is no uniform cost system in the steel industry today, and he expressed the opinion that it would be a good thing if there were.

Activities of Steel Users and Makers

(*Concluded from page* 28)

corporation. Franklin H. Fowler is president and general manager. Associated with him are W. A. Barr, vice president in charge of manufacturing; F. A. Emmons, vice president in charge of sales; and J. R. Fagan, secretary and treasurer.

♦ ♦ ♦

Stockholders of both the Muskegon Piston Ring Co., Muskegon, Mich., and the Sparta Foundry Co., Sparta, Mich., have approved the merger of the two companies. The combined firms will be known as the Muskegon Piston Ring Co. Consolidation is being effected through acquisition and purchase by Sparta of all the assets of Muskegon Piston Ring by means of an exchange of 1½ shares of Sparta common for each share of Muskegon. The Sparta and Muskegon plants will continue to be operated as separate divisions.

Officers of the new firm include: T. E. McFall, president; John E. Johnson, vice president in charge of the Muskegon division; Harold G. Vaughan, vice president in charge of the Sparta division; George W. Lundee, treasurer, and Mrs. Lou Keller, secretary.

Steel Industry Quick To Overcome Flood Handicaps

(*Concluded from page* 18)

downtown Pittsburgh were so designated and will consequently have to be torn down and rebuilt entirely. Many of these were of old-type construction, 30, 40 and 50 years old.

Part of one large industrial plant, Crucible Steel Co. of America's La-Belle works on the North Side of Pittsburgh, has been condemned and therefore will have to be torn down and rebuilt. This was damaged by a $100,000 fire on March 18, just as the flood waters were nearing their crest. Firemen were almost completely handicapped in fighting the blaze.

On the rivers themselves, vast steel tonnages for replacement will be needed. Many lock gates, such as those at the Emsworth, Pa., unit, were washed away. Damage has been widespread to barges, docks, cranes and marineways that belonged to industrial plants in the Tri-State area. Large losses were also reported in piling for river bank protection, railroad sidings and bridges.

Late last week the Pennsylvania state highway department estimated that 38,000 miles of state roadway were damaged, 29 major bridges destroyed and six bridges probably damaged too seriously for further use.

Allegheny county damage to bridges and other county property was estimated last week at $3,000,000. Johnstown, Pa., city officials estimated flood damage there at $28,821,692, exclusive of bridges, and compared the loss with that of the great flood of 1889, which amounted to around $10,000,000.

The railroads conducted repairs quickly, the Pennsylvania alone having 150 work trains and 15,000 laborers repairing wrecked sections on the main line at Altoona, Pa., and elsewhere early in the week.

What Pittsburgh—and other districts, too—were going to do about it to prevent a repetition of this disaster was a matter of conjecture last week. Many recalled that the Pittsburgh Flood commission as long ago as 1907 predicted a 45-foot flood stage in Pittsburgh. It took 29 years to come, yet no up-river reservoirs have ever been built in the meantime.

Flood Notes

ALL Pittsburgh machine tool houses are open and rendering service. Telephone, telegraph and mail service is back to normal, according to William K. Stamets.

Reliance Electric & Engineering Co., Cleveland, is broadcasting a bulletin on the recommended method for salvaging and cleaning electrical equipment that was submerged.

A General Electric Co. engineer heard over the radio at his home in Schenectady, N. Y., an appeal from Tarentum, Pa., for a 125-horsepower induction motor for the city pumping station. He relayed the request to his office, the need was confirmed and a motor dispatched promptly from Schenectady by truck.

Hours before the flood reached its crest at Pittsburgh, officials of the Westinghouse Electric & Mfg. Co., at East Pittsburgh, were anticipating the need for repairs. A schedule for repairing large utility and industrial plant equipment was formulated, a simplified clerical system for handling emergency repair work was set up, and special drying ovens were constructed.

American Rolling Mill Co. plants suffered no damage from flood conditions. The Ashland, Ky., plant sits so high that the peak of the Ohio river flood interfered only with the blast furnace, and this caused no delay because of the ample supply of pig iron. As a matter of fact, record shipments of finished products were

made last week from the Ashland plant.

Weirton Steel Employes Bulletin was the first paper to publish pictures of flood scenes in Steubenville, O., scooping all contemporaries, including the daily newspapers.

Pratt & Whitney Inc., Hartford, Conn., is located on ground sufficiently high so that flood waters of the Connecticut river did not reach its plant. It did, however, suffer inconvenience from temporarily halted power supply and interrupted railroad service. These difficulties are being rapidly overcome, the company states.

While Holyoke and nearby towns in Massachusetts suffered severely from the flood, the plant of B. F. Perkins & Son Inc., manufacturer of rolls and textile and paper finishing machinery, was able to continue operations without interruption during the high waters.

Equipment

Chicago—While still buying on a limited scale, railroads are slightly more active in the machine tool market. The Santa Fe has closed on two items on its current list, while the Rock Island is inquiring for several large tools. The Milwaukee road is in the market for a number of small tools, and small inquiries also have appeared from the Denver & Rio Grande and Denver & Salt Lake. Machine tool demand elsewhere is holding sufficiently well to indicate that March business will show a fair gain over February. Prompt action usually is taken following the issuing of inquiries. Additional price advances on machine tools will go into effect April 1, these generally being 10 per cent. Higher quotations are said to have had little effect in stimulating new business.

New York—Though somewhat fewer consumers in this territory have purchased machine tools in March than in February, the volume has been equal to that of February, which was the best month, from standpoint of bookings, since 1929. One of the important buyers is Hyatt Roller Bearing Co., Harrison, N. J., which has been in the market on a fairly large scale. Another active buyer is Ingersoll-Rand Co., Phillipsburg, N. J., which has been purchasing for all its plants. General Electric Co., Schenectady, N. Y., continues to buy for its turbine department at Schenectady and now also is buying for its electric refrigerator shop there.

The New York board of transportation will open bids May 3 on a list of eight machine tools and much miscellaneous equipment and shop furniture for the Independent subway system, New York. The New York Central railroad is in the market for a radial drill for its Beach Grove shops at Indianapolis. Crown Cork & Seal Co., Baltimore, is expected to come into the market on a large scale in connection with a new branch plant which it proposes to locate at Brooklyn, N. Y. Moore Drop Forge Co., Springfield, Mass., victim of a fire and a flood last week, is expected to place considerable business.

Prices on horizontal boring machines last week were marked up 5 to 7½ per cent by some makers. One of the planer manufacturers has withdrawn former prices and now is prepared to quote on application, which means an advance. Other advances are expected in the near future.

Seattle—Volume is increasing as the season advances. Logging and lumber activities are calling for various types of equipment and machinery while mining continues to expand. Seattle has opened bids for five hoists and four dump bodies.

Construction and Enterprise

Ohio

BEREA, O. — City, John J. Baesel mayor, is taking bids due 1 p. m. April 13 for completion of sewage plant at estimated cost of $35,800. Engineer is Rollin F. MacDowell, Chester-Twelfth building, Cleveland.

BUCYRUS, O.—Zenith Mfg. Co. has been incorporated, with Arthur W. Sieglaff president, and will take over a shop formerly owned by the W. A. Riddell Co. to do general foundry work and manufacture automobile cylinder heads, manifolds, piston pins and rings.

CANTON, O. — Hoover Vacuum Cleaner Co., 1310 Fifth street, northeast, is building a $100,000 addition to its plant.

CLEVELAND—Empire Sheet & Tin Plate Co., Hanna building, plans construction of a $300,000 addition at Mansfield, O.

CLEVELAND — Industrial Rayon Corp., West Ninety-eighth street and Walford avenue, plans additions to its factory, including new boiler house, total to cost $750,000. Architect is Christian, Schwarzenberg & Gaede Co., 1836 Euclid avenue, Cleveland.

COLUMBUS, O. — City, Robert Tucker superintendent of the division of electricity, City hall, is contemplating construction of one-story, 32 foot x 62 foot electric power substation to cost $16,500.

CONVOY, O. — George Champe & Associates, Nicholas building, Toledo, O., is completing plans for waterworks and sewer system to be submitted to village for approval about April 15. J. S. Redlinger is mayor, Theodore A. Kreischer clerk.

DAYTON, O. — Contracting officer, materiel division, air corps, Wright field, will receive bids until April 17 for a milling machine, circular 36-697; until April 14 for aircraft steel bolts, turnbuckle eyes, and castle nuts, circular 36-702.

DELPHOS, O.—City has authorized Service Director A. E. Weger to obtain estimates of cost of municipal electric light plant.

EAST CANTON, O.—Village, S. H. Browning mayor, is taking bids due noon April 3 for $57,000 water works

system, including pumping unit, pump house, and elevated steel storage tank of 100,000-gallon capacity. Engineer is Roscoe Rice, First National bank building, Canton, O.

EAST LIVERPOOL, O.—Patterson Foundry & Machine Co., Richard L. Cawood president, will purchase one large set of bending rolls for handling heavy plate, and two sets of smaller rolls for lighter and narrower plate work, heavy duty presses for forming, angle rolls, planers, additional hammers, large radial drill, welding machines and annealing ovens, in connection with its $100,000 plant extension. (Noted in STEEL, March 23.)

FINDLAY, O.—H. A. Montgomery Co., 17191 Swift street, Detroit, is building a $250,000 unit in a refinery and plant for chemical specialties here.

GREENFIELD, O.—Village, E. E. Sulcebarger mayor, is contemplating light and water plant improvements, including new building, new 750-kilowatt turbo-generator, complete new remote control switchboard, condensers, pumps, new motor and turbine-driven exciter sets, new superheaters for boilers, 750-gallon pump for waterworks and miscellaneous accessories, total cost to be about $75,000. Engineer is W. I. Barrows, 1169 Reibold building, Dayton, O.

HAMILTON, O.—Beckett Paper Co. is taking bids for erection and equipment of new 250-pound pressure boiler plant, at cost of $250,000. Fosdick & Himer, Union Trust building, Cincinnati, engineers.

KENT, O.—I. P. Harger, city service director, is taking bids due 2 p.m. April 8 for one motor-driven deep well turbine pump with capacity of not less than 700 gallons per minute.

LANCASTER, O.—City has adopted ordinance authorizing service director to advertise for bids for drilling deep water well and equipping with motor-driven centrifugal turbine pump. Walter Graf, City hall, is engineer.

LIMA, O.—Buckeye Machine Co. is building an addition to its plant on East O'Connor street.

LYNCHBURG, O. — Frieberg & Workum Distillery, care of J. L. Bennett, Decatur, Ind., is planning reconditioning of its plant to cost $100,000.

MILLERSBURG, O. — Holmes Rural Electric Co-operative Inc., engineer Carl Frye, 620 Broad street, Columbus, O., is taking bids for rural electrification to service 1200 consumers in Holmes county.

MONTPELIER, O.—Board of public affairs, O. K. Wingard clerk, is taking bids due noon April 8 for steam turbine and generator, air cooler, condenser and necessary auxiliaries for light plant and waterworks, at cost of $46,000.

MT. VERNON, O. — Cooper-Bessemer Co., B. B. Williams president, is considering reopening its foundry here.

NEWTON FALLS, O.—Village, through Bryan & Sigmon Engineering Co., 5900 Madison avenue, Cincinnati, consulting engineer, is surveying feasibility of electric power plant. Dana M. Bailey Jr. is mayor.

PLYMOUTH, O.—Fate-Root-Heath Co., manufacturer of diesel engines, recently purchased another building.

PORTSMOUTH, O. — Structural Steel Co. has been organized following sale of assets of Portsmouth Structural Steel Co. to Portsmouth Auto Supply Co. Calvin Clark is president. New machinery to manufacture all grades of auto and truck springs will be installed at the plant, Eleventh and Washington streets.

URBANA, O. — Champaign Rural Electric Co-operative Inc., Carl Frye engineer, 620 Broad street, Columbus, O., is taking bids for rural electrification to service approximately 1900 farms in Champaign county at an estimated cost of $594,361.

WARREN, O. — General Motors Corp. will soon expend $200,000 on its Packard Electric Co. plant here, including construction of a new 50,000-square feet building, improvement of the old structure, and addition of about $50,000 equipment.

WELLINGTON, O. — Lorain-Medina Rural Electric Co-operative Inc., care of Mr. Powell, Holland-Pratt building, Herrick avenue, east, is taking estimated total bids of $534,690 for rural electrification to service 1664 farms in Lorain and Medina counties. Engineer is Carl Frye, 620 East Broad street, Columbus, O.

YOUNGSTOWN, O. — Cold Metal Process Co., V. J. Lamb president, 1054 Mahoning avenue, plans a new $100,000 modern factory for manufacturing rolling mills for steel plants. (Noted in STEEL, March 9.)

Pennsylvania

CHARLEROI, PA.—Pittsburgh Coal Co., Oliver building, Pittsburgh, is planning development of coal deposits in vicinity of Charleroi, including erection of conveyors, elevating machinery, loaders and other mining and operating machinery. Total cost over $300,000.

CLAIRTON, PA.—American Sheet & Tin Plate Co., Pittsburgh, is planning early purchase of motors and controls, regulators, conveyors, electric traveling cranes and other equipment for new strip sheet mill, entire project to cost over $25,000,000.

CONNELLSVILLE, PA. — Indian Creek Coal & Coke Co.'s tipples were destroyed by flood March 17.

CONSHOHOCKEN, PA. — Conshohocken Pattern Works is in the market for a master aluminum melting furnace.

CORAOPOLIS, PA. — Waverly Oil Co. plant here was damaged by fire March 18.

DURANT CITY, PA.—Continental Glass Mfg. Co., The Hague, Holland, which recently bought the $4,000,000 glass manufacturing plant of the Durant Motor Car Co., is considering rehabilitating and improving the plant at a cost over $37,000. P. G. Sullivan, attorney, First National building, Pittsburgh, is acting for the owner.

GROVE CITY, PA.—Borough, Herman F. Smith secretary, is taking bids due 5 p.m. April 3 for two deep well pumps.

OLYPHANT, PA.—City is planning new electric power plant to cost $195,000. F. F. Kaufman, 909 Pine street, Camden, N. J., engineer.

PHILADELPHIA—Tidewater Boiler Works Inc., Pier 13, Port Richmond terminal, was recently organized to manufacture galvanized range boilers and similar products.

PITTSBURGH — LaBelle works of Crucible Steel Co. of America, at Reedsdale street and Ridge avenue, was damaged by fire March 17.

RIDGWAY, PA.—Ellicott Co., turbine manufacturer, suffered severe losses from recent floods.

SCRANTON, PA.—Board of education plans manual training department in new $350,000 three-story junior high school in South Scranton.

SHIPPENVILLE, PA. — Borough Secretary W. A. Jeannerat will receive bids until 8 p.m. April 8 for construction of a vertical steel tank or standpipe, 15 feet in diameter and 40 feet high, with 52,876-gallon capacity.

New York

BUFFALO — Air Reduction Sales Co., 730 Grant street, will soon take bids for boiler house, to cost over $37,000. J. R. Wolf is in charge.

BROOKLYN, N. Y. — New York Water Service Co., 90 Broad street, New York, is planning to install 132-foot diameter storage tanks costing $65,000 at 3402 Foster avenue. T. H.

Wiggins is engineer, care of owner.

CORNING, N. Y. — Corning Glass Works, Walnut street, will receive bids for five-story, 60 x 165 x 400 foot plant addition, to cost $350,000.

HERKIMER, N. Y.—City will receive bids until April 6 for complete sewage disposal system. H. W. Taylor, 11 Park place, is engineer.

NEW YORK — Electric Light and Power Co., 4 Rector street, plans improvement throughout system in 1936 costing $14,500,000.

ROCHESTER, N. Y.—Standard Oil Co. of New York, Genesee building, Buffalo, plans erection of two 1000-gallon storage tanks, each costing $1000, at 657 Brooks street and 710 South avenue.

ROCHESTER, N. Y.—Tidewater Oil Co., 11 North Pearl street, will erect one 1000-gallon storage tank costing $1000 at Genesee and Hawley street. E. C. Smith, is engineer.

ROCHESTER, N. Y. — Goodyear Wende Oil Co., 26 Lansing street, Buffalo, will erect several 1000-gallon storage tanks here, each costing $1000.

SYRACUSE, N. Y. — W. Gerber, Herald building, plans erection of storage tank at East Fayette and Ellis streets, costing over $1000. Engineer is W. Markam, Everson building.

TROY, N. Y.—Burden Iron Co. is planning factory enlargement costing $37,000. A. Musso, East Orange, is purchasing machinery.

WARSAW, N. Y.—Village is considering plans for water filtration plant to cost $25,000.

Michigan

CHARLOTTE, MICH. — Standard Stamping Co., 530 West Lovett street, is in the market for sheet steel and shearings of all gages from 20 to 10, usually hot-rolled, pickled and oiled, to be used in the manufacture of spacers and bushings for spring and automobile manufacturers. (Noted STEEL, March 23.)

DETROIT — Hydraulic Brake Co., 84 West Hancock street, is planning to embark on the manufacture of electric washing machines, and is expected to be in the market for equipment.

DETROIT—Detroit Vapor Stove Co., Kercheval and Connors avenues, will let contracts soon for new stove factory to cost $45,000. Engineer is Smith, Hinchman & Grylls, Marquette building, Detroit.

HOWELL, MICH. — City will take bids soon for complete sewage disposal plant costing $60,000. Francis Engineering Co., Eddy building, Saginaw, Mich., is engineer.

MONROE, MICH. — Steelcraft Co., automobile body panel manufacturer, will rebuild plant following destruction by fire recently. William Hayes is vice president.

WEST BRANCH, MICH.—Producers Refining Co. will erect a $250,000 oil refinery here. Roy J. Miller, Petroleum Engineering Co., 20 North Wacker driver, Chicago, is engineer.

Illinois

BELLEVILLE, ILL. — City plans complete sewage disposal plant to cost $434,545, of which PWA has allocated $195,545, bonds to be voted for remainder. J. G. Cooney, 3303 Rowland street, is engineer.

CHICAGO—Odman Paper Co., 123 West Austin street, plans rebuilding fire-damaged plant, to cost over $50,000.

CHICAGO — A. B. Electrical Mfg. Co., 2849 North Halsted street, has been incorporated to manufacture electrical appliances. Correspondent is Judson L. Parker, 6420 South Halsted street.

CHICAGO — Republic Steel Corp., Republic building, Cleveland, is planning installation of heavy-duty motors and controls, transformers and accessories, conveyors, electric hoists and other equipment in new wire mill on Burleigh avenue, South Chicago, costing over $750,000. (Noted STEEL, March 9.)

LOMBARD, ILL.—City, through J. E. McCoy village attorney, will soon take bids for 600,000-gallon reservoir and 250,000-gallon elevated tank.

Indiana

INDIANAPOLIS — Rauh & Sons, Union stockyards, plans fertilizer factory construction costing over $40,000.

INDIANAPOLIS — Balkamp Mfg. Corp., 421 North Capitol avenue, has been incorporated to manufacture automobile and truck supplies and accessories, by Roy E. Hardy, Carlyle Fraser and John H. Baldwin, the latter also being resident agent.

INDIANAPOLIS — Indiana Wheel & Rim Co., formerly located at 40 West North street, has acquired a 50 x 195 foot one-story building at 1032 North Illinois street and will install machinery. (Noted in STEEL, March 23.)

Massachusetts

CAMBRIDGE, MASS. — Dewey & Almy Chemical Co., 235 Harvey street, plans early award of contract for new two-story, 57 x 142 foot, factory costing $140,000.

SPRINGFIELD, MASS. — Springfield Armory will receive bids until April 8 for a cutoff saw, circular 172, and a drill grinder, circular 171; until April 9 for a rotary filing machine, circular 178.

New Jersey

NEWARK, N. J.—Hoffman Beverage Co., 402 Grove street, will let contract soon for erection of four-story brewery addition, costing $80,000, with equipment. Architects are Epple & Kahrs, 15 Washington street.

Alabama

MOBILE, ALA. — Rubberoid Co., 500 Fifth avenue, New York, asphalt manufacturer, is taking bids for an extension to its plant, to cost $200,000.

Delaware

WILMINGTON, DEL.—Ludlow Mfg. Associates, Ludlow, Mass., will take bids soon for a one-story, 74 x 74 foot, steel boiler plant to cost $37,000, with equipment. Architect is C. T. Main, Inc., 201 Devonshire street, Boston.

Maryland

BALTIMORE — Maryland Paper Products Co., 1200 South Eutaw street, will remodel an unused factory recently purchased, work to cost $40,000.

District of Columbia

WASHINGTON — Bureau of docks and yards, navy department, will take bids until April 15 on two 75-kilowatt diesel engine generating sets and auxiliary equipment, specification 8168, for aviation station at St. Thomas, Virgin Islands.

Kentucky

LORRETTO, KY. — Loretto Distilling Co. has been incorporated by R. E. Cambron and J. A. Ball, and plans erection of a plant with mash capacity of 500 bushels, work to start sometime in April.

SCOTTSVILLE, KY.—City is planning new electric power plant and substations to cost $150,000. Mayor is R. O. Huntsman.

Florida

FERNANDINA, FLA. — Container

(*Please turn to Page* 104)

(*Concluded from Page* 102)

Corp. of America, 101 West Washington street, Chicago, plans construction of paper plant here. J. J. Broussard is vice president in charge of operations.

Georgia

ATHENS, GA.—Chamber of commerce is negotiating for construction of hosiery mill to cost $100,000, with machinery.

ATHENS, GA.—Lockwood Green Engineers Inc., 30 Rockefeller Plaza, New York, is preparing plans for a proposed $400,000 hosiery mill.

ATLANTA, GA. — William E. Dunn Jr., 470 Peachtree arcade, is in the market for a 50,000-gallon water tank on a 100-foot tower.

MILAN, GA.—Georgia Power Co., 75 Marietta street, Atlanta, tentatively plans extending power line into Milan. City, D. R. Newton mayor, to obtain right-of-way.

Louisiana

JONESBORO, LA. — G. S. Wyatt, town clerk, will receive bids April 7 for 500-horsepower diesel engine generating unit with switchboard.

Mississippi

PICAYUNE, MISS. — Pearl River Corp. was recently organized for textile manufacture and plans construction of initial one-story unit, 180 x 275 feet, to cost with machinery over $150,000. Krouse & Brasfield, Meridian, Miss., architects.

UTICA, MISS.—Taormenia Canning Corp., New Orleans, has acquired a site here and is considering erection of a plant.

North Carolina

GREENSBORO, N. C.—Vick Chemical Co., Wendover avenue, is planning improvements to plant at estimated cost of $37,000.

HATTERAS, N. C.—Hatteras Development Co. will start work in 60 days on erection of power plant, following approval of application by state utilities commission, Raleigh, N. C.

Tennessee

CHATTANOOGA, TENN. — Lloyd S. Jones, Simplicity System building, has incorporated a firm to manufacture boilers, tanks and stacks.

COLUMBIA, TENN. — Mayor and board of aldermen have passed ordinance authorizing issuance and sale of $350,000 light plant system bonds.

MEMPHIS, TENN. — Maj. Thomas H. Allen, chairman water and light division, plans opening bids in June for construction of distribution system, following sale of authorized $10,000,000 Tennessee Valley Authority city bond issue. Roy Husselman, City hall, engineer.

Missouri

ST. LOUIS—International Printing Ink Co., 75 Varick street, New York, will repair fire-damaged factory at 106 Dock street, St. Louis, at approximate cost of $40,000.

Arkansas

LITTLE ROCK, ARK. — City has sold $4,090,000 bonds for proposed water distribution system, opening contracts to be awarded around May 1. (Noted STEEL, March 2.)

Wisconsin

ELCHO, WIS.—Elcho Corp. is planning altering and repairing furniture factory at cost of over $40,000.

KAUKAUNA, WIS. — Thilmany Pulp & Paper Co. plans plant addition to cost $50,000.

Montana

LIBBY, MONT.—Universal Insulation Co. plans to build a new plant here.

Nebraska

OMAHA, NEBR.—Armour & Co., Union Stock Yards, Chicago, plans addition and improvements to packing plant, costing $450,000.

Idaho

PRESTON, IDAHO—City plans rebuilding and enlarging waterworks system, including addition of two reservoirs of 500,000-gallon capacity, costing $30,000. Engineer is R. G. Harding, Bountiful, Idaho.

Pacific Coast

MAXWELL, CALIF.—Maxwell public utility district, C. H. Lausten secretary, has voted $45,000 bonds for sewerage and waterworks improvements.

PLACENTIA, CALIF. — City will hold election April 14 to approve $75,000 waterworks bonds. G. Bates, city hall, is engineer.

PORTLAND, OREG. — Industrial Distillers Inc. will remodel the plant of the Clayton China Works.

ABERDEEN, WASH.—West Coast Plywood Co. will start work immediately on proposed $200,000 plant. Plans include boiler equipment and power plant. A. R. Wuest is president.

ABERDEEN, WASH.—Grays Harbor Chair & Mfg. Co., W. B. Knauer, manager, will start immediately construction of a new factory, 120 x 130 feet.

CLARKSTON, WASH.—Washington Water Power Co. announces plans completed for improvements to local water system.

HOQUIAM, WASH.—City engineer is preparing plans for proposed improvement of local water distribution system.

SEATTLE — Fire recently gutted state highway department garage and laboratory, destroying machinery and equipment.

TACOMA, WASH.—Nelson Boiler & Tank Co. has been organized by former executives of the Birchfield Boiler Works, with C. A. Nelson, president; L. E. McClelland, vice president, and W. T. Lawson, treasurer.

VANCOUVER, WASH. — Port of Vancouver will receive bids after April 2 for construction of freight terminal, 191 x 810 feet, and warehouse 120 x 740 feet, estimated to cost $316,000.

Canada

EDMONTON, ALTA. — North Star Oil Co., 801 McLeod building, plans constructing and erecting oil storage plant costing $45,000. Manager is J. H. McArthur.

LETHBRIDGE, ALTA. — Royal View Coal Mines Ltd., plans reconstruction of power house, including installation of compressors, and hoists.

NORTH EDMONTON, ALTA. — Canada Packers Ltd., Edmonton, is considering erection of new packing plant to cost $1,000,000.

OSHAWA, ONT.—Grant Engineering Co. Ltd., J. H. Purkess secretary, 1164 Beaver Hall hill, Montreal, Que., will soon take bids for new coke manufacturing plant to cost $50,000.

SAULT STE. MARIE, ONT.—Algoma Steel Corp. will take bids about May 1 for construction of new plant, costing over $500,000.

TECUMSEH, ONT.—Empire Foods Corp., J. Wall president, Victoria avenue, plans improvements in ten canneries in Canada in 1936, total costing $200,000.