STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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DEEP DRAWN *and difficult*

● It is one thing to re-design this cash register housing in two deep drawn stampings—each pressed from a single sheet—and quite another thing to make those stampings. But TRANSUE & WILLIAMS Engineers are practical, and the job was done.

As re-designed this new housing has much less weight than the previous assembly, and because of the smoother and more uniform surfaces of the one-piece stamping, our customer obtains a more satisfactory finish. But that isn't all. Production costs are less, handling is easier, and with fewer parts to assemble, *labor is saved.* Moreover, the re-designed cash register has already rung up increased sales!

TRANSUE & WILLIAMS has the ability to design, the facilities to produce. For stampings in production quantities, call in our engineers for counsel.

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ENGINEERING • DESIGN • PRODUCTION SERVICE IN PRESSED STEEL

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As the Editor Views the News

FUTURE generations will regard the floods of 1936 as a convenient landmark of time, much as we refer to the earthquake and fire of 1906, the Dayton flood of 1913 or the stockmarket crash of 1929. However, the immediate effect of last week's disaster is a major setback to operations in many branches of industry. From New England to the lower Ohio (p. 14) high waters have caused serious damage to furnaces, mills and factories. Until the toll is reckoned accurately, estimates will mean little. Nevertheless it seems safe to say that American industry last week suffered a greater property loss than from any single calamity in its history.

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Floods Curb Upward Trend

The angry waters descended just at a time when steelworks operations and industrial activity generally were pointed toward new postdepression high points. Steelmaking schedules at the beginning of the week, if uninterrupted by the floods, easily would have carried the average operating rate for the week to a point comfortably above 60 per cent of capacity. STEEL's index of activity (p. 30) was moving toward the previous high of last December. The floods, of course, have interrupted this upward trend and have set back the indicated gains. Simultaneously, the disaster has created a need for steel (p. 14) for repair and reconstruction.

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Senators Do Not Understand

Hearings on the Wheeler anti-basing point bill (p. 20) have been marked by a ill-concealed disposition upon the part of certain senators to discount the evidence submitted by representatives of steel producing companies. Some of the members of the upper house, who obviously know little of the industry and even less about the basing point system, persist in believing that the system is advantageous to large producers and injurious to small consumers. They seem to think that in fighting for the abandonment of basing points they are protecting the small company from the oppression of large corporations. The system is not as simple as that. Large and small companies alike benefit from basing points, and others—both large and small—are penalized by them. No one claims that basing points are equitable to all interests.

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Refinement Is Better Way

In one sense the basing point system is analogous to the present freight rate structure. Under the existing system or structure certain consumers and shippers enjoy definite advantages over other consumers and shippers. If the basing points or freight tariffs are changed to satisfy complaints, then benefits will accrue to a new group and immediately another group will be penalized. However, this method—while not ideal—does work in the direction of equity for the largest number of interests. It is the process of evolution and refinement. It seems infinitely preferable to the Wheeler proposal, which would upset everything and expose small companies, as well as large corporations, to the chaos of drastic readjustments.

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Be Forehanded in Buying

Hand-to-mouth buying, which was much in vogue during recent years, loses much of its charm when business conditions are improving. One commentator (p. 27) places timely emphasis upon the present desirability of forward purchasing, particularly of "tailor-made" ferrous products. Using steel castings as an illustration, he points out the penalties one pays when he insists upon "rush" shipments. Forehandedness in purchasing should pay dividends—at least under present conditions. . . . STEEL presents in this issue (p. 36) a summary showing the chemical and physical test requirements in all current A.S.T.M. specifications for steel castings. This information, together explanatory text by a recognized authority on the applications of steel castings, should assist consumers in specifying and purchasing the various grades of these products more intelligently.

E. L. Shaner

Steel Industry in Ohio Valley Is Making a Rapid Recovery from Flood

AMERICA'S Ruhr is rising indomitably from the unprecedented twin floods which last week raced down the Monongahela and Allegheny valleys to inundate Pittsburgh's Golden Triangle to a record depth, and thence sweep down the Ohio valley.

Few iron and steel producing and consuming works on these three great rivers escaped some degree of flood waters. Levels four to five feet above the floors of main buildings were not uncommon.

But the flood waters receded late last week as rapidly as they rose, and scarcely had they disappeared when thousands of workmen—almost 50,000—made idle in production departments undertook the task of clean-up and repair. In only a few plants was there sufficient warning to remove the more important motor equipment to high ground.

Notwithstanding the almost herculean task of drying out motors, cleaning out bearings and otherwise removing the mechanical handicaps of the flood, some mills in the Pittsburgh-Ohio river area were again in production at the week-end, and others will rapidly follow.

The brunt of flood conditions was borne by mills in the Pittsburgh-Wheeling-Weirton district, but other districts also felt the heavy hand of inclement weather.

Snow Handicaps Buffalo

At Buffalo, a fall of 22 inches of wet, hard-packing snow gave mills great difficulty in the movement of cars within their yards. At the Lackawanna plant of Bethlehem Steel Corp. hundreds of switches had to be dug out by hand, yet not a single major production unit was shut down.

Bethlehem experienced difficulty at its Steelton, Pa., plant as well as at Johnstown, but the waters at Steelton receded rapidly and the suspension was not prolonged.

In the lower New England area, flood conditions hit consumers of finished steel, resulting in requests for suspension of deliveries.

In eastern Pennsylvania, steel production at three large plants was seriously threatened at the height of the flood, the greatest danger being at Harrisburg, Williamsport and Wilkes-Barre, Pa., and Cumberland, Md.

The silver lining—if national misfortune can be termed that—for the steel industry is the prospective requirement for considerable structural steel and reinforcing bar tonnage for road and bridge reconstruction. But even this lining is dimmed because some of the funds to be devoted immediately to the construction of new bridges and highways will be diverted from funds destined for 1936 maintenance.

In the iron and steel empire stretching from Johnstown on the north to Portsmouth on the south, is approximately 35 per cent of the nation's steelmaking, and 33 per cent of the nation's steel finishing capacity. In units, some 75 blast furnaces and 450 open-hearth steel furnaces, with an annual capacity of 22,000,000 tons of ingots and 18,000,000 tons of finished products, are in the affected area.

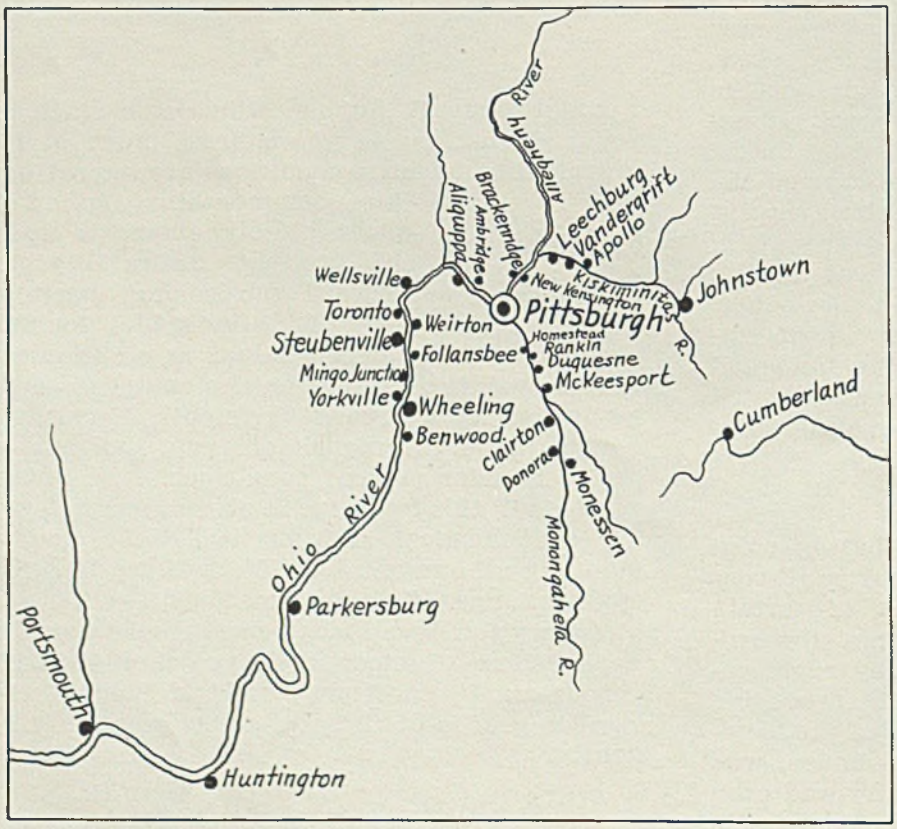
Many Plants Isolated

From last Tuesday and Wednesday through Saturday many plants in this territory were completely out of communication with their headquarters and their branch sales offices.

Up to this writing (Friday night) only incomplete reports were available, though it was generally understood that repair and clean-up forces were at work and resumption of production was near.

Jones & Laughlin Steel Corp.'s Eliza and South Side works in Pittsburgh were many feet under water. At its Aliquippa, Pa., plant, down the Ohio river, water rose to five feet above the floor in the tin house, wire department, and pipe mill, but did not reach the blast furnaces or open hearths. Some finishing departments at Aliquippa already have resumed.

Being on high ground, the Carnegie-Illinois Steel Corp.'s Clairton plant was not affected by water, although handicapped by the inability



On this map are spotted the principal iron and steel cities inundated last week by the flood waters of the Ohio and its tributary rivers

of railroads to handle traffic in and out of the greater Pittsburgh area. The Homestead plant was down for several days, but was reported rolling in some departments Friday. One bar mill at Duquesne was operated through the flood period, and one open hearth resumed there Friday.

Flood waters from the Allegheny and Monongahela rivers began to rise at Pittsburgh late last Tuesday and through the night and Wednesday rose at the rate of more than one-half foot an hour. By Wednesday evening the depth of the water had risen to the unprecedented high of 46 feet.

Previous high was 38.5 feet, established in 1907, but the waters of last week, some eight feet deeper, rose up through the Golden Triangle and submerged stores, office buildings and industrial plants through at least the first floors.

Steel Offices Deserted

On Wednesday the national guard was called out and martial law declared in downtown Pittsburgh. However, with elevator, water, heat, light, telephone and telegraph service suspended, there was no possible opportunity for steel headquarters in downtown Pittsburgh office buildings to function anyway.

The tragedy of last week from the Pittsburgh standpoint was the fact that it had just started to operate at 50 per cent, a sharp advance from the 43 per cent rate the week ended March 14.

This spurt resulted from a heavy influx of steel demand against expiring first quarter contracts, in view of the recent movements to clarify and impose quantity differentials. For all practical purposes, the 50 per cent rate held only for the first two days of last week; from then on, production was negligible.

Even had flood waters permitted steelworks to operate, railroads were unable to handle traffic. So high was the stage of water at Pittsburgh & Lake Erie railroad's Smithfield street station in Pittsburgh that the canopies over the passenger tracks were completely submerged. The Pennsylvania railroad's tracks in its Conway yards were four feet under water.

As the crest of the flood passed Pittsburgh, Wheeling and other steel cities on the Ohio river below Pittsburgh began to fall victim. Relatively, the flood damage was less because of the warning afforded by the Pittsburgh situation, but even so several days at least will be required to clean up the mills.

The Crucible Steel Co. of America's LaBelle works on the north side of Pittsburgh was badly gutted by fire last Tuesday night. At Etna, Pa., the Metzger Bolt & Nut Co. also suffered fire damage.

At Ambridge, Pa., down the river from Pittsburgh, there was four feet of water on the floor of the main erecting shop of the American Bridge Co.

Many iron and steel consumers in the greater Pittsburgh area not directly affected by the flood were com-

Cambria Iron Bears Brunt of Historic Flood in 1889

LOOKING back some 47 years to the time of the disastrous Johnstown flood, it is interesting to recall the following comment in the June 6, 1889, issue of Iron Trade Review (predecessor of STEEL*), published just one week after the tragic Johnstown inundation:*

'Direct and indirect financial loss, by reason of the appalling flood in the Conemaugh valley of Pennsylvania last week can never be accurately estimated. Allowing for natural exaggeration, it would seem that the generally accepted estimate of $40,000,000 is not unreasonable, when it is considered that not only was great loss, both individual and corporate, entailed, but that in very many instances entire assets were swept away in a moment, beyond all recovery . . .

"Upon no one corporation has the direct financial loss fallen with greater force than upon the Cambria Iron Co. . . . Published estimates of the loss of this company place it at from $2,000,000 to $2,500,000. It can scarcely be less than the latter figure, for the upper mill is totally wrecked, the lower mill is damaged to such an extent that all machinery and buildings are useless, the Gautier wire mill was destroyed, the great supply stores were swept away, the company's handsome office was ruined and, of course, most of the tenement houses are gone. Greater than this property loss, however, is the loss of many of its most faithful lieutenants and employes. . . .

"In the midst of this almost crushing calamity, the recuperative power of the company has been amazingly demonstrated. Scarcely had the waters subsided, before it was announced that the work of cleaning up and rebuilding would immediately begin. . . ."

Airplane view of the Cambria plant of the Bethlehem Steel Corp. at Johnstown, Pa., under flood waters. In the foreground are the seven blast furnaces; in the background are shown some of the Bethlehem mills. International News photo

pelled to close because of inconvenience to employes. Typical was the Westinghouse Electric & Mfg. Co. which broadcast instructions to its employes through its radio station KDKA Wednesday evening.

The large stocks of scrap dealers in the Pittsburgh district were under water for several days, suffering no damage, of course. But the scrap trade was disorganized much of last week through its inability to make shipments.

The Weirton, W. Va., plant of the Weirton Steel Co., a subsidiary of the National Steel Corp., was able to operate throughout the flood period, but its Steubenville, O., works was down the latter part of the week, with 4 feet of water in it. On Friday this situation began clearing up.

Among the important steel producing centers, Chicago was singularly blessed by the elements last week. Completely escaping the blizzards and floods which wrought havoc in the East, mill operations advanced to the best rate in more than a year. Ingot production at 63½ per cent was the highest since February, 1935.

In the meantime the district was speculating on the possibility of being required to absorb temporarily the business which the inundated Pittsburgh and Wheeling mills were unable to handle. Late last week it was difficult to estimate how much benefit would accrue to Chicago interests by virtue of the eastern tieup, but it was thought that a westward gravitation of a fairly substantial tonnage was inevitable.

Carnegie-Illinois Steel Corp. was awaiting a determination of the time necessary to put Pittsburgh mills in operation before calling on the Gary and South Chicago works to fill the breach. Chicago sheet mills already are heavily booked for the remainder of March and are unable to accommodate additional business immediately.

Chicago sales offices of Pittsburgh district mills figuratively were marooned to the same extent as were their home offices and plants. Flooded by calls from customers inquiring as to the probable date of shipment against old orders, officials for a time were unable to give a satisfactory answer because of the lack of communication facilities to Pittsburgh. Order cancellations were not infrequent, but salesmen were as helpless to report cancellations as they were to file new business. The latter dwindled sharply, however, as soon as the crippled condition of eastern plants became known.

Recall Capt. "Bill" Jones' Aid to Johnstown in 1889

LAST week's flood at Johnstown, Pa., recalled the unprecedented action of Capt. "Bill" Jones, the beloved steel man of a generation ago, in rendering aid in the catastrophe of 1889. Hearing that Johnstown had been made a shambles by the breaking of the dam, Captain Jones immediately shut down the Edgar Thomson steelworks of the Carnegie Steel Co. at Braddock, Pa., crowded his employes into freight cars, and dispatched them to Johnstown to assist in rescue work. Only four months later an explosion as he was righting a "hanging" furnace took Captain Jones' life

After the Deluge, What Happens in a Modern Steelworks?

For the answer, STEEL *has gone to John D. Knox, an associate editor who spent many years in practical blast furnace and steel mill employment prior to taking a place on the staff of* STEEL. *His appraisal of the situation follows:*

PLANTS in the Johnstown, Pittsburgh, Steubenville and Wheeling districts which were compelled to suspend operations on account of high water conditions are alive with seething activity as the waters recede.

Storerooms will ration out many pairs of gum boots, and men whose duty it is to manipulate levers in rolling mill pulpits, on cranes or open-hearth charging machines as well as those who ply their trade in various steelworks departments, will be pressed into service shoveling mud and mud and mud.

Firehoses, long in red painted cabinets, will discharge many a gallon of water just as soon as pumps can be started. And in another week steelworks stacks will be pouring out smoke, whistles will be announcing the change of turns, and the time clocks again will be ringing full time crews in and out of plant enclosures.

What does it mean to a steel plant when the rivers overflow their banks and bring operations to a standstill? Well, it means plenty. Of course, many if not all plants in the flooded area had sufficient time to prepare for the worst with the possible exception of some of the blast furnaces. Even so, there is plenty of work ahead for every mill man in the flooded districts to do.

Take the blast furnace that may not have had time to get ample blanks of coke down into the bosh. Perhaps the furnace was cast just before the crew was compelled to leave. Maybe the blowpipes were dropped. Maybe they weren't.

It will not make much difference what was done just before the furnace gang left if the water was high enough to encircle the hearth. The intermediate cooler may have to be pulled out and many a tank of oxygen used to break through the skull in order to get the iron out through the cinder notch. Or perchance the furnace crew may be obliged to go higher up, say to the first bosh cooling plate in order to get the iron running.

Work for Electricians

What about the motors driving pumps which usually are located in pits many feet below ground level?

What about motor-generators and other pieces of electrical equipment in steel plant power houses? All now are bedecked with mud and moisture, both inside and out, and to apply power before drying out coils and armatures and windings would mean short circuits and further delay. No, electrical gangs in every steel mill encircled by flood waters will have many an hour's work as well as a fat pay envelope for the next few weeks.

Open-hearth departments probably had sufficient time to get rid of heats before the water came into casting pits. But the flues, regenerators, and possibly the slag pockets of open-hearth furnaces would bear the brunt of the damage. Unusual maintenance work is ahead for the mason departments, for if the brickwork was hot when the water rose in the plant refractory replacement will of necessity have to be made on a large scale before furnaces are again ready for charging. Then there are the pumps, electrical equipment, conduits, bearings on ingot cars, etc.

Millwrights will be swinging sledges for the next few days and nights in an effort to get mill pinions and roll stands free of mud and in condition to send tonnage over the runout table to the cooling bed. For every roll in the housings of mills flooded with water will have to come out to afford bearing inspection and make sure that no grit and grime will remain to destroy the bearing surface when power again is applied.

Then there is the tin house, where swirling waters engulfed tin pots. Gas burners require cleaning.

Well, just as water went 'round and 'round, so are the repair gangs doing. Discouraging as was the first view after the waters subsided, the cleanup will be accomplished quickly, and in a few days the mill forces will be talking about "the big flood of 1936" as past history.

Who Is Under Suspicion In Sales Management?

BY AUSTIN S. CHAVE

WE HAVE salesmen, order takers, customer spoilers, and other members of our selling fraternity. A sales manager has them all, and it is his job to sort them out, develop some, and replace others. An eye must be on retaining customers and securing new ones in each territory; not for one item or a good volume only but for all items salable in each territory and for as large a volume of each as is possible.

This sorting out, retaining, and disposing of salesmen selling a balanced line and getting volume all ties together.

It is not the sales manager's job to produce the article to be sold in most cases. That is up to the production end. We expect the latter to study the product, test it this way and that, strengthen its weak points and build it up to a great degree of efficiency, test its ability to serve its purpose, and generally to have the product as good or better than its competition. It must be right when turned over to the sales department. The sales manager asks for an up-and-coming something to sell.

Manager Must Know Men

Now the sales manager has a job: Does he hire men, maybe put them through a sales course, send them out with a senior and then bless them and turn them loose? If they sell, that's good; if not, fire them! Get another?

A sales manager builds up his salesmen the same as the production man develops his product. He knows when, where and how his salesman is failing, if he is, what part of the selling program stumps him when presenting, if he is selling a balanced line (proper proportion of all items), if his volume is up or down —before it is too late to save the situation—whether he is a good salesman in a poor territory or a poor man in a good territory—Or does he?

A sales manager should know his men. He should study them as though they were his product. They really are. He should try to know why they are going to fail before they do. Assume it costs the company $200 to hire and train a salesman; this is a very nominal cost and yet in dollars, it represents a fair return on a $4000 investment at 5 per cent for one year. A company owes a debt of responsibility to the salesman and his family which was incurred when making certain representations to induce him to join up. We lose standing with our customers when salesman turnover is too frequent.

It is not any more possible to outline a blanket plan to handle preparation of salesmen or the salvaging of them than it is to lay down a blanket rule how to make commodities and services. Each industry has its problems, and each individual salesman becomes a separate job. If the sales manager thinks of his salesman as a $4000 capital investment entrusted to him, he will more carefully protect and develop this asset.

Let's carry this idea of entrusting capital to the sales manager farther. Let us assume this salesman produces $1000 per year earnings for the company—that seems to place a real responsibility on the sales manager. A great auto manufacturer stated recently that it has $7800 invested for each employe, including the sales force.

Austin S. Chave

His knowledge of sales is a result of many years of study in this specialized field combined with practical experience as a sales manager. He also has handled large groups of men. Now a resident of Cleveland, Mr. Chave was brought up in the steel industry, and later operated a large machine shop and foundry

We are all familiar with cases where a salesman joined the company, made good as a salesman, was promoted, and finally reached the sales manager's job. This man may become more of a burden than a help unless he has the breadth of vision of a true executive.

A good machinist may be a star at his lathe but a production manager "co-ordinates." A sales manager must see all things too. Here is a salesman who fails in his opening, another in his presentation, and a third in his close. One may be fearful and another too cocksure. Some can be told their weaknesses, others must be led gently.

The average company thinks that its product must be exactly right. It would not think of employing a production manager unless he knows how to analyze his job, but it will hire a sales manager who has not the slightest comprehension of building a sales force with the same exactness that is required of the production man. The sales manager must know each cog (salesman) in his organization as well as the production man builds each cog in his machine perfectly.

Paying Attention to Details

The writer recently talked with a sales manager of a national company who could not present its sales story. really read the records of salesmen's daily progress, did not know or have records to show what items each man sold (only total volume), and thought such detail unnecessary. He rose from the ranks and has the confidence of his superiors, in spite of irregular sales results and unhappy salesmen. For five months he was out of the sales manager's saddle and volume went up, but he still thinks detail used by his substitute is the "bunk."

It is important that each salesman be made happy and is treated as an important individual. He must know the company is interested in him personally. Loyalty and volume are the natural result.

The sales manager who can adopt this procedure understands methods of compiling records and controls, produces the result of increased volume, a better balanced business, and a stronger and more permanent organization. He attracts better men because he has something to offer them. Salesmen recognize this as building for expanded opportunity.

It seems that a sales manager should be trained for his work as though for a profession to the same degree that a production manager must train for his specialized duties.

The sales manager must give something of himself each time he calls on

his salesmen or has them come in to him. When the salesmen sense this they sense a leader. An analysis of the salesman is disturbing but it must be applied audibly, in writing, or by corrective measures.

If a company has a number of items to sell and services to render for a charge, it is necessary for the sales department to sell a full quota of each item. This finally rests on the salesman. No company intends to leave such a salesman to his own devices but desires to give him generous co-operation, yet certain conditions are frequently overlooked. The average large company has the run of the nest variety of salesman, better or worse. He must be built up, so he is sent to a class for a short period or perhaps placed under a store or branch manager or in smaller companies directly under the sales manager.

Keeping Sales Records

He is taught the line, its application, how to handle his customer, and sometimes how to present his sales story. Sometimes we go further. We keep a record on a card or in a binder of his sales by volume or quantity. Sometimes we send the salesman or his superior a report of volume by item, though this is further than most go. Where there is failure we ask for improvement—or else!

Salesmen at times feel they are used like machines, and yet sometimes they would be better off if they really were used as a machine. Can you picture the production manager walking over to the shop, and telling the superintendent to see that some machine is improved and then the superintendent going down the aisle to the machine in question and "bawling it out"? Not at all; he would check the machine for its weak points and correct them. If the superintendent cannot do this, the production manager helps him to a point where he can check his own machines in the future.

A national company recently suffered from competition; a sales story was needed. Canned talk was out, yet it was necessary for the salesman to tell the entire story. Interruptions threw him off the track. He forgot good points, and when a certain feature came up he danced around it and failed to impress the prospect. He forgot the answer.

Poor closes meant poor commission, and good men were not attracted.

The division manager knew the volume of the offices, but not who failed and who made good. He thought he had too many men for more than a monthly report to the branch manager, which was usually in the form of a scolding. Detail daily sales report were sent in, filed, and forgotten.

Branch managers were salesmen who had made good. Many were good salesmen but not good sales managers.

Branch managers and salesmen were fed up with criticism.

Sales Plan Is Introduced

What appeared to be a hand-made, typed, and pasted-up sales presentation "outline" was worked out. Salesmen tried it and closed their deals. The troublesome feature was capitalized on and used as a close. (Printed sales presentations with no personal touch have little value.)

The sales plan was used to attract good men for branch manager jobs. Opportunity was built around it.

A visible signalled record of salesmen's progress was set up, and instead of 50 salesmen's sheets buried on cards, the division manager is now able to get comparative conditions for any particular study in a minute or two. Offices were also set up on the same type of comparative record. A helpful letter went to each salesman, where needed, three times a month. The sales manager now knew the weaknesses, if any, and was in position to give help. Average earnings increased as did the company business.

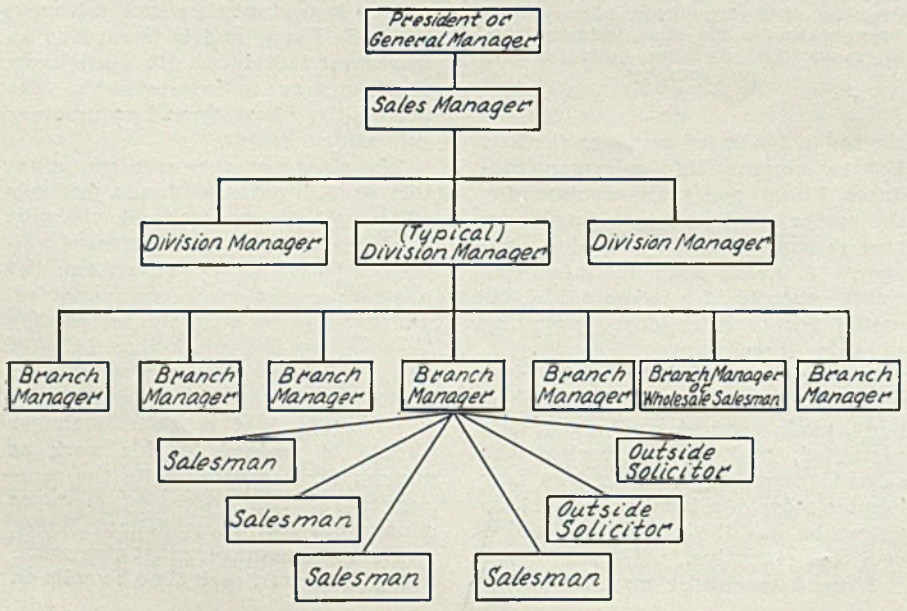
Division Heads at Fault

Everyone in the sales organization saw the need of help. The weakest point was not in the salesmen group. It was higher up. The division managers did not talk in detail to the salesmen or have meetings with them when in town. They were not close to their men, because they had little to offer. They did not "dig" in. Here was a salesman who skipped over this line, and another passed up that one. One made too few calls, another too many. Some were sometimes discouraged, and when the division manager called they unloaded, but since the division manager was hazy about their individual record it ended just in talk. The branch managers could not help often for they felt the salesman's failure reflected on them and their alibis were unique. They usually were not instructed as branch *managers of salesmen.* When promoted they were taught mostly how to send in reports, orders, etc.

Here was the machine out of order; a production man would clean up the situation if it took all night. He would not talk generalities and leave town.

Another large company had a salesman in a certain large city who was so good he was called a leader, sat at the speaker's table, etc. It had another salesman who was being discharged as a failure the day a check-up was made. The record had shown our great salesman was a non-producer who just wrote business he had not intitiated, and was not calling on his trade; it indicated the branch manager in the city of the failing salesman was in need of help.

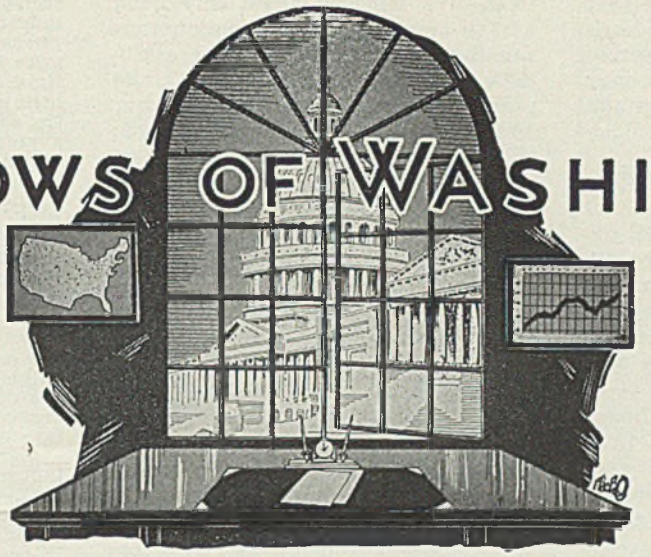
To sum it up—if one salesman can be saved, one improved 20 per cent, another 12 per cent, perhaps another not all, the average increase may be enough to pay a good return on the entire business. Business curves are going up; now is the time for sales forces to tighten up.



Wired for Sound?

RAVENS in the vicinity of Delhart, Tex., are building nests out of barbed wire according to the Associated Press. Sticks, straw, and other materials normally preferred are said to have been blow away by recent dust storms, and the birds have been compelled to resort to short, rusted bits of barbed wire left in fence corners

WINDOWS OF WASHINGTON



WASHINGTON

THE ways and means committee of the house, that body which is charged with producing the extra taxes asked for by the President, is having a hard time giving birth to ideas.

Every effort was being bent last week by the subcommittee, which has been working on a new bill ever since the President sent his message to congress, to have some kind of a bill or report ready for the full membership so that hearings could be commenced some time this week.

Chairman Hill of the subcommittee has announced that there is a possibility that congress might have to resort to processing taxes in spite of a sincere desire on the part of members of both parties to avoid that if possible during this election year.

Weaknesses Develop in Plan

Administration spokesmen feel that the income taxes which were collected last week are going to be much higher than they have been, but, of course, this was taken into consideration when Mr. Roosevelt asked for the additional sum. It can be taken for granted that he put these figures as high as he dared, in order that the extra taxes should be as small as possible.

Several weaknesses have developed in connection with the suggestion of assessing taxes on undistributed corporation taxes which evidently had not been taken into consideration before. One is that foreign holders of American stock are not subject to individual income taxes of this country, and Mr. Roosevelt had specifically pointed out that when extra dividends were paid that the United States government through tax collections would benefit by this.

Another one is the fact, which of course had been taken into consideration but apparently not by members of congress, that the wholesale distribution of corporate reserves would weaken companies in times of business depression. This latter matter has been given the most serious consideration by the subcommittee in its deliberations recently.

As has been pointed out in this column several times, because of the approaching campaign many legislators have indicated that they want to make the tax program as small as they possibly can and get by with it.

It should be understood that imposition of the proposed tax will be accompanied by elimination of the present capital stock tax and the recently-revised corporation tax. Presumably the new burden would fall heaviest upon personal income taxpayers in the higher brackets, whose income is derived primarily from dividends.

Following is a tentative schedule drawn up by the subcommittee:

Per Cent of Total Net Income		Effective Tax on Amount Retained	Rate of Tax on Total Net Income
Retained	Distributed	Per cent	Per cent
0	100	.....	.....
10	90	15.0	1.5
20	80	22.5	4.5
30	70	30.0	9.0
40	60	36.3	14.5
50	50	40.0	20.0
60	40	42.5	25.5
70	30	44.3	31.0
80	20	45.6	36.5
90	10	46.7	42.0
100	0	47.5	47.5

BERRY COUNCIL REPORTS, BUT NOW WHERE DOES IT GO?

Following submission to President Roosevelt last week of the recommendations of the George L. Berry council for industrial progress, there is increasing speculation as to just what is going to become of that body.

At its meeting here a few days ago, after having approved, unanimously and otherwise, seven reports, it also passed a resolution asking for the continuance of the organization.

There is the feeling on the part of some that the President is most anxious to do something for Major Berry, especially in view of the fact that he has publicly announced that he will run for governor of Tennessee. It has been pointed out in some quarters that, if something is not done by the President, he will put himself in the position of throwing down the major, and this is apparently the last thing he wants to do.

However, as pointed out in these columns before, the only thing that can be done to prolong the life of the council is by Presidential proclamation and also by the President digging up money out of some sock.

At the recent conference of the council, owing to a protest by William Green, president of the A. F. of L., the report favoring the withdrawal of the government from competition with private enterprise was modified. Mr. Green called attention, in executive session, to the fact that the federal government greatly aided recovery through the RFC, the Home Owners Loan Corp. and similar organizations, which in normal times might be considered competitors of private enterprise.

FTC MAKES STRIDES TOWARD GREATER POWER

In spite of all the opposition which the National Association of Manufacturers and the United States chamber of commerce could muster, the senate committee on commerce has favorably reported out the Wheeler bill to expand the powers of the federal trade commission.

The trade commission, under this new measure, would have power on its own motion to eradicate and investigate "deceptive acts and practices in commerce" in addition to its present authority to attack "unfair methods of competition."

Moreover, under authority provided in the new Wheeler bill it could direct its authority against "persons and partnerships" as well as corporations. It was the contention of the

committee in making its report that "it is manifest that unfair, detrimental or illegal practices affecting or interfering with commerce may be carried on as well by persons and partnerships as by corporations."

STEELMAKERS, FABRICATORS HOLD TO NRA STANDARDS

The iron and steel industry is given a moderately clean bill of health in regard to maintenance of hour and wage standards of the now defunct setel code, in the Roberts report just transmitted to the President by Secretary of Commerce Roper.

In the iron and steel industry proper, 143 establishments with 183,233 employes were surveyed. No departures from the NRA standards were reported in 116 establishments employing 131,276. Departures are reported in the following classifications: In both labor and trade practices, five establishments employing 34,880 persons; in labor only (trade practices covered also), two establishments employing 5165; in trade practices only (labor covered also); 19 establishments employing 4712; in trade practices only (labor not covered), one establishment employing 7200.

In the cast iron soil pipe industry in which there are 43 establishments employing 6645, there were no departures from code standards in 22 establishments with 4755 employes.

In the fabricated metal products industry with 2824 establishments and 153,983 employes, there were no departures in 1676 establishments employing 97,628. The largest group to depart from code standards was in regard to labor only (trade practices covered also) numbering 794 establishments, involving 28,122 employes.

Steel Leaders Defend Basing Points; Ickes Threatens a Federal Steelworks

WASHINGTON

AS HEARING on the Wheeler-Utterback anti-basing point bill dragged through its second week it became increasingly apparent that a big majority of members of the interstate commerce committee of the senate is convinced that something should be done about the steel basing point system.

The best opinion is that the bill will be reported out favorably by the committee in some manner calculated to make every steel producing point a basing point, but while the bill might be passed by one house of congress at the present session, its passage by both is doubtful.

Industry Should Take Lead

The Washington viewpoint is that if the steel industry does not revamp its pricing system congress will, and that the industry would be well advised to do this job from the inside. This, however, is an orthodox viewpoint based upon the alleged divine right of Washington to control industry, and steel leaders who testified were not disposed to get into a panic over the possibility.

It was a decidedly hostile committee before which the parade of steel executives passed last week. Senators Bone, Wheeler, and Shipstead, in particular, attempted to harass the steel witnesses. Senators Davis and Minton, when they attended the hearings, tended to smooth down other members of the committee and to be more gentle toward witnesses.

Walter S. Tower, executive secretary of the American Iron and Steel institute, declared that basing points, with few exceptions, are places which are important centers of iron and steel production, that in all there are more than 80 basing points for the steel industry. He said further:

> In quoting a price for his product the seller uses the basing point which will give the prospective customer the lowest "delivered" price. As a result of that practice a producer no matter where located may sell his products in any part of the country in competition with all other producers.
>
> That is an advantage to the producer because it frees him from dependence upon local markets alone to absorb his products. He may reach out for markets anywhere in the country.
>
> It is an advantage to the buyer because he is not dependent on local steel producers either as to price, time of delivery, or quality of material. He may draw upon the entire country for supplies without penalty of price.
>
> Another objection made against the basing point method is the alleged charge that it is a device for fixing a uniform level of prices in the steel industry thus destroying competition. It is no more a device for fixing prices than any other method of quoting prices.
>
> The idea that competition does not exist in the steel industry has no foundation in fact. In no industry is there keener and more severe competition. This is a natural result of the basing point method. Under it a large number of producers are enabled to compete at a given point. The greater the number of sellers seeking orders in any consuming area, the greater the competition. Conversely, the fewer the number of sellers the less the competition is likely to be.
>
> A third theoretical objection to the basing point method is found in the charge that under it prices are held at rigid and artificially high levels. It seems ludicrous to suggest that any industry which had the power to fix prices or is alleged to have practiced price fixing over a period of years should have consistently sold its products at little or no profit. In the steel industry earnings over the past decade have averaged only 2.5 per cent on capitalization and during the four years from 1931 to 1934 large deficits were incurred.
>
> There is nothing in the record to show that the steel industry has profited from the basing point method or that the ultimate consumers of articles made from iron and steel have suffered from high prices. Certainly the level of steel prices has not hampered the amazing growth of such industries as automobile, electric refrigeration, washing machine, farm tractor, etc., whose success has depended upon the use of steel and low cost mass production and distribution.
>
> As a matter of fact, prices in the steel industry declined steadily from 1923 to 1933. The industry has made tremendous strides in improving the technic of production, and the resulting savings in cost have been largely passed on to the public in the form of lower prices. During the past few years, for example, steel companies have invested over $200,000,000 in new continuous strip mills, with the result that the product has been improved and the price cut almost in half.
>
> If it is the primary aim of the champions of the anti-basing point bill to bring about still lower prices for steel products, it is well that they face certain facts in the steel industry. During the depression dividends practically disappeared. Taxes, railroad rates and raw material costs must be met. The only remaining flexible item is that of wages, and it is only a question of time when wage rates would have to give way if prices were forced much lower

Employment at 1929 Level

At the present time the industry, operating at 60 per cent, is employing about 450,000 persons, a figure approximating the total of 1928 and 1929 when operations were around 85 per cent. Wage rates have been increased 35 per cent since 1933 and are now at the highest level since 1929, and in some sections they exceed 1929.

The fourth objection lodged by theorists against the basing point method is that it encourages wasteful cross hauling of freight. This is a subject about which there is little if any information. Is it cross hauling if a man living near a shoe factory in Boston wants to buy a particular brand of shoes made in Chicago and vice versa? Steel is shipped to all parts of the country to customers who, for reasons of their own, want particular grades from particular companies. Are they to be denied that right?

The elimination of cross hauling, if that is the purpose, would be a serious blow to the railroads. It has been suggested that cross hauling costs $1,000,000,000 a year. This figure is fully 25 per cent of the gross income of the railroads. Wipe this out and what would happen to railroad employment and freight rates?

The fact that proponents of the anti-basing point bill are using cross hauling as an argument for its passage indicates that the intent of the legislation is to close the door of national markets to many producers and thus to restrict competition and not to promote it.

Robert Gregg, vice president in charge of sales, United States Steel Corp., made a particularly clear statement to the committee and although Senator Wheeler tried any number of times during his testimony to make him say that prices are

filed and fixed in the steel industry, he refused to be confused—even by hypothetical questions.

The witness described the method of quoting of his company and its subsidiaries. He said that in general prices quoted are delivered. He stated that while some of the mills of the corporation are not at basing points the principal mills are, and he admitted that his company follows the basing point system along with other leading corporations of the industry.

Mr. Gregg, on being questioned by committee members, stated that the invoices of his company show the amount of freight charges. Dealing with the question of the basing point Mr. Gregg testified that the industry must consider the secondary markets in its steel sales. The delivered price net, he contended, tends to make for more stability in the secondary markets.

He stated that the steel industry is highly competitive and denied that prices are invariably uniform. He also denied that prices are now filed in the industry; this he said, has not been done since the code became inoperative.

Mr. Gregg emphasized the fact that the basing point system is the general merchandising plan in the steel industry. He told the committee, again answering questions, that there have been many instances recently when there was variation in prices.

The present multiple basing point system, he testified, is the expansion of the old Pittsburgh-plus plan which was used by the industry prior to 1924.

Refutes Noncompliance Charge

Senator Wheeler got into quite an argument with the witness about the federal trade commission's case against the Steel corporation and the senator insisted that the Corporation is not now complying with the "cease and desist" order issued by the commission when it uses the basing point system. Mr. Gregg insisted that the Corporation is living up to its agreement with the commission. He read into the record parts of the Corporation's agreement and said that that had never been challenged by the commission.

Mr. Gregg denied questions that the steel industry makes more profit out of freight charges than it does on the manufacture of steel itself. He stated that taking the industry as a whole, because of absorption of freight rates, probably loses money on freight.

"As I read the Wheeler bill," said N. J. Clarke, vice president in charge of sales, Republic Steel Corp., "it hardly seems to be aimed at the so-called basing point method of pricing, or, in fact, any particular method in pricing, as much as it seems to have the basic principle of lowering prices."

Mr. Clarke told the committee that "so far as the steel industry is concerned, we merely have to look at its history, to show that regardless of the practice of some 25 to 50 years of using the basing point method of selling, prices have not tended to be higher, but on the contrary, prices have over the years, steadily gone downward."

Naturally, Mr. Clarke testified, the keen competition which the basing point method creates, has played a large part in this trend, due to the fact that it enables any mill, no matter where located, to compete for the going business in any and all territories.

"With a company the size of ours," stated Mr. Clarke, "with more than $200,000,000 invested in plants, we naturally require a broad base of operations, and were this bill passed, we feel that it would so circumscribe our operations that the results would not only be disastrous to many mills, but terribly confusing and disturbing to our thousands of customers.

"Frankly," continued Mr. Clarke, "I cannot recall ever having a customer complain about the basing point method of quoting, as the main interest of the buyer is, 'What is this particular lot of steel going to cost, laid down at my plant?' and when he receives his quotations, all of which cover delivered costs to his plant, his one concern is whether he is purchasing at as low a price as any of his competitors."

E. L. Parker, president, Columbia Steel & Shafting Co., Pittsburgh, testified that his plant had been located in Pittsburgh because of the access to raw materials. He stated that any change in the basing point system would disrupt the whole industry.

During the course of his testimony Senator Wheeler said that "the basing point is just a price fixing scheme." Mr. Parker in answer to this said that the system is merely "a method by which we arrive at delivered prices."

Would Limit Markets

George L. Gordon, general sales manager, Lukens Steel Co., Coatesville, Pa., testified that his company makes about 7 per cent of the plates of the country and that his plant rolls the largest plates in the world.

Mr. Gordon expressed the belief that the Wheeler bill would limit mills to selling in their immediate territories. Senator Wheeler denied this and said further that there is nothing in his bill which conflicts with the Clayton act.

It was testified by Mr. Gordon that his plant can sell only 40 per cent of its output in its own territory. He said further that the company will get less for its product if the present method of pricing is changed. He denied that prices are fixed in the steel industry or kept up. The basing point, he testified, is a distinct advantage to the small consumer. Under this system, said Mr. Gordon, the little consumer knows as much about the market as the larger consumer.

Others testifying included John L. Neudoerfer, vice president, Wheeling Steel Corp., Wheeling, W. Va., who said that the revolutionary changes suggested in the Wheeler bill would cause drastic relocation of the industry, and A. S. Booth, vice president, Sharon Steel Corp., Sharon, Pa., who said that passage of the bill would greatly hamper some of the business of his company.

Secretary of the Interior and PWA Director Ickes, testified Friday on identical bids received by the PWA reclamation service and other government services on steel. In connection with identical bids he said:

"In the circumstance there does not seem to be much reason for continuing to ask for bids. If all prices are identical we might as well bargain with a single firm."

He testified that all purchasing records seem to tell the same story and then said: "In fact, there seems to be an increasing tendency toward uniform bidding on the part of vendors and manufacturers. This tendency is especially marked at the present time as regards steel and machine equipment on PWA projects."

Cites Identical Bids

In connection with specific commodities on which identical bids have been received he prominently mentioned structural steel, steel tanks, sheet piling, reinforcing bars, cast iron pipe, and machine tools. He said:

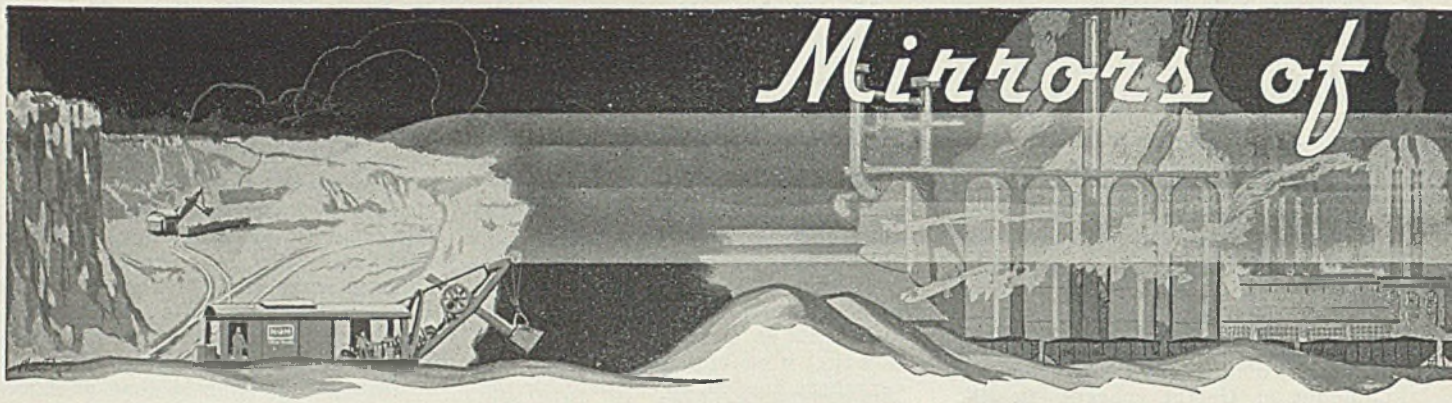
"Outstanding instances of identical bids on steel occurred in connection with the huge triborough bridge project, Morehead City, and Miami Harbor project. In all these cases bids were quoted in terms of destination price, and they were identical to the second decimal point regardless of the point of shipment.

"You might be interested in the fact that in cases where identical bids have been rejected and readvertising resorted to, very often the new bids submitted have also been identical, not only as to price but the price has been the same as the original bid."

Secretary Ickes said that "the situation where bids have been the same to the second or third decimal point have occurred so often that it is a fair inference that the bidding does not represent free and unrestricted competition."

He said that he is in sympathy with the Wheeler bill and "it would

(*Please turn to Page* 87)



DETROIT

JUST to be certain they're not missing a sale, the motor industry has about spread-eagled the public's tastes with models on its present 1936 lines.

Actually, you as a buyer of an automobile can choose between an average of 10 to 15 different body styles, all on the same chassis and each under one name. In some makes, double that number—Chevrolet, for an example, makes both a standard and a master series complete.

Then, multiply the number of body styles by at least five, and often more, standard colors, and you will have some idea of how thoroughly this industry blankets every conceivable taste.

The comparison is startling, especially as against a decade ago, when there were only four conventionally "standard" body jobs: Roadster, coupe, touring, and sedan—and even fewer standard colors.

Keeps Costs Down

Credit the motor industry with smart merchandising in this respect, for it must be remembered that the automobile of today has no immediate and direct competitor. If, by the wildest stretch of the imagination, the horse and buggy were carving into motor sales, you could visualize the many motor styles of today as a competitive attack.

In truth, some individual automobile manufacturers have been driven to this wide coverage defensively, through the initiative of certain makers in the field. But, to analyze, the condition results with smaller costs that one might first think.

For the most part, one frame specification suffices for as many different bodies as the planning department can think up. On closed jobs, rear quarter and hood panels are interchangeable; so are instrument panels, coach trim, motor assemblies and driving mechanisms.

Side panels, top assemblies, fenders, and running boards are the nub of the subject where an inch or two here and there account for all the outward dissimilarity.

Translated to the retail buyer, the automobile industry is fair in its costs. Obviously lowest on the volume models, the tag to the buyer there is commensurately down. For example, General Motors has been finding the two-door sedan job on Chevrolet, Pontiac and Olds is moving at the rate of one in every four cars sold. Thus it is priced at the lowest figure.

In brief, the idea of as many models as possible to a series is unbeatable as a sales talk. Actually, if you buy a slow-moving model you pay for it. To illustrate, there is a spread of over $260 from the Ford V-8 coupe to the convertible.

Still Introducing New Types

As if there were not enough models now to cope with this spring's buying, the last few weeks the plants here have been announcing additions, mostly convertibles.

DeSoto has a new "traveler" model, a roomier sedan on a 130-inch wheelbase; Chrysler has brought out a town car in the deluxe eight on a 133-inch wheelbase with LeBaron body; Packard has broken out with a convertible on the 120, making 12 body styles now available for that series alone; LaFayette has just marketed a cabriolet; Hudson will soon drop an eight sedan that has been on a 127-inch wheelbase onto a 120-inch base.

DeSoto also has a seven-passenger custom Airstream now on a 130-inch wheelbase, against 117 inches for other Airstreams. Graham is working out details on a "businessman's coupe" model. High-wheel models have been recent announcements of such as Plymouth and Chevrolet. Packard's small six, a late-summer prospect, falls more in the new series description rather than a new model.

Since Feb. 1, there has hardly been a car manufacturer that has not dusted off advertising copy on convertibles. Many of these, it is true, date from last November when the entire new series was presented, but announcements are worded as "new models." Most are; the winter never gave them a chance to see if they'd sell.

The story that Detroiters have liked best to tell the last week is the one of a certain local Pontiac dealer who made ten new car sales over a recent weekend. Equally good for its cheering qualities is that of a Plymouth salesman who alone closed five used car sales in a single evening.

Based on a multiplication of these yarns by the thousand over the country, finished car assemblies in the plants here are generally on the five-day week that was initiated the week before last.

Ford and Chevrolet both knocked out 25,000 to 26,000 assemblies last week, each on the basis of working five days. Hudson stepped a day, to a five-day week, and made 2700 models. Plymouth did 10,000 units in five days followed by Dodge at 7000 for the week.

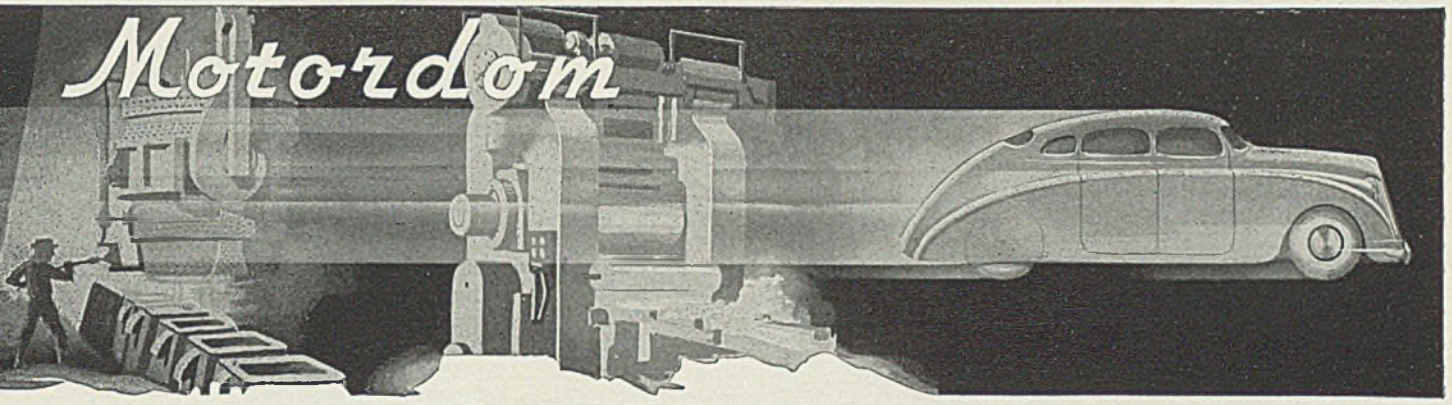
Other totals in the assembly column were Buick at 3300; Olds, 3200; Studebaker, 2000; Packard, 1700; Nash, 1700; and Chrysler jumped with DeSoto, 2200.

Changes in Ford Purchasing?

At present Ford is considering some changes at the main purchasing division. Buyers from the English and German assembly divisions have been recent visitors back home at the Rouge headquarters, so has certain personnel from the Japanese assembly unit. A rumor in Detroit that will not down says a consequential change may be made soon close to the top in an important Rouge purchasing division.

Ford, like many others at present, continues to hold to a 20-day bank of parts. Of course 20 days' supply under today's 5000-per-day assemblies is really comparable to 45 or 60 days' bank of a few years back.

A leading parts' manufacturer, which has been working closely with Ford, will announce an import-



ant motor car improvement soon, presumably for the 1937 models.

This is to be an oil filter system predicated on the assumption that good lubricating oil is by no means exhausted at 10,000 miles provided it can be kept clean and freed from acids, abrasives, dilution and other conditions that tend to cut down its life. There is talk that lubricating oil might be good for 10,000 miles under ideal conditions.

Logically, the new system may be installed in any car, but this particular parts maker has been working closest with Ford on tests so far.

(About two years ago Mirrors of Motordom reported that experiments were being made to create a crankcase situation whereby engine oil would have to be changed only every 10,000 miles. It was intimated that Ford might press this as an economy talking point. Oil producers were much disturbed at this report, which Ford subsequently denied.)

Here and There on Motor Row

Willys-Overland, now that receivership has been lifted and the trustee permanently appointed has a freer hand, is thinking about putting out a new model. . . . Spicer Mfg. Co., Toledo, O., recently acquired an undeveloped tract at Adrian, Mich., but declines to say anything about expansion. . . . Chrysler's foundry has been working on a 4-day week recently. . . . Bundy Tubing Co. and Ternstedt Mfg. Co., two of the most important parts' suppliers to Detroit assembly lines, have been on a five-day week. . . . The Hupp plant here remains closed and some of the company's storage space is being used by a competitor. . . . Though Chevrolet sold 145,754 new cars in January and February, its sales outlets moved better than 400,000 used cars in November, December, January and February. The Chevrolet junking program is credited with having disposed of 50,000 wrecks. . . . The body, made by Briggs at the Le Baron plant, for Lincoln-Zephyr is reputed to be the most costly in motordom. They say that "in the white," that is, ready for painting, it costs around $125 for each one. . . . A fleet of tugs, engaged as ice breakers, worked between Toledo and Dearborn last week, clearing the way for coal barges to move into Ford's plant, the latter's coal supply being badly depleted. . . .City Auto Stamping Co., Toledo, O., has its die division booked to capacity until September. . . . Chrysler, never an enthusiastic advertiser via the ether, began an elaborate radio program a week ago last Thursday. . . . Experiments continue to be carried on here with aluminum for automobiles in wider spread usage. Pontiac has been testing on body applications of sheet aluminum and Bohn Aluminum has been working on an all-aluminum engine block, presumably for a rear-engine car. Fisher Body has been experimenting with high-tensile, light-weight steels for fenders. . . . In some parts of the country Ford dealers are pooling the sale of their used car trade-ins and arranging for servicing among any member of the pool. In Cook county (Chicago), Illinois, recently 70 dealers got together on this basis and sold 5500 cars in ten days. . . . Willys made an average of $8 per car on the 28,741 produced during receivership.

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	.....
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

Niles-Bement-Pond Merges With General Machinery

Niles-Bement-Pond Co., New York, which owns the Pratt & Whitney Co., Hartford Conn., is working on a plan to merge with General Machinery Corp., Hamilton, O. A new company to be formed which will be of the same name—Niles-Bement-Pond Co. —will exchange its securities for stocks of the merging units.

The consolidated company will have assets of more than $12,000,000. General Machinery had assets of about $4,500,000 on last Dec. 31.

Officers are to be as follows: Chairman Edward A. Deeds; president, George A. Rentschler; vice presidents, Clayton R. Burt, A. A. Byerlein, Robert M. Derby, Curtis T. Ziegler and Charles K. Seymour the latter also treasurer; secretary, B. E. Johann. Mr. Seymour now is president of Niles-Bement-Pond; Mr. Rentschler is now president of General Machinery; Mr. Burt is now president of Pratt & Whitney.

The proposed merger will be submitted to stockholders at a meeting at Jersey City N. J., April 21.

Finishing NRA Steel Study

A. G. White, in charge of the NRA steel study, stated Friday that work on the survey will be completed March 25. It looks at present, he said, as though all of the chapters will be completed except that on prices. It probably will be some time yet before the study is made public.

Production

STEELMAKING averaged 50 per cent last week, a decline of 7½ points, due largely to curtailment in the flooded districts. Heavier schedules at Youngstown, Chicago, Cleveland, Buffalo and New England, with unchanged operations at Birmingham, Detroit and Cincinnati, served to hold the rate at the 50 per cent level. It is expected by the beginning of this week that most of the closed plants in these affected territories will again be in operation in some degree and operations will again be on the upward trend. Further details follow:

Youngstown—Gained 3 points last week to 74 per cent, and will hold at this level at this week's start. Some orders from mills in the flooded areas are being transferred to valley mills.

Pittsburgh—At best only an estimation, steelmaking operations here last week probably averaged about 18 per cent. The week opened at a rate of 50 per cent, up 7 points, but by Tuesday night flood conditions resulted in widespread cessation. Jones & Laughlin Steel Corp. was able to maintain uninterrupted blast furnace and steelmaking operations at Aliquippa. No explosions of blast furnaces or open-hearth furnaces were reported. It is expected by the beginning of this week that most closed plants will resume in some degree at least.

Wheeling—Estimated at 55 per cent last week, with the handicap of floods difficult to gage. Weirton Steel Co. was able to operate at Weirton, although its Steubenville plant went down.

Birmingham—Unchanged at 69 per cent, with little change indicated in the immediate future.

Detroit—Held at 94 per cent last week, with 16 of 17 open hearths active.

Central eastern seaboard—Off 1 point, to 38 per cent, due in part to the suspension of operations at one plant because of the flood. Certain consuming plants in the flooded areas have requested suspension of shipments for the time being, although this should have little bearing on steelmaking operations, which should again soon be tending upward.

Cincinnati—Unchanged at 76 per cent, as 18 to 24 open hearths were active. Peak of the Ohio river flood was expected at Cincinnati Monday, possibly placing handicaps on production of river mills. Open hearths at Middletown will be unaffected.

New England—Up 5 points to 56 per cent last week, with a schedule calling for a further advance to 67 per cent this week.

Chicago—Increased 1½ points to 63½ per cent, the best rate since early February. A continuation of operations at around the present level is indicated for the next several weeks. Blast furnace schedules are steady, with 20 of 41 stacks active.

Cleveland-Lorain—Up 4 points to 79 per cent, highest since last December. Republic Steel Corp. is operating 13 of its 14 open hearths; Otis Steel Co. 7 of its 8; and National Tube Co., Lorain, 11 of its 12. Republic has three of its four blast furnaces on; Otis, its two, and National, three of its five.

Buffalo—Climbed 5 points last week to 47 per cent, peak of this quarter. Reports of additional units being called into production before the end of this month are current which will lift the rate above 50 per cent. Bethlehem Steel Corp. is now using all of the 14 open hearths in its No. 1 battery at Lackawanna, and cannot add further to production without going into the long idle No. 2 battery. No such action is contemplated until the company's new strip mill gets into full production.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Mar. 21	Change	Same week 1935	Same week 1934
Pittsburgh	*18	−25	35	33
Chicago	63½	+ 1½	47	48½
Eastern Pa.	38	− 1	28	33
Youngstown	74	+ 3	60	56
Wheeling	*55	−23	92	66
Cleveland	79	+ 4	70	82
Buffalo	47	+ 5	37	52
Birmingham	69	None	55½	52
New England	56	+ 5	51	71
Detroit	94	None	88	100
Cincinnati	76	None	†	†
Average	50	− 7½	46	49

†Not reported.
*Estimated in view of flood conditions.

Twenty Years Without a Lost-Time Accident!

That is the remarkable record recently established by the roll turning department of the American Rolling Mill Co., Middletown, O. Back in 1916, when the World war was being waged, to make the world safe for Democracy, this group of men turning rolls in Armco's Middletown works determined to make their department safe for themselves. They succeeded. Despite the dangers of handling heavy rolls, intricate machinery and grinding wheels continuously, the department worked safely through one year....five years....ten years... fifteen years.... and now twenty years! The prolonged record of this Armco department shows that a steel plant can be made safer than a city street

Meetings

CONCRETE Reinforcing Steel institute will hold its twelfth annual meeting at The Homestead, Hot Springs, Va., April 20-22. A program of business and entertainment has been arranged, details of which will be announced soon. Reservations are being taken by W. S. Thomson, secretary, 201 North Wells street, Chicago.

WASHER MAKERS MEETING

Plain Washer Manufacturers association is holding a meeting at French Lick Springs hotel, French Lick, Ind., March 23. Part of the program is a golf tournament, to be held March 24.

Trade Commission Sues Over End to "Stock" Tin Plate Sales

FIFTEEN companies engaged in the manufacture of tin plate are charged with violation of the federal trade commission act, in a complaint just issued by that commission.

The complaint alleges that the respondents entered into an agreement under which they have refused to sell a certain grade of their product, known as "stock plate", to jobbers of tin plate and small manufacturers of tin cans and other metal containers. Thereby, the complaint charges, the respondents have arbitrarily and unduly enhanced the prices which jobbers and manufacturers must pay for a higher grade of plate sold by the same respondent companies.

The complaint also alleges that the respondents' practices tend to lessen and suppress competition in the sale of tin plate, and to create a monopoly in the manufacture of tin containers on the part of the American Can Co. and the Continental Can Co., which together consume approximately 65 per cent of the production of tin plate.

Leading Interests Named

The respondents are: American Sheet & Tin Plate Co., Pittsburgh. Bethlehem Steel Corp., Bethlehem, Pa.; Canton Tin Plate Corp., Canton, O.; Columbia Steel Co., San Francisco; John Follansbee, George T. Ladd and Isaac M. Scott, trustees in bankruptcy for Follansbee Bros. Co., Pittsburgh; Granite City Steel Co., Granite City, Ill.; Inland Steel Co., Chicago; Jones & Laughlin Steel Corp., Pittsburgh; McKeesport Tin Plate Co., McKeesport, Pa.; Republic Steel Corp., Youngstown, O.; N. & G. Taylor Co., Cumberland, Md.; Washington Tin Plate Co., Washington, Pa.; Weirton Steel Co., Weirton, W. Va.; Wheeling Steel Corp., Wheeling, W. Va.; and Youngstown Sheet & Tube Co., Youngstown.

The complaint points out that the respondents produce three grades of tin plate, namely, "production plate", which constitutes the bulk of the tin plate they manufacture, and which is made in accordance with customers' specifications; "stock plate", designated as "over-runs" and "seconds", which, because of the difficulty in controlling production in the manufacture of "production plate", is accumulated in large quantities, and for which the respondents do not have specific orders, and "waste-waste", which contains defects so great that it cannot qualify as "seconds".

According to the complaint, the respondent companies, in October, 1934, entered into the alleged combination to eliminate competition in the sale of "stock plate" by agreeing not to quote prices on such grade of tin plate nor to offer the same for sale to jobbers and to small can manufacturers, who, because of lack of financial capacity, were unable to carry "production plate" in stock.

Since January, 1935, it is alleged, the respondents, by refusing to sell "stock plate", have accumulated such quantities of it and have cut it into such shape that it cannot be used by jobbers and small manufacturers of tin cans, and it now is classified as "waste-waste", being sold as such for domestic consumption and for export, although in the latter case the shape is not mutilated.

The result of these alleged acts, the complaint charges, tends to increase the prices of tin plate above the prices which prevailed in the past and which would prevail under normal and open competition among the respondents, and tends to force jobbers of tin plate out of business.

Monopoly Is Charged

American Can Co. and Continental Can Co. are, it is said, the principal purchasers of "production plate", because of their size and large purchasing power, and the complaint alleges that the practices of the respondents tend to create a monopoly in American Can and Continental Can by depriving the competitors of these two companies, namely, the small manufacturers, of their normal source of supply of tin plate by forcing such competitors, who in the past could purchase "stock plate" through jobbers, to buy "production plate" at prices substantially higher than they were formerly required to pay and which are in fact higher than the prices paid for the same product by the American Can Co. and the Continental Can Co.

The commission fixed April 17 as the final date for the respondents to show cause why an order to cease and desist from the practices complained of should not be issued against them.

BUYS FARM LIGHTING DIVISION

Continental Motors Corp., Muskegon, Mich., has acquired the farm lighting division of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and the operating equipment is to be transferred to Muskegon.

Died:

GEORGE GORDON CRAWFORD, 67, former president of Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and of the Jones & Laughlin Steel Corp., Pittsburgh, in Birmingham, March 20.

Born in Madison county, Georgia, he received his degree of bachelor of science from Georgia School of Technology in 1890. From 1891 to 1892 he studied at Karl-Eberhard university, Tubinger, Germany, and returned to the United States to become chemist for the Edgar Thomson works, Carnegie Steel Co. In 1895 he was made assistant superintendent of blast furnaces at Edgar Thomson, and in 1897 he became superintendent of blast furnaces and steel works at McKeesport, Pa., for National Tube Co., remaining until 1899. In that year he returned to Edgar Thomson as blast furnace superintendent, serving in that capacity until 1901.

For the next six years he was department manager of National Tube Co., McKeesport, Pa., and in 1907 was elected president of the Tennessee company. He held this position for 22 years, and in February, 1930, was elected president and member of the executive committee of Jones & Laughlin, remaining there until May, 1934, when he severed his connection with the company to return to his home in Birmingham, Ala.

♦ ♦ ♦

Sidney S. Porter, 56, formerly vice president and one of the founders of the Calumet Steel Co., Chicago, in Hollywood, Fla., March 13. A son of J. E. Porter, first president of Inland Steel Co., Chicago, Mr. Porter at one time was associated with that company. In 1907 with his brother, J. H. Porter, and A. S. Hook he founded the Calumet Steel Co. Mr. Porter served as vice president from that time until last summer, when the company was acquired by the Borg-Warner Corp., and he retired.

♦ ♦ ♦

Louis J. Koster, 71, founder and former president of the McNamara-Koster Foundry Co., in Indianapolis.

♦ ♦ ♦

Thomas A. Orr, 73, member of the firm of Robinson & Orr, Pittsburgh, brokers of iron and steel products, at Pittsburgh, March 13.

♦ ♦ ♦

E. T. Conner, 68, affiliated in a sales capacity for the past 26 years with Reliance Steel Casting Co., Pittsburgh, in Pittsburgh recently.

♦ ♦ ♦

Samuel S. Winner, 73, until his re-

tirement in 1931 foreman of the general labor department of the Homestead works of Carnegie Steel Co., at Homestead, Pa., March 12.

♦ ♦ ♦

W. E. Leake, 71, vice president of the Railway Fuel Co., Birmingham, Ala., and for many years closely connected with the iron and coal business of the district, in Birmingham, recently.

♦ ♦ ♦

James Crombie, 68, head of the sheet metal and furnace manufacturing business which bears his name, in Rochester, N. Y., March 19. He had been engaged in this line of manufacture since 1900.

♦ ♦ ♦

Robert G. Blotter, 41, assistant treasurer of the National Tube Co., Pittsburgh, at Pittsburgh, March 16. He was a resident of Pittsburgh all of his life and had been assistant treasurer of the company since 1931.

♦ ♦ ♦

James F. Loucks, 59, vice president and chief engineer, Universal Metal Sections Co., Cleveland, manufacturer of steel decks and other special steel sections for building construction, in Cleveland, March 16.

♦ ♦ ♦

John P. Corley, for the past two years district manager at Cleveland for the Wailes-Dove-Harmiston Corp., New York, in Erie, Pa., March 16. He had been connected with the Wailes corporation for 11 years, previous to that was with the Ingersoll-Rand Co. in San Francisco for ten years.

♦ ♦ ♦

J. Stuart Brown, 85, president of Brown & Co., a number of years ago a leading producer of puddled iron in the Pittsburgh district and liquidated in 1923, in Pittsburgh, March 12. At the time of his death, Mr. Brown was board chairman of the Fidelity Trust Co., Pittsburgh.

♦ ♦ ♦

Alonzo R. Clarkson, 91, for 40 years president of the Niagara Screw Co., Buffalo, in Rochester, N. Y., March 12. He was graduated from the University of Rochester in 1863, and was the university's oldest alumnus. He founded the Niagara company about 50 years ago.

♦ ♦ ♦

George E. Mittinger, 66, former general manager and vice president of the American Steel Container Co., Cleveland, in Cleveland, March 18. He was the inventor in 1912 of the steel-bilged barrel. Born in Cleveland, he served as general superintendent of the New Castle Stamping & Enamel Co., New Castle, Pa., from 1908 to 1912, and from 1912 to 1922 was general manager and vice president of the Petroleum Iron Works Co., Sharon, Pa. From 1922 to 1928 he was associated with the American company.

Men of Industry

DONALD P. HESS, who has been associated with Timken Roller Bearing Co., Canton, O., the past 17 years, the last several of which as executive assistant to the president, has announced his resignation to take effect as soon after April 1 as possible, so that he can devote his whole time to his new capacity of vice president and director of the Ebco Mfg. Co., Columbus, O., maker of plumbing fixtures, metal cabinets and partitions, in which he has recently purchased a substantial interest.

Mr. Hess joined the Timken company in 1919, as assistant factory manager, and in 1921 was transferred to the Columbus, O., plant as general manager in charge of all operations, where he remained until 1927. He then returned to the main plant in Canton in his present capacity. He has also been in charge of all foreign operations of the organization.

♦ ♦ ♦

Fred Clements, director and general manager of the Park Gate Iron & Steel Co. Ltd., Rotherham, England, has been awarded the Bessemer gold medal for this year of the Council of the Iron and Steel institute. The medal, which was endowed in 1873 by the late Sir Henry Bessemer, well-known steel manufacturer and inventor of the bessemer process, is awarded each year on an international basis in recognition of services rendered to the iron and steel industry.

Mr. Clements, in addition to the active part he has played in the development of the Park Gate works, has gained recognition as an expert in the industry, and his opinion is sought as a consultant in many directions. He is a member of the industrial research council of the British Iron and Steel Federation, and is chairman of the blast furnace committee of that organization.

Fred Clements

♦ ♦ ♦

W. M. Phares has been appointed district representative in the Chicago territory for the Peninsular Steel Co., Chicago, with headquarters at 1 North Crawford avenue.

♦ ♦ ♦

Ernest F. Fisher, formerly foundry and machine shop superintendent of the Fisher Machine Works Corp., Leavenworth, Kans., has been appointed superintendent and assistant manager of the Illinois Foundry Co., Springfield, Ill.

♦ ♦ ♦

George P. Schumacker, for the past 15 years associated with the Worthington Pump & Machinery Corp., Harrison, N. J., has opened an office at 1120 Chester avenue, Cleveland, as sales engineer to handle power plant equipment for steel mills, railroads and marine.

The companies represented are: Cooling Tower Co. Inc., Pennsylvania Pump & Compressor Co., National Steam Pump Co., Stets Co., V. D. Anderson Co., Quincy Compressor Co., Williams Valve Co., Sea-Roe Packing Co., and Mabbs Hydraulic Packing Co.

♦ ♦ ♦

H. L. Pierson, president, Detroit Motor Valve Co., Detroit, has been elected to the board of the Eaton Mfg. Co., Cleveland, succeeding Carlton M. Higbie, Detroit stock broker, who has retired to devote more time to other interests.

♦ ♦ ♦

Frank J. Weber has been appointed district sales engineer of the heating division of the Fedders Mfg. Co., Buffalo, in charge of its western New York territory. He will have his headquarters in the company's Buffalo plant.

♦ ♦ ♦

John Rolfe has been appointed sales promotion manager of the All-Steel-Equip Co., Aurora, Ill., manufacturer of metal cabinets, lockers, and industrial handling equipment. Mr. Rolfe succeeds James H. Gregory, who is now with Cramer-Krasselt Co., Milwaukee.

Mr. Rolfe has had several years experience in industrial advertising with the publicity department of the

Barber-Greene Co., Aurora, Ill., during which time he also contributed news stories to publications in the contracting, coal handling, and materials handling fields, and for a time served as reporter, photographer, and feature writer on Aurora newspapers.

♦ ♦ ♦

J. M. Degnan has acquired an interest in the Hill Diesel Engine Co., Lansing, Mich., and has been appointed general sales manager. He will assume his new duties April 1. A graduate of Lehigh university, Mr. Degnan has been connected with Worthington Pump & Machinery Corp., Harrison, N. J. He was manager of the multi-V-drive and automotive sales divisions of this company.

♦ ♦ ♦

E. S. Taylerson, formerly manager of the research laboratory of the American Sheet & Tin Plate Co., Pittsburgh, has been appointed research engineer.

G. N. Schramm has been appointed manager of the research laboratory, succeeding Mr. Taylerson, and J. A. Schlegel has been appointed assistant manager of industrial relations.

These appointments became effective March 1.

♦ ♦ ♦

Ben Cohen, of Louis Cohen & Son, Wilkes-Barre, Pa., chairman of the yard dealers' committee of the Institute of Scrap Iron and Steel Inc., has appointed the following to his committee:

David Feinburg, of David Feinburg & Co., Medford, Mass.; A. Clonick, of Clonick Steel Co., Chicago; H. Israel, the Israel Bros. Co., Dayton, O.; Sam Kesle, of the Kesle Iron & Metal Co., Toledo, O.; N. H. Jacobs, of Buffalo Housewrecking & Salvage Co., Buffalo; David Freedman, of Woodmere Scrap Iron & Metal Co., Detroit; Frank Contey, of Frank Contey Inc., Jersey City, N. J.; J. A. Moskowitz, of Samuel Sons Iron & Steel Co., Brooklyn, N. Y.; H. Kirchmann, of Allegheny Iron & Metal Co., Philadelphia; Lester Finkelstein, of Finkelstein Foundry & Supply Co., Los Angeles; H. N. Cohn, of Butler Iron & Steel Co., Butler, Pa.; Gus Gillerman, of Gus Gillerman Iron & Metal Co., St. Louis; M. Sidell, of Seattle Iron & Metals Corp., Seattle; B. Smith, of Smith Metal Co., Charlotte, N. C.; O. L. Ford, of Ford Iron & Metal Co., Baltimore.

♦ ♦ ♦

John P. Courtright, who has been Cleveland representative for Penola Inc. for the past three years, on March 15 became district manager at Chicago for the Marion Steam Shovel Co., Marion, O. He succeeded I. D. Lumby, who will handle special sales in the coal stripping industry, with headquarters at Terre Haute, Ind. Mr. Courtright formerly had been associated with Marion Steam Shovel Co. as a salesman in the Chicago district for seven years, prior to going with Penola.

John P. Courtright

♦ ♦ ♦

Earl W. Stewart, vice president, and Marshall T. Boden, secretary and treasurer of the Federal Screw Works, Detroit, have been elected directors, succeeding J. S. Freud and W. H. Wildes, resigned.

♦ ♦ ♦

Leroy Brooks Jr. has been elected president of the Cincinnati branch of the National Metal Trades association. Other officers elected include Richard E. LeBlond, vice president; Warner Atkins, treasurer, and O. E. Schauer, secretary.

♦ ♦ ♦

Thomas O. Duggan, formerly merchandising director of Thompson Products Inc., Cleveland, has been named general manager of the company's service division. He joined the Thompson organization in 1931, after four years as merchandising director of the National Standard Parts association.

Early Ordering a Safeguard Of Quality in Steel Castings

BY R. L. COLLIER

HASTE makes waste—and often results in the production of sub-standard goods. This is certainly true as regards steel castings.

Quite frequently in the past few years buyers have held to a policy of "hand-to-mouth" purchasing. Inventories have been reduced to a minimum so as to free working capital for other purposes. This worked well on a declining market with values dropping more or less steadily. It meant lower inventory losses. It is not profitable to buy supplies for stock at $10 only to find the going price $9 when ready to market them.

But this policy of buying to meet immediate orders only has its weak points, especially during a rising market. Few will deny we are in such a period now. Investment in inventories is not a bad hedge against inflation. You might pay $10 per unit for supplies placed in stock and be able to sell them for, say $11 or $12 as values increase. Then there is the matter of quantity discounts obtainable on larger volume purchases that may represent appreciable savings.

With wages, taxes, and prices of raw materials on the increase it is only natural to expect that deferred buying will, over a period, cost real money. There is at this time much to commend the policy of anticipating future requirements and "laying in" ample stocks of goods that will be needed.

That brings us to the real subject of these observations: The effect of hand-to-mouth buying on the quality of steel castings. What is here stated with respect to steel castings can be applied with equal force to any product involving preliminary preparation for production, set-ups or "make-ready", the application of engineering principles, careful layout, etc.

Steel castings are tailor-made articles. The best casting for a given purpose is dependent upon a number of fundamental factors, the neglect of any one of which may result in an unsatisfactory product. These factors may be summarized as follows:

First, conference between the purchaser's engineers who design the casting and the steel foundry engineers who will be called upon to make it. This conference will usually enable the foundryman to suggest any changes in design which, while not affecting the ultimate in-

The author is secretary of the Steel Founders' Society of America.

dustrial use of the casting, will make it possible to apply orthodox production methods which experience has demonstrated will insure maximum soundness, strength, resistance to impact, dynamic stresses, etc. Such conferences frequently lead to simplification of designs, weight savings and the like.

Then, too, if the foundryman understands how the casting is to be used—whether it must withstand alternating stresses of great magnitude or resist high temperatures, abrasion or erosion, sudden impacts, high pressures or static loads—often he can recommend some alloy steel that will last longer, for the purpose in question. The total cost per unit of useful life is a real economy consideration.

Let Foundry Make Pattern

Next there is the question of pattern equipment. Certain foundries use one general type, others another. Obviously it is poor economy to make a drawing, buy a pattern and ship it to a foundry, expecting to receive perfect castings by return express.

The foundry might not be able to use the pattern at all. Necessary alterations might easily cost as much as new patterns, to say nothing of the time lost in revamping them. Most steel foundries have their own pattern shops, manned by skilled operators, who are familiar with steel foundry production methods and can turn out suitable patterns with minimum delay.

With the matter of design settled and arrangements made for the production of the proper patterns, the rest of the job is up to the foundry. Here the last preparatory steps are taken before putting the pattern into production.

If alloy steel castings are wanted, the job is scheduled for a time when a sufficient amount of similar work will have accumulated to justify running a full furnace heat of the particular analysis of steel required. Otherwise melting costs would be excessive. The pattern is checked against the customer's blueprint, not once but perhaps two or three times, to be sure that the castings will conform to the correct dimensions.

Then expert foundrymen decide how the mold shall be made; how and where the molten steel shall be poured into the mold cavity (placement and type of gates); where vents shall be placed through which the gases generated in the mold during the pouring operation can freely escape; where reservoirs of liquid metal (risers or heads) shall be provided to insure proper "feeding down" of the metal to produce correct solidification, insuring maximum density of the steel.

Cores must be formed, baked and inspected. Suitable heat treatment must be scheduled. A score of minor decisions must be made, each of which will have an important influence on the quality of the casting.

Contrast such careful evolution of the designer's original idea into a finished casting with a situation like this: Customer makes a blueprint; has a pattern made; ships both to a nearby foundry with a rush order to supply castings within a day or two. The foundry receiving the order has two alternatives: it can accept the order and muddle through in an effort to produce acceptable castings within the delivery time specified, or it can insist upon the omission of no essential step in the orderly process of creating first quality castings, fully adapted to the particular service requirements they must fulfill.

Too frequently the foundryman will hesitate to take the matter up with the customer feeling that he would only antagonize him by suggesting procedure which might delay ultimate delivery. He goes ahead; does the best he can. He may find the design awkward and costly, if not next to impossible to mold. He may find the pattern inadequate for his use and improvise adaptations for the purpose of "getting by this one." He may use a steel he doesn't believe the right one for the purpose. He may resort to any number of weird practices to get the castings through on time. He may compromise with his best judgment all along the line in order to meet a mandatory delivery dead-line.

Who Is To Blame?

Would it be fair to blame that foundryman if the castings turned out to be a little off dimension, or "dirty," or flawed, or if they broke down under load, or proved defective when later machined? The answer to that question is "Yes" and "No."

Some will say a foundryman should protect his reputation for quality castings by *insisting* upon ample time in which to engineer the job all the way through. Others will contend that the steel foundry art being what it is, and buyers' demands what they are, if "impossible" deliveries are specified, all the foundryman can do is make the best of it, but should not be held fully accountable for the resulting product.

We suggest that users of steel castings look into the future as far as they can and anticipate their requirements in advance of actual need. If new designs are being developed we suggest calling in the steel foundryman while the drawing is still on the drafting board, so that by the time the thumb-tacks are pulled the steel foundryman will know what to expect and the buyer will have the assurance that the design is as simple as possible, that the steel to be specified will be the one best suited to the application, that the castings he will ultimately receive will be the best which advance precautions and good foundry technique can supply.

There is, of course, the question of real emergency rush orders that cannot be anticipated. Little that has been said above would apply to such situations other than this: Essential precautions should be taken if at all possible, within the time limitations imposed. In such cases buyers will usually find the steel foundryman more than willing to co-operate even if it means dropping everything and concentrating on that particular job. There are plenty of cases where foundrymen have been called from bed in the middle of the night to rush through a casting vital to the preservation of life or property. Many a Sunday and holiday has been spent in the foundry working day and night to get out a real rush job.

Time Is Essential

That's different. The thought we want to convey is that it takes time to make good castings just as it does to make a good suit of clothes or any other made-to-order product. All the foundryman wants is enough time for the job so as to avoid subsequent grief for the customer, and the "turning out" of castings which would detract from his reputation as a manufacturer of products of integrity.

Much of the criticism directed against castings in general has been based on experience with castings produced under pressure, without ample time to do the job as it could have been done under normal circumstances.

Letters

Has Any Reader Figured It?

STEEL,
Penton Building,
Cleveland,

Gentlemen:

I am making a study of the trend, seasonal variation, and cycles of the steel industry, having for original data the years 1921 to 1935 inclusive, by months.

One of the questions which I should appreciate having an opinion on is, "What effect should be given to the present depression years, if any, in calculating this trend?"

Would the trend and seasonal variations for the steel industry as a whole be comparable with those for a company that produces rods, round and flat wires, wire rope, electrical cables, nails, and springs, or should some adjustment be made?

I used the link relative method to calculate the seasonal variation, and have used the methods of least squares and semi-averages to calculate the trend. I do not want to make any further analyses of cycles or of correlations with other industries until I am certain that my trend is a representative one.

Very truly yours,

Editorial

Industry Cannot Anticipate "Unusual" Emergencies

LOOKING at history from a broad perspective, one may find grounds for suspecting that there are mysterious and perhaps sympathetic links between the acts of man and the acts of God.

The past decade has been marked by an unusual number of critical situations which are directly traceable to the mistakes of man. Our modern civilization during that period seems to have become unmanageable. Nations and individuals have found it extremely difficult to compose their differences. Society has been torn by hatred, dissension and misunderstanding. The economic structure of the world has been thrown seriously out of balance. Politically, socially and economically the man-made civilization has been in a state of turmoil.

Strangely enough we find a parallel in the behavior of nature. During the past few years the elements have been unusually bold in displaying their contempt for man's feeble defenses against their wrath. Drought, fire, famine and many lesser manifestations have been visited upon helpless victims throughout the world. Last week Dame Nature, in a particularly vicious mood, dealt a climatic blow to the works of mere man by letting loose floods upon the very heart of industrial America.

Last Week's Floods Probably Set New Mark In Property Damage to American Industry

From New England to Ohio unprecedented high water has swept through industrial districts, causing a far greater amount of property damage and extending over a greater area than any other flood or series of floods in the nation's history. From the busy Connecticut valley on the east, through the southern tier of New York, practically all of Pennsylvania and large portions of Maryland and Virginia, to the low sections of Ohio and West Virginia, scarcely any important industrial section has escaped the wrath of the flood. The victims include the diversified industries of the Connecticut and Naugatuck valleys; the iron and steel centers of eastern and central Pennsylvania; the Ruhr of America which nestles in the valleys of the Allegheny and Monongahela and their tributaries; and the mills and furnaces in the Ohio valley of Ohio and West Virginia.

In this flood, as in the recent economic depression, something that was believed to be impossible actually happened. In 1929, after the crash, many well informed people believed that a serious depression would follow but no one believed that it would or could be as severe and as prolonged as it has been. On Wednesday of last week thousands of experienced industrialists knew that a serious flood was imminent, yet probably not one expected anything as devastating as that which swept the cities and towns in the following 24 hours. In both cases the "impossible" had happened.

Again there is a parallel in man's attitudes against the acts of his own folly and against the acts of God. Generally speaking, we are a prudent people. We try to protect against predictable emergencies. We try to store up resources against average depressions. We try to build our factories and our transportation and communication lines with a sufficient margin of safety to meet the average emergencies of our historical experience.

Civilization Still Is Far from Achieving Adequate Protection Against the Elements

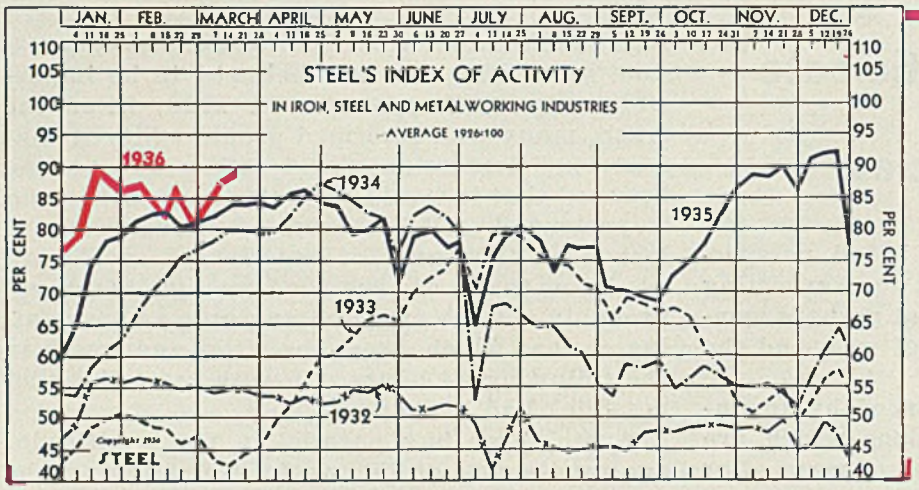
Working along these lines, we have no effective defense against a depression such as that of the thirties because its magnitude exceeds that of our average experience by such a great margin. Likewise we have no adequate protection against floods of almost unprecedented character, such as those which occurred last week. We can guard against emergencies which recur at intervals of a decade or two, but we cannot afford to protect ourselves against the "impossible" that comes once in a century.

It may be a good thing for us to be shown emphatically every now and then that there are some events against which we cannot be fully prepared. It may be worth something for us to know that we cannot rid this world of emergencies.

However, the late disaster showed that progress has been made in dealing with major crises. Considering the widespread area of the floods and the density of population, the number of lives lost was small. We can attribute this to improvement in communication. Restoring facilities in the affected districts will be accomplished more promptly than in previous floods. This is due to improved organization and more adequate resources.

Industry has been dealt a blow which seriously interrupts its operations in a busy period. But it will be doing "business as usual" in a surprisingly short time.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained* 1.9 *points to* 89.6 *in the week ending March* 14:

Week ending	1936	1935	1934	1933
Jan. 11	90.2	73.8	58.1	48.6
Jan. 18	89.3	78.1	60.9	49.8
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	89.6*	84.0	79.9	42.7

†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.

Activity Is Pointing Toward New Postdepression High

SHARPLY expanding operations since the first of March are responsible for a steady upward movement in STEEL'S index of industrial activity and may carry it to a new high for the recovery period.

The all-time low for the index was recorded in the week of July 9, 1932. Since that time the important peaks occurred in the weeks ending July 22, 1933; April 28, 1934; and April 20 and Dec. 21, 1935. The highest postdepression peak was that of the week ending last Dec. 21, when the index touched 91.9.

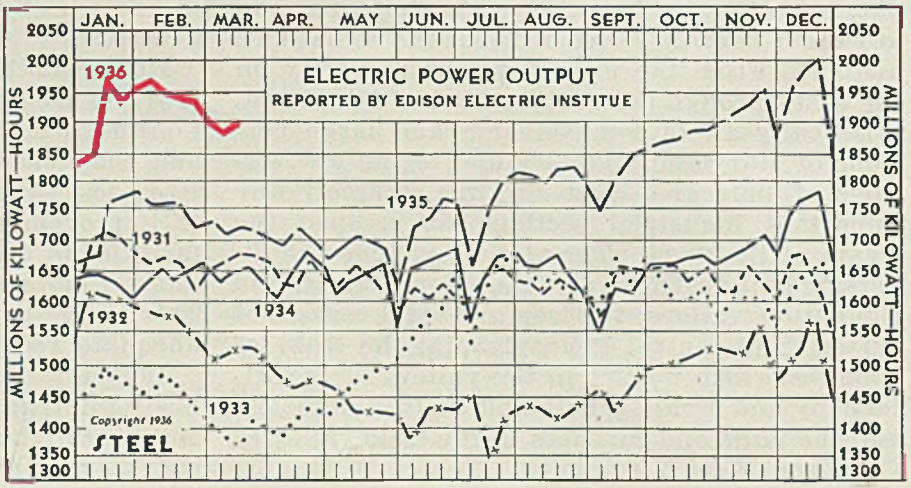
According to present indications, that mark will be eclipsed before the end of this month. The index stood at 87.7 for the first week of March, and has advanced to 89.6 for the second week. As this is written, the preliminary reports on automobile output and steelworks operations indicate gains of such magnitude that it is quite likely that the index for the third or fourth week will equal or exceed the previous postdepression high of December.

How much of the bulge in mid-March is due to natural demand and how much can be attributed to abnormal influences is difficult to determine. Severe weather in February undoubtedly pushed some activity over into March. The price situation probably is partly responsible for concentrating an undue volume of steelmaking activity into the final weeks of the first quarter. In other words, had the elements of price and weather been absent from the situation, some of the activity crammed into a few weeks of March might have been more evenly distributed through part of February, all of March and part of April.

The trend of activity during the early weeks of the second quarter will prove or disprove this line of reasoning.

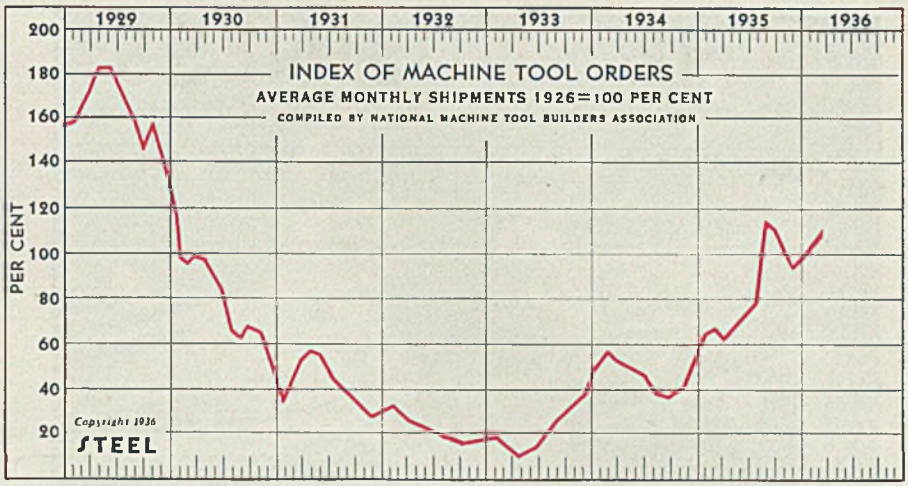
Millions Kw.-Hrs.

	1936	1935	1934	1933
March 14	1900	1728	1650	1375
March 7	1893	1724	1647	1390
Feb. 29	1903	1734	1658	1422
Feb 22	1941	1728	1646	1425
Feb. 15	1950	1760	1641	1469
Feb. 8	1952	1763	1652	1482
Feb. 1	1962	1762	1636	1454
Jan. 25	1955	1781	1611	1469
Jan. 18	1949	1778	1625	1484
Jan. 11	1970	1772	1646	1495
Jan. 4	1854	1668	1564	1461
	1935	1934	1933	1932
Dec. 28	1847	1650	1539	1415
Dec. 21	2002	1788	1657	1554
Dec. 14	1983	1767	1644	1563



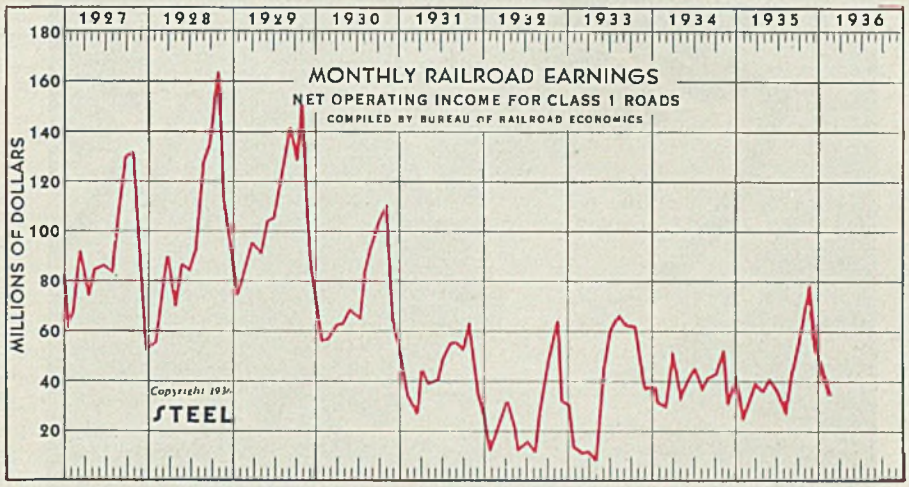
Domestic Orders Push Machine Tool Index Up

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



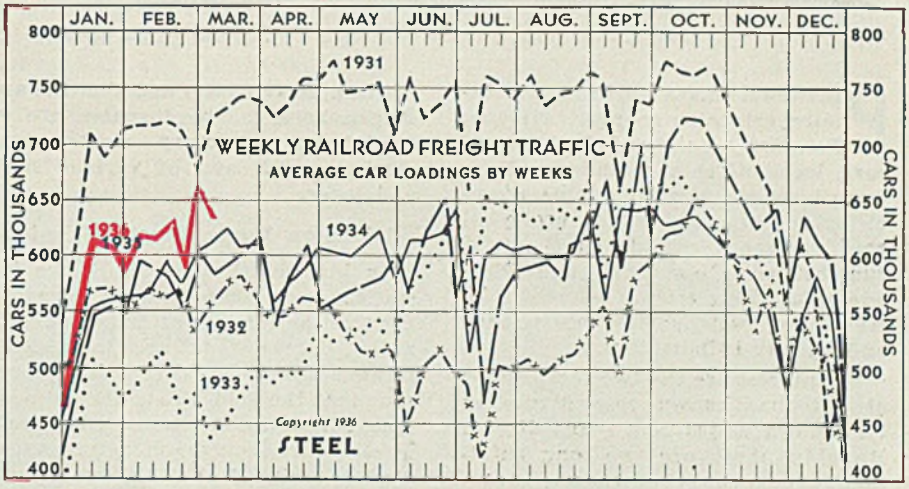
Class I Railroads Earn 2.53 Per Cent in January

	1936	1935	1934
Jan.	$35,874,738	$21,348,557	$31,058,275
Feb.	.....	25,719,919	29,420,772
March	.....	37,850,965	52,217,083
April	.....	34,625,786	32,433,939
May	.....	39,505,069	39,699,194
June	.....	34,024,691	42,037,757
July	.....	26,851,397	35,441,265
Aug.	.....	42,074,108	40,564,071
Sept.	.....	57,359,339	41,713,425
Oct.	.....	75,425,092	49,336,307
Nov.	.....	54,234,305	32,540,502
Dec.	.....	46,040,165	38,738,295



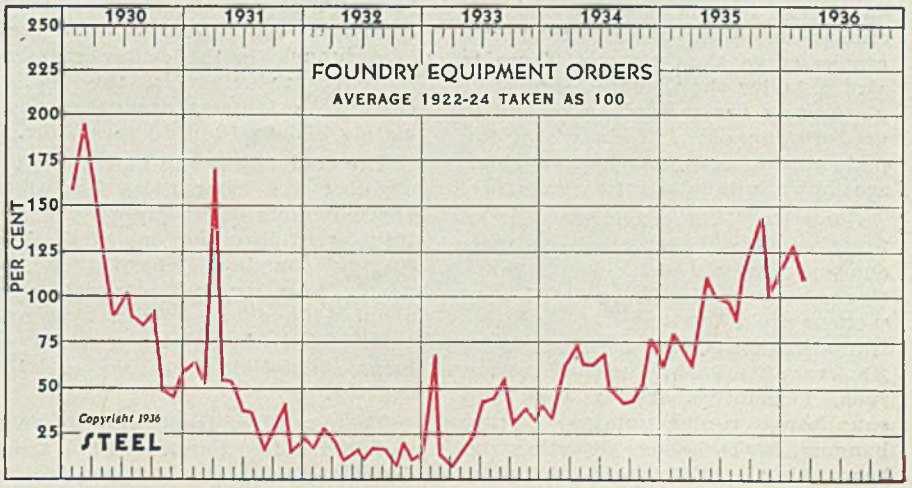
Weekly Car Loadings Hold Above 625,000 Mark

	1936	1935	1934
March 7	634,828	587,190	614,120
Feb. 29	673,123	604,331	605,717
Feb. 22	586,712	553,165	574,908
Feb. 15	631,347	581,669	600,268
Feb. 8	622,097	591,327	573,898
Feb. 1	621,839	596,961	565,401
Jan. 25	584,691	555,528	563,100
Jan. 18	611,408	562,900	560,400
Jan. 11	615,028	553,518	557,266
Jan. 4	541,984	497,274	500,813
	1935	1934	1933
Dec. 28	466,679	425,404	454,765
Dec. 21	599,534	548,478	531,464
Dec. 14	615,237	580,202	559,419
Dec. 7	637,133	551,490	541,992



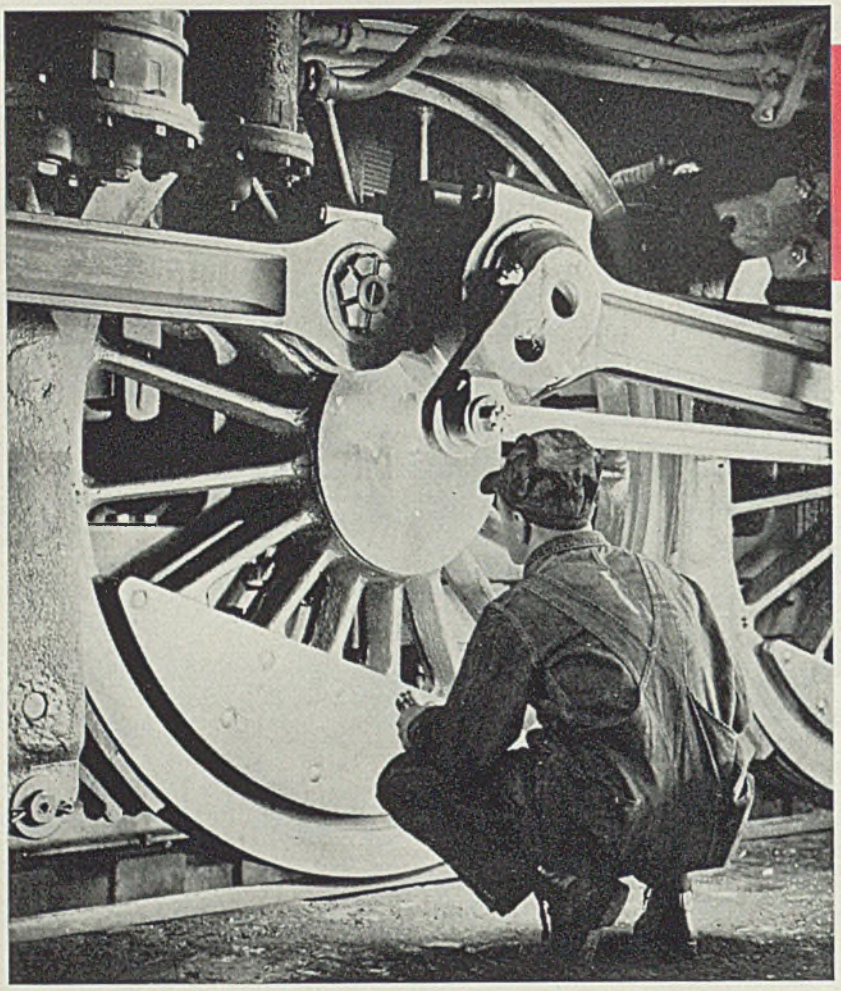
February Foundry Equipment Orders Off; Above Year Ago

	Per Cent			
	1936	1935	1934	1933
Jan.	127.0	86.6	37.2	68.4
Feb.	110.4	75.7	65.8	16.1
March	.....	69.3	75.4	9.8
April	.....	113.2	67.9	19.4
May	.....	100.7	66.5	25.6
June	.....	100.2	70.4	45.5
July	.....	94.0	50.7	48.8
Aug.	.....	113.0	43.1	56.3
Sept.	.....	128.5	46.4	34.9
Oct.	.....	140.0	55.3	42.5
Nov.	.....	100.4	80.4	36.6
Dec.	.....	118.1	66.9	43.8



Forging and

By J. B. NEALEY



—*Robert Dudley Smith*

PENNSYLVANIA railroad maintains extensive shops at Altoona, Pa., for repair and building of cars, locomotives and tenders. Here were built the new and streamlined electric locomotives which broke all previous speed records on the trial run between New York and Philadelphia. This type of engine is 79 feet long, weighs 460,000 pounds and has six twin motors.

Of interest are the two forge shops at Altoona, known respectively as blacksmith shops No. 1 and No. 2. Roughly, these are two long buildings with rows of furnaces, steam hammers, forging presses and jib cranes on both sides. Overhead cranes serve shop No. 2. There is also a boiler shop where large steel plate parts are formed. Gas fuel is used throughout. Steels are of the plain carbon type, analyses of which are shown in tabular form (Page 35).

Shop No. 1 is provided with 11 furnaces serving hammers of various types and sizes with several large steam hammers in the center. Heavy sections are worked mostly in double-frame hammers and are handled by jib cranes. Parts such as piston rods, locomotive driving rods and equalizers, center plates, spring hangers, brake levers, adjusting rod boxes, king bolts, knuckle joint pins, shifting valve covers and the like are forged here. The furnaces are of brick and refractory construction, steel encased, and of various sizes and types.

Modern Forge Practice Used

In blacksmith shop No. 1 are installed two three-chamber furnaces used in the forging of main and side rods. These rods are later heat treated and it is, therefore, important that the cold billets are not subjected immediately to excessive heat. These three-compartment furnaces are so designed that the waste gas products formed in the two outer chambers are discharged through heat tunnels to the center chamber thereby producing in this center chamber a temperature of approximately 800 to 1000 degrees Fahr.

The cold billets are placed in this chamber and after being heated to approximately 900 degrees Fahr. are transferred to either one of the end forging chambers where they are heated to a forging temperature of about 2250 degrees Fahr. Approximately 2¼ hours is required to bring the billets from 900 to 2250 degrees.

There are two drop forge furnaces, each 6 x 9 feet long, with two front doors and four gas burners, two in each end. A center wall, which rises part way to the roof was installed so that the operators can work out of either compartment without materially reducing the heat in the other. One of the adjacent hammers is rated at 12,000 pounds and the other at 16,000 pounds. A hydraulic trimmer is close by. Most of the other furnaces are about the same size and type but contain only one chamber. The hearths of the smaller ones are 4 x 5 feet.

Formerly, the furnaces in these shops were producer gas or oil fired but the changeover to city gas effected economies and practically eliminated the smoke nuisance. Venturi-type gas burners are used, with 80-pound air inspirating gas dropped to zero pressure in a governor. The burners fire through refractory tunnel blocks set in the furnace wall and a space of ½-inch, is left between the burner tip and the steel shell of the furnace. This reduces the furnace pressure and eliminates stingers or flames from around the doors.

Reclamation of scrap is a large item here, an example being small wrought iron scrap which is bloomed into billets. This is accomplished by making a cross pile of old wrought iron arch bars, and miscellaneous

Heat Treating Locomotive Parts

short pieces which are charged into a furnace with a pallet swing from a jib crane. When hot, the mass is removed with tongs and put under a hammer where it is worked into billets and shapes and these are then drop forged into various items, such as locomotive equalizers. Some of this is done by forging on the working heat and then finishing on a reheat. Freight car center plates are formed from hot scrap under drop hammers to shape and then trimmed on the same heat.

In forging, care is first exercised in selecting the grade and approximate size of the material. Sufficient reduction is made at the points of maximum stress to insure a "packing" of the grain. Forgings should be so made that the grain fiber does not end abruptly at any one point, but will preserve a continuity of fiber, thus eliminating any tendency for sudden rupture. The rate and duration of heating should be carefully guarded as either operation performed improperly is not conducive to a sound finished product.

Old axles are sometimes heated and worked down into rectangular or square sections and forging blanks cut from these. Bushings and other items are made in this way. All dies for this and other work are made in the company's own tool and die shop.

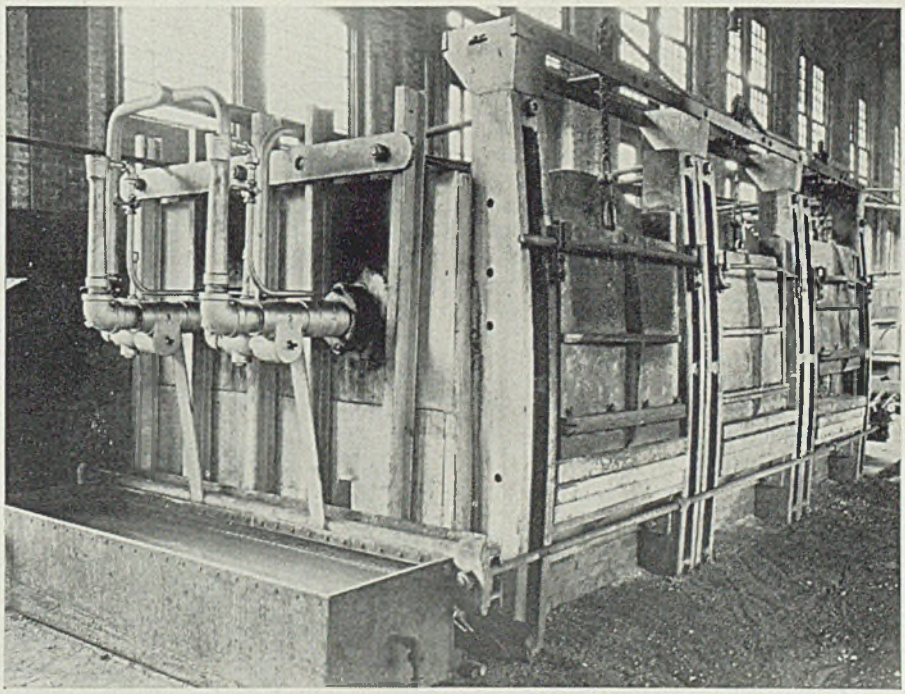
Heat Treatment Records Kept

No. 2 shop contains six drop-hammer furnaces, 18 smaller furnaces for swing-belt hammers and forging machines, forges or tool dressing or hardening, six carbottom and four cylindrical vertical furnaces for various types of heat treatment. The furnaces serving the hammers are of the gas-fired box type, similar to those already described.

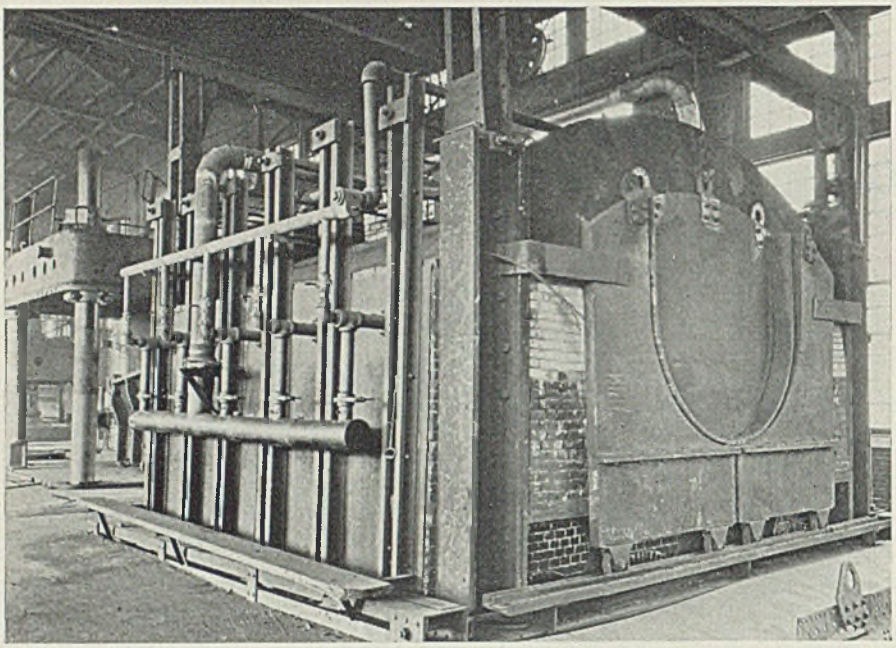
Annealing, prior to machining, is accomplished in the car bottom furnaces. Each of these is 7 x 12 feet in size and is fired with 16 gas burners, eight on each side. The burners are arranged to fire both above and below the work, the lower ones firing through refractory tunnel blocks which form the car top and on which rests a layer of firebrick to form the hearth. The hot products of combustion rise up around the sides and into the furnace chamber. Each side wall contains four vertical vents for the waste heat. Drive rods, piston rods, crank pins, crosshead pins, valve gear motion parts and other locomotive parts are treated in these. The work is placed in the furnace with a temperature of 300 degrees Fahr. and is brought up to 1450-1500 degrees Fahr. at the rate of 200 degrees per hour after which it is soaked at this heat for two hours. The gas burners are then turned off and it is allowed to cool in the furnace. Most of these parts have carbon ranges of 0.40-0.50 and 0.45-0.60.

Some of these parts later are hardened and both the cylindrical vertical and carbottom type furnaces are employed for this purpose. Each cylindrical vertical is 6 feet in diameter and 18 feet deep and they stand in pits about 12 feet deep. Heat is supplied to each by 12 gas burners arranged spirally around the furnace and firing tangentially to the inner wall. The quench tank is rectangular and of concrete and is 12 feet square and 14 feet deep. The cylindrical oil quench tank is located in one corner of the large water quench for such parts as require cooling in oil. The water around this tank tends to cool the oil. The work is handled by a fixture, swung from an overhead crane and hoist. Parts made from steel of the lower carbon range are heated to 1450-1500 degrees Fahr., quenched in water and drawn at 1000-1100 degrees Fahr., while those of the upper carbon range are cooled in air after heating, and drawn using the same temperatures.

The heat treating furnaces are all equipped with automatic temperature controls. All work that is heat treated bears a serial or heat number and that heat number is also put on the pyrometer chart. This chart is filed so that in the event of a failure or unsatisfactory performance of the heat treated part, by referring to the serial number on the piece in question, the chart can be referred



Three-chamber gas-fired furnace for heating main and side rods before forging. Waste gas products of the two end chambers are discharged through heat tunnels to the center chamber



Boiler shop furnace for hating heavy plate work. It is of the double-end type with doors in three sections, as shown. Two side sections move on rollers while the center U-shaped section is raised by a hoist

to and the treatment can be studied.

Other parts such as knuckle joint pins and bushings, valve motion pins and bushings, brake rigging pins and bushings are carburized and hardened to a depth of 3/32-inch. For this purpose there are two, single door, box type furnaces 4 x 5 feet in size each heated with three gas burners underfiring the hearth from one side only. The parts are packed in boxes, 14 x 18 inches x 4 ft. long which are pressed from hot steel plate in the boiler shop. Ordinary carburizing compound is employed. Selective carburizing is used on bushings as the inside surface only is case hardened. A number of these are piled up and bolted rigidly together between two plates. The center is filled with the compound and the entire mass heated.

These parts, of carbon steel, grade A, are carburized at 1750 degrees Fahr., cooled in the box, removed from the box when cold, and are reheated to 1450 degrees Fahr., for quenching. The same furnaces are used for the second heat but the compound and boxes are omitted. There is a central control room where visual pyrometers for all these furnaces are located on panels.

Hydraulic Presses Used

The boiler shop, where much of the heavy plate work is formed, machined and fabricated, is equipped with two hydraulic presses of 700 and 1200 tons capacity, respectively, served by two large, double-end gas-fired furnaces. This set-up is employed to heat and form heavy boiler plate into locomotive throat sheets, crown sheets, domes, firebox sheets and other parts. One of these furnaces is 14 x 15 x 16 feet in size, outside, and inside is 9 feet high from hearth to top of arch. Heat is supplied by ten gas burners, five on each side. The front and back doors are built in three sections to admit partially formed sheets; the two side sections move back and forth on rollers and rails while the center and upper section is lifted by hoist. The bed of the largest press is 12 x 16 feet and holds a platen with a die, which is moved up with a hydraulic piston against a stationary die attached to top platen. The top platen is held in place by four heavy steel posts. This press has an 8-foot stroke. The work is heated to 1700 degrees Fahr., for forming.

Causes for Failure Analyzed

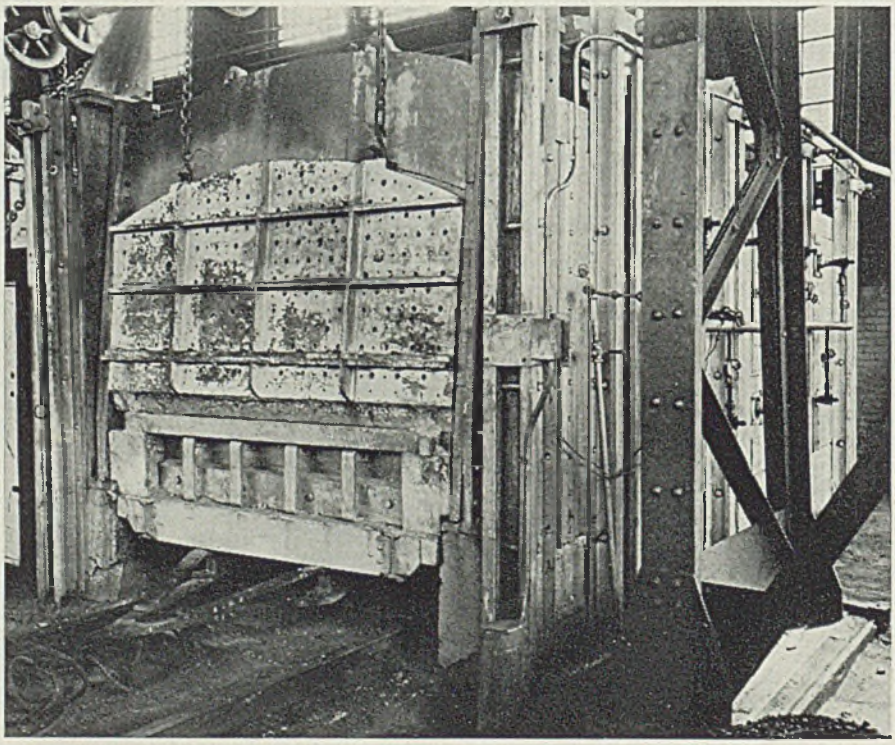
Causes for failure of steel parts in service are many and varied, some of the most common being: (1) Faulty design, (2) rough surfaces, (3) poor quality steel, (4) improper forging temperatures or practices, (5) improper heat treating temperatures or methods.

Briefly analyzed, these causes are as follows:

1. Faulty design often permits of sharp corners where it is possible to place a healthy fillet or radius and thus eliminate a point where stresses may concentrate, improper distribution of weights in relation to static or repeated stresses under service conditions.

2. Rough machining often leaves deep scars or tool marks which are excellent places for fractures to start, commonly called detail fracture but properly named "progressive fracture."

3. Poor quality of steel such as "unsound," "segregated," "porous," "piped," "seamed," "lapped," is more often the cause of failure. It has frequently been found that unsound steel has withstood the trains set up in heat treatment and has withstood proof testing and then shortly after will fail in service, revealing gas or slag inclusions or



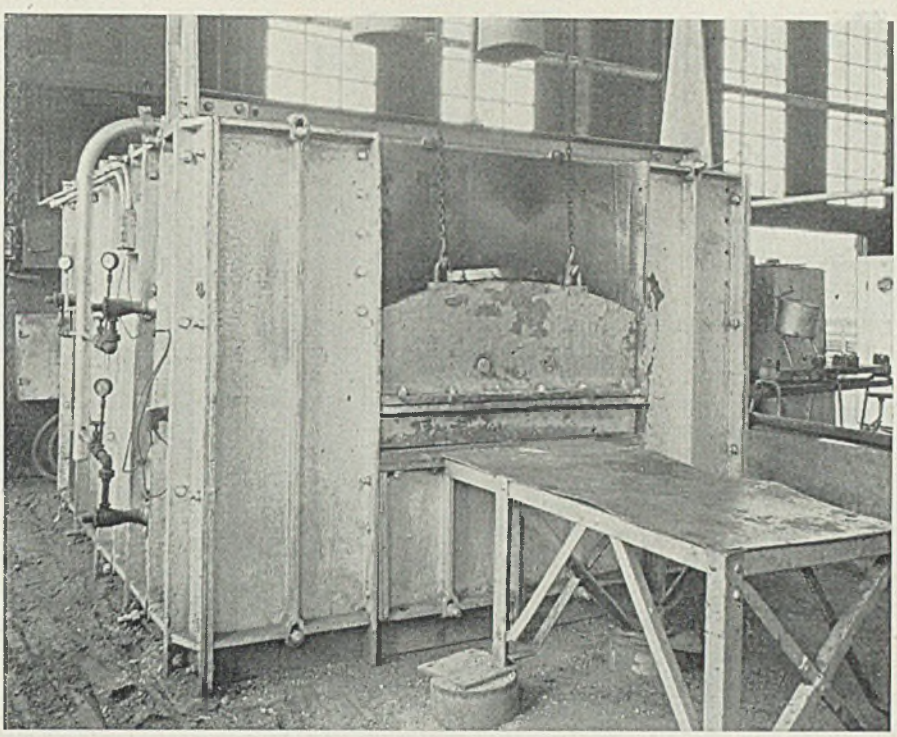
One of six carbottom furnaces for annealing prior to machining. Gas burners both overfire and underfire the charge

segregations of its constituents.

4. Forging temperatures and practice already have been discussed.

5. The heat treating operation which, in the past has been the object of much misplaced criticism is important and should be governed by all the safeguards of modern science.

First it should be remembered that any piece of hardened metal is in an unstable state of equilibrium since during heat treatment certain strains must be set up to obtain the desired physical properties. The steel should be of such constitution that the strains necessarily set up will not be dangerously near the limits of elasticity or ultimate strength. The critical temperatures should be predetermined and the temperatures so used should not exceed, by any great degree, that limit; parts should be preheated initially slowly so that unequal expansion will not start ruptures; heats should be advanced at correct rates and maintained only long enough to permit thorough and even heating as any excess duration of heating at or above the critical temperature tends to increase grain size with a corresponding loss of strength.



Single-door box-type furnace for pack carburizing various pins and bushings

Introduces Two New Oil Cups of Sight-Feed Type

Alemite, a division of Stewart-Warner Corp., Chicago, announces an expansion of manufacturing activities to include the production of oiling devices. First to be introduced are two types of oil cups which combine the best principles of sight-feed oilers with features that are distinctly new.

One of these two items is the thermatic oil cup. Where a constant, slow flow of oil is desired, it affords reliable and economical bearing protection, and requires no other attention than filling. It operates simply by the expansion of air due to the *normal* increase in temperature of a running bearing.

There are no moving parts in this cup. Air expansion forces the oil from the bottom of the air chamber, and that supply is replaced from the cup reservoir by gravitational action. An inlet in the base of the cup admits sufficient air to maintain pressure on the oil. The air vent in the filler tube is placed so as to prevent dirt getting into the cup. Whatever foreign particles may be in the oil when put into the cup are strained out by an 80-mesh filter screen at the bottom of the reservoir.

The second new device—the microflow cup—is particularly adapted to bearings which require a continuous flow of oil in small, adjustable quantities. It is fitted with a resistance unit which permits a fine adjustment of oil flow and assures positive operation by preventing clogging. The larger opening in the discharge valve assures an unhampered flow of oil, which has been strained of foreign particles through an 80-mesh screen. The grooved cylindrical plug, through which the oil must pass to reach the valve, can be adjusted to such a degree that the flow of oil can be made extremely small, yet constant.

Prepares Manual on Care And Selection of Files

Henry Disston & Sons Inc., Philadelphia, has issued a 12-page manual dealing with files, their selection and care. This manual, of 5 x 7¾-inch page size, perforated for ring binder filing, discusses the general types of files made by the company, file steel, file making machinery, major operations in manufacture, sizes and cuts of files, classifications of files according to shape and use, and instructions on use. Copies of the manual may be obtained by addressing the company.

Pennsylvania Railroad Forge Shop Specifications for Carbon Steels

	Steel Billets			Steel Bars*				
	A	B	C	A	B	C	D	E
				Per Cent				
Carbon	0.15-0.25	0.40-0.55	0.45-0.60	.....	.....	0.40-0.55	0.50-0.60	0.12†
Manganese	0.30-0.50	0.40-0.70	0.60-0.90	0.30-0.70	0.30-0.70	0.40-0.80	0.40-0.80	0.30-0.70
Silicon	.....	0.10-0.30	0.10-0.30	.....	.....	.....	.....	.....
Phosphorus	0.05†	0.05†	0.05†	0.05†	0.04†	0.05†	0.05†	0.05†
Sulphur	0.05†	0.05†	0.05†	0.06†	0.05†	0.05†	0.05†	0.05†
Chromium	.....	0.30†	0.30†	.....	.....	.....	.....	.....
Nickel	.....	0.40†	0.40†	.....	.....	.....	.....	.....

†Maximum.

*These specifications cover the the various classes of steel bars used for locomotive, car and stationary boiler construction, classified as follows: Class A—Bars for locomotives, cars and general service; class B—Bars for stationary boilers; class C—Bars specified as "axle steel," for bolts and other purposes; class D—Bars for superheater header bolts and for set screws; class E—Bars for drop forgings.

Purchasing Data for Various Grades of Steel Castings

BY R. A. BULL*

THE great metallurgical activity that has been one encouraging characteristic of these momentous times when progressively we have had frenzied speculation, financial reverses and political developments, all without precedent, is reflected in the technical developments which have occurred in the steel foundry. While its product is not one that lends itself readily to dramatic publicity, it is an essential factor in modern industry. No one who is and has been familiar with the steel casting industry can doubt that the progress it has made since the World war will be followed during the next ten years by achievements exceeding those of any similar period of time.

Inevitably the strong tendency to meet exacting demands and for that purpose to develop new grades of metal producible in the steel foundry has resulted in some varieties which have prompted differences of opinion as to proper technical classification. Thus there are persons who prefer to term some of the specially alloyed metals now made in the steel foundry as iron, while others insist on calling them steel. The old dividing line formerly established for differentiating between steel and iron is not as widely applicable as it used to be. The limitation generally accepted for many years was a carbon content of 1.70 per cent. That is to say, if the ferrous metal which was not specially alloyed contained no more than the amount of carbon mentioned, usually the procedure was to classify it as steel; whereas a larger proportion of carbon in similar material identified it as iron.

Conception Has Changed

But this was before the days when specially alloyed metals produced in steelmaking furnaces were made regularly, as they are now, with carbon contents ranging roughly from 1.25 to 1.75 per cent; and having certain characteristics representing, for certain purposes, a happy compromise in respect to strength, stiffness, wear resistance, and economical production.

To prevent misunderstanding it may be advisable to state (while not intending to develop this article along strictly scientific lines) that the carbon limit of 1.70 per cent which has been mentioned was found to be the amount of carbon in unalloyed steels and cast irons which represents the maximum solid solubility of carbon in iron. But the effect of carbon in this important respect is greatly influenced by certain elements. Thus, metallurgists discovered that aluminum, copper, nickel, phosphorus and silicon lower the solid solubility of carbon in iron. Because of the influence of numerous elements and because of the variable amounts of some of these elements in all irons

Consultant on steel castings, 541 Diversey parkway, Chicago.

Summary of Physical and Chemical Laboratory Requirements in All A. S. T. M. Specifications Now Effective Covering Steel Castings

STANDARD SPECIFICATIONS A27-24, FOR CARBON-STEEL CASTINGS (FOR GENERAL SERVICE AND FOR SHIPS, AS DESCRIBED IN "SCOPE" CLAUSE)

CHEMICAL REQUIREMENTS (MAXIMUM):

	Class A	Class B
	—Per Cent—	
Carbon	0.45	....
Phosphorus, Acid	0.07	0.06
Phosphorus, Basic	0.06	0.05
Sulphur	....	0.06

PHYSICAL REQUIREMENTS (MINIMUM):
Specified Only for Class B

	Grades		
	Hard	Medium	Soft
Tensile strength, lbs./sq. in.	80,000	70,000	60,000
Yield Pt., lbs./sq. in.	45% of Tensile Strength		
Elongation in 2 ins., per cent	17	20	24
Reduction of area, per cent	25	30	35
Angle of Bend, degrees (Only when specified)	....	90	120

NOTE: These specifications now are regarded by many persons as being improperly applicable to some carbon steel castings for general service. It is expected that these specifications will be cancelled when Specifications A180 are found satisfactory in their present or subsquently modified form, and when contemplated new separate specifications for marine steel castings and possibly other special types of steel castings are adopted.

TENTATIVE SPECIFICATIONS A180-35T, FOR CARBON-STEEL CASTINGS FOR MISCELLANEOUS INDUSTRIAL USES

CHEMICAL REQUIREMENTS (MAXIMUM):

	Per Cent
Manganese	1.00
Phosphorus	0.05
Sulphur	0.06

PHYSICAL REQUIREMENTS (MINIMUM): Only for Grades A-1, A-2, B, and H. To be determined by described methods of producing test coupons (separately cast unless otherwise specified) which permit moderate rates of cooling after pouring.

	Grades			
	A-1	A-2	B	H
Tensile Strength, lbs./sq. in.	60,000	60,000	70,000	80,000
Yield Pt., lbs./sq. in.	30,000	30,000	38,000	43,000
Elongation in 2 ins., per cent	22	26	24	17
Reduction of area, per cent	30	38	36	25

NOTE: All grades except N-1 and A-1 are required to be annealed. Grades N-1 and N-2 are not required to be physically tested.

TENTATIVE SPECIFICATIONS A87-35T, FOR CARBON-STEEL AND ALLOY-STEEL CASTINGS FOR RAILROADS

CHEMICAL REQUIREMENTS (MAXIMUM):

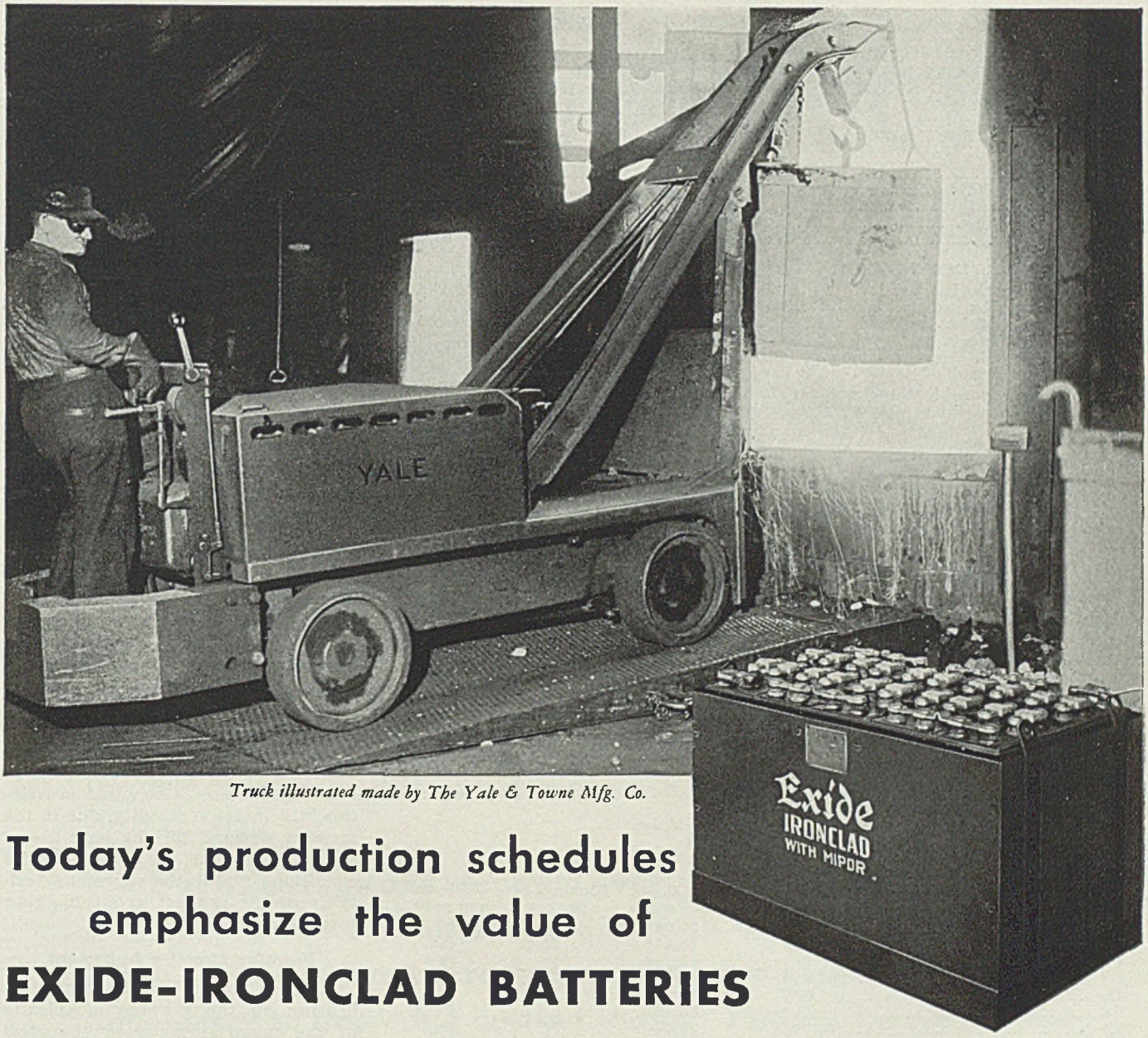
	Grades	
	A-1, A-2, & B	C
	—Per Cent—	
Manganese	0.85	....
Phosphorus	0.05	0.05
Sulphur, Acid	0.06	0.06
Sulphur, Basic	0.05	0.05

PHYSICAL REQUIREMENTS (MINIMUM):

	Grades			
	A-1	A-2	B	C
Tensile strength, lbs./sq. in.	60,000	60 000	70,000	90,000
Yield point, lbs./sq. in	30,000	30,000	38,000	55,000
Elongation in 2 ins., per cent	22	26	24	22
Reduction of area, per cent	30	38	36	40

NOTE: Grades A-1, A-2, and B are defined as carbon-steel. Grade C is not defined. All grades except A-1 are required to be annealed. These specifications conform to Specification M-201-34 of the American Association of Railroads in all major requirements.

(*Continued on Page* 38)



Truck illustrated made by The Yale & Towne Mfg. Co.

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(*Continued from Page 36*)

STANDARD SPECIFICATIONS A95-33, FOR CARBON-STEEL CASTINGS FOR VALVES, FLANGES, AND FITTINGS FOR HIGH TEMPERATURE SERVICE (RANGING FROM 500 TO 850 DEGREES FAHR., ACCORDING TO NOTE APPENDED TO SPECIFICATIONS)

CHEMICAL REQUIREMENTS:

	Per cent
Carbon	0.15-0.45
Manganese, min.	0.50
Silicon, min.	0.20
Phosphorus, max.	0.05
Sulphur, max.	0.06

PHYSICAL REQUIREMENTS (MINIMUM):

Tensile strength, lbs./sq. in.	70,000
Yield point, lbs./sq. in.	36,000
Elongation in 2 ins. per cent	22
Reduction of area, per cent	30
Angle of Bend, degrees (Only when Specified)	90

NOTE: These specifications are supplemented by Specification A157-35T for similar castings of alloy steel suitable for higher temperatures.

TENTATIVE SPECIFICATIONS A157-35T, FOR ALLOY-STEEL CASTINGS FOR VALVES, FLANGES, AND FITTINGS FOR SERVICE AT TEMPERATURES FROM 750 TO 1100 DEGREES FAHR.

CHEMICAL REQUIREMENTS:

	Ferritic Steels						Austenitic Steels	
	C1	C2	C11	C4	C5	C6	C9	C10
	C-Mo	Mn-Mo	Ni-Cr	Ni-Cr-Mo	4 to 6% Cr	13% Cr	18% Cr, 8% Ni	8% Cr, 20% Ni
C	0.45*	0.35*	0.45*	0.45*	0.15-0.35	0.15*	0.15*	0.35*
Mn	1.00*	1.00-1.60	1.00*	1.00*	1.00*	1.00*	1.00*	1.50*
P	0.05*	0.05*	0.05*	0.05*	0.05*	0.05*	0.05*	0.05*
S	0.06*	0.06*	0.06*	0.06*	0.06*	0.05*	0.05*	0.05*
Si	0.20†	0.20†	0.20†	0.20†	0.20†	1.00*	2.00*	2.00*
Ni	.....	.....	1.00-2.25	0.75-1.50	.....	0.80*	8.00-10.3	19.0-22.0
Cr	.....	.....	0.50-1.00	0.50-1.00	4.00-6.50	11.5-13.5	17.5-20.0	7.00-9.00
Mo	0.40†	0.20†	0.20-0.40[1]	0.30-0.60	0.40-0.65[2]	0.50*	‡	.....
W	.....	.....	0.40-0.80[1]	.....	0.80-1.25[2]	.....	.....	.....

*Maximum. †Minimum. ‡As agreed upon.
[1] Either molybdenum or tungsten may be used, if desired.
[2] Either molybdenum or tungsten shall be used.

PHYSICAL REQUIREMENTS (MINIMUM):

Grade	Ten. str., lbs./sq. in.	Yld. pt., lbs./sq. in.	Elong., 2 ins., per cent	Red. area, per cent
C1	80,000	50,000	22	45
C2	90,000	60,000	22	45
C11	100,000	65,000	18	30
C4	100,000	65,000	18	30
C5	100,000	65,000	18	30
C6	85,000	55,000	20	40
C9	70,000	30,000	35	40
C10	65,000	30,000	30	35
Angle of Bend for all grades, degrees (Only when specified)			90	

TENTATIVE SPECIFICATIONS A148-33T, FOR ALLOY-STEEL CASTINGS FOR STRUCTURAL PURPOSES (EXCLUSIVE OF HIGH TEMPERATURE APPLICATIONS, AS STATED IN "SCOPE" CLAUSE)

CHEMICAL REQUIREMENTS:

	Per cent
Phosphorus, max.	0.05
Sulphur, max.	0.06

Other elements only as specified.

PHYSICAL REQUIREMENTS (MINIMUM):

		Ten. str., lbs./sq. in.	Yld. pt., lbs./sq. in.	Elong., 2 ins., per cent	Red. area per cent
Class A	Grade 1	75,000	40,000	24	35
	Grade 2	85,000	53,000	22	35
Class B	Grade 1	85,000	55,000	22	40
	Grade 2	90,000	60,000	22	45
	Grade 3	100,000	65,000	18	30
Class C	Grade 1	90,000	65,000	20	50
	Grade 2	120,000	100,000	14	35
	Grade 3	150,000	125,000	10	25
Angle of Bend, degrees (For Class A only, when specified.)					120

NOTE: All class distinctions are made solely by virtue of prescribed and permissible heat treatments. Class A must be full annealed. Class B must be full annealed or normalized. Class C must be full annealed or normalized, and may also be liquid quenched and drawn.

(*Continued on Page 40*)

and steels, no absolute dividing line for carbon content can be established for differentiating between steel and cast iron. The nature of the structure is the determining factor.

Some steel founders are in the habit of classifying their product as steel, however high the carbon content may be, provided it is under 2.00 per cent; no matter what may be the total quantity of nonferrous elements in the composition. Steel foundrymen generally assign the term cast steel to such cast material as has been used successfully for several million automobile crankshafts and camshafts (applications of castings hardly predictable ten years ago); also to cast material required to resist corrosion or high working temperatures, sometimes containing roughly from 12 to 55 per cent of nonferrous material.

The significant point to be remembered in connection with the present discussion is the *product* of the steel foundry; not whether it should now accurately be termed steel or iron, or by another name that might be applied to an alloy that is predominantly nonferrous in composition percentage. It may be predicted safely that the number of grades of metal produced in the foundry and coming into the questionable zone in respect to correct technical description will increase steadily, due to the growing demand for the long life of metals subjected to severe service conditions, and to the enormous flexibility of the product of steelmaking furnaces.

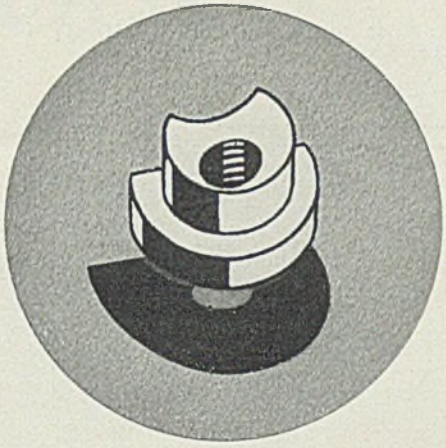
Foundry Practice Important

Perhaps the preceding comments bearing on the growing complexity of the material made in the steel foundry will explain in some degree the wide range in chemical composition covered by the current specifications for steel castings which have been adopted by the American Society for Testing Materials. Within the last few years there has been unparalleled activity in developing such purchasing requirements.

The more experienced consumers of steel castings do not need to be told that the value of the steel casting cannot be appraised solely by the physical and chemical tests on laboratory specimens. There are many details of foundry practice independent of the factors indicated which are essential to the production of satisfactory material. The purchaser who realizes this is apt to make general and specific inquiry before selecting his sources of supply. Such an investigation needs to be attended by good practical judgment regarding some rather indefinable elements of skillful manufacture. For example, the customer usually has

25% to 40% REDUCTION

WHEN WIRE IN COILS REPLACES STEEL RODS



This clincher nut was formerly made from steel rod on a screw machine. Today it is made on a Manville Cold Heading Machine—and it is estimated that savings range from 25% to 40%.

Such savings are common every-day experience where manufacturers are able to use wire in coils instead of bar stock. Not only must round rods be straightened, but it is necessary to use edge cutting tools. The maker of these clincher nuts was amazed to learn that round wire fed through a Manville Machine not only was practical—but cut costs and developed a better product.

Manville engineers will be glad to tell you whether some of your products now made from rod stock can be made from wire. Remember too, the Manville quality has been "top" in cold processing machines for many years. We'll be glad to hear from you.

MANVILLE MACHINES

E. J. Manville Machine Company, Waterbury, Conn.
CLEVELAND OFFICE: 1209 SWETLAND BUILDING

(*Continued from Page 38*)

STANDARD SPECIFICATIONS A128-33, FOR AUSTENITIC MANGANESE STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon	1.00-1.40
Manganese, min.	10.00
Phosphorus, max.	0.10
Sulphur, max.	0.05

PHYSICAL REQUIREMENTS (MINIMUM):

Angles of bend, degrees (Only when specified)	150

NOTE: No tension tests are specified.

TENTATIVE SPECIFICATIONS A168-35T, FOR 12 PER CENT CHROMIUM STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.15[1]
Chromium	11.5 -14.0 [1]
Manganese	0.25- 0.75
Silicon, max.	1.00
Nickel, max.	0.80
Sulphur, max.	0.050
Phosphorus, max.	0.050

[1] If the carbon content exceeds 0.12 per cent, the chromium shall not be less than 12.50 per cent.

PHYSICAL REQUIREMENTS:

Tensile strength, min., lbs./sq. in.	80,000
Yield point, min., lbs./sq. in.	50,000
Elongation, 2 ins., min., per cent	20
Reduction of area, min., per cent	30
Brinell hardness, max.	215
Angle of bend, minimum, degrees (Only when specified)	90

TENTATIVE SPECIFICATIONS A169-35T, FOR 19 PER CENT CHROMIUM STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.30
Chromium	17.0 -21.0
Manganese	0.25- 0.75
Silicon, max.	1.00
Nickel, max.	1.00
Copper	0.90- 1.20[1]
Sulphur, max.	0.050
Phosphorus, max.	0.050

[1] Required for heat-resisting castings.

PHYSICAL PROPERTIES:

Tensile strength, min., lbs./sq. in.	90,000
Yield point, min., lbs./sq. in.	55,000
Elongation, 2 ins., per cent	5.0
Reduction of area, per cent	5.0
Brinell hardness, max.	230

TENTATIVE SPECIFICATIONS A170-35T, FOR 28 PER CENT CHROMIUM STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon	0.25- 0.50
Chromium	26.00-30.00
Manganese	0.25- 0.75
Silicon, max.	0.80
Nickel, max.	3.00
Sulphur, max.	0.050
Phosphorus, max.	0.050

PHYSICAL REQUIREMENTS:

Tensile strength, min., lbs./sq. in.	55,000
Yield point, min., lbs./sq. in.	40,000
Brinell hardness, max.	230

TENTATIVE SPECIFICATIONS A171-35T, FOR 24 PER CENT CHROMIUM, 12 PER CENT NICKEL ALLOY-STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.25[1]
Chromium	22.0 -26.0
Nickel	11.0 -13.0
Manganese	0.25- 1.00
Silicon	0.25- 1.50
Sulphur, max.	0.050
Phosphorus, max.	0.050

[1] 0.40 per cent for heat-resisting castings.

PHYSICAL PROPERTIES:

Tensile strength, min., lbs./sq. in.	70,000
Yield point, min., lbs./sq. in.	45% of Tensile strength
Elongation, 2 ins., min., per cent	30
Reduction of area, min., per cent	30
Brinell hardness, max.	200
Angle of bend, min., degrees	120

(*Concluded on Page 43*)

the opportunity of convincing himself that the vital factor of molding sand preparation is or is not fully appreciated by the particular foundry whose operations are being scrutinized. But it is impossible, except in general terms that would mean little or nothing when applied to an individual job, to write clauses into specifications intended to have extensive application, in such a way as fully to safeguard regular production.

Designer Determines Needs

The designing engineer representing the purchaser of industrial metals develops the proportions of the parts on one or more rather definite hypotheses. If neither heat nor corrosion resistance is a factor, the designer is concerned mainly with the resistance to such stresses as are customarily borne by structural members. In such case the prescribed minimum value for yield point provides the engineer with the basis for most of his calculations. Using this value and multiplying it by the safety factor regarded as proper to employ, the designer must then depend on his good judgment, when considering the minimum degree of ductility that should prevail in the metal to be selected.

Going further than that if he chooses, the designer may depend to some extent on shock resistance as shown by using the Izod or the Charpy impact testing machine. Bend tests may also be specified. Resistance to surface wear may be an important factor. Only rarely are there applied room temperature testing methods besides those mentioned, for indicating resistance to mechanical stresses. It is generally assumed without making laboratory tests that the fatigue value of cast steel is approximately 45 per cent of the tensile strength.

Place of Laboratory Data

If the designer is developing a part or a structure which must exhibit unusual resistance to heat or to corrosive agencies, the chemical composition of the steel becomes extremely important, partly but not wholly because of the difficulty of making quick laboratory tests on specimens under conditions comparable with those to be experienced in service.

When all is said and done, it seems necessary for steel castings specifications, intended for broad application, to be built largely around appropriate requirements for properties ascertained in laboratory specimens. These are prescribed in conjunction with somewhat general clauses relating to any specified heat treatment (such as normalizing, full annealing, drawing or tempering, and liquid quenching), marking,

"Speedometer Failure is no excuse"

Car manufacturers demand dependable accessories. Wissco Shaft and Casing Wire used in flexible shafts reduce speedometer failure from cable breakage. Other manufacturers, too, makers of portable drills, grinders, brushes, flexible shaft dental and barber equipment find that better shafts made from Wissco Wire mean greater dependability of their products. Wissco development has not been limited to Casing and Shaft Wires. Engineers in the Wickwire Spencer laboratories are anticipating demands for all kinds of wire fabrication and uses. Write today and we will tell you about the Wissco Wire we have ready for you.

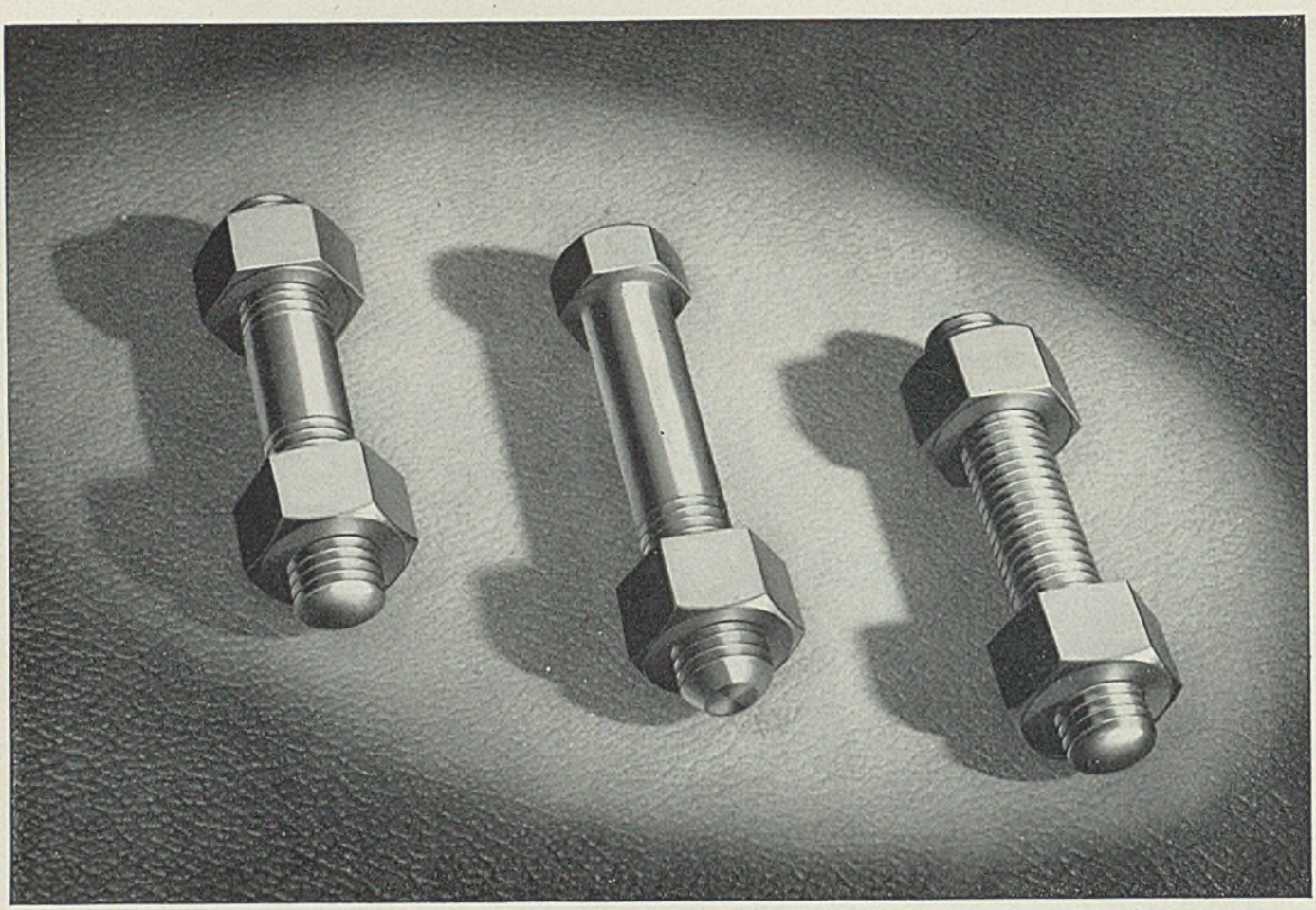
WICKWIRE SPENCER STEEL COMPANY

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

•

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

WISSCO WIRE
by Wickwire Spencer



BOLTS and STUDS of Stainless Steel

FROM both the metallurgical and manufacturing standpoints, the making of stainless-steel bolts involves complex problems.

The required physical properties and corrosion-resisting qualities are closely interwoven with fabricating and heat-treating considerations. All these factors must be carefully weighed in selecting the grade of stainless steel to be used, as well as in deciding on the processing in making the bolts.

Bethlehem's Bolt and Nut Division is exceptionally well prepared to evaluate all the elements involved in making bolts and studs of stainless steel. Bethlehem is a large producer of stainless steels, and has done much work on the development of the various grades and their application to the needs of industry. The Bolt and Nut Division can draw freely on the fund of information accumulated through this intimate acquaintance with problems related to stainless steels.

This collaboration between stainless-steel specialists and men thoroughly skilled in bolt-and-nut manufacture is an important reason why Bethlehem's Lebanon Plant is a good place to come to for stainless-steel bolts and studs.

Bethlehem District Offices are located at Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

(*Concluded from Page 40*)

TENTATIVE SPECIFICATIONS A172-35T, FOR 25 PER CENT CHROMIUM, 20 PER CENT NICKEL ALLOY-STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.30[1]
Chromium	23.0 -27.0
Nickel	19.0 -22.0
Manganese	0.25- 1.00
Silicon	0.25- 1.50
Sulphur, max.	0.050
Phosphorus, max.	0.050

[1] 0.40 per cent for heat-resisting castings.

PHYSICAL PROPERTIES:

Tensile strength., min., lbs./sq. in.	72,500
Yield point., min., lbs./sq. in.	45 per cent of Tensile strength
Elongation, 2 ins. min., per cent	25
Reduction of area, min., per cent	25
Brinell hardness, max.	225
Angle of bend, min., degrees	90

TENTATIVE SPECIFICATIONS A173-35, FOR 28 PER CENT CHROMIUM, 9 PER CENT NICKEL ALLOY-STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.30[1]
Manganese	0.25- 1.00
Silicon	0.25- 1.50
Nickel	8.0 -10.0 [2]
Chromium	26.0 -30.0
Sulphur, max.	0.050
Phosphorus, max.	0.050

[1] 0.40 per cent for heat-resisting castings.
[2] 10.0 to 12.0 per cent desirable for certain applications.

PHYSICAL PROPERTIES:

Tensile strength, min., lbs./sq. in.	85,000
Yield point, min., lbs./sq. in.	45 per cent of Tensile strength
Elongation, 2 ins. min., per cent	20
Reduction of area, min., per cent	20
Brinell hardness, max.	225
Angle of bend, min., degrees	90

TENTATIVE SPECIFICATIONS A174-35T, FOR 20 PER CENT NICKEL, 9 PER CENT CHROMIUM ALLOY-STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.20[1]
Chromium	8.0 -10.0
Nickel	19.0 -22.0
Silicon	0.25- 2.00
Manganese	0.25- 1.00
Sulphur, max.	0.050
Phosphorus, max.	0.050

[1] May be 0.35 per cent for heat-resisting castings.

PHYSICAL REQUIREMENTS (MINIMUM):

Tensile strength, lbs/sq. in.	65,000
Yield point, lbs./sq. in	30,000
Elongation, 2 ins., per cent	30
Reduction of area, per cent	35
Angle of bend, degrees	120

TENTATIVE SPECIFICATIONS A175-35T, FOR 35 PER CENT NICKEL, 15 PER CENT CHROMIUM ALLOY-STEEL CASTINGS

CHEMICAL REQUIREMENTS:

	Per cent
Carbon, max.	0.60
Manganese	0.25- 1.00
Silicon	0.50- 1.75
Nickel	34.0 -37.0
Chromium	14.0 -17.0
Sulphur, max.	0.050
Phosphorus, max.	0.050

PHYSICAL REQUIREMENTS:

Tensile strength, min., lbs./sq. in.	60,000
Yield point, min., lbs./sq. in.	45 per cent of Tensile strength
Brinell hardness, max.	185

cleaning, substantial adherence to drawing dimensions, etc.

The limitations in respect to fixed, mathematically expressed standards of acceptability which are imposed by the very nature of foundry operations compel many purchasers to depend mainly on the values characterizing laboratory specimens, supposed to be typical of the material put into commercial castings. Unfortunately this circumstance prompts some consumers to magnify the results from test specimens beyond their true relative significance. The conscientious foundryman who has at heart the interests of his customer tries to develop in him (if it does not already exist) a metallurgical sense of proportion regarding such matters as test bars and chemical analyses.

Since 1932 there have been issued by the A.S.T.M. 12 new sets of specifications for steel castings. Ten such sets were tentatively adopted last year, to cover 13 composition grades of metal that are differently prescribed. In addition, there are three A.S.T.M. specifications for steel castings which were adopted several years ago and are still in effect; making a total of 15 sets of specifications for the product of the steel foundry which are now "on the books." In each of two of these sets of specifications there are eight grades of metal provided.

Producers, Consumers in Accord

It will be clear from these explanations that important agreements between producers and consumers were obtained recently on the characteristic properties of many metal grades, and that some industrialists now need information regarding the newly established purchasing requirements for steel castings, particularly those made from special grades of metal. As a means of distributing such information in concise and convenient form, the writer presents as an accompanying portion of this article a summary showing the chemical and physical test requirements in all current A.S.T.M. specifications for steel castings. Complete information regarding these may of course be obtained from A.S.T.M. headquarters, which will supply any individual, irrespective of his membership in the organization, with desired pamphlet copies of any of its specifications.

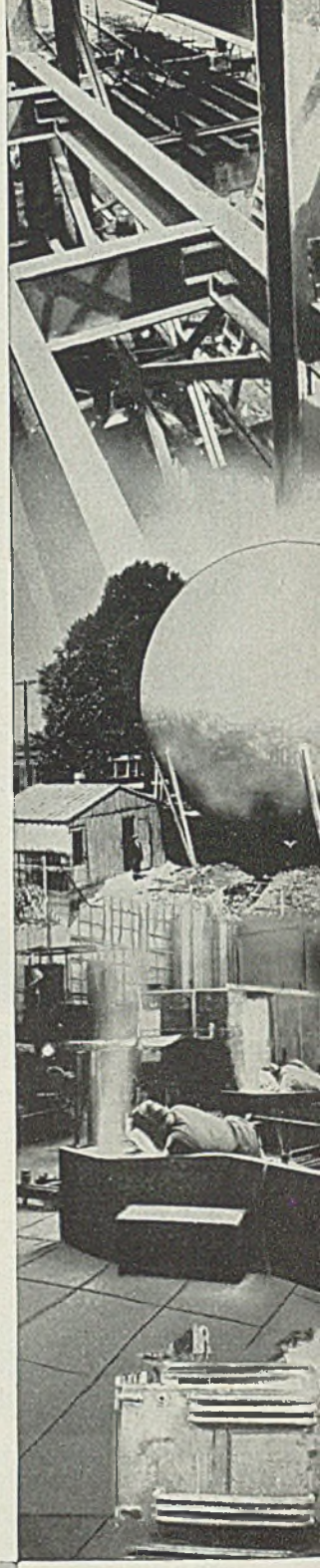
It seems appropriate to conclude this attempted presentation of information on the subject by mentioning the fact that a vast amount of helpful data relating generally and specifically not only to purchasing requirements but to many details of and results from foundry practice may be found in the *Cast Metals Handbook*, published last year by the American Foundrymen's association. Designing and construction engineers who use or might economically employ sand castings made from any ferrous or nonferrous metal will find this volume informative and suggestive. The extent to which metallurgical advancement has caused the four metal divisions of the foundry industry to become competitive with each other should prompt all progressive casting producers to study, in the *Cast Metals Handbook* and elsewhere, reliable published data on the properties now obtainable in every cast metal.

PROFIT from the Experience of the World's Most Extensive User of Arc Welding

FOR YEARS, General Electric has been serving industry through the application of arc welding to its own manufacturing processes. It has thereby produced assemblies that are stronger, lighter, and more compact than those fabricated by other methods. From the smallest tank to the largest generator—wherever it will produce, economically, a higher-quality job—arc welding is applied.

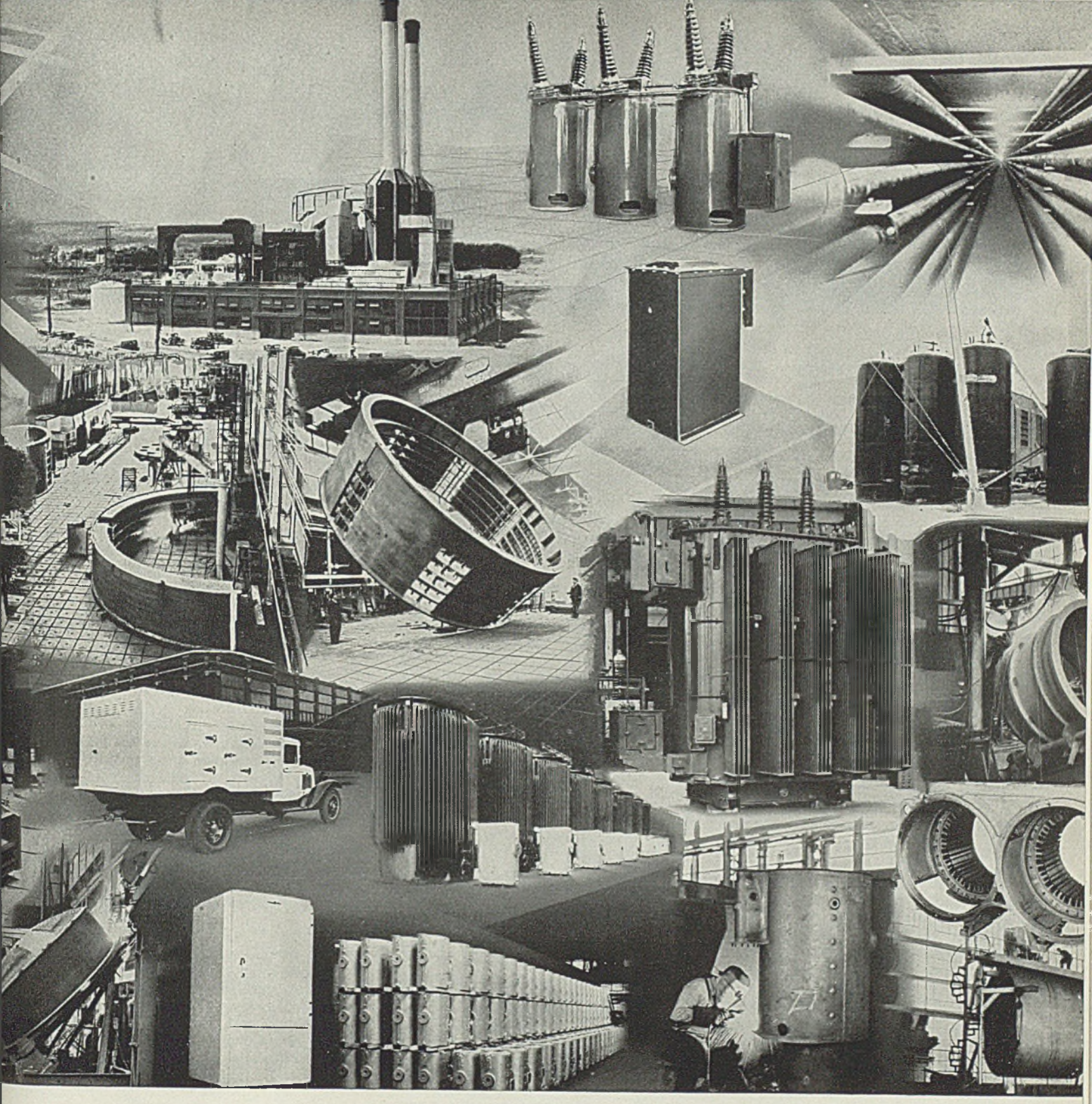
General Electric research facilities and the large staff of G-E engineers have given their utmost toward furthering the advancement of arc welding in industry. By constant effort they have solved many assembly problems. They have accomplished this through improvement of manufacturing processes, through refinements in the design and manufacture of apparatus, and through development of welding equipment and electrodes. As a result, G-E welding equipment provides long, trouble-free, economical service under the strenuous demands of present-day production, and G-E electrodes give the strong, uniform, high-quality welds required.

In G-E welding equipment and electrodes lies more than mere nicety of design, for, in addition, they are built on the sound foundation of years of experience with electric welding—experience which only the most extensive user of electric welding can have—years of constant research and actual use. Thus, when you specify G-E, you can be sure of getting welding equipment and electrodes that are definitely right—that will give you added dividends in superior-quality products and lower costs. General Electric, Schenectady, N. Y.



G-E Welding Equipment Is Used in the Fabrication of These Products

. . . . . From the smallest tank to the largest generator—wherever it will produce, economically, a higher-quality job—arc welding is applied.

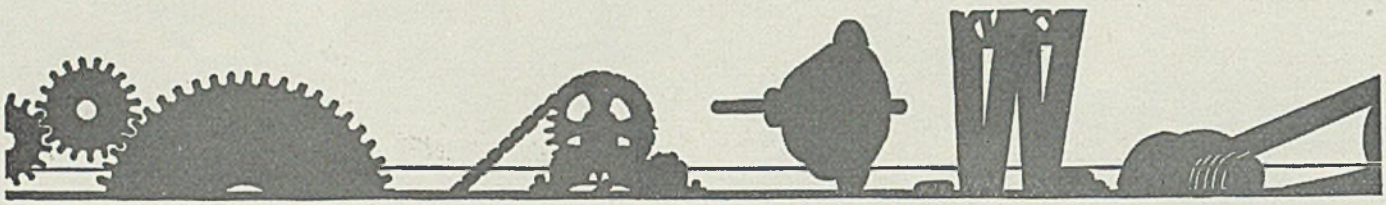


THE MORE WE WELD—THE BETTER WE SERVI

GENERAL ELECTRIC

140-30

Power Drives



Complete Information

POWER drives may be divided into three parts: The motor, its control, and the mechanical elements (belts, chains, gears, etc.) connecting the motor to the machine or machines. Each of these elements should be designed in co-ordination with the others and according to the load or operating conditions and requirements.

The vast majority of drives operate without meeting any unusual conditions. They simply plug along, doing a good day's work without ever being called upon for any pronounced overexertion. Engineering of such drives is comparatively simple: Select a motor large enough, or according to recommendations of the machine manufacturer, and add the control and transmission equipment of the corresponding rating, as listed in the catalogs. Such engineering is usually ample for normal drives, most of which operate at considerably below full load.

Certain types of drives, however, which are subject to shock or reversals under loads, continuous full load, peaks, especially if of more than momentary duration, exceptionally high speed reductions, increases in speed, or other severe operating requirements, usually necessitate special attention to all three parts of the drive. It is in such drives that most trouble occurs.

Overload Factor Vital

The common cause of such trouble is to neglect to apply a sufficient overload factor to all three elements of the drive. For example, the use of a special motor with high starting torque or other overload characteristics necessitates a corresponding increase in the mechanical transmission elements because even though the nameplate rating may indicate only, say, 10 horsepower, the special characteristics may permit it to operate part of the time as a 15-horsepower motor. Usually the control must be adapted to the motor or this neglect will quickly show itself and necessitate correction. Mechanical elements, however, do their best until they wear out or break under such conditions which, unfortunately may result in dissatisfaction and short life.

The best solution of such problems depends upon the special conditions in each individual case. Often these overload conditions are not appreciated or even recognized. To be on the safe side many plant engineers provide mechanical transmission elements designed to transmit a load equal to the highest rated overload capacity of the motor and then set the overload releases or circuit breakers to act quickly at, or just above, this point and so protect the motor, and the mechanical elements as well, from any further increase.

Where plant men have not had considerable experience on such unusual drives it is well to seek as much outside advice as possible. Often, calling in a consulting engineer is a real economy.

♦ ♦ ♦

Look Inside!

SPEED reducers, chain drives and gear boxes usually are enclosed for safety, to protect them against the entrance of foreign materials, and also to retain and direct the lubricant. Electrical control equipment is also enclosed, largely to protect against contact by the operator and against the entrance of dirt and foreign materials.

Such enclosures, however, do not mean that working parts inside can be neglected. One advantage of inspections of gear and chain enclosures is to discover excessive wear which might result from the lubricant not being applied as it should, pitting due to improper lubricant, or abrasive material in the lubricant. Emulsification of the lubricant may cause some of the emulsified material to stick inside the case and not drain out. The same is true of abrasive material, especially if the case is drained while the drive is idle or has remained idle for some time prior to draining so that any solids have settled out.

Many plant engineers also open ball or roller bearings every year or two to inspect them, especially where grease lubricated. This checks the amount of lubricant to see if too much or too little has been used, whether the grease is gumming or solidifying, and whether dirt or water has entered the bearing.

Ordinarily, once a year is sufficient for such inspections, which require only a few minutes, except in the case of large units, and are best made when the lubricant is being changed.

Electrical control equipment, however, should have more frequent inspections, the period varying from monthly to quarterly, depending on the type and frequency of operation. Such inspections disclose burned or bent points which make poor contacts, and loose points or parts which may fall off, stick in position, or cause a short circuit.

The adjustment or replacement of such parts before they cause trouble usually costs less than waiting until absolutely necessary. The chief advantage, however, is that such inspection work and minor maintenance can be performed when convenient and with a minimum of interruption of operation, whereas a failure always interrupts production and usually at the most inopportune time.

♦ ♦ ♦

When mounting motor and control on a machine tool, be sure that they do not interfere with or must be removed for servicing or maintenance of the machine, and that they are not exposed to trucking or materials handling hazards.

♦ ♦ ♦

It is not enough to consider how a lubricant looks or feels when taken from the can. How it works in the bearing under the particular operating conditions is what counts.

♦ ♦ ♦

When complicated control equipment is disconnected for any reason it is seldom safe to try to reconnect from memory. If no diagram is on file, make one or tag leads before disconnecting. A new diagram may be obtained by writing for it. Such diagrams should be kept as they save time in tracing out circuits in maintenance work. It is too late to send for it when urgently needed.

New developments quicken with *specialization*

• With an entire organization devoted to the betterment of a single product and with all hands skilled to the problems of production, new developments are easily and quickly handled and to greater customer satisfaction.

West Leechburg, specialists in the rolling of hot and cold rolled STRIP STEEL, are engaged in no other manufacture. The presentation of something new in STRIP STEEL involves no delay or red tape prior to action—affording a most logical source of supply to both small and large consumer.

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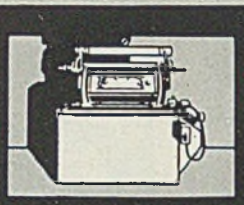
No matter what your requirement might be, if it concerns polishing or plating, Udylite has it!



PLATING BARRELS—sturdy, efficient, high-production units—made in a variety of sizes and shapes.

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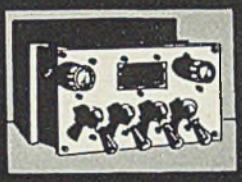

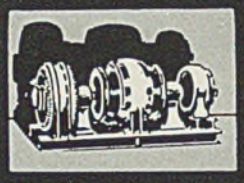

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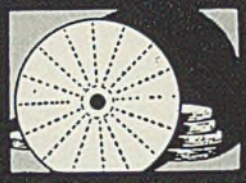
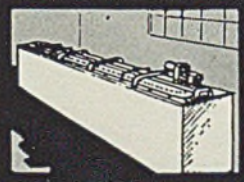
BUFFS, POLISHING WHEELS—any size, any type, any sewing—made to your specifications.



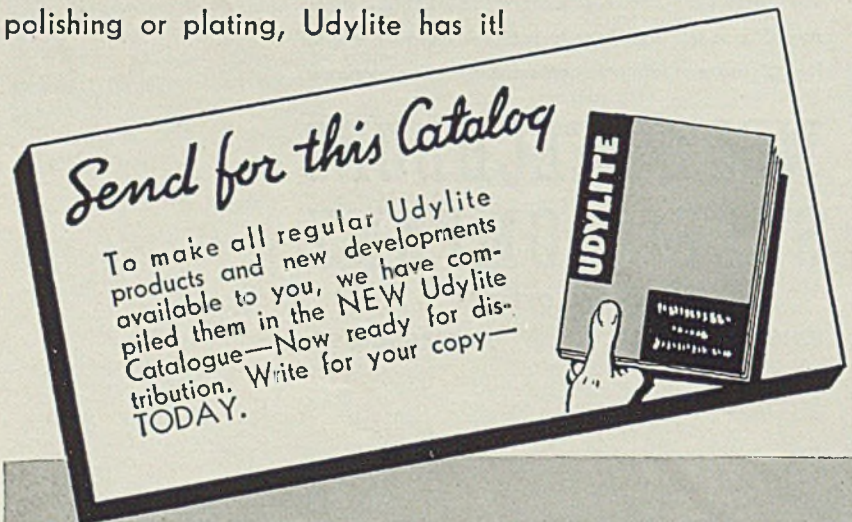
COMPOSITION—all grades for all classes of work.

BALL ANODES—copper, cadmium, zinc—improve plating efficiency and eliminate scrap losses.



SEMI-AUTOMATIC—semi and full automatic plating machinery—built to specification.

SALTS, CHEMICALS—a complete line of chemicals used in electro-plating.



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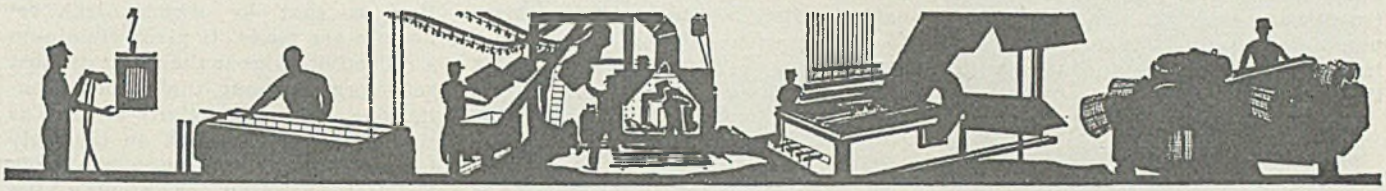
Surface Treatment and Finishing



Stripping Costs on Damaged Parts Reduced by Electrolytic Process

MANUFACTURERS of large volumes of metal parts finished with lacquer or enamel often have a considerable percentage of parts which are damaged in handling and must be refinished. The cost of stripping these parts and preparing them for refinishing is considerable and the methods used have required excessive handling.

In the past it has been the custom to strip the lacquer or enamel in a typical still tank using a hot solution of sodium hydroxide to which an accelerator has been added. While this solution will quickly remove the lacquer and primer, it leaves a thin film of pigment residue on the metal surface which necessitates a scrubbing and high-pressure compressed air and water rinse. The time required to salvage parts in this manner varies from 1 to 8 hours.

Thorough Study Made

In an attempt to aid its customers to reduce the number of operations required, the Detroit Edison Co., through its Delray research laboratory, made a study of the problem and experiments indicated an electrolytic process showed the most promise. Accordingly a series of experiments was undertaken to determine what results could be obtained using direct current and a suitable solution. A formula finally was determined and tests were undertaken to ascertain what effects could be obtained when the parts to be stripped were processed anodically or cathodically.

Early in the experiments it was learned that when the parts were cleaned anodically a thin film deposited on the metal shortly after it had been cleaned. If the part being cleaned could be removed from the bath the instant the coatings were removed, no film would form. Such accurate timing under commercial conditions obviously is not practicable. It was further found that a subsequent cathodic treatment would remove the film formed during the anodic cleaning, but if this cathodic treatment was not perfectly timed, a scum formed on the metal surface. Alternating current was then tried but the results were unsatisfactory with regard to the time required and the ultimate cleanliness obtained.

Successful Method Found

Finally tests were run wherein the parts were passed through a bath and while submerged were alternately treated cathodically and anodically. The treatment finally found to be satisfactory for lacquer and enamel coatings was to place the part to be stripped in the bath for 5 minutes, and to make the work negative for 10 seconds, then positive for 10 seconds, and alternately negative and positive for the entire period of treatment. In some cases the treatment may require the time of anodic treatment to be different from the time of cathodic treatment. The operation was followed by a water rinse.

It was found that the above method gave excellent results as to cleanliness; that the time required for stripping would enable the manufacturer to handle these operations on a conveyor and thus reduce the damage due to handling with trucks, racks or other methods.

The equipment required for this method consists of a direct-current generator of from 6 to 12 volts, a steel tank and, where required, a conveyor. Between 30 to 50 amperes per square foot may be used for stripping. The stripping bath should be maintained at a temperature of from 200 to 205 degrees Fahr.

The composition of the alkaline solution used in the experimental tank was as follows: 63 per cent by weight, NaOH; 29.5 per cent by weight Na_3PO_4; 7.5 per cent by weight Na_2SiO_3. The NaOH and Na_3PO_4 act as carriers of the electric current and also as emulsifiers while the Na_2SiO_3 helps in the free rinsing of the work. These chemicals are added to water in the proportion of 13.6 ounces per gallon NaOH; 6.38 ounces per gallon Na_3PO_4; 1.62 ounces per gallon Na_2SiO_3. When the work is negative, hydrogen is liberated; when the work is positive oxygen is given off.

No license agreement or payment of royalties is required in the use of this process or any modification of it and manufacturers are free to develop it to suit their own particular requirements.

◆ ◆ ◆

Pitting of Nickel Plate and How To Overcome It

EXPERIENCE has shown that the formation of pits in nickel plate is due mainly to the evolution of gases during the electrolysis, and to suspended matter present in the solution.

Electrolysis in acid solutions always involves the evolution of hydrogen; the more acid the solution, the greater the amount of hydrogen evolved. The chemicals used in making up the solutions are always of commercial grade and contain impurities which remain in the solutions as suspended solid matter. As the anodes erode the impurities present in them also pass into the solution as undissolved solid matter. In a chemically pure solution hydrogen has little tendency to cling to a smooth surface but when suspended matter is present, small particles may get into the nickel plate and form a convenient place for a bubble to lodge. A pit is then formed when the nickel plates around the bubble.

The easiest and best method of overcoming this difficulty is to filter the solution, not only when freshly prepared, but at frequent intervals during its use. This is especially true when chromium is to be plated over the nickel. It will be found that the percentage of rejections will be low-

ered considerably by the use of filtered solutions.

Commercial filters of the portable type, equipped with filter bags which can be removed and cleaned, will be found convenient. The use of an extra storage tank can be avoided by pumping the filtered solution back into the tank simultaneously with the actual filtration.

It is also important that the "pH" of the nickel bath is not permitted to become so acid that large quantities of hydrogen are evolved. Agitation of the work rod will help considerably to dislodge hydrogen bubbles from the work. Hydrogen peroxide is often used in nickel solutions to help prevent pitting; about one pint of 3 per cent hydrogen peroxide to every 200 gallons of solution is usually sufficient.

Progress Made in Surface Treatment And Finishing of Aluminum

APPEARANCE of all metal surfaces is artificial, if one excepts the condition in which they come from mold or mill, says R. T. Griebling, Aluminum Co. of America, Pittsburgh. They roughly are divided into four classes: Those that are obtained by (1) mechanical means such as brushing, polishing, buffing or sandblasting; those that are obtained by (2) chemical or electrochemical treatment; those that are obtained by (3) painting or lacquering; those obtained by (4) a combination of the first three.

Finishes of the first group have little or no protective value; they make the metal more attractive and serve as a preliminary treatment for other protective or decorative finishes. In the second and third groups, however, may be found the finishes which are highly protective to the metal underneath, and on these much concentrated effort has been spent in the last few years.

Added Protection Obtained

Painting aluminum in order to give added protection to metal subjected to severe surface conditions has been necessary in a number of cases where the natural color of the metal is of no particular importance. Contrary to popular belief, paint can be applied easily to aluminum, whether smooth or rough, and good adherence can be obtained, although the painting systems employed must be adapted to the service expected of the metal.

If, for instance, protection against salt water is desired, the priming coat is pigmented with a corrosion inhibiting pigment such as zinc chromate, and the vehicle usually is made with a synthetic resin of the alkyd or phenol-formaldehyde types. Such a vehicle is highly impervious to moisture. Further resistance to penetration by moisture is accomplished by applying top coats preferably pigmented with aluminum bronze powder or aluminum paste.

Finish effects obtained by chemicals include the frosted finish, in which aluminum is etched in a hot solution of sodium hydroxide (caustic soda), followed by treatment in strong nitric acid. When coloring the metal, it is necessary to deposit some coloring material on the surface, because the oxide of aluminum is white and colorless, and the many methods which are employed in the coloring of brass or copper are ineffective when used on aluminum.

Oxide Film Deposited

By far the most durable surface coating yet applied to aluminum, says Mr. Griebling, is that which is deposited by the Alumilite process, giving the metal an anodic oxide coating possessing many virtues. This coating is similar to that which nature herself applies to the metal. When aluminum comes in contact with air, oxidation immediately takes place, just as in other metals. But the oxidation on aluminum is not progressive. It stops after a certain depth has been reached and it actually serves to protect the metal from further surface attack.

Such an oxide coating, only thicker and more durable, is deposited on aluminum by the Alumilite process, whose patents and applications for patents are owned by Aluminum Colors Inc., Pittsburgh, and whose development is being carried on by the Aluminum Co. of America. The surface becomes so hardened that the metal retains its original brightness indefinitely, even though exposed to atmospheric attack. The coating also may be colored by dyes or mineral pigments, thus infinitely increasing the versatility of aluminum. Aluminum is the only metal to which the Alumilite process can be applied. When immersing the piece to be treated in a solution of special composition, it serves as the anode or positive terminal of the electrolytic treatment, while the lead-lined tank is the cathode. In this process oxygen is, in effect, deposited on the surface and combines with the aluminum to form aluminum oxide.

Another of the newer finishes which is comanding increased attention is that by which Alzak reflectors are made. It gives aluminum a reflectivity higher than that of most reflectors, without their many limitations, and a reflectivity as high as that of silver but with an infinitely longer life. Alzak reflectors are made by first polishing or etching the metal and then subjecting it to an electrolytic brightening treatment, followed by the application of a protective oxide coating which serves to keep the surface from being marred. The resulting surface is smooth and glassy and can be cleaned by mere washing with soap and water. If more drastic cleaning methods are necessary, the surface can be effectively scoured with a mild abrasive without harm. Alzak reflectors, says Mr. Griebling, give added luster to floodlights, highway lights and lighting fixtures. A great market for this material will be captured, he adds, if it is ever used for locomotive and automobile headlights.

The mechanical finishes, though much older, he concludes, have not been forgotten, and a number of suggestions for improving work have been released to the trade in recent months.

New Water, Oil and Acid Proof Bituminous Coating

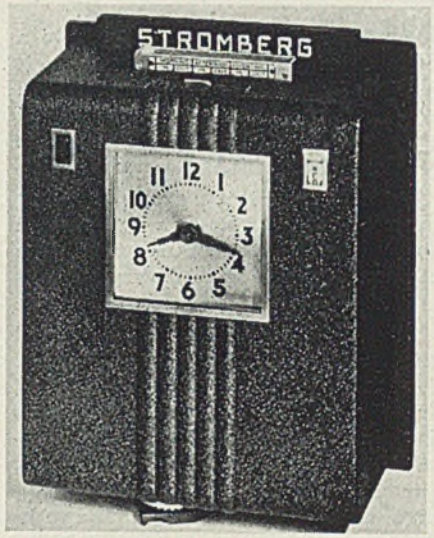
A new bituminous product for coating steel and metals, known as Elasticflint, has been developed by the Elastic Compound Paint Co., Germantown, Philadelphia. It is said to dry waterproof in 24 hours to a smooth uniform surface. It may be used as a primer or a combined primer and finishing coat. It is said also to be oil proof, rust proof and highly acid resistant. It is recommended for the protection of steel buildings and bridges, water tanks, gasholders and other steel and metal structures.

Cleaning Process Employs Sodium Hydroxide

In the article "Reviewing Some Methods for Treatment of Metal Surfaces" appearing in this department in the issue of March 2, the first sentence of the third paragraph reads as follows: "The electrolytic cleaning process which uses solutions of sodium phosphate or sodium carbonate is efficient, except in the case of delicate parts." The term "sodium phosphate" should have been "sodium hydroxide."

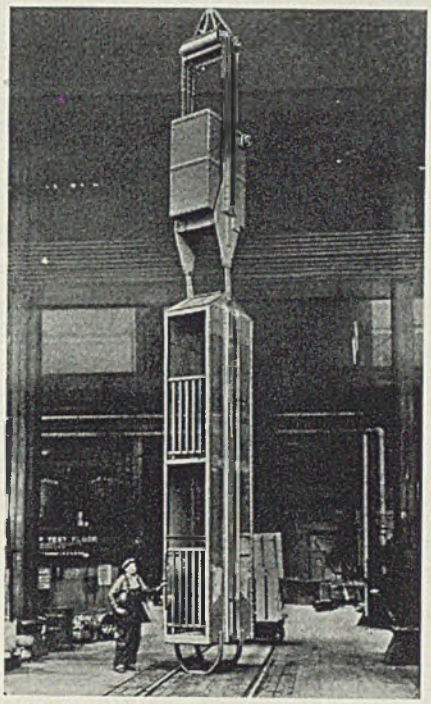
Parade of Progress in Pictures . . .

Compact Time Clock



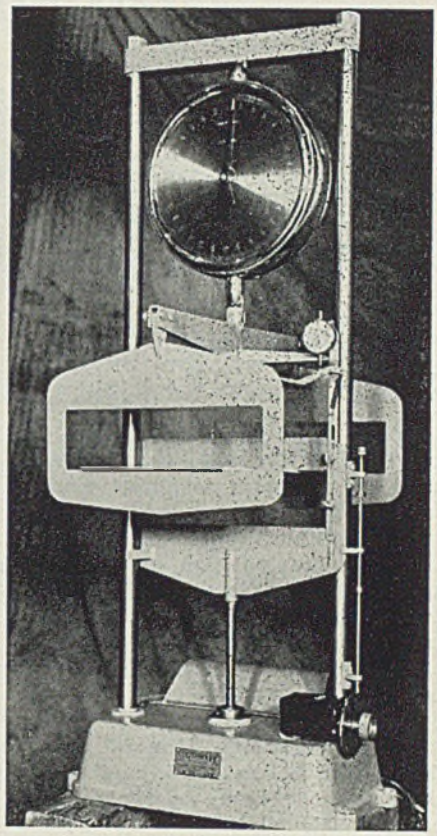
SO PROSAIC a device as the time clock, in the hands of an industrial designer, takes on a new guise, as shown by this recorder recently placed on the market by Stromberg Electric Co., Chicago, the design being evolved by Wilbur Henry Adams, Cleveland. Small and compact, the recorder is electrically operated, and requires no hand manipulation of controls

Skip Weight Is Reduced



HIGH-STRENGTH, low-alloy steel was employed in this combination vertical ore skip and double-deck hoisting cage, one of three recently fabricated by Allis-Chalmers Mfg. Co., Milwaukee, for a deep mine in northern Mexico. By use of this steel, weight was reduced nearly one-third from similar existing combined skips and cages made of ordinary steel. This reduction in weight is sufficient to permit the mine to operate to a depth 800 feet greater than heretofore without increasing the rope pull on existing hoisting equipment

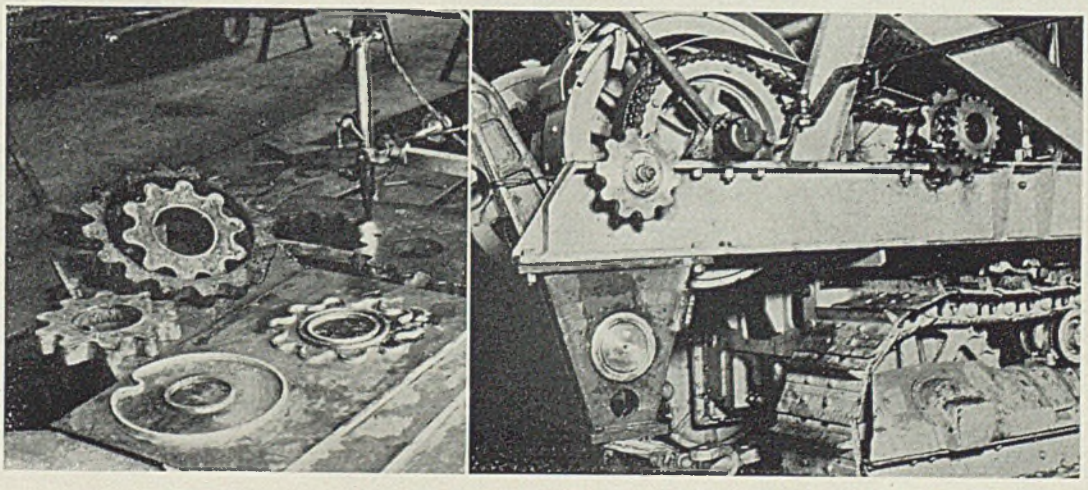
Welds in Testing Machine



WELDED steel construction was used in transverse supports of this shingle testing machine built for Johns-Manville, New York, by Baldwin-Southwark Corp., Philadelphia. The machine is approximately 4 feet high and weighs 200 pounds. In it, shingles may be tested in transverse for deflection and breaking point under variable loads ranging up to 300 pounds

Parts for Oil Field Equipment Are Flame Shaped

FINISHED steel parts, flame-shaped and ready for installation, are turned out daily in hundreds of manufacturing plants. These illustrations show the use of oxy-acetylene shape cutting in the fabrication of oil field equipment. Photo courtesy of Linde Air Products Co.



Methods and Materials

High Molybdenum Makes Rolls Abrasion Resistant

Use of high molybdenum content is advocated for rolls that must be hard and resistant to abrasive wear such as is encountered in crushing cement clinker, coal and ores. The suggested composition according to a recent patent is 0.20 to 1.00 per cent silicon; 1.00 to 1.75 per cent manganese; trace to 1.50 per cent chromium; 3.00 to 4.00 per cent molybdenum, and 3.50 to 4.00 per cent carbon. Hardness of the rolls is about 600 brinell. If a soft core is desired, nickel is used, and where there is no reason to worry about carbides, the chromium content can be increased to 5.00 per cent.

$ $ $

Diamonds Employed To Make Steel 140 Years Ago

In the history of metallurgy diamonds have been used to make steel at least three times and were one of the most expensive raw materials used in steelmaking, according to the American Iron and Steel institute.

In 1796, during the First Republic of France, Citizen Clouet, a research worker of some repute, attempted to prove definitely that steel consisted of pure iron combined with carbon in some manner then unknown. For iron, he carefully selected some nails made of the most nearly pure iron available, cut off their heads and forged the heads into a tiny cup-shaped crucible. For carbon, Clouet used a diamond because it is the purest form in which carbon is found.

The account of Clouet's experiment published in England in 1799 reveals that the diamond used weighed 4½ carats. It was probably a diamond of the type known as "industrial" diamond and not a gem stone, which would have been far too expensive for even the most zealous research man to use. The price today of a 4½ carat industrial diamond is well in excess of $100.

Clouet placed the diamond in the crucible which he then sealed tightly and heated in a very hot fire for an hour. When the experiment was completed, the iron which had previously been soft was found to have a surface of steel so hard that it scratched glass; its surface had been hardened by the carbon which it had absorbed from the diamond. The diamond itself had disappeared.

Following Clouet's example, other research metallurgists in France and England conducted similar tests with diamonds which were duly published in the technical journals of the day.

The carbon which is combined with the iron to make steel now commonly comes from powdered coal or coke. However, certain steels do contain as alloying elements such unusual or rare metals as columbium, zirconium, titanium, barium, vanadium, chromium, selenium, and others.

$ $ $

Cast-Iron Disk Replaces Air Furnace Hinged Door

Instead of the usual hinged door, subject to cracks and distortion, over the slag skimming opening in the side of an air furnace melting gray iron, a plain cast-iron disk is being used by a midwestern plant. The disk is provided with a handle near the outer edge by which it is rolled into position in front of the door opening or moved to either side of the same opening. It is held in place close to the wall by a cast-iron guide rail at the top and another at the bottom.

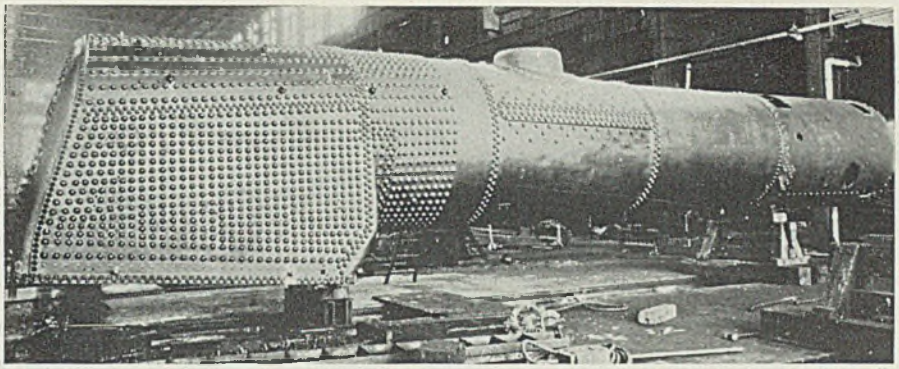
$ $ $

Cement-Sand Mixer Is Used for Foundry Molds

In a process developed in France and recently introduced into the United States, a cement sand mixture is employed for making molds, in many instances without the necessity of using flasks of any kind. It is claimed that the process is applicable to molds for either ferrous or nonferrous metals. The material is manipulated like ordinary sand, but commences to set in a few hours, and in approximately 24 hours the mold is as firm and hard as concrete.

Scouring the Bath Tub

HE MAY look like the "man from Mars" or a deep sea diver but really he is a worker in the plumbing ware plant of the Briggs Mfg. Co., Detroit, sandblasting a pressed steel bath tub. Sand is driven through the nozzle of the hose under a pressure of 80 pounds. The purpose is to roughen the surface of the metal to increase the adhesion or "grip" of the ground coating of porcelain enamel, which later is applied to the tub



As much as 9000 pounds in weight per locomotive was saved through the use of nickel steel plate in this and 26 other boiler and firebox elements

Nickel Steel Saves Weight, Prolongs Life of Boilers and Fireboxes

BY R. E. PENROD

Engineer of Tests,
Cambria Plant, Bethlehem Steel Co.

WHEN the Lehigh Valley railroad first considered the application of nickel steel for locomotive boiler and firebox elements the object was to determine at close range the possibilities for economy that might be obtained from its use. The application of nickel steel plates in two locomotives placed in main-line freight service early in 1931 proved to be so successful that 25 additional units were built, the last of which was placed in service early in 1935.

These 27 new locomotives have been in almost continuous service to date without the need for repairs to either boilers or fireboxes; each new locomotive replacing two locomotives of the type formerly used in the same service and in addition improving the running time between scheduled points. These results are attributed directly to the use of nickel steel plate, and in terms of economy represent savings in operating costs, maintenance charges, and locomotive replacement costs that approximate 38 per cent on the investment.

Analyses Varied for Comparison

The specifications for the first two locomotives called for nickel steel of a different type analysis for each locomotive in order to provide a basis of comparison to determine which type would be best suited for the purpose. In addition, each locomotive was to be the product of a different builder. The nickel steel plate was furnished by Bethlehem Steel Co., Bethlehem, Pa. One locomotive was built by the Baldwin Locomotive Works, Eddystone, Pa., and the other by the American Locomotive Co., Schenectady, N. Y. Each builder fabricated a particular, yet different, analysis of nickel steel plate into the boiler and firebox of the locomotive it had under construction.

Both units were designed to handle 3000-ton trains over the main line from Buffalo and suspension bridge to Jersey City, N. J., a run of 450 miles, with helper service at the Wilkes-Barre mountain where there is a 21-mile climb with a maximum grade of 68.6 feet per mile. They are of the 4-8-4 type, having one-piece, cast-steel bed with cylinders cast integral, and equipped with feedwater heaters, thermic syphons and cross-compound pumps; boiler diameter, 86 3/16 inches; water heating surface, 5439 square feet; superheating surface 2056 square feet; firebox, 144 3/8 x 96 1/4 inches, arranged to accomodate automatic stokers using soft coal.

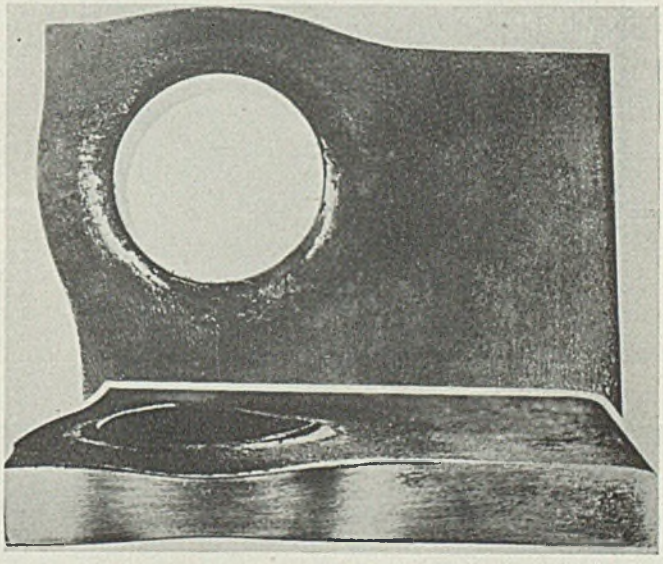
The two locomotives were delivered and placed in service early in 1931, and because of the results obtained from their use each builder was ordered to furnish ten duplicate locomotives, using Bethlehem nickel steel plate for boiler and firebox elements in accordance with the original specifications. These 20 locomotives were delivered and placed in service during May, 1932, replacing 40 locomotives of the type then being used on the main line haul.

Adapted to Passenger Service

While these 22 units were engaged in freight service, five additional locomotives were projected for passenger service which necessitated slight modifications in the original design. The principal changes included an increase in the diameter of the driving wheels, boosting the working steam pressure, and increasing the grate area. As with the preceding units nickel steel plate was specified for boilers and fireboxes.

In service, each locomotive covers not less than 7600 miles of run per month, although it is not uncommon for some to cover as much as 9600 miles in a like period. From the time one locomotive went into service it covered, up to March 1, 1935, 267,122 miles without need for repairs to either boiler or firebox.

While performance of this character emphasizes the possibilities for economy in operation that nickel steel makes possible, its factor of weight saving is of equal importance. Owing to the high tensile strength of the nickel steel furnished for these



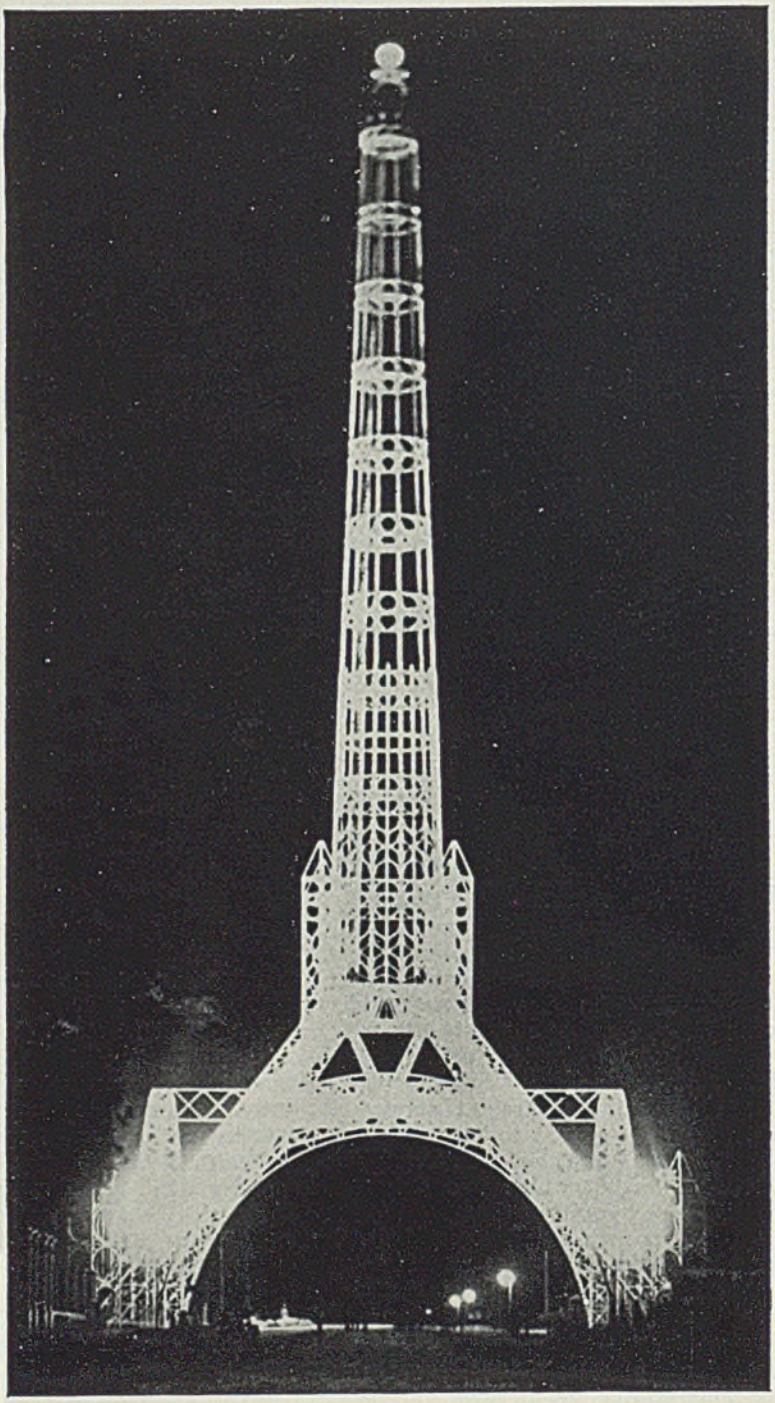
Closeup of nickel steel plate specimen, showing absence of fractures after being subjected to specified drift test

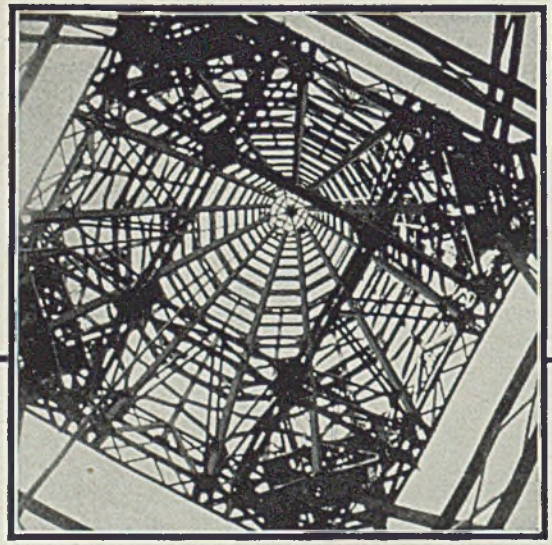
A MILEPOST OF STEEL

on the Sands of Time

THE hundredth anniversary of the birth of General Justo Rufino Barrios, famous Guatemalan patriot, is signalized by this beacon and bell memorial tower over the intersection of the Boulevard 15 de Septiembre and the Calle Miguel de Granados, Guatemala City, Central America.

It may be unusual but quite fitting for a modern land to erect memorials of steel, a newer material of known strength and long life, adaptable to any construction purpose or esthetic treatment. The entire job of design, fabrication and erection was given to American Bridge Company because of the wide experience of their engineers in all kinds of structural steel-work. Plain material was rolled by the Carnegie-Illinois Steel Corporation.





(*Above*)—Visible at night throughout Guatemala City, this floodlighted 246' galvanized tower stands on four legs centered 104' apart, leaving an arched roadway 82' wide and 39'4" high for the passage of vehicles in four directions. The base structure rises 64'6", the lower ends of the legs being supported and protected by four corner pylons 31' high.

(*At left*)—Looking up into the twelve-sided shaft towards the bell, observation walk, and 3,000,000 candlepower revolving beacon light.

AMERICAN BRIDGE COMPANY, Pittsburgh, Pa., CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh, Pa., Chicago, Ill., TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham, Ala.

Pacific Coast Distributors: Columbia Steel Co., San Francisco
Export Distributors: United States Steel Products Company, New York

US STEEL

UNITED STATES STEEL

locomotives, which was specified on the boiler steel at not less than 75,000 pounds per square inch and on the firebox steel at not less than 65,000 pounds per square inch, it made possible a reduction in the overall weight of each unit amounting to 9000 pounds, toward which the cost increment over similar purpose, carbon steel plates was applied.

In plate form the nickel steel furnished for these units had an excellent grain structure and a surface smoothness comparable to the best carbon steel plate made, which is indicative of the process followed in its manufacture. The nickel steel used in the Lehigh Valley locomotives is an open-hearth furnace product. In the process of manufacturing the plates, it is Bethlehem's practice to reheat the steel ingots and roll them into slabs instead of rolling them directly into plate. These slabs, when cool, are inspected and reconditioned if necessary, and then reheated and rolled longitudinally and transversely into plates. This process of double heating, double cooling, and double rolling is followed to obtain the grain refinement and ductility that the finished plates possess.

After the plates are normalized they are carefully inspected, sheared to size, and subjected to the standard tests for the determination of physical properties, including bend and drift tests, which, as outlined here, represent the requirements for the nickel steel plate furnished the builder of one of the sample locomotives. These specifications for physical properties are as follows:

	Flange	Firebox
Tensile strength, lbs. per sq. in.	75,000 (min.)	65,000 (min.)
Yield point, min. lbs. per sq. in.	0.6 ten. str.	0.6 ten. str
Elongation in 8 ins., min.	18 per cent	20 per cent

These same specifications also required that for the bend test, the test specimen be bent cold through 180 degrees without cracking on the outside of the bent portion, as follows:

Thickness	Longitudinal	Transverse
1-inch and under	Flat on itself	Around a pin, having a diameter equal to thickness of specimen
1 to 1½-inch, incl.	Around a pin, having a diameter equal to thickness of specimen	Around a pin, having a diameter equal to twice thickness of specimen
Over 1½-inch	Around a pin, having a diameter equal to twice thickness of specimen	

To check the ductility of the finished product, a sample 6 inches square was cut from that portion of a plate representing the top of the ingot from which it was rolled. In it was drilled a 1¼-inch diameter hole 1⅞ inches from the edges. This hole was then spread cold to 2¼ inches in diameter without sign of fracture in the metal, as may be seen by referring to the illustration on the preceding page.

The results of these tests show that the plate will withstand the severe forming during its fabrication into boiler and firebox elements and that it will safely resist the stresses to which it will be subjected in service.

Design Influences Use of Castings

BETTER co-operation between the foundrymen and casting user will be mutually advantageous through the production of better castings and the reduction of foundry losses, it was stated by George Zabel, foundry superintendent, Fairbanks, Morse & Co., Beloit, Wis., in speaking before a joint meeting of foundrymen and engineers at Chicago, March 16.

The meeting, devoted to the "Application of Cast Metals to Engineering Requirements," was sponsored by the Western Society of Engineers; Chicago section of American Society of Mechanical Engineers; and Chicago chapter of American Foundrymen's association. F. A. Lorenz Jr., vice president, American Steel Foundries, Chicago, and president, Steel Founders' Society of America, presided as chairman. About 450 attended.

Mr. Zabel pointed out that the engineer's lack of understanding of design problems may be responsible for difficulties in the production of satisfactory castings. For instance, designs may be unduly complicated or may be such as to result in unnecessarily high cleaning costs. One important point which at times is overlooked by the designer is the fact that adjoining sections of unequal size in a casting will cool at varying rates, thereby resulting in cracks or high internal stresses, the speaker indicated.

Illustrations were presented of designs of diesel engine parts which were changed to eliminate this latter condition. Other instances were cited in which a small change in design permitted a material reduction in time and cost of cleaning through the elimination of pockets which trapped burned sand.

Discussing "Selection and Application of Cast Metals for Engineering Construction," G. P. Phillips, metallurgist, International Harvester Co., Chicago, described the properties of each of the four principal classifications—steel, malleable, cast iron and nonferrous. Steel castings were divided further into the low, medium and high-carbon and alloy groups. Low-carbon steel castings are limited in their application principally to products requiring surface hardness and a tough core, since superior mechanical properties are available in metal of a higher carbon content, it was pointed out.

Medium-carbon steel castings have the widest range of usefulness, their application embracing practically the entire field of engineering construction. Because of the improved physical properties resulting from heat treatment, medium-carbon steel castings rarely are used in the as-cast condition. High-carbon steel castings, containing more than 0.40 per cent carbon, have a special field of usefulness among products requiring high strength, abrasion resistance and hardness. Such applications include dies and rolls.

Alloy Field Widening

Use of alloys in the production of steel castings has increased rapidly the past ten years and has been instrumental in improving the quality of the castings for various applications requiring high strength and wear and abrasion resistance.

Principal properties and uses of malleable iron, cast iron and nonferrous metal castings were described similarly. Ductility and machinability of malleable castings were emphasized in recommending their use in instances where resistance to shock must be provided. Gray cast iron is the most widely used of the main groups of cast irons. White iron offers higher resistance to wear but is brittle and difficult to machine. Chilled cast irons provide a combination of white iron and gray iron in a casting through different rates of cooling of various sections.

An exhibit of castings, held in conjunction with the meeting, was participated in by 23 producers of the Chicago and nearby districts.

Announces Training Courses On Metal Radiography

Two practical training courses in metal radiography, one during the week of July 6 immediately following the annual meeting of the American Society for Testing Materials, and the second during the week of

July 13, will be conducted by St. John X-Ray Service Inc. at its laboratory, 30 Thomson avenue, Long Island City, N. Y. Sessions will be held morning and afternoon on five successive days.

The course will include the physics of X-rays, tubes, X-ray technique, X-ray as an inspection tool, interpretation of results, equipment installations, operating and cost data, and gamma ray inspection. Theory will be as brief as possible and merely the influence of various factors upon results will be demonstrated and discussed. The purpose of the course is to teach how to make and how to interpret radiographs.

Two Stainless Steel Trains For Chicago-Denver Run

Only 16 hours will be required for the 1039-mile trip between Chicago and Denver when the Chicago, Burlington & Quincy railroad places two 3000-horsepower, ten-car, diesel-electric, streamlined trains in operation in June. This will be 11 hours and 45 minutes faster than the present westbound schedule, and 9 hours and 15 minutes faster than the eastbound time.

To make the proposed 16-hour schedule will necessitate an average running speed between Chicago and Denver of approximately 65 miles per hour, including possibly seven station stops. The train will be geared for a maximum speed of 116 miles per hour.

New Accommodations Added

The two new trains, to be known as the "Denver Zephyrs," are under construction by the Edw. G. Budd Mfg. Co., Philadelphia. Each train will have a combination baggage and auxiliary power car, a combination passenger-baggage car, a reclining chair car, four sleeping cars, a club car, a dining car, and an observation car. The total capacity of each train will be 200 passengers. The trains will embrace a modified form of articulation to facilitate interchange of cars.

Each train will be hauled by a two-unit diesel-electric locomotive in two vehicle units built by the Electro-Motive Corp., Chicago. One unit will have two 900-horsepower engines, and the other a 1200-horsepower engine. General Electric single-bearing generators will be direct-connected to each engine, and each unit will have four two-axle trucks, each equipped with General Electric motors.

The two power units will be built of stainless steel. Front ends will duplicate in appearance the present Zephyr trains. They will be streamlined to match the cars they haul.

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.

Earners and Spenders

IT IS not strange that tax spenders and industrial executives have difficulty understanding each other. They have different points of view and wholly different objectives.

Tax spenders deal with a public which has income. The tax spender consciously or unconsciously begins by making an estimate of how much more he can tax the public income to obtain money to spend on public needs or fancies so that he can build up his political power and prestige. There is no implication whatever that he is either a crook or guilty of anything which even resembles moral turpitude if he follows out this perfectly normal behavior pattern. The tax spender will spend just as much money as he can borrow on public credit or collect in taxes. The only limit is how much he can get.

The industrial executive has a much different problem. The only way he can raise money from the public is to supply the public with something it wants at a price it can afford to pay. To do this, he must manage plant and personnel effectively. The public can and will quit him over night if he fails.

Economics Govern Industry

Plant and equipment are always changing in value. A welding machine, a machine tool or any other equipment always will be worth less tomorrow than it is today. Personnel is always changing in value so far as achievement is concerned. Out of this confusion, the industrial executive must deliver what the public wants at a price it can afford to pay. The price of failure is extinction.

No such problems confront the tax spender. So long as he can spend, someone who can vote will get the money and his power and political prestige will be enhanced. He will spend for the wildest schemes anyone can devise, so long as he can spend.

Granting that neither tax spender nor industrial executive are actuated by anything more than self interest, it is at least plain to see why they cannot understand each other.

What About Wages?

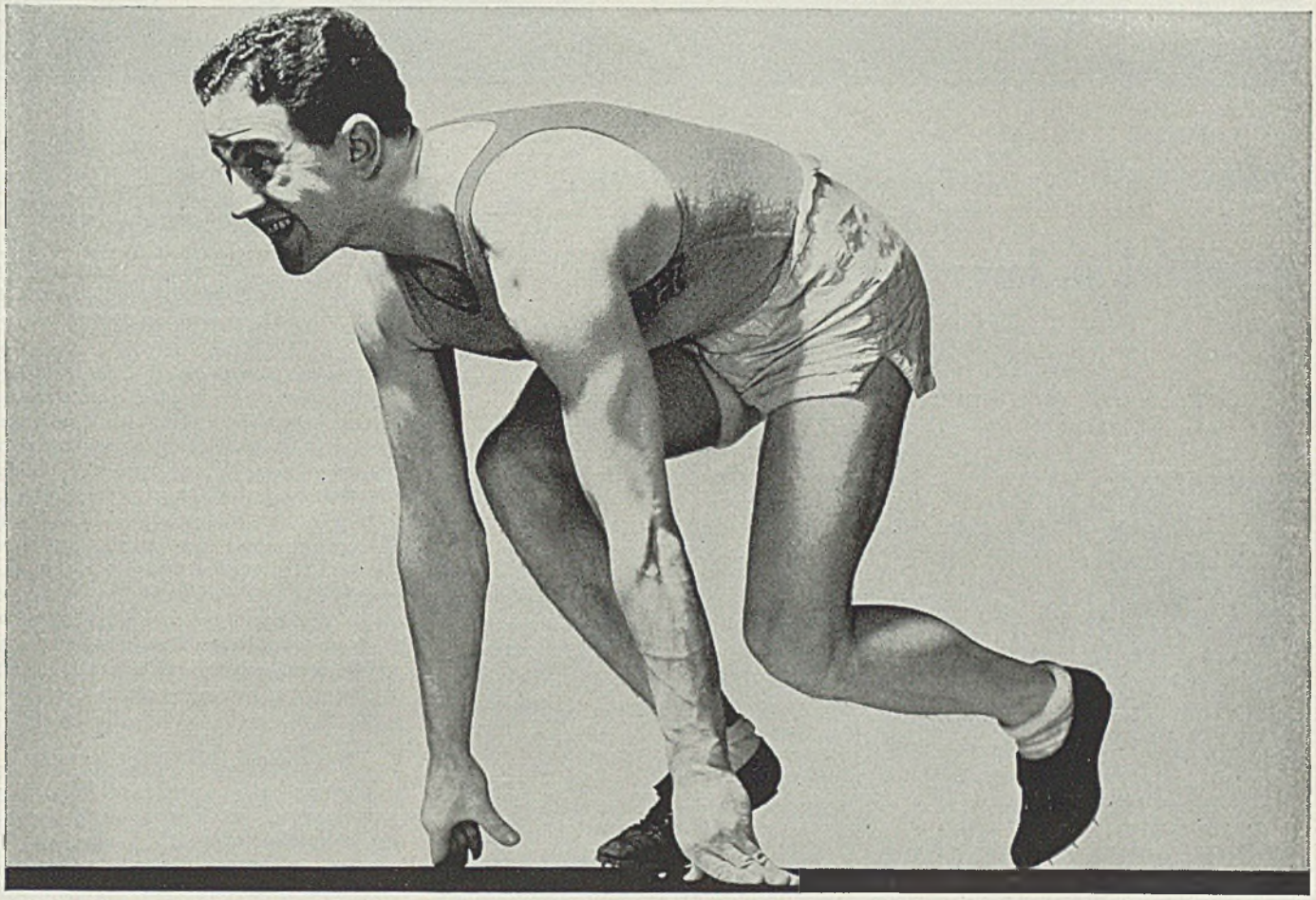
AT A CONFERENCE between a welding operator's business agent and the supervisor of welding, we recently heard the business agent's argument for higher wages for the men and the supervisor's answer. So far as we know, no strike was in immediate prospect, but two well-meaning individuals were trying to work out a compromise. We heard no good reasons advanced on either side of the argument. The business agent's line of argument was that the men simply ought to be paid more and the supervisor's argument was that management would not assent to the figure asked. Right there was being formed the basis of some future strike which is nothing more than localized civil warfare.

Thero was no thought in the business agent's mind that if the men get paid more, the money must come from the job. There was no thought in the mind of the supervisor that a vast and undeveloped field of profitable enterprise was present and unexploited for the men who wanted to earn more. And this happened in America in the year 1936 when both capital and labor are begging for more profitable employment.

To the everlasting credit of American financial leadership, let it be understood that supervisors are paid by management to do the job of making it possible for operators to earn more. Let the issue be clearly defined: The men are sending a business agent to wangle a raise for them, management employs a specially trained individual to find out how the man might earn more. One method contemplates the use of force, the other the use of intelligence. Both demand the same result.

MANY A RACE IS WON BY

Starting Right



AND to the manufacturer of products made of steel, starting right most often means starting with a steel that is right for the job . . . a steel that will free him from costly uncertainties in fabrication . . . that will give the performance he has a right to expect when it goes into service.

Uniformity in quality and unvarying dependability are available in Carnegie-Illinois Controlled Steels—plain Carbon Steels for forging, heat treating, forming, and machining. There is no need to guess about their behavior. In these steels those "mysterious differences" which make it difficult to obtain consistent results with ordinary steels are eliminated. Users know that each shipment will perform in the same satisfactory manner as the last.

Let our metallurgists tell you what they are doing to reduce manufacturing costs and improve product quality with Controlled Carbon Steels. Let them help you to determine the grade and character of steels best suited to your purpose. In other words—make sure *you* are starting right!

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UNITED STATES STEEL

Inventory of Competitive Position Essential in Improvement Program

BY GEORGE A. BRYANT JR.
Executive Vice President, The Austin Co., Cleveland

BUSINESS trends are beginning to convince industrial executives that deferment of vital plant improvements between 1930 and 1935 only served to intensify and prolong the depression, and to increase the size of their own operating deficits. Expanding markets emphasize the competitive advantages now enjoyed by the producers who responded early to known needs for more flexible and efficient operations.

Those who tackle modernization programs today, however, can command a perspective of recovery trends that may compensate in some measure for delays. Nowhere is this more true than in building.

Greater Efficiency Possible

New materials and methods of construction which were evolved by research and experiment during the lull in building operations represent the most rapid progress in the history of the building arts. Drawing upon every branch of science, engineers and chemists have made possible the construction of more healthful and efficient plants, in which permanence, utility and economy set new standards.

When structural steel welding is advocated today, executives faced with responsibility for decisions are not in the dark about it. They have the proved experience of organizations such as General Electric Co. and the General Motors Corp. to guide them. They can see in daily operation the giant 200-ton all-welded electric crane, which rides with perfect safety on an all-welded frame having a 104-foot span and supports as much as 48 feet apart, in the Electro-Motive Corp.'s diesel-electric locomotive erection shops.

When installations of air-conditioning equipment, scientific illumination or improved conveyor systems are recommended, the experience of leading manufacturers in widely distributed industrial fields is available to guide decisions in the same way that the known rate of productivity of a new machine tool recommends its purchase.

Historically, those companies which produced the most serviceable goods at prices commanding the broadest available market have been America's strongest. Consequently, when a manufacturer contemplates plant improvements in the light of present concentration upon low-cost production, self-interest compels him to weigh every factor which enters into the cost of his product to the ultimate consumer.

Modern automatic machinery and machine tools have made undeniable contributions to the attainment of low per unit costs, but unless the plant which uses these devices is properly laid out and situated where it can serve consumers with prompt dispatch at minimum expense, much of the potential saving is sacrificed. Obvious as is the need for integrated and controlled straight-line operation in all volume production, many a shop superintendent is blind to the knots and kinks which frequently interfere with efficiency. Their number is insignificant, however, by comparison with the array of executives who keep a hawk's eye on expense sheets but are totally blind to economies which could be attained by major plant adjustments, that sometimes require relocation of entire businesses.

If a survey could be made today to determine the most logical site for every industrial plant in the country, in the light of raw material sources, power requirements, labor markets and the actual and potential markets for its product, we probably would find that more than half of our production activities are uneconomically situated. There can be little disagreement as to the cause. It is but natural for businesses to grow where they first take root, whether or not they belong in the original site.

Warehouse Problem Changed

Technological progress, however, has operated to increase the importance of location. When machine efficiency is increased to achieve reductions in production costs, transportation charges on both materials and finished goods become increasingly important factors in the ultimate cost of any product. They must be taken into account, and particularly heeded in those industries where bulk or weight of products gives a high ratio of freight to manufacturing expense.

The habit of hand-to-mouth buying which was fostered by stringent credit conditions during the depression created new distribution and warehousing problems which for a time appeared only temporary. Now many fabricating industries and distributive trades threaten to continue this buying practice which will force suppliers to carry large inventories and be prepared to make shipments on short notice. The function of branch warehouses has become increasingly important with the spread of this practice and has been further influenced by highway and motorized transport facilities which simplify distribution in all major markets.

Modernization, to be worthy of the

name, must provide for profitable business growth under any and all conceivable circumstances. Hence, before an industry sets its plant in order it should have some assurance that an adequate supply of cooperative labor will be available to meet present and future needs, and that the community and local governments with which it will have to reckon respect and understand the rights of industry. These considerations have been responsible for numerous plant relocations during the recent period of changing labor relationships. They are compelling an ever-increasing number of businesses to take inventory of situations which have a fundamental bearing upon their ability to serve, without interruption, those markets which required years to cultivate.

Healthful working conditions have become increasingly essential with mounting rates of production, greater precision in manufacture and the growing complexity of employer-employe relationships. It is significant that progress in this direction is rapidly satisfying all physical needs for the attainment of maximum personal efficiency through measured nonglare illumination and perfected ventilation and air conditioning.

New Regard for Flexibility

Experiences of the last few years have impressed the importance of flexibility in all production organizations upon executives throughout industry. All are in agreement on the need for a maximum of elasticity in their operations, but relatively few appreciate the extent to which this capacity to shrink or expand production can be carried in a single plant by providing broad, unobstructed working areas. Give the men in charge of production a free area to work in and they will find a way to maintain efficiency in the face of unpredictable economic trends, inevitable changes in equipment needs and unhalting scientific progress.

Keener recognition of the need to protect one's business from the effects of cyclical upheavals has also brought efforts to diversify production by the addition of complementary lines which lend stability in the face of declining demands for major products. Wherever the nature of the business permits, the development of auxiliary products in fields which suffer least from prolonged economic stress should accompany plant modernization.

Consciousness of the contributions being made by product development departments is finally compelling industry to provide adequate facilities for research and experimentation, which during boom times are orphaned in whatever quarters happened to remain available after all other needs had been satisfied. Many of the larger industries have discovered distinct advantages can be gained through the unification of principal research and experimental activities at a central point, with the result that the International Nickel Co., American Brake Shoe & Foundry Co., and others have established special headquarters for such work in buildings specially adapted to that purpose.

When it is recognized that all of the varied problems touched in this brief resume augment the primary considerations of efficient layout and equipment, the dangers of a piecemeal approach to modernization become apparent. They make a complete inventory of one's own position in competitive markets the first and most vital step in any well-ordered improvement program.

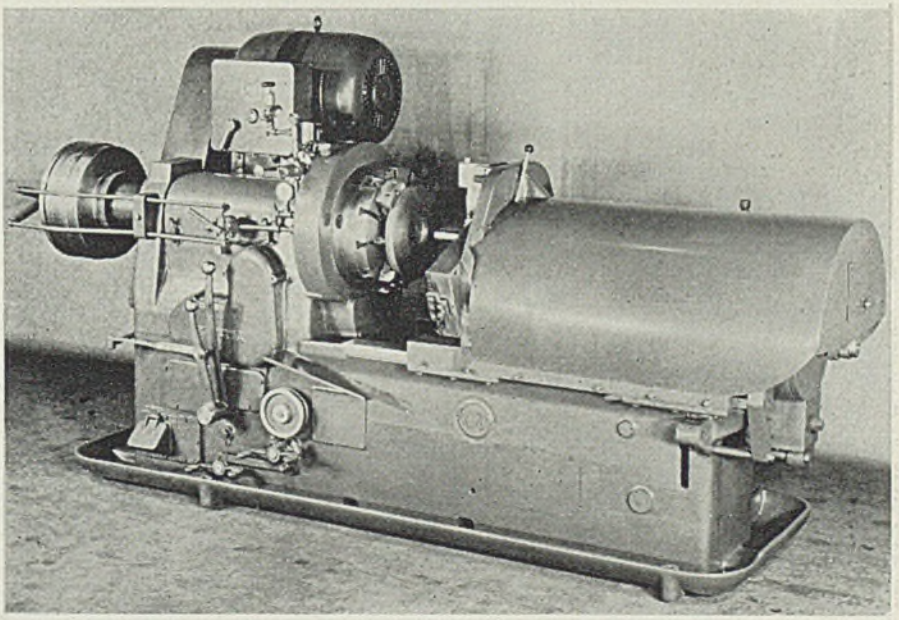
Much Stainless Steel Used in Long Lunch Counter

Stainless steel is used prominently in connection with a new lunch counter in Neisner's 5, 10 and 25 cent store in Cincinnati. Length and beauty of this counter is accentuated by highly polished 18-8 chrome-nickel steel in what is said to be one of the longest straight-line fountains and back bars in the country. The stainless steel was supplied by the American Rolling Mill Co., Middletown, O.

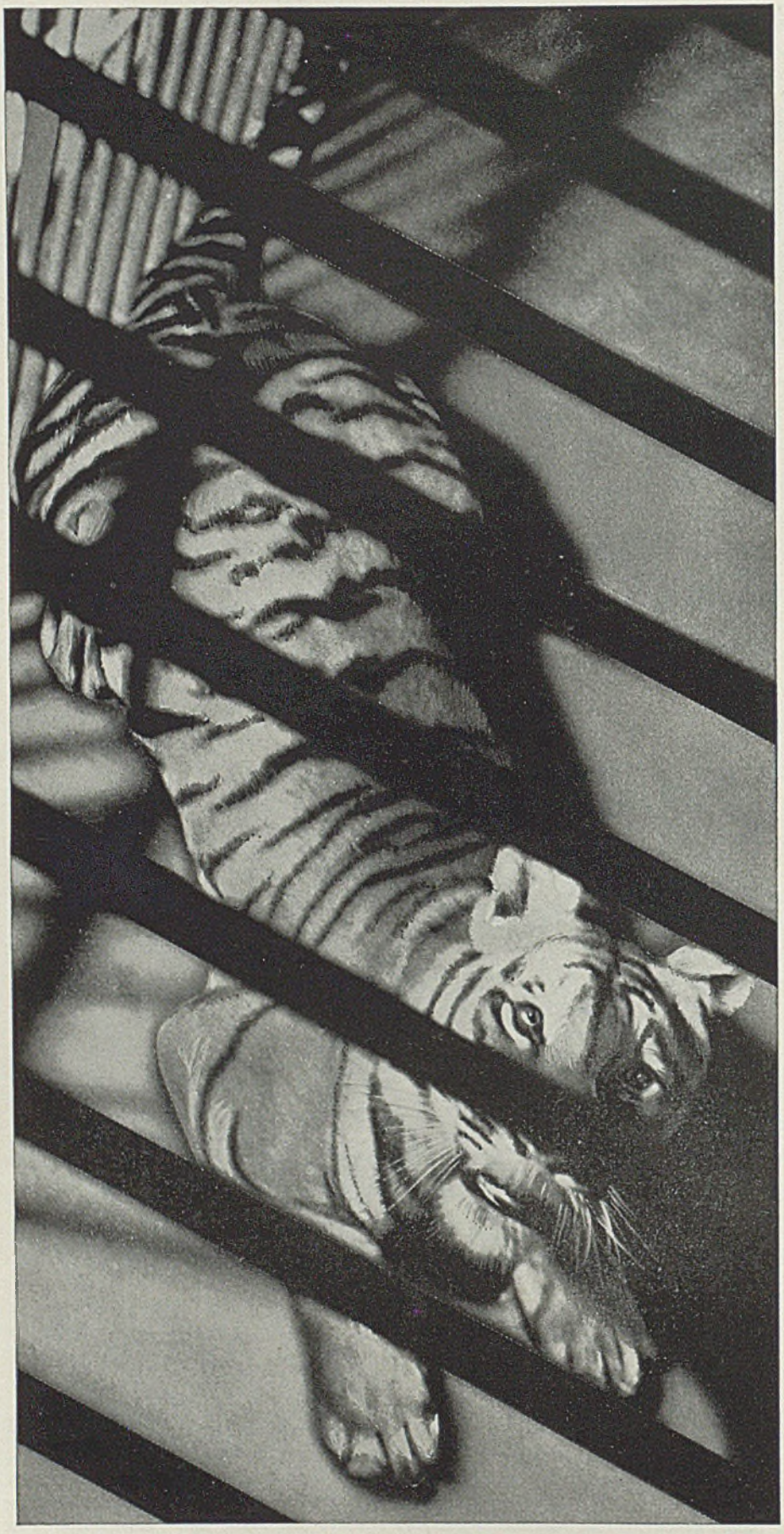
Work tops and drainboards, fountain and salad units are fabricated from stainless with all joints welded. Corners are welded and rounded, making it possible to keep the units clean and sanitary with minimum labor. Four large urn stands are recessed in the wall with convenient storage for cups, saucers and other supplies. Kitchen and dishwashing equipment is of the most modern type and includes two large all-stainless steel electric refrigerators.

The extremely long counter panel is only 32 inches high; it eliminates foot rails or steps. A convenient parcel rack for customers' packages is located under the counter immediately in front of the individual chairs.

Doubles Production by Modernizing



INCREASING production of flywheels from 18 to 44 per hour, floor to floor time, has been accomplished in the plant of Plymouth Motor Co., Detroit, by installation of a battery of two of these radial-slide lathes built by Gisholt Machine Co., Madison, Wis. Three obsolete tools are replaced by the new equipment which completely machines the flywheel in two operations. A new design tool carriage with a vertical face on which the tool slides are mounted in a radial position to the work, and rapid traverse of the carriage between cutting operations are largely responsible for this increased speed. A single drum-type master cam actuates the tool slides. The work is held in a three-jaw air chuck equipped with a 16-inch cylinder. The machining cycle is entirely automatic and the operator has only to move one lever to complete the operation. The two machines are tended by one operator. Tungsten carbide and Stellite J-metal tools are used in the roughing operations, removing approximately 3/32-inch stock. The cutting speed is approximately 200 feet per minute, which is dropped to 100 feet per minute for the final shaving operation. A feed of about 0.030-inch per revolution has been found to give the most economical tool life



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UNITED STATES STEEL

Progress in Steelmaking

High-Grade Sheets from Storage Are Cleaned and Dried Before Shipment

A SHEET drier has been devised for use in strip mills where it is often necessary to hold finished sheets in storage pending shipping instructions or to apply against orders. During this period in storage, the sheets usually become dirty and may oxidize to a slight extent. These foreign materials must be removed before shipping.

In a large strip mill in Michigan, the following system is employed: The sheets are removed from storage and passed through an acid bath to remove any oxide which may have been deposited since the metal was stored. The product then passes into a machine which scrubs and cleans both sides and thence into the drier.

Warm Air Is Employed

The sheet drier is equipped with fiber-tired ball bearing drive wheels which carry the sheets through the unit. While in transit through the drier streams of warm air are blown against both sides of each sheet. They proceed clean and dry on belt conveyor to the piling unit where they are stacked, bound and made ready for shipment.

The belt conveyor and sheet drier are built by the Mathews Conveyer Co., Ellwood City, Pa.

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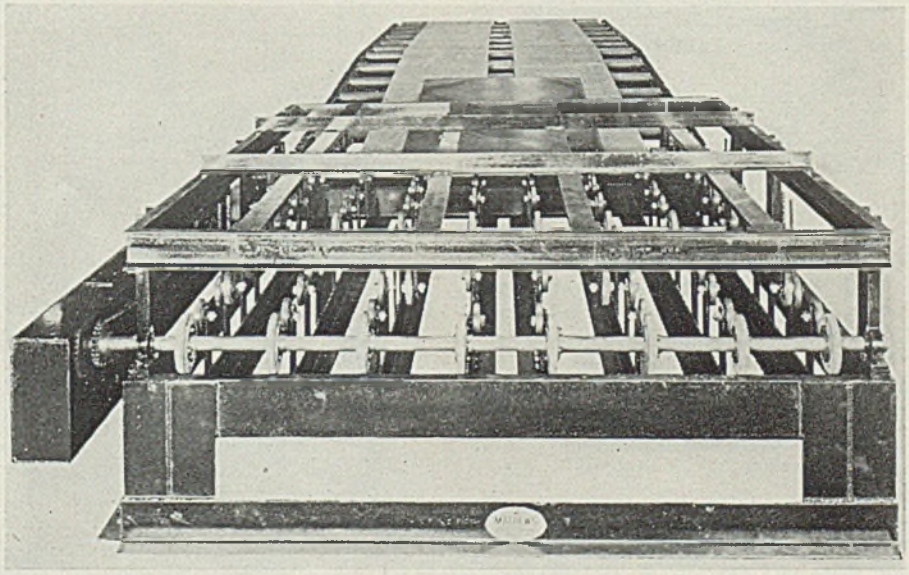
Conditions Edges of Strip

Edges on slit strip steel in coil form or straight lengths are rendered smooth by a recently developed conditioning machine. The new unit is designed for plants which slit wide strip to narrow widths. The strip coming from an uncoiler first passes through slitting shears, then through the edge-conditioning machine and finally to the recoiler. The sharp edges caused by the shearing operation are rolled smooth by the conditioner. The edging rolls of the unit with their feed and pinch rolls are mounted on three planes making it possible to roll simultaneously the edges of eight strips slit from 38-inch wide stock. This multiple pass arrangement makes it practical to place the conditioner between the slitting shear and recoiler in the slitting lineup.



Drier unit which receives sheets from the scrubber and delivers them clean and dry to the piler

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Iron Rolls Are Employed

Chilled cast-iron base work rolls now are used for the most part for hot rolling strip. Where the deflection of the rolls and reduction per pass are not excessive, clear chill alloy iron rolls are recommended. Some hot strip mills use a condensed grain type roll in all stands when great strength is required; other mills employ both type rolls.

◆ ◆ ◆

Surface Finish Improved

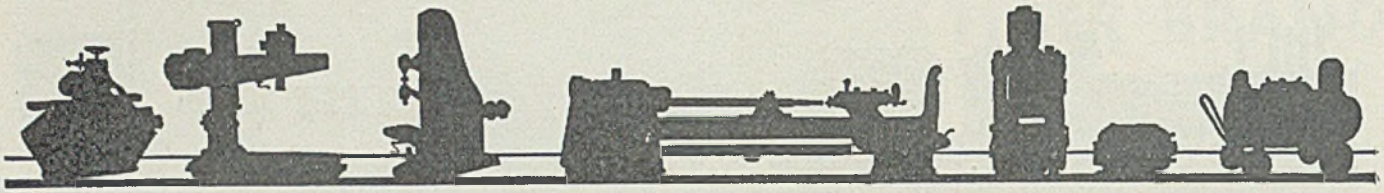
Cost of finishing steel articles a few years ago was so high that it made the use of steel for certain commodities prohibitive. At present excellent work is being marketed with one coat of synthetic enamel which formerly could not be accomplished with less than three or four coats. A large factor is the surface finish of the steel itself. Many sheetmakers today are bending every effort to produce a sheet free from imperfections. Developments have been so widespread that it now is possible to enamel products direct from the punch press without grinding or polishing.

◆ ◆ ◆

Supplies Uniform Oil Film

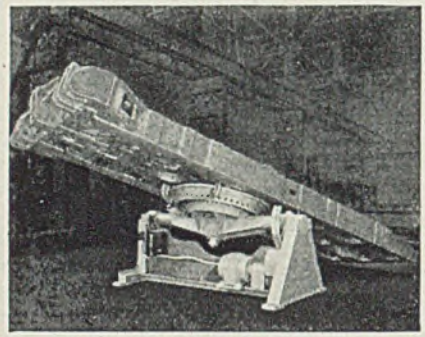
Sprays now are used by a large sheetmaker instead of pet-cocks in the application of oils to the surface of sheets during the cold rolling process. By the use of these sprays the amount of oil has been reduced by 50 per cent and a better surface finish obtained because of the ability of the spray to apply oil to both sides of the sheet.

New Equipment



Welding Positioner—

Harnischfeger Corp., Milwaukee, recently introduced a new P-10 welding positioner with a tilting turntable arrangement that handles pieces up to 4 tons, enabling the welding operator to maintain work in the proper welding position with



Harnischfeger welding positioner

a minimum of time and effort. Features of the positioner, shown herewith, include a 48-inch revolving table that is manually operated, turns on roller bearings and is self-locking in fifty positions. It tilts 90 degrees in one direction and 45 degrees in the other. The tilting mechanism is driven by an electric motor and can be stopped at any angle by electric pushbutton control. Motor is supplied for either a-c or d-c operation, limit switch controlled.

♦ ♦ ♦

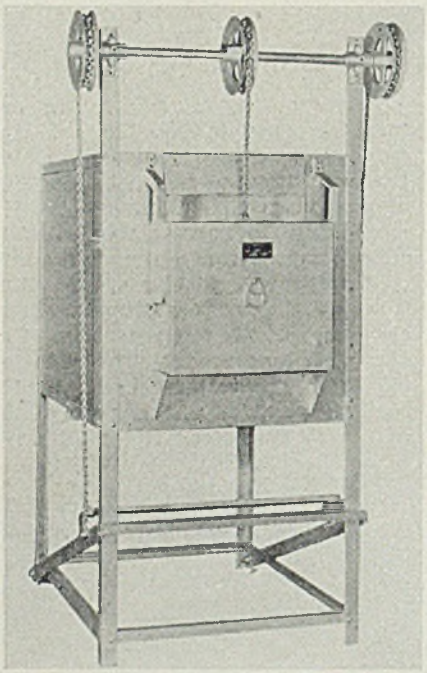
Profiling Machine—

Engineering & Research Corp., 6100 Sligo Mill road, N. E., Washington, has designed and built a machine for cutting accurately to 0.002 inch the profiles in metal blades for airplane propellers. The unit profiles only one side of the blade at a time. A cast iron master cam or form, which cuts the contour of the blade, rotates and is geared directly and synchronized with the table holding the blade forging which is fed horizontally past the cutter. Each line radially on the cutter represents a corresponding element of the blade. The cutter, with a roller of similar profile, reciprocates fore and aft, oscillating freely about a trunnion that permits the vertical travel necessary to the contour. This cutter has a peripheral speed of about 5000 feet per minute.

♦ ♦ ♦

Electric Furnaces—

Harold E. Trent Co., 618-640 North Fifty-fourth street, Philadelphia, is announcing a further development of its "H" line of electric furnaces. The new design, illustrated herewith, is rated at 14 kilowatts, 230 volts, single phase, and is capable of working temperatures up to 1850 degrees Fahr. Inside



Trent type H electric furnace

dimensions are 12 inches wide, 9 high, and 24 inches deep. The unit is equipped with a folded and formed heating element on all four walls. A foot treadle lifts the door, and the chain can be locked in any desired position. Automatic release is provided to close the door when the occasion arises.

♦ ♦ ♦

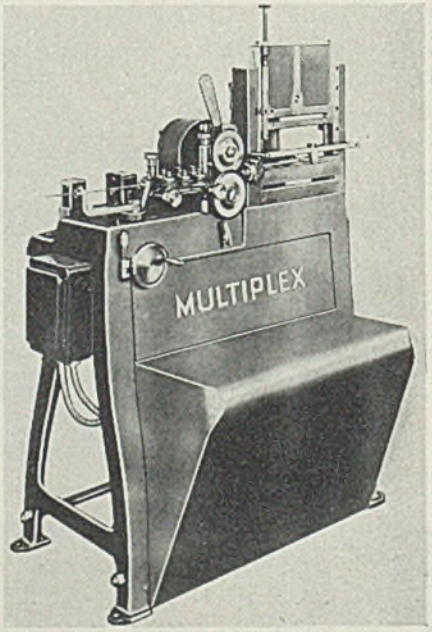
Wire Forming Machine—

Economy Tool & Machine Co., Muskegon Heights, Mich., is introducing a high-production wire forming machine that is automatic in operation. Wire is fed into the machine from a reel, is straightened, cut to the desired length and formed with dies to exact specifications. With this new unit, shown herewith, the length of the wire being produced and formed can be varied while the machine is in operation. This is accomplished by simply loosening the adjusting lock and turning a small hand wheel that adjusts the cutting mechanism. Less than five minutes are required to change dies and adjust the machine for production. Wire forming capacity ranges up to No. 10 gage and 21 inches in length. Production capacity is 100, 125, or 150 accurately formed wires per minute.

♦ ♦ ♦

Portable Test Units—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced a line of compact portable volt-ohmmeters and test unit particularly adapted to general testing and laboratory work. Several types are available including simple ohmmeters, volt-ohmmeters, d.c. test units, and more elaborate multi-scale a.c.—d.c. test units. The instruments weigh approximately 2 pounds, have



Economy wire forming machine

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Years ago the founders of this firm set a safe, definite course for us to follow—and we have never veered from it since. That course included first of all the manufacture of a QUALITY PRODUCT—then the valuable Policy of real SERVICE and COURTESY at all times.

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Sheared Steel Plate up to 150" wide.

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a 2.4-inch scale length, and an accuracy within 2 per cent for d.c. volts and milliamperes and within 5 per cent for a.c.

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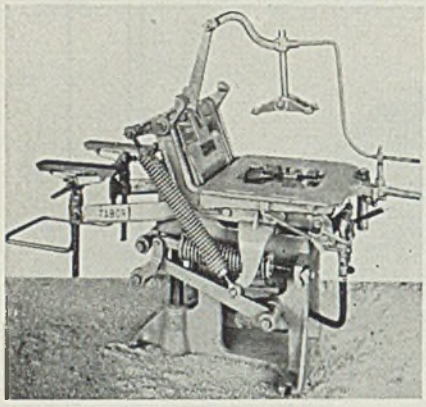
Foundry Molding Machine—

Tabor Mfg. Co., 6223 Tacony street, Philadelphia, has introduced a 20-inch, power jar, hand roll, foot draw molding machine, similar in de-



Tabor 20-inch molding machine has foot draw device

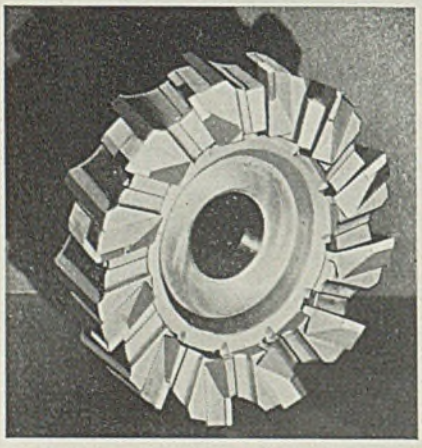
sign to the hand draw machine of that company. A double guide is provided to accommodate the heavier loads, with each guide designed to be sand-proof and dust-proof.

Equipment includes a four-point leveling device having metal coreplate supports with a simple adjustment to take up wear. The machine, shown herewith, is operated by a convenient, quick-acting gate valve.

♦ ♦ ♦

Cemented Carbide Cutters—

Ingersoll Milling Machine Co., Rockford, Ill., has developed zee



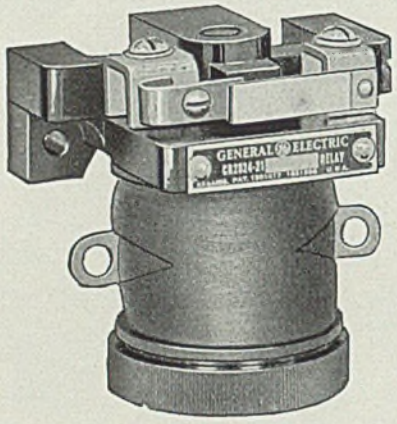
Ingersoll cemented carbide cutter

lock milling cutters embodying blades tipped with cemented carbide and inserted into a forged and case hardened alloy steel cutter body. The Z-shaped wedge securely retains the serrated cutter blade in the housing, hooking the back of the blade and the front of the cutter body. Back hook of the wedge is on a slant so that when the cutter blade is reinserted and moved out a serration, it automatically moves forward a slight amount, compensating for the slight amount of face wear.

♦ ♦ ♦

Thermal Induction Relay—

General Electric Co., Schenectady, N. Y., is announcing a thermal induction relay designed for use in oil-immersed motor controllers. In the new device, shown herewith, a series line-current coil produces a flux in a magnetic core and induces a current in a copper sleeve about the core. Heat from this sleeve is di-



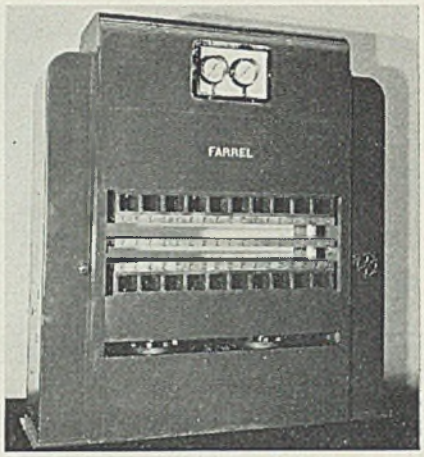
G-E thermal induction relay

rectly conducted and radiated to a bimetal strip, the deflection of which causes a set of contacts either to open or close.

♦ ♦ ♦

Hydraulic Press—

Farrel-Birmingham Co. Inc., Ansonia, Conn., is announcing an hy-



Farrel-Birmingham 140-ton two-platen hydraulic press

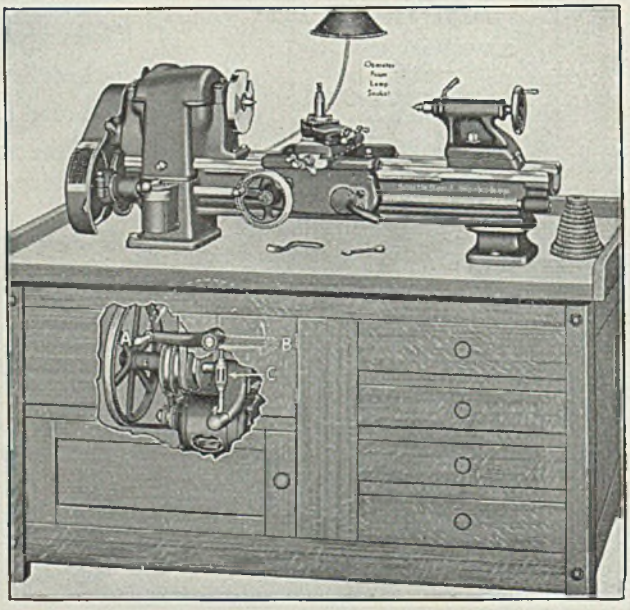
draulic press of new design which incorporates a self-contained hydraulic power unit. Although made especially for plastics and rubber molding operations, it can be adapted readily to other work. Capacity is 140 tons and platens are 60 inches wide and 30 inches deep. Two 8-inch diameter rams working in the cylinders, which are integral with the bottom crosshead casting, provide a pressure of 150 pounds per square inch over the platen area. The top crosshead, which also serves as an oil reservoir, is provided with a steel bedplate on the top surface, on which is mounted the variable displacement pump with its driving motor.

♦ ♦ ♦

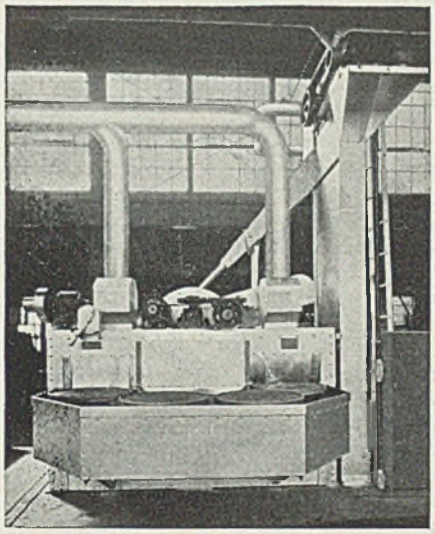
Underneath Belt Motor Drive for Lathe—

South Bend Lathe Works, 928 East Madison street, South Bend, Ind., announces that its new model 9-inch "Workshop" lathe now is available with an underneath belt motor drive. As shown herewith, the lathe is mounted on either a cabinet bench or frame while the driving mechanism and the

THE new 1936 model 9-inch South Bend Workshop lathe now is available with an underneath belt motor drive. Features include down drive to lathe spindle, completely enclosed mechanism with no moving parts exposed, screw type belt tension adjustment, etc.



motor are supported on a pivoting frame on the underside of the bench top. A belt tension release crankhandle controls the position of the frame and the countershaft. The new Workshop lathe is available in either a flat or V-belt model. The former has a three-cone headstock, providing six spindle speeds ranging from 39 to 630 revolutions per minute. The V-belt style has a four-cone headstock with eight spindle speeds which range from 44



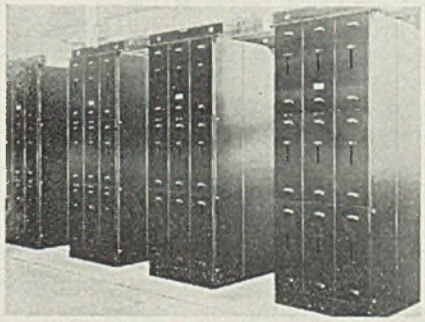
American blasting unit embodies independent rotating tables

to 585 revolutions per minute. Both will cut screw threads from 4 to 40 per inch, and with a fine screw thread cutting attachment the number is increased to 80 threads per inch.

♦ ♦ ♦

Multirotary Blasting Table—

American Foundry Equipment Co., 555 Byrkit street, Mishawaka, Ind., has introduced a multirotary blast-



Four banks of Westinghouse AB switchboard draw-out units

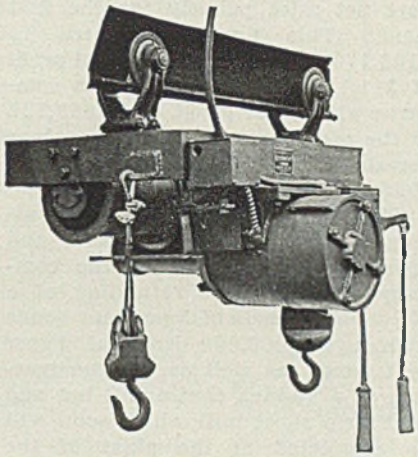
ing table, consisting of a number of independent tables with a guide under the center of each, running on a 6-foot track directly under a Wheelabrator unit. The tables are directed under the blast so that the work will receive the full effect of the abrasive as it leaves the wheel.

The flat vertical side of the table contacts a variable-speed belt revolving the tables as they pass under the blast. The turning speed as well as the forward speed of the table can be varied. After traveling under the blast, the tables move where the castings can be removed or turned over for a second trip through the blast chamber.

♦ ♦ ♦

Twin Hook Electric Monorail Hoist—

Electro Lift Inc., 30 Church street, New York, is bringing out a new twin hook electric monorail hoist built in capacities ranging from ¼ to 3 tons. Hoist cables are carried on two drums spaced to meet requirements, operating from a single shaft from the worm geared hoist unit. The mechanism is carried on a compact and rigid welded steel frame. As shown herewith, the



Electro Lift hoist with rope control

motor is attached directly to the hoist frame, resulting in a compact unit and providing close headroom. Either rope type control operated by pulling pendant cords, or a pushbutton station is available.

♦ ♦ ♦

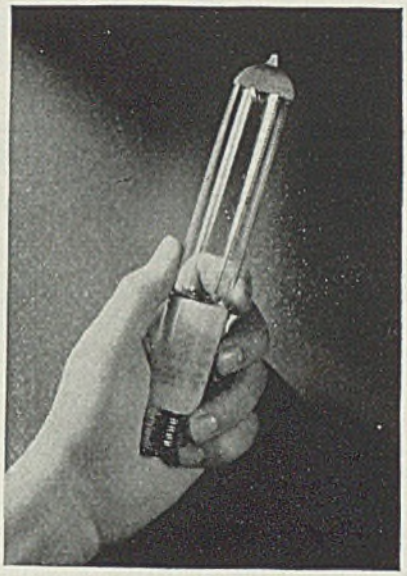
Switchboard Draw-Out Units

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces that dead front distribution switchboard construction now is further advanced by AB breaker draw-out units which include three positions—"operating," "test" and "all-out."

♦ ♦ ♦

Mercury Vapor Lamp—

General Electric Vapor Lamp Co., Hoboken, N. J., is announcing the development of a new high-intensity mercury vapor lamp rated at 250 watts and of much smaller dimensions than its 400-watt companion lamp. The new unit, shown herewith, is equipped with a tubular bulb and a standard screw base socket. It is recommended for applications



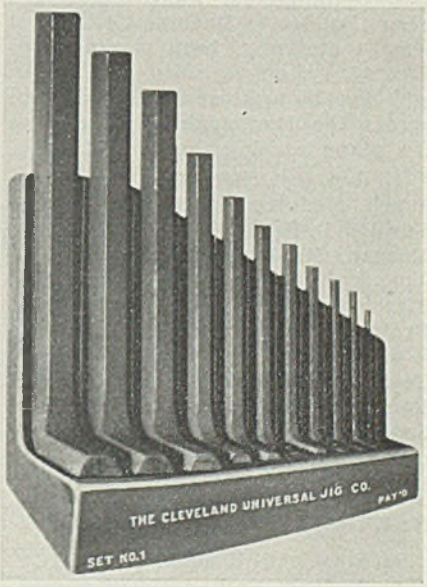
G-E 250-watt mercury vapor lamp

which do not permit use of the standard 400-watt lamp, and it has an efficiency of 25-30 lumens per watt. Of the universal burning type, the new lamp functions efficiently in a vertical, horizontal or angular position and has an operating life rating of 2000 hours. The company states that it produces as much light as is delivered by 425 watts in incandescent lamps. The smaller size, lesser wattage and color characteristics of the new lamp make it particularly adaptable to combination with incandescent lamps.

♦ ♦ ♦

Socket Wrench Holder—

Cleveland Universal Jig Co., 13328 St. Clair avenue, Cleveland, recently introduced a socket wrench holder, shown herewith, consisting of a molded rubber composition base with a separate receptacle for each wrench. Bases are made in two sizes.



Cleveland socket wrench holder

J & L Defers Bonds for New Mill; Other Financial News

JONES & LAUGHLIN STEEL CORP. last week postponed indefinitely the $40,000,000 first mortgage bond issue whereby it is to finance a wide continuous strip-sheet mill at its Pittsburgh works and other improvements both at the Pittsburgh and Aliquippa, Pa., works.

The reason given was the present congestion in the security market. Another issue also deferred last week to avoid crowding the market was the $9,000,000 in refunding bonds which the Louisville & Nashville railroad originally planned to offer March 18.

Though none doubts that Mesta Machine Co., West Homestead, Pa., will receive the award to build the $25,000,000 continuous strip sheet mill when it appears propitious to begin construction, obviously owing to the fact that the bonds have not yet been offered did Jones & Laughlin last week continue to delay in naming contract awards.

It did indicate, in connection with registering its bond issue before the Securities and Exchange commission. the principal companies for whom contracts are signified on materials and supplies.

Suppliers named included Mesta Machine Co., Mackintosh-Hemphill Co., General Electric Co., Morgan Engineering Co., Surface Combustion Co., Treadwell Engineering Co., and others.

Since Mackintosh-Hemphill Co. has had the contract to build the new Jones & Laughlin blooming mill on South Side for almost a year, a contract which by now has been practically completed, indications were clear that Mesta Machine Co. had, at least tentatively, been signified for award on the strip sheet mill, which will also be built at South Side, but across the Monongahela river from the plant housing the new bloomer.

Mellon Securities Co. Inc., Pittsburgh, pledging to sell $14,000,000; Edward B. Smith & Co., $6,000,000; Morgan, Stanley & Co. Inc., $6,000,000; Kuhn, Loeb & Co., $3,250,000; First Boston Corp., $3,000,000; Brown, Harriman & Co. Inc., $2,500,000; Blyth & Co., $2,000,000; Goldman, Sachs & Co., $1,250,000; Bonbright & Co. and Kidder, Peabody & Co., $1,000,000 each, made up the list of underwriters for the issue.

HARVESTER MAKES $19,618,238

International Harvester Co., Chicago, had net profit in 1935 of $19,618,238, against $4,948,637 in 1934. Sales last year totaled $217,583,447, of which tractors contributed $51,078,000, farm implements $50,277,000, motor trucks $48,291,000 and steel, binder twine and other items $19,082,000. Foreign sales totaled $48,855,000.

National Steel Corp. Net Rises to $11,136,452

NATIONAL STEEL CORP. and subsidiary companies in its pamphlet statement for 1935 report net sales publicly for the first time. This figure amounted to $103,176,629, from which a net profit of $11,136,452 resulted. This compares with a net profit of $6,059,722 in the previous year. On an earnings per share basis, $5.16 was earned in 1935, against $2.80 in 1934.

The report embraces several outstanding steps in the financial and operating development of the company, including the refunding of a $37,000,000 issue of 5 per cent bonds with a $50,000,000 issue of 4 per cent bonds, as well as the construction of a 96-inch continuous hot and cold strip sheet mill which soon will be completed at the plant of the Great Lakes Steel Corp., Detroit, and the modernization and enlargement of facilities at this and plants of the Weirton Steel Co. Referring to this program, E. T. Weir, chairman, says in the report:

"It is expected that the construction work will be finished by Oct. 1, 1936, and with its completion, our properties and equipment will be outstanding in the industry. All modern equipment, with a range of capacity suited to the needs of our markets will enable us to serve our customers efficiently and completely, as in the past, and permit us to more effectively maintain and improve our competitive position. Our executives, officers and organization were never more optimistic concerning our ability to meet the problems we face, and to solve them to the advantage of our customers, employes, and stockholders."

Net additions to plant and equipment during the year amounted to $14,930,162, and working capital at the year-end amounted to $38,367,090, including funds for disbursement in connection with the present construction program. The charge to operations to provide for depreciation and depletion amounted to $3,929,383, which compares with $3,653,743 charged for this purpose in 1934.

Wages and salaries paid during the year amounted to $29,038,393, and the number of employes at December 31 was 20,531. For the year 1934, wages and salaries amounted to $22,603,691, and the number of employes at the year-end was 16,590.

Dividends amounting to $3,233,740, equal to $1.50 per share, were paid during 1935. A regular quarterly dividend of 37½ cents per share was declared on Jan. 10, 1936, payable on Jan. 31, 1936.

COLORADO'S FIXED CHARGES ARE REDUCED TO $225,000

United States District Judge J. Foster Symes at Denver last week approved with modification the reorganization plan for the Colorado Fuel & Iron Co., Denver and Pueblo, Colo., indicating that the company will emerge from bankruptcy in 60 days.

A new company will be incorporated under the laws of Colorado. Fixed charges are reduced from $1,600,800 a year to $225,000. The reorganization leaves preferred and common stockholders only with the right to purchase stock at $35 a share. Said Judge Symes: "Stockholders must forget their losses."

An issue of $4,883,000 general bonds is not disturbed. The $27,000,000 of industrial bonds which constituted the second mortgage will be exchanged on the basis of one $400 bond and a warrant for the purchase of three new common shares at $35 in exchange for each $1000 bond.

SHARON OFFERS BONDS IN REFINANCING PROGRAM

Sharon Steel Corp., Sharon, Pa., on March 17, offered to the public securities under its new financing plan. Offering included $2,000,000 of convertible $5 preferred stock, without par value, priced at 100.

Proceeds from sale, totaling a financing arrangement of $6,000,000, will be applied to the redemption on April 20 of $5,328,000, principal amount of Series A bonds at 103 and accrued interest. The balance will be utilized by the company's treasury for general corporate purposes.

CONTINENTAL IN PROFIT AREA

Continental Steel Corp., Kokomo, Ind., reports for the six months ended Dec. 31, 1935, net profit of $336,832. This compares with a loss of $240,922 in the second half of 1934 and with earnings of $481,978 in the fiscal year ended June 30, 1935.

GOES FROM BLACK TO RED

Pittsburgh Screw & Bolt Corp., Pittsburgh, reports net loss of $46,004 for 1935, compared with net profit of $228,696 in 1934. A strong

(*Please turn to Page* 87)

Steel Demand Strong; Rate 50, Despite Floods

Early Resumption Is Indicated; Price Plan Generating Confidence

MARKET IN TABLOID

DEMAND *. . . Strong, and tending to increase in automotive and miscellaneous.*

PRICES *. . . Firm. Mills cleaning up shipments on quotations issued before open price plan was adopted.*

PRODUCTION *. . . Steelworks operations down 7½ points to 50 per cent, due to suspensions caused by floods.*

SHIPMENTS *. . . Heavier, except from Pittsburgh-Wheeling areas.*

EARLY resumption of steel production is expected in the Pittsburgh and adjacent districts—where one-third of the country's steel capacity is located—and where floods last week caused a general suspension, reducing the national average for steelworks operation 7½ points to 50 per cent.

Steelmakers believe that barring further unfavorable developments, nearly normal operating conditions will be attained at the majority of plants this week. Many mills shut down mainly as a precautionary measure, while at others where floods were the highest, considerable equipment was removed in time to avert damage. Relatively little steel tonnage for shipment from mills in the flood areas was diverted to production facilities at other centers.

Inquiries from users in outside territory depending on Pittsburgh for deliveries brought the response from producers that their steel would be delivered early this week.

This temporary interruption came just as steelworks operations as a whole were reaching up toward 60 per cent, highest since June, 1934. Pittsburgh was on its way up from 43 per cent to near 50 per cent.

Pittsburgh averaged only 18 per cent. Wheeling was down 23 points to 55; eastern Pennsylvania 1 to 38. Chicago advanced 1½ to 63½; Youngstown 3 to 74; Cleveland 4 to 79; Buffalo 5 to 47; New England 5 to 56, and others were unchanged.

As sheet and strip mills were rushing to complete deliveries by March 31 on the quotations issued before the recent adoption of quantity differentials, there were indications that the time would be extended.

The open price plan has engendered a feeling of confidence among consumers, but few contracts have been closed for second quarter. Some sheet producers estimate that the differentials will result in an average advance of $2 a ton for them from the recent low, whereas steel bar mills figure their average will be less, by as much as $1 a ton. Steelmakers now are issuing a new card covering prices and differentials for sheet piling, and on piling accessories for the first time.

A generally strong situation prevails in the market for iron and steel, led by commitments from the automobile industry, whose output last week again advanced, 5000 units to 95,000.

Rail and accessory releases on recent orders are heavier. Chesapeake & Ohio is distributing 5000 tons of accessories, and plans to repair 1700 steel hopper cars this year, requiring about 7000 tons of steel. Norfolk & Western took bids last week on 11,000 tons of steel for building rolling stock in its shops. The Edward G. Budd Mfg. Co., Philadelphia, has placed more than 500 tons of stainless steel for 80 streamlined cars, more than half of which are understood to be for Santa Fe. Great Northern has awarded 500 ore cars. Nickel Plate will inquire this week for 825 freight cars.

A large tonnage of steel will be required for repairing bridges and highways in the flood zones. Structural steel awards last week amounted to 12,787 tons, compared with 27,762 tons in the preceding week. Columbia Gas & Electric Co.'s award of 44,000 tons of seamless pipe for a line from Zionsville, Ind., to Detroit, to National Tube Co., is the largest pipe line job since 1930.

Pig iron stocks at foundries are steadily declining; shipments from blast furnaces so far this month are 35 per cent heavier than in the comparable February period. A sharp increase in demand for scrap has had a stimulating effect on this market in the East.

STEEL's iron and steel price composite advanced 1 cent to $33.05; the finished steel index was unchanged at $52, while that for scrap remained $14.46.

COMPOSITE MARKET AVERAGES

	March 21	March 14	March 7	One Month Ago Feb., 1936	Three Months Ago Dec., 1935	One Year Ago March, 1935	Five Years Ago March, 1931
Iron and Steel	$33.05	$33.04	$33.60	$33.48	$33.31	$32.36	$31.65
Finished Steel	52.00	52.00	53.10	53.70	53.70	54.00	49.42
Steelworks Scrap	14.46	14.46	14.50	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 21, 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	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	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 21, 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	4.00	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 stp	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. 2.30c-2.40c

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

Spring wire, Pitts. or Cleveland 2.90c-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.	4.00- 4.25
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 100 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	Malle-able	Basic	Besse-mer
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 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malle-able	Basic	Besse-mer
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 N. Y.	Lead East St. L.	Zinc St. L.	Alumi-num 99%	Antimony Chinese Spot, N. Y.	Nickel Cath-odes
Mar. 14	9.25	9.37½	8.95	48.20	46.70	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 16	9.25	9.37½	8.95	48.37½	47.00	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 17	9.25	9.37½	8.95	48.25	46.80	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 18	9.25	9.37½	8.95	48.25	46.80	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 19	9.25	9.37½	8.95	48.12½	46.75	4.60	4.45	4.90	*19.00	13.50	35.00
Mar. 20	9.25	9.37½	8.95	48.00	46.60	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.	10.75-11.00
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	12.00-12.50
Detroit, No. 2	11.00-11.50
Eastern Pa., No. 1	13.00-13.50
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.)	16.50-17.00
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	9.50-10.00
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	7.75- 8.25
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	10.00-10.50
Cincinnati	8.50- 9.00
Detroit	9.00- 9.50
St. Louis	7.00- 7.50

STEEL RAILS, SHORT

Birmingham	12.50-13.00
Buffalo	15.25-15.75
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	17.00-17.50
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	16.50-17.00
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.	12.00-12.50
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	11.50-12.00
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	7.00- 7.50
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	7.75- 8.25
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	7.75- 8.25
E. Pa., chemical	11.00-13.00
New York, dealers	4.50- 5.00
St. Louis	4.50- 5.00
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	11.00-11.50
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston, dealers	6.00- 7.00
Chicago, heavy	16.00-16.50
Eastern Pa.	12.00-12.50

ARCH BARS, TRANSOMS

St. Louis	13.00-13.50

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.	13.50-13.75
Eastern Pa.	19.00
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
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.	8.50- 9.00
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.	17.00-17.50
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	16.00-16.50
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, ⅜-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. 19

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	
PIG IRON	£ s d	Quoted in dollars at current value	**Quoted in gold pounds sterling	£ s d
Foundry, 2.50-3.00 Silicon	$15.56	3 2 6	$14.14	1 15 0
Basic bessemer	15.56	3 2 6*	12.13	1 10 0
Hematite, Phos. .03-.05	17.68	3 11 0	.....	.....
SEMIFINISHED STEEL				
Billets	$28.26	5 17 6	$18.99	2 7 0
Wire rods, No. 5 gage	42.33	8 10 0	36.39	4 10 0
FINISHED STEEL				
Standard rails	$41.09	8 5 0	$44.17	5 10 0
Merchant bars	1.69c	7 15 0	1.13c to 1.18c	3 2 6 to 3 5 0
Structural shapes	1.64c	7 10 0	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.76c	8 1 3	1.55c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.13c	9 15 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.56c	11 15 0	2.29c	6 5 0
Bands and strips	1.91c	8 15 0	1.42c	4 0 0
Plain wire, base	2.13c	9 15 0	1.92c	5 5 0
Galvanized wire, base	2.51c	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.	$ 4.67	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	$17.43	3 10 0(a)	$17.29	260	$13.43	395	$25.54	63
Basic bessemer pig iron	17.43	3 10 0(a)	12.63	190	11.90	350	28.18 (b)	69.50
Furnace coke	4.98	1 0 0	6.32	95	4.15	122	7.70	19
Billets	29.26	5 17 6	28.60	430	18.87	555	39.12	96.50
Standard rails	1.80c	8 5 0	2.01c	671	1.65c	1,100	2.38c	132
Merchant bars	1.97c	9 1 0	1.68c	560	.98c	650	1.98c	110
Structural shapes	1.91c	8 15 0	1.65c	550	.98c	650	1.93c	107
Plates, †¼-in. or 5 mm.	1.98c	9 1 3	2.10c	700	1.20c	800	2.29c	127
Sheets, black	2.51c	11 10 0§	1.80c	600‡	1.31c	875‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.94c	13 10 0	2.85c	950	2.25c	1,500	6.66c	370
Plain wire	2.02c	9 5 0	2.70c	900	1.73c	1,150	3.11c	173
Bands and strips	2.14c	9 16 0	1.95c	650	1.20c	800	2.29c	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 68

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Cleveland—The open-price plan apparently has engendered a feeling of more confidence among consumers. Some bar producers estimate that their net return on their business after April 1 will be less than on the equivalent tonnage before the quantity differentials were changed, one says it will be $1 a ton less, as an average. A few contracts have been booked for second quarter. Current orders and specifications have increased substantially, from automobile forge shops, nut and bolt manufacturers, builders of lighter types of steam shovels, and miscellaneous consumers.

Chicago — While second quarter contracting for bars is light, mills continue busy in completing shipments against contracts. Specifications hold to the average of the past several weeks, with an upward tendency in automotive shipments. Tractor and farm implement interests are taking heavy deliveries, and the miscellaneous trade is specifying freely. Mills anticipate receipt of some additional business as a result of the Eastern flood. Bar prices are steady.

Boston—Steel bar specifications are fair. Second quarter contracting has been small. The market continues 1.85c, base, Pittsburgh, equivalent to 2.27c delivered Boston. Consumption of steel bars shows a slight tendency to increase.

New York—Steel bar specifications are fair, with more current business being diverted to eastern sellers because of interrupted operations in some western districts, particularly around Pittsburgh.

Plates

Plate Prices, Page 68

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Chicago — While plate demand lacks briskness experienced by lighter flat rolled material, moderate orders are being received from structural fabricators and railroad car shops.

Cleveland—Leading plate producers are holding firmly to 1.80c, base, Pittsburgh, or 1.99½c, delivered Cleveland, although one outside mill continues to offer a slightly lower price. Tank and boiler manufactur-

ers are ordering little material. Present demand consists mainly of structural plates. Some fair size orders have been booked for making rubber molds for the Akron district rubber manufacturers.

New York—Plate sellers are endeavoring with fair success to close contracts for second quarter. Meanwhile, business is spotty with a fair volume of oil company tonnage being reported.

Boston—The steel plate market continues 1.90c, base, Coatesville, Pa., equivalent to 2.22c, delivered, Boston, and has been reaffirmed for second quarter. While there has been some contracting for second quarter forward buying has not yet assumed volume. Most current demand calls for small lots for prompt shipment.

Philadelphia—Plate tonnage has about held its own, although routine contracting for second quarter should be more pronounced shortly, sellers having opened their books at unchanged prices. District mills submitted bids last week on a substantial tonnage of plates for the Norfolk & Western car program, which in all will require 11,000 tons of plates, shapes and bars. Some ship work also is pending, including requirements of the tanker noted a fortnight or so ago as having been placed with a shipbuilding company at Chester, Pa., by the Atlantic Refining Co., this city. No formal award of the one or two passenger cargo boats for the American-South African Steamship Line Inc., New York, has yet been announced. The market is 1.90c, Coatesville, Pa., or 1.99½c, Philadelphia.

San Francisco—Awards were confined to unimportant lots and bookings for the year, so far, total 47,869 tons, compared with 13,487 tons for the same period last year.

Seattle—While no large tonnages are immediately pending, important projects are developing. Everett, Wash., is planning an industrial 48-inch water supply main which may cost $1,500,000. Small jobs, involving less than 100 tons each, are reasonably numerous.

Contracts Placed

650 tons, water mains, Danbury, Conn., to Walsh Holyoke Steam Boiler Works, Holyoke, Mass.

100 tons, 49 batch cars, metropolitan water district, Los Angeles, specification 147, to unnamed interest.

Contracts Pending

2500 tons, 18 miles of 36-inch welded steel pipe, Salem, Oreg.; bids soon.

300 tons, storage tanks, White Fuel Co., South Boston, Mass.

Transportation

Track Material Prices, Page 69

Bids were opened last week by the Norfolk & Western, Roanoke, Va., on 11,000 tons of plates, shapes and bars for rolling stock to be built in its own shops. Nickel Plate will inquire this week for 825 freight cars of various types.

Edward G. Budd Mfg. Co., Philadelphia, has placed more than 500 tons of stainless steel for cars under schedule. There are about 80 of these cars, of which more than half are understood to be for Atchison, Topeka & Santa Fe. It is reliably reported that the Budd company, in order to handle its increasing volume of car business is going to start construction soon on the erection of a car shop on leased property at Fox and Roberts streets, that city.

Substantial orders for accessories have been placed by the Chesapeake & Ohio. This road plans to repair 1700 freight cars this year, requiring about 7000 tons of steel. It had not issued its anticipated inquiry for 5000 to 7000 new freight cars up to late last week but has placed some

orders on its requirements for 4600 tons of tie plates, and is inquiring for 750 tons of screw spikes.

Car Orders Placed

Great Northern, 500 ore cars, to American Car & Foundry Co., New York.

Car Orders Pending

Nickel Plate, inquiry to be issued this week for 550 fifty-ton box cars, 200 fifty-five-ton gondolas, 50 fifty-ton flats, 25 seventy-ton gondolas.

Locomotives Placed

Louisiana & Arkansas, five 2-8-2 locomotives; pending.

New York Central, seven diesel-electric locomotives; bids asked.

Buses Booked

American Car & Foundry Motors Co., New York: Three coaches for Worcester Street Railway, Worcester, Mass.; three coaches for Boston, Worcester & New York Street Railway, Boston; two for Des Moines Railway, Des Moines, Iowa.

General Motors Truck Co., Detroit: 185 duralumin buses for Public Service Co-ordinated Transport, Newark, N. J.; buses will be streamlined, with a 22-foot wheel base and with a seating capacity of 21.

Pierce-Arrow Motor Corp., Buffalo: Ten deluxe passenger buses for Yosemite Park & Curry Co. of California; four deluxe passenger buses for Grand Canyon National Park, Arizona.

Sheets

Sheet Prices, Page 68

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Cleveland — Sheet mills in this district are working at capacity, as automotive and other manufacturing requirements have increased, and buyers have specified heavily against former quotations. A leading producer estimates that the new quantity price schedule will advance its average booking price about $2 a ton, over the recent average. It is pointed out that the conditions of sale provide for one size, of one analysis for rolling at one time for shipment to one destination, for the quantity deductions to apply. Contracting for second quarter is light.

Boston — Sheet specifications against first quarter contracts are heavy. So far there has been almost no second quarter contracting. The market on new business now appears to be firm at recently announced quotations. A considerable tonnage of sheet steel lining will be required in contracts for the metropolitan district commission, Boston.

Chicago—Sheet mills are rushed to complete shipment before April 1 of the heavy tonnages specified shortly after the introduction of new quantity differentials. Most mills are booked for the balance of March but are receiving only a few contracts for third quarter delivery. Further gains in automotive requirements are in prospect and a continuation of relatively active operations is in sight for April. A generally favorable reaction on the part of consumers toward the new pricing plan recently announced is reported, though the new system so far has had only a limited period of operation. Prices on new business generally are steady.

New York—Sheet sellers look for a less active market over the next several weeks. Recent concessions brought out good buying, with a result that some consumers at least have covered their probable requirements for the next 30 to 60 days.

Cincinnati—Books of sheet mills are open for the second quarter under the new quantity differential schedule. Books of the leading interest for first quarter shipment are filled. Mills along the Ohio river in this district showed anxiety on predictions of flood stage but may avoid serious interruptions.

Philadelphia—Sheet demand has tapered off, and as a result of recent

floods, affecting certain industrial centers of this district, sellers have received requests for suspension of shipments in a number of cases. This will probably result in more tonnage being carried over into April at recent concessions than would otherwise have been the case. Most sellers accepted business at concessions for delivery by the end of this month or at the mill's convenience. However, some sellers advised the trade they would take tonnage at the old concessions for delivery up to April 16.

The District of Columbia will open bids March 26 on approximately 150 tons of No. 24 gage hot rolled pickled sheets and the Federal Prison Industries Inc., Lewisburg, Pa., is figuring on 43 tons of miscellaneous steel sheets on which bids were opened March 21. The state of North Carolina has asked bids on a car of galvannealed sheets.

The Edward G. Budd Mfg. Co., this city, is understood to have closed on more than 500 tons of stainless steel. This company is now reported to have 80 streamlined cars on schedule, of which almost 50 are for the Atchison, Topeka & Santa Fe.

Buffalo—Buffalo sheet mills are operating at 75 per cent and orders indicate continued production at this rate, possibly with gains toward the end of the month. There is some thought that curtailments in flood areas may result in shifting orders to Buffalo. Bethlehem Steel Corp.'s new strip mill could be placed on a full production schedule quickly if necessity arose, it is understood.

St. Louis—Sheet business continues brisk and diversified. Seasonal requirements are much in evidence. Heavy purchases have been made by the stovemakers, a number of plants operating six days a week. Galvanized sheets are moving in larger volume to the rural areas. One seller reports the best demand from the oil industry in a number of years, mainly for tanks, drums and other containers.

Birmingham, Ala.—With good contracts on hand and new business coming in, reports indicate active production at sheet mills. Prospects are declared bright for second quarter. Operating schedules recently have been above normal.

Pipe

Pipe Prices, Page 69

Pittsburgh—National Tube Co., Pittsburgh, closed on an order last week for 44,000 tons of 22-inch seamless pipe with the Columbia Gas & Electric Corp. The largest percentage of the order will be turned out at the Lorain, O., works of National, with a share to be rolled at the National works, McKeesport, Pa. Construction in the field will commence this spring.

Chicago—Cast pipe is more active as a result of the appearance of an increasing number of inquiries for WPA work. Privately financed inquiries and purchases are few, but the volume of prospective WPA orders points to a fair volume of business during coming months. Prices are steady, with no early changes indicated.

Boston—Actual awards in the cast pipe market in this district are slow. Several thousand tons, however, are in sight, and with the moderation of the weather, additional tonnage is to come out shortly. Prices are firm, and concessions are restricted to 10 cents a ton.

New York—Awards of about 1000 tons by the procurement division, treasury department, New York, in which three producers shared, featured the cast pipe market during the past week. A good deal of work involving cast pipe in large quantities is contemplated, indicating consid-

erable activity ahead. Market continues firm at $43 per net ton, eastern foundries, on 6-inch class B pipe.

San Francisco — United States Pipe & Foundry Co., Burlington, N. J., secured the outstanding award, 717 tons of 10 to 16-inch, class E to H cast pipe for San Francisco. The treasury department at Los Angeles and Santa Barbara, Calif., has opened bids on 118 tons of 4 to 8-inch, and 115 tons of 6 to 12-inch pipe, respectively.

Seattle—Inquiry is slack. Salem, Oreg., will take bids March 27 for improvements, including a $50,000, 10,000,000-gallon reservoir, plans by Stevens & Koon, Portland. This is one unit of the proposed $1,203,000 system to include a gravity filtration plant, 18 miles of 36-inch steel pipe, a tonnage of 18-inch pipe, and other items.

Cast Pipe Placed

717 tons, 10 to 16-inch, class E to H, San Francisco, to United States Pipe & Foundry Co., Burlington, N. J.

350 tons, sewage disposal system, Columbus, O., to James B. Clow & Sons, Chicago.

336 tons, procurement division, treasury department, New York, to United States Pipe & Foundry Co., Burlington, N. J.

320 tons, procurement division, treasury department, New York, to Florence Pipe, Foundry & Machine Co., Florence, N. J.

225 tons, water system, Baltimore, O., to James B. Clow & Sons, Chicago.

216 tons, 4 to 10-inch, Seal Beach, Calif., to unnamed interest.

200 tons, procurement division, treasury department, New York, to Warren Foundry & Pipe Corp., Phillipsburg, N. J.

200 tons, 6-inch, treasury department, San Diego, Calif., invitation 12-214 and 216, to unnamed interest.

180 tons, water system, Basil, O., to James B. Clow & Sons, Chicago.

160 tons, water system, Lake county, Ohio to James B. Clow & Sons, Chicago.

136 tons, 36-inch, Buffalo, through procurement division, treasury department, New York, to United States Pipe & Foundry Co., Burlington, N. J.

131 tons, 6-inch, treasury department, Los Angeles, schedule 6042, to unnamed interest.

Steel Pipe Placed

44,000 tons, 22-inch seamless pipe, Columbia Gas & Electric Co. line from Zionsville, Ind., to Detroit, to National Tube Co., Pittsburgh.

450 tons, 1½ to 12-inch, for district No. 42, King county, Washington, to Washington Corrugated Culvert Co.; Parker & Hill, Seattle, engineers.

Cast Pipe Pending

1600 tons, Harwich, Mass.; bids soon.

850 tons, Mansfield, Mass., Warren Foundry & Pipe Corp., Phillipsburg, N. J., low.

400 tons, 6, 8, 10, 12 and 14-inch, Needham, Mass.; bids taken.

200 tons, Andover, Mass.; bids soon.

175 tons, contract 112, metropolitan district commission, Boston; C. N. R. Construction Co., Roslindale, Mass., contractor.

118 tons, 6 to 12-inch, treasury department, Los Angeles, schedule 6989; bids opened.

115 tons, 4 to 8-inch, treasury department, Santa Barbara, Calif.; bids opened.

Unstated tonnage, filtration plant, Athol, Mass.; bids soon.

Unstated tonnage, 25,000 feet, various sizes, waterworks extension, Houghton-Hancock, Mich.; bids soon.

Unstated tonnage, 9000 feet of 8-inch, Park Falls, Wis.; bids April 9.

Unstated tonnage, 1800 feet of 12 to 24-inch, Appleton, Wis.; bids March 27.

Strip Steel

Strip Prices, Page 69

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Chicago—Strip production is stimulated by specifications placed upon the recent announcement of quantity differentials and reaffirmation of base prices. While second quarter contracting still is rather slow, strip mills are comfortably booked for the balance of March. Consumers are

anticipating requirements only a brief period ahead, however, so that fairly heavy business is in prospect for next quarter. Automotive requirements gradually are increasing.

Cleveland—Some strip mills continued to book orders last week on quotations issued prior to the new price set up, which will become generally effective April 1. Mills are cleaning up these orders and specifications, and volume is heavier. Few contracts have been placed for second quarter.

Boston—With restoration of the former base prices on strip steel, equivalent to an advance of $3 a ton on base quantities, consumers are concerned chiefly with specifying as much tonnage as possible against first quarter contracts and thus carry over a considerable stock to take care of second quarter requirements.

New York—Narrow strip is less active and in some instances requests for suspension of shipments have been received from consumers in the flood-ridden areas.

Philadelphia—Sellers of narrow strip look for a few weeks of dullness following recent heavy buying under the price recently announced for second quarter. Some consumers appear to be fully covered for 60 days. Subject to the new quantity extras and deductions, hot strip for second quarter is quotable at 1.85c, Pittsburgh, or 2.16c, Philadelphia, and cold strip at 2.60c, or 2.91c.

Wire

Wire Prices, Page 69

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Cleveland—A strong demand is noted for wire and fencing material from jobbers in the rural areas, in anticipation of spring trade. Buying of manufacturers' wire is steady, with a slight increase in orders for automobile production.

Chicago—Wire mills are busier as a result of heavier specifications for shipment before the end of March. Since prices on new business in certain wire products are higher than those quoted recently, consumers are anxious to take delivery on such material.

Boston—The recent advances on steel wire and wire products have stimulated specifying against first quarter contracts at the old prices. There is practically no second quarter buying at this time.

Semifinished

Semifinished Prices, Page 69

Boston — Wire rods continue quoted in this territory at Worcester base prices which are $2 a ton higher than the Pittsburgh base. Nos. 4 and 5 rods are $40, base, Worcester. On No. 5 to 15/32-inch the base is $42, Worcester, and on heavier than 15/32-inch to 47/64-inch it is $44 Worcester. Carbon rerolling billets are $28, base, Buffalo, and forging billets $35, base, Buffalo.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 69

Second quarter contracting for bolts, nuts and rivets is progressing slowly. Specifications against contracts hold previous gains and continue well ahead of the rate a year ago, particularly among railroads and farm implement manufacturers. Demand from jobbers reflects steady buying by miscellaneous consumers. Bolt and nut prices still lack strength, while rivets generally are steady.

Shapes

Structural Shape Prices, Page 68

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

New York—While lettings have been slow, the list of projects pending has been expanded greatly by virtue of new projects which have come out for bids. These new projects aggregate between 10,000 and 15,000 tons and early action is expected. Prospects for eastern fabricating shops are the best in a long time. Prices on fabricated steel continue low with $72 to $73 a ton representative of erected quotations on buildings of the school type. The market on plain structural shapes continues firm at 1.90c, base Bethlehem, Pa. Foreign steel continues to sell at somewhat lower prices but the foreign shapes that are offered are principally the smaller sections and do not appear to comprise any great percentage of the current business.

Cleveland—Structural shape orders are small, but reflect more activity in industrial plant expansion. Early action is expected on 1200 tons for a federal-aid bridge over the Black river, near Lorain, O., requiring 1200 tons, on which Holmes Construction Co., Wooster, O., is reported low. Plain shapes are steady at 2.00c, delivered Cleveland.

Republic Steel Corp. has purchased 700 tons of new sheet piling, and 400 tons of used piling for dock improvements at its Corrigan-McKinney division here.

Opening up of the spring construction season has brought indications that industrial building in 1936 may exceed that of last year by as much as 75 per cent, according to George A. Bryant Jr., executive vice president and general manager of the Austin Co., Cleveland. Estimated material requirements for use by the company in construction this year include: 20,000 tons fabricated structural steel; 5000 tons reinforcing steel; 3000 kegs miscellaneous bolts; 5000 kegs rivets; 4500 kegs wire nails; 1500 rolls annealed wire; 100 tons welding rod; and 1250 tons pipe.

Chicago—Awards are mainly for bridges and include 2500 tons for nine Illinois structures. Inquiries continue below the average of the past several weeks, with public work still predominating. Placing of 15,000 tons for the Chicago outer drive development is expected soon. Inland Steel Co. has issued a card of prices and extras covering steel sheet piling and accessories. This is the first time that published prices have been issued for accessories and with the exception of the steel code period, it will be the first time that an extra card has been published. The base price of piling is unchanged at 2.25c, Chicago, and 2.60c, Gulf and Pacific ports.

Boston—A fair volume of business continues to feature the market here. Fabricators look forward to much new work, especially in replacing bridges and other structures which have been destroyed by floods throughout New England. Plain shapes have been reaffirmed for second quarter at 1.90c, base, Bethle-

Shape Awards Compared

	Tons
Week ended March 21	12,787
Week ended March 14	27,762
Week ended March 7	8,738
This week, 1935	54,120
Weekly average, 1935	17,081
Weekly average, 1936	21,815
Weekly average, February	23,355
Total to date, 1935	192,959
Total to date, 1936	263,349

hem, equivalent to 2.20½c, delivered Boston. Foreign shapes continue available at less.

Philadelphia—Following the improvement of a week ago, awards have declined, with business in this district confined principally to the award of three or four jobs, the largest involving 300 tons. However, a substantial tonnage is pending for the Crown Cork & Seal plant and two public schools, the two requiring approximately 1500 tons on which Ralph Herzog, general contractor, is now taking bids. Steel also will be required for a plant addition to be erected by Edward G. Budd & Co. on leased property at Roberts and Fox streets. Shapes are 1.90c, Bethlehem, Pa., or 2.01½c, Philadelphia.

Birmingham, Ala. — Larger steel fabricating shops are well supplied with business and new tonnages are reported every week. With weather conditions improving, a substantial amount of outdoor work will soon be under way.

San Francisco — Structural shape awards aggregated 3379 tons, bringing the total for the year to 34,520 tons, compared with only 14,812 tons in the corresponding period in 1935.

Included among the larger lettings were 500 tons for the Santa Clara river bridge in Ventura county, California, placed with Consolidated Steel Corp., Los Angeles.

Seattle—An increase is noted in the amount of private work, but quantities are restricted generally to less than 100 tons. Pioneer Construction Co., Seattle, has completed a navy department hangar at Pearl Harbor, T. H., for which 800 tons of shapes were furnished by Virginia Bridge & Iron Works, Richmond, Va.

Shape Contracts Placed

870 tons, plant addition, Aluminum Co. of America, New Kensington, Pa., to Fort Pitt Bridge Works, Pittsburgh.

800 tons, viaduct, Los Angeles, to Consolidated Steel Corp., Los Angeles.

800 tons, navy hangar, Pearl Harbor, T. H., to Virginia Bridge & Iron Works, Richmond, Va.; Pioneer Construction Co., Seattle, general contractor.

705 tons, processing building, gas plant, Hammond, Ind., to Wisconsin Bridge & Iron Co., Milwaukee.

700 tons, plant, Lever Bros., Hammond, Ind., to Wisconsin Bridge & Iron Co., Milwaukee.

700 tons, sheet piling, dock improvement at Cleveland for Republic Steel Corp., to unidentified fabricator. Also purchased 400 tons of used piling.

675 tons, plate girder bridge, Polk county, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

610 tons, boiler and power house, Viscose Co., Marcus Hook, Pa., to Belmont Iron Works, Eddystone, Pa.

603 tons, state bridge, St. Clair county, Illinois, to St. Louis Structural Steel Co., East St. Louis, Ill.

600 tons, bridge, Lorenz, Idaho, to Virginia Bridge & Iron Co., Roanoke, Va.

496 tons, state bridge, La Salle county, Illinois, to Midland Structural Steel Co., Cicero, Ill.

423 tons, state bridge, Pike county, Illinois, to Clinton Bridge Works, Clinton, Iowa.

400 tons, dredge for Yuba Manufacturing Co., Yuba City, Calif., to Moore Drydock Co., Oakland, Calif.

400 tons, extractor for Tacoma, Wash., smelter, to Minneapolis Moline Power Implement Co., Minneapolis.

340 tons, pier No. 1, Charlestown, Mass., navy yard, to Bethlehem Steel Corp., Bethlehem, Pa.

335 tons, apartment house, 46 West Seventy-eighth street, New York, to Harris Structural Steel Co., New York.

309 tons, state bridge, St. Clair county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

290 tons, plant addition, Campbell Soup Co., Camden, N. J., to American Steel Engineering Co., Philadelphia.

270 tons, Ruppert Brewery addition, Hempstead, N. Y., to Joseph T. Ryerson & Son Inc., Chicago.

245 tons, boiler plant addition, Fort Wayne, Ind., to Pan-American Steel Co., New Castle, Ind.

210 tons, Montgomery Ward & Co. store building, Peoria, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

200 tons, Mother Cabrini memorial hospital, New York, to Schacht Iron Works, New York.

190 tons, overpass, Tarrent county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.

177 tons, state highway bridge, St. Johnsbury, Vt., to Bethlehem Steel

Corp., Bethlehem, Pa., through Earle C. Hayden, Barre, Vt.
170 tons, state bridge, Hopkinton, N. H., to Bethlehem Steel Corp., Bethlehem, Pa., through Kittridge Bridge Co., Concord, N. H.
170 tons, county bridge, Collingsville, O., to Pan-American Bridge Co., Newcastle, Ind.
160 tons, Narbonne high school, Los Angeles, to Bethlehem Steel Corp., Bethlehem, Pa.
158 tons, state bridge, Cook county, Illinois, to Zieber Steel Co., Chicago.
147 tons, state bridge, Wells, Me., to Bridge Construction Co., Hazzardville, Conn.
145 tons, Pomeroy avenue and Columbus avenue bridge, Pittsfield, Mass., to Phoenix Bridge Co., Phoenixville, Pa., through Daniel O'Connell & Sons, Holyoke, Mass.
138 tons, state bridge, Perry county, Illinois, to Worden-Allen Co., Milwaukee.
125 tons, extension to pier No. 2, Oakland, Calif., to Herrick Iron Works, Oakland, Calif.
123 tons, state bridge, Mount Carmel, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.
115 tons, bridge, South Kingston, R. I., to Bethlehem Steel Corp., Bethlehem, Pa., through F. T. Wescott, North Attleboro, Mass.
115 tons, underpass, Union county, Iowa, to Des Moines Steel Co., Des Moines, Iowa.
110 tons, state bridge, Du Page county, Illinois, to Mississippi Valley Structural Steel Co., Melrose Park, Ill.
110 tons, portable bridge, Fort Peck, Mont., to Des Moines Steel Co., Des Moines, Iowa.
100 tons, state bridge, McConnell, Ill., to Midland Structural Steel Co., Cicero, Ill.
100 tons, tunnel ribs, metropolitan water district, Los Angeles, specification 146, to Commercial Shearing & Stamping Co., Youngstown, O.
100 tons, miscellaneous local contracts, to Pacific Car & Foundry Co., Seattle.
100 tons, brewery, Charlestown, Mass., to A. O. Wilson Structural Co., Cambridge, Mass., through John Capobianco, Boston.
100 tons, building for the Packard Motor Car Co., Wilmington, Del., to Morris Wheeler & Co., Philadelphia.
Tonnage unstated, sheet piling, Metropolitan Coal Co. pier, Boston, to Carnegie-Illinois Steel Corp. Pittsburgh.

Shape Contracts Pending

6400 tons, Sixth avenue subway, second section, New York; bids April 14.
1675 tons, Twenty-third street viaduct, Kansas City, Mo.; Wisconsin Bridge Co., Milwaukee, low on general contract.
1200 tons, federal-aid bridge over Black river, near Lorain, O.; Holmes Construction Co., Wooster, O., reported low for general contract.
1000 tons, mid-town Hudson tunnel, ventilation building on New Jersey side, New York.
1000 tons, Livestock building, San Francisco; P. F. Reilly, San Francisco, low on general contract at $448,000.
760 tons, Tri-City airports, Tennessee.
700 tons, coliseum, Ft. Worth, Tex.
700 tons, bridge, Mountain Home, Idaho.
500 tons, bridge, Denver, Colo.
500 tons, bridges, Salt Lake City, Utah.
500 tons, Rockland county hospital building, Orangeburg, N. Y.
500 tons, two New York state highway bridges, Queens, New York.
400 tons, storage track supports, Steinway tunnel, Flushing section, New York Board of Transportation, New York.
350 tons, Mallets Bay road bridge, Burlington-Colchester, Vt.; Charles I. Hosmer, Greenfield, Vt., low.
310 tons, bridge, El Paso county, Colorado; bids March 23.
300 tons, children's hospital building, Richmond, N. Y.
300 tons, power plant, Welfare Island hospital, New York; bids March 23.
300 tons, Rockland county tuberculosis hospital, Pomona, N. Y.
300 tons, bridges, scattered locations, Wisconsin; bids March 27.
290 tons, state highway bridge, Shawano, Wis.; Wisconsin Bridge & Iron Co., Milwaukee, low.
210 tons, Ivory avenue viaduct, St. Louis; Condon, Cunningham, St. Louis, low.
200 tons, hospital building, Bangor, Me.; J. Sletnick, Boston, low.
200 tons, wool combing building, North Smithfield, R. I.; bids March 19.
157 tons, state hospital dormitory, Augusta, Me.; D'Amore Construction Co., Boston, low.
150 tons, barracks and recreation building, Veterans' bureau, Togus, Me.; bids April 21.
140 tons, high school, Seawanahka, N. Y.
100 tons, nurses' home, Bangor, Me.; W. H. McPherson, Bangor, low.
100 tons, Gas House bridge, Concord, N. H.
Unstated, frame for Warm Springs, Oreg., hospital; bids to Indian agency, Billings, Mont., March 17.
Unstated, portal assemblies, anchor rods, liner supports, for Coulee, Wash., dam project; bids to reclamation bureau, Denver, March 30.

Reinforcing

Reinforcing Bar Prices, Page 60

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

New York—The New Jersey state highway commission opened bids on one project for March 16, grade crossing elimination at Westfield, N. J., involving only 100 tons. It is not yet known what action will be taken with respect to projects on which the New Jersey state highway commission is scheduled to take bids on March 30. Only one letting of importance, 690 tons by the procurement division, treasury department, featured the market. In general the price of new billet bars is firm at 2.05c base, Pittsburgh, equivalent to 2.40c base delivered, New York, and sellers generally again are adding the trucking charge for delivering to building sites, making the full delivered price 2.50c.

Cleveland—Reinforcing bar awards are light, and prices are unchanged. The largest item pending is 215 tons for the Black river, Lorain, O., bridge, on which bids were taken by the state, March 17.

Chicago—The market was quiet, and while a fairly large tonnage of bars is pending and in prospect, recent orders have consisted almost wholly of individual lots of less than 100 tons. Public work constitutes most of the larger tonnages pending, though a fair volume of business is involved in the private purchases which are being made regularly. While prices have yet to be tested thoroughly, a steadier tone compared with that of a few weeks ago is apparent.

Boston—While concrete reinforcing bar orders are small, the aggregate is fairly good. The largest pending job involves 225 tons. As a rule the market on new billet bars of domestic manufacture is 1.95 to 2.05c, base, Pittsburgh, equivalent to 2.37c to 2.47c, delivered in this district.

Philadelphia—Leading business involves 375 tons for the Veterans' hospital in Coatesville, Pa. Sellers look for the early award of 800 tons for the building to be erected for the Acme Can division of the Crown Cork & Seal Co., Baltimore. Bids on two sizable jobs for the state of New Jersey, March 16, were returned unopened, with the explanation that funds for much of the road building program under contemplation have been diverted to relief. Owing to recent floods in Pennsylvania, there is also the likelihood that the state will require less tonnage over the next several months than was originally scheduled. This belief is based on the assumption that funds for many new road projects will be diverted to the repair of highways damaged by high water. Prices are easier.

Seattle—New business generally consists of small tonnages, although several sizable awards are awaiting government approval. Prices are steady.

San Francisco—The reinforcing bar market was the most active one of the week, and 10,153 tons were

Concrete Awards Compared

	Tons
Week ended March 21	1,680
Week ended March 14	6,385
Week ended March 7	12,168
This week, 1935	2,891
Weekly average, 1935	6,862
Weekly average, 1936	8,614
Weekly average, February	8,982
Total to date, 1935	58,974
Total to date, 1936	10,369

booked. This brought the total for the year to 69,813 tons, compared with 29,201 tons for the same period a year ago. New inquiries include 1280 tons for the Macy street subway, Los Angeles, bids April 4.

Reinforcing Steel Awards

690 tons, park projects in New York metropolitan area, to W. Ames & Co., Jersey City, N. J., through procurement division, treasury department, New York.

375 tons, Veterans' hospital, Coatesville, Pa., to Bethlehem Steel Corp., Bethlehem, Pa., through Sinclair & Grigg, Philadelphia, general contractor.

150 tons, women's dormitory, Pomona College, Pomona, Calif., to unnamed interest.

115 tons, state highway bridge, S. Kingston, R. I., to Joseph T. Ryerson & Son Inc., Chicago, through F. T. Wescott, N. Attleboro, Mass.

100 tons, overpass, N. Kingston, R. I., and Davisville bridge, S. Kingston, R. I., to Joseph T. Ryerson & Son Inc., Chicago, through Seaboard Construction Co., Boston.

100 tons, Narbonne high school, Los Angeles, to unnamed interest.

100 tons, El Molino school, Pasadena, Calif., to unnamed interest.

Unstated, tunnel work, Fort Peck, Mont., project, to Sheffield Steel Corp., Kansas City, Mo.

Unstated, state overcrossing, Portland, Oreg.; Tom Lillibo, Reedsport, Oreg., low.

Reinforcing Steel Pending

1280 tons, Macy street subway, Los Angeles; bids April 4.

941 tons, Livestock building, San Francisco; P. F. Reilly, San Francisco, low on general contract.

500 tons, Twenty-third street viaduct, Kansas City, Mo.; Wisconsin Bridge Co., Milwaukee, low on general contract.

375 tons, state bridge, Lake Forest, Ill.; Michael J. McDermott & Co., Chicago, low on general contract.

350 tons, Sixth avenue subway, second section, New York; bids April 14.

300 tons, De Reimer avenue sewer, Bronx, New York; S. T. C. Contracting Co., New York, low.

225 tons, Hodges reservoir for San Diego, Calif.; M. H. Golden, San Diego, low.

225 tons, contract 112, metropolitan district commission, Boston; general contract to C. & R. Construction Co., Roslindale, Mass.

143 tons, under-crossing, Douglas, Ariz.; Jack Casson, Hayward, Calif., low.

100 tons, addition to county hospital, Anaheim, Calif.; bids soon.

100 tons, White Fuel Co., South Boston, Mass., improvements.

100 tons, state hospital building, Augusta, Me.; D'Amore Construction Co., Boston, low.

100 tons, hospital building, Bangor, Me.; J. Slotkion, Boston, low.

100 tons, New Jersey state highway grade crossing elimination, Westfield, N. J.; Richards & Gaston, Somerville, N. J., low.

Tonnage unstated, west side highway extension, Ninety-second to 106th streets, New York; bids to be taken.

Tonnage unstated, sewage disposal plant, Barnstable, Mass.; Cenadella Construction Co., Milford, Mass., general contractor.

Pig Iron

Pig Iron Prices, Page 70

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Cleveland—Substantial orders for second quarter have been booked at $19.50, base, Cleveland, Toledo and Detroit, this representing the first test of the $1 a ton price advance first announced last November. Both orders and shipments this month are far ahead of the comparable period in February, shipments having increased their lead to 35 per cent. Heavier releases are being received from automobile foundries, while demand from other consumers is steady.

Chicago—Sales and shipments continue to increase. Second quarter contracting is heavier, and with foundries' stocks steadily declining, a further gain in bookings and shipments is in sight for the next several weeks. Production of automotive castings is increasing, while schedules of practically all types of foundries are

steady or heavier. Prices are firm.

Boston — Although books have been opened for second quarter, sales so far have not been made generally, as many melters still have large stocks on hand. However several good size firms are included in the group of companies which have bought for second quarter. The price is unchanged at $20.50, Everett, Mass., furnace, for No. 2 foundry.

Philadelphia — Specifications are slightly improved, although the market is still far from active and there has been little future buying. Trend in foundry operations is still upward, with sellers anticipating further gain in shipments. Recently approximately 1500 tons of Russian iron arrived at this port, bringing total importations within a period of two weeks up to 6000 tons, of which 5000 tons were from Holland.

Buffalo—Demand is improving, and shipments would have shown material gain last week but for weather conditions making loading and handling of iron difficult. Consumers who are short are likely to find it difficult to get rush deliveries, for so far as Buffalo is concerned movement is almost as badly retarded as in flooded areas. Most consumers have been taking a good tonnage this month, and the majority will be able to get along until shipping conditions improve.

Cincinnati—Shipments are heavier than in February, furnaces having fixed a March 31 deadline on old contracts. With the melt apparently steady, some of the iron will be added to stock and thus affect April demand, but have no influence later in the quarter. Buying for second quarter has been dilatory.

St. Louis—A steady expansion in purchases and shipments has been evident since the last week of February. Current buying is mainly for spot shipment, but a considerable number of orders have been placed for second quarter. Jobbing foundries report of a large volume of new business. Stove foundries are operating on full schedules

Birmingham, Ala Steady delivery is reflected in the reduction of stocks on yards. Consumers, however, are not carrying a large quantity of metal, and apparently there will be need for continued active moving of the product from furnaces to melters. Two blast furnaces will be under repairing and relining shortly.

Toronto, Ont.—Current sales are at the highest level in several years. Inquiries have been received for second quarter delivery, but booking is slow. Prices are firm.

Behind the Scenes with STEEL

Waterlogged

WE SUPPOSE you'd like to know how the Pennsylvania floods have affected our business. At least 15 people have asked us personally, so we'll try to give you a few sidelights, as reported from our Pittsburgh office which was right in the thick of things last week.

Water poured into the basement of the Koppers building, STEEL's Pittsburgh headquarters, temporarily shutting off all heat, light and elevator service. Ed France, Pittsburgh editor, says he sat huddled around his typewriter, trying to keep warm by wearing his overcoat and thinking about heat waves, mint juleps etc. Wednesday evening he trudged wearily down 16 flights of stairs (his office is on the 16th floor) and then trotted a mere 3 miles to his home. No street cars or taxis, it seems.

Mail, telephone and telegraph service was seriously crippled for a while, telegraph companies refusing to accept any messages except those from government or Red Cross interests. We disguised our telegraph girl as a Red Cross nurse, but it didn't work. Several letters received from Pittsburgh looked as though they had made part of the trip on the bottom of the Monongahela river, but they were still legible. Trains scheduled into Pittsburgh gave up the battle as far off as Youngstown. Air travel was supposed to be going through O.K., but it's a long and devious jaunt from the airport to downtown Pittsburgh.

Suffice it to say that although many difficulties in communication and transportation services were encountered, our energetic news editors nevertheless managed to corral the necessary information from iron and steel headquarters in the afflicted districts.

Borrowing a phrase from the New York postoffice building — "Neither snow, nor rain, nor heat, nor gloom of night stays these couriers from the swift completion of their appointed rounds." To which we add: Nor floods.

* * *

No Stuffiness

W D. HAMERSTADT, president of the Rockwood Mfg. Co. Division of General Fibre Products Inc., Indianapolis, writes: "I have been watching with much interest your *Power Drives* section and, frankly, I think you are handling this in a very nice manner. In so many publications power transmission articles are tedious and stuffy and appear only as propaganda or desperate effort to fill space."

Thanks from editors to Mr. H. for this compliment. Let it be understood that *Power Drives* will continue to be unstuffy and untedious in its weekly reporting of interesting developments and reflections in this important field of manufacturing.

* * *

Widow Wanted

FOREIGNERS struggling with the English language are always good for a laugh, it seems. Wallace Irwin's *Letters of a Japanese Schoolboy* are a classic example, but there are many more of later vintage.

For instance, the note received recently by the Armco Distributors association of America from a certain Ohioan:

Dear Association:

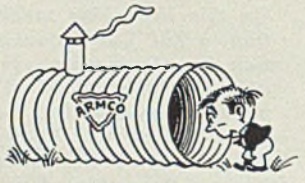
I am a widower. 30 years ago got tinshop in Old Country not in here. If You no widow with tinshop please let me no. Very truly.

Thanks to the indefatigable Armco publicity department for relaying this masterpiece of nostalgic brevity to us.

* * *

More Poemtry

THIS appears to be Armco week in this department, but if you can stand it, we'll continue. In Armco's *Ingot Iron Shop News* for March, we read



with joy a six-stanza poem called *The Coming House*. The poet is W. R. Dineen. Unfortunately, we do not have space to reproduce the verses in their entirety, but we can give you the last stanza, which will convey the general idea:

No more need man on fancy's wings
the land of fairies roam;
Skill and persistence have attained the
magic of the gnome.
For now on boulevard and street most
picturesque, appears
The real house—the steel house—
sought for ten thousand years.

A nod to Editor Bill McFee for the use of this rhythmic gem.

—SHRDLU

Scrap

Scrap Prices, Page 71

Owing to flood conditions and martial law the Pittsburgh market report is omitted this week.

Cleveland—Effects of the flood interruption in the Pittsburgh and adjacent districts have not become apparent in the scrap market here. Diversion of scrap from Pittsburgh to outlying mills may be expected. In the meantime the situation is static, awaiting developments.

Chicago—Scrap prices are firm. While sufficient material is entering the market fully to meet current requirements of consumers, no easiness in prices is apparent. Sellers still are paying $14.75 and $15 in covering contracts for which $15 also was paid. Foundry demand for scrap is moderately heavier and prices of both iron and steel foundry grades are steady.

Boston — The trend of prices in iron and steel scrap continues upward. The potential supply of scrap which eventually will come into the market has been expanded by wide-

spread destruction of bridges and other structures by floods. On No. 1 heavy melting steel $10.75, delivered, Worcester, Mass., recently has been paid.

New York—While dealers have not booked many new contracts of late for iron and steel scrap, they continue to advance buying prices in order to obtain scrap for shipment against orders booked a few weeks ago. In some cases the difficulty of obtaining material is causing dealers to take a loss on No. 1 heavy melting steel of as much as $1 a ton to fulfill commitments. Current competition in buying scrap has resulted during the past week in advances of 50 cents a ton in prices on grate bars and stove plate and 25 cents on heavy breakable cast scrap.

Philadelphia—With export demand more active the scrap market here is stronger. No. 1 steel can still be quoted at $13 to $13.50, delivered, district consuming plant, as no sales have been reported above this spread recently, but sellers are already paying as high as $13.50 on certain tonnage booked at that figure, and with dealers paying $12.50, Port Richmond, for No. 1 steel for Japan, it would appear that consumers in this district who have paid $13.50 will have to pay more than that when they again enter the market.

Buffalo—Buying of scrap has been checked temporarily by refusal of larger holders to sell No. 1 heavy melting steel at Bethlehem's offer of $13.50. Dealers say deliveries on orders already taken at this price probably will run largely to substitutes which may be delivered on these orders at $1.50 to $2.50 less than the face of the contracts.

Cincinnati—Again the weather is casting an influence over the iron and steel scrap market. First intense cold and an ice-clogged river hampered activity; now brokers see in flood conditions, with subsequent suspension of scrap shipments to many points, a softening influence. Meanwhile quotations are unchanged, and mills disinclined toward tonnage commitments.

St. Louis—Iron and steel scrap prices are firm but unchanged and the market is virtually at a standstill. Activities are confined to dealers seeking material for delivery on contracts. In some grades they are experiencing difficulties and in some instances are paying consumer prices.

Birmingham, Ala.—A strong undertone is present in the market for steel and iron scrap and prices are firm. No shortage is apparent.

Seattle—Demand is improving and Japanese buyers are interested but exporters are handicapped by lack of steamer space. Larger tonnages are coming to tidewater but the space situation is affecting shipments. Prices are firm, $10.50, f.a.s., being quoted for No. 1 melting and $11.50 for rails. Local mills are also buying in volume to offset consumption.

Toronto, Ont.—While there was good movement of iron and steel scrap last week, heavy snow on Tuesday practically stopped deliveries. Demand for steel grades is holding. Foundries also have been taking good tonnages of iron scrap and a few forward contracts have been placed recently although most sales are for spot delivery.

Warehouse

Warehouse Prices, Page 72

Pittsburgh—On a day-to-day basis, March jobbing business has been comparable to February. Owing to the longer month, however, total tonnage shipped out of stock will be ahead of February. Jobbers here have not revised price schedules since the producing mills have named second quarter markets.

Chicago—Sales are widening their gain over the volume a year ago.

Heavier demand is appearing for various products used in building repairs. Warehouses defer price adjustments on flat-rolled products and all quotations are unchanged.

Cleveland—Warehouse prices here are steady. Orders are small, but the volume has increased slightly.

Boston—Volume is only slightly above that of February. Jobbers take considerable satisfaction in the adoption by mills of quantity differentials believing they will make it harder for mills to compete for small business.

New York—Expectations by jobbers here for an improvement in volume in March continue unfulfilled. Volume is comparable to that of January and February, and considerably below that of last Fall. Prices are unchanged.

Philadelphia—Demand is improving, following a slow start earlier this month. Some of the recent improvement is attributed to emergency demands from flood-stricken areas, but normal seasonal influences seem to be at work. Prices on special grades of galvanized sheets—Armco, Gohi and Toncan—have been reduced $2 a ton, to 5.41c. On the regular line of galvanized and black sheets there has been a slight change in differentials, the minimum now being reduced to apply to 25 bundles and over, instead of 50 bundles and over.

Cincinnati—Some of the iron and steel jobbers reported individual orders during the past week were more numerous than in any one week in the past five years, although most orders are not large. Prices are unchanged.

St. Louis—With the exception of a slight reduction in black annealed wire, prices remain unchanged. Seasonal demand is reflected in current sales, which so far this month are well ahead of February.

Seattle—Warehouse business has improved, and although buying is in small lots, there is an increased demand from private interests. Prices are unchanged. Mill buying is at a minimum, the turnover being mainly out of stock.

Metallurgical Coke

Coke Prices, Page 69

Flood conditions in the Pittsburgh district have produced chaos in the coke market and until the situation has been cleared after the waters have receded no market will exist.

Foundry coke deliveries in the Chicago district are moderately greater than the rate of a month ago and March is expected to set a record for several years. The price is steady. New England shipments of by-product coke are increasing slightly as foundries broaden their activities.

Ferroalloys

Ferroalloy Prices, Page 70

New York—Ferromanganese has been reaffirmed for second quarter at $75, duty paid. Domestic spiegeleisen also has been reaffirmed at $26, Palmerton, Pa., on lots up to 50 tons and at $24, on 50 tons and over.

On those ferroalloys which are subject to change in accordance with fluctuations in ore prices, there so far has been nothing new. The market on ferrotungsten and tungsten powder, however, possibly may be affected in the near future by an advancing tendency in market prices on wolframite and scheelite.

Steel in Europe

Foreign Steel Prices, Page 72

London — (*By Radio*) — Foreign trade of Great Britain in February was slightly heavier than in January, despite the shorter month. Imports of steel and iron gained 3324 gross tons from 119,900 tons in January to 123,224 tons in February. Exports were a shade larger, 167,845 tons in February, compared with 167,500 in January.

Production of pig iron is expanding, relieving the foundry situation. Active conditions continue in the steel trade and exports are expanding. Some makers are fully booked and are retiring from the market. Domestic sheet and galvanized sheet demand is keeping up but sheet exports are dull. Tin plate trade is satisfactory.

The Continent reports lively export trade in semifinished steel and bars, especially to Great Britain, with moderate movement in other export markets.

Nonferrous Metals

Nonferrous Metal Prices, Page 70

New York—General price steadiness combined with light routine business activity featured major nonferrous metals last week. New buying over the immediate future in zinc and tin is expected to reflect forced shutdowns of many plants in the flood area.

Copper—March sales so far have averaged over 1000 tons per calendar day. This is considered a satisfactory rate in view of the heavy business done during February. Several sellers continued to ask 9.50c, Connecticut, for electrolytic but all business was booked at 9.25c. It is still considered likely that prices will advance when the next change takes place.

Lead—New demand subsided from the increased buying pace of the previous week and was confined to carlots. Sellers appeared content to await renewed demand and held prices firm at 4.45c, East St. Louis, and 4.60c, New York, with St. Joseph Lead Co. asking $1 premium per ton on the latter market.

Zinc—Sales showed no improvement over the slow rate of the previout week but shipments continued to

move well. No pickup is expected until unfilled orders on sellers' books are further reduced. Prices were steady at 4.90c, East St. Louis for prime western.

Tin—Consumer buying was light but prices held fairly steady, closing around 48.00c on Straits spot. The trade is watching closely negotiations for the renewal of the restriction scheme which expires at the end of this year.

Antimony—The domestic market weakened on reports of lower levels in China. American spot eased to 13.12½c, New York, while Chinese spot was nominally 13.50c.

Steel Leaders Defend Basing Point System

(*Concluded from Page* 21)

be indeed a happy event if some way could be found by which the growing practice of submitting identical bids could be corrected in the public interest."

Senator Davis asked about foreign steel used on PWA projects, and Mr. Ickes explained that it was only on sheet piling where American firms could not compete because they do not manufacture the same kind of steel. Mr. Ickes suggested the possibility of a government steel mill to be used as yardstick for steel prices for the government in the future.

Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, was the only other witness Friday. He stated while scrap has no basing point it is much interested in section 29 of the Wheeler bill which, he stated, would seriously disturb his industry.

Mr. Schwartz spoke of the importance of scrap to the steel industry, that 60 per cent scrap and 40 per cent pig iron is now used in steel manufacture. He told of the method of merchandising scrap and called it a very sensitive commodity. The bill, he stated, would prevent present merchandising method of scrap except for small quantities.

Financial

(*Concluded from Page* 66)

current position was shown in the company's report, which also revealed that the decision had been made to abandon operations at the Hammond, Ind., plant and transfer equipment to other divisions.

ALLIS DOUBLES EARNINGS

Allis-Chalmers Mfg. Co., Milwaukee, reported net income of $1,985,137 after charges, in 1935, compared with a loss of $1,039,406 in 1934. Billings for the year amounted to $38,787,006, compared with $20,287,148 in 1934, and orders booked totaled $38,283,740, against $21,875,009 a year ago.

DIVIDENDS DECLARED:

Arthur G. McKee & Co., Cleveland, regular of 25 cents on class B stock, April 1 to record of March 20. To conserve its cash, partly because of the European situation, the extra of 25 cents paid the preceding two quarters is omitted.

Fedders Mfg. Co., Buffalo, quarterly dividend of 37½ cents, payable April 2 to record of March 24.

Eaton Mfg. Co., Cleveland, 50 cents May 15 to record of May 1. This doubles the recent return.

Fostoria Pressed Steel Corp., Fostoria, O., 15 cents March 31 to record of March 24.

City Auto Stamping Co., Toledo, O., 15 cents April 1 to record of March 24.

Vichek Tool Co., Cleveland, 10 cents on the common and $1.75 on the preferred March 31 to record of March 24.

Aluminum Co. of America, Pittsburgh, 37½ cents a share and an additional 50 cents on the preferred, both April 1 to March 14 record. The latter payment is on account of accumulations, totaling $15 per share.

EARNINGS STATEMENTS:

¶General Refractories Co., Philadelphia, net of $654,857 in 1935, against $615,058 in 1934.

¶Niles-Bement-Pond Co., New York, and subsidiaries, net of $266,193 in 1935, against $25,485 in 1934.

¶Clark Equipment Co. and subsidiaries, Buchanan, Mich., profit of $6014 in 1935, compared with $192,477 in preceding year.

¶E. W. Bliss Co., Brooklyn, N. Y., including subsidiaries, net income of $238,708, in 1935, compared with net loss of $281,584 in 1934.

¶Art Metal Construction Co., Jamestown, N. Y., net of $259,147 in 1935, after charges, as compared with loss of $71,970 in 1934.

¶Emsco Derrick & Equipment Co., Los Angeles, reported net profit, after charges, of $571,306 in 1935, against $444,164 in 1934.

Equipment

Chicago—Machinery and equipment sales generally are holding to a satisfactory rate, though demand is spotty as to the source of business. Machine tool orders are heaviest from miscellaneous users. The Santa

Fe railroad still has its machine tool list pending, while the Milwaukee road has abandoned its proposed purchase of a number of tools. Other railroad shops are inactive in buying of major types of equipment, though operations have increased. Work is progressing on new open-hearth furnaces for Inland Steel Co., and these units are expected to be available for operation the latter part of the summer.

Seattle—Seasonal demands are increasing, especially for logging and mining equipment. Pumping units are also moving in larger volume. Bids will be received by bureau of reclamation, Denver, March 27, for 13 pumping units required at the Coulee dam project.

Pittsburgh—Hasty survey of havoc wrought by flood waters in industrial plants in this district indicates a good market for various types of maintenance equipment. Removal of silt, slime and river debris is being accomplished quickly, but widespread repair and replacement of motors, pumps and other equipment has been necessitated. It will be at least another week before full appraisal of damage can be made.

Follansbee Bros. Co. has sold a 1000-ton ingot forging press, which has been at the Follansbee, W. Va., plant of the company, to the Barium Steel Corp., Canton, O., for $4500. Forging of ingots was discontinued six years ago at the Follansbee plant.

Construction and Enterprise

Ohio

BELLEVUE, O.—Bayshore Canning Co. has been incorporated by R. C. Irons, R. R. Parkhurst and W. O. Wyant, and plans are being formulated for construction of a plant.

CINCINNATI—Merchants Paper Co., J. Brennan, president, plans repairing fire-damaged plant at cost of $40,000.

CLEVELAND—Iron Fireman Mfg. Co., 3170 West 106th street, is planning installation of motors and controls, conveyors, electric hoists, etc., in new additions to stoker manufacturing plant. Cost estimated at $100,000.

CLEVELAND — City, division of light and power, room 105, City hall, is seeking purchase and delivery of eight subway-type cable switch boxes, 12 cable pot heads, 20 pole-type oil switches, five gong-operated disconnecting switches, 500 30-ampere cutout switches, and 30 150-ampere cutout switches. Bids are due noon, March 27.

COSHOCTON, O.—City will spend $164,000 for water softening and filtration plant.

DAYTON, O.—Contracting officer, materiel division, United States air corps, will take bids April 9 for carriage bolts, hexagonal head bolts, machine screw nuts, wing nuts and washers, circular 36-674.

DOYLESTOWN, O. — Charles W. Schaffer, clerk of the village board of public affairs has extended the closing date until noon March 27 for bids on a 100,000-gallon elevated tank. George B. Gascoigne, Leader building, Cleveland, is engineer.

EAST LIVERPOOL, O. — Patterson Foundry & Machine Co., Richard L. Cawood president, plans to spend immediately $100,000 for plant extensions, including a new building and new equipment. Stainless steel equipment will be manufactured.

ELYRIA, O.—City is considering installation of diesel engine generating station to operate in conjunction with municipal sewage disposal works. A committee of the council, City building, has been appointed to secure details and cost estimates.

MINERVA, O.—Board of public affairs, Margaret Wright, clerk, plans power plant improvements when financing is completed, including installation of new generator unit and accessories, 1500-kilowatt turbine and two superheaters, total cost $75,925. H. Ralph Hadlow, 5005 Euclid avenue, Cleveland, engineer. Harry E. George is mayor.

NELSONVILLE, O.—City, William Barrows service director, plans installation of new engine and generator at light plant, costing approximately $12,000.

NILES, O.—Iron & Steel Roofing Co., 412 Warren street, plans repairing and altering plant, to cost $37,000.

SEBRING, O.—Council has authorized J. A. Reddy, town clerk, to obtain estimates of cost of survey of construction of municipal light and power plant.

STEUBENVILLE, O.—City is taking bids until noon, March 26, through E. C. Boyd, service director, for 200 pieces of three-inch standard gage boiler tubes cut to eight-inch lengths.

TOLEDO, O. — City, George N. Schoonmaker service director, 525 Erie street, will take bids until March 31 for improvement in power plant, including installation of two gasoline engines and accessory equipment and relocation and reconnection of existing synchronous motor to act as generator. H. P. Jones & Co., Second National Bank building, Toledo, O., is consulting engineer.

Michigan

BAD AXE, MICH.—Detroit Edison Co., 2000 Second boulevard, Detroit, is preparing plans for a new 25-mile electric power transmission line in the vicinity of Bad Axe, project to cost $25,000.

CHARLOTTE, MICH. — Standard Stamping Co. Inc. has been incorporated to manufacture steel stampings. Leslie A. Shaffer, 530 West Lovett street, is correspondent.

DETROIT—Packard Motor Car Co. will construct a foundry and crane extension at its Detroit plant, 1580 East Grand boulevard. Albert Kahn Inc., third floor, New Center building, Detroit, is architect.

DETROIT—Detroit Lubricator Co., 5842 Trumbull street, is planning addition to plant costing $37,000. Engineer is R. O. Derrick, Union Guarantee building.

DETROIT — Fanny Farmer Candy Shops Inc., 7 Griffith street, Rochester, N. Y., plans installing of motors and controls, conveyors, loaders and other equipment, for new factory here. Cost over $200,000.

GRAND RAPIDS, MICH. — Challenge Machine Co. plans erection of foundry building for which details

have just been completed by Pierre Lindhout, architect, 725 Michigan Trust building, Grand Rapids.

MUSKEGON, MICH. — Standard Auto Parts Corp., 660 Nims street, will erect a new foundry and factory building here, for which plans have been completed by Roger Allen, architect, 463 Houseman building, Grand Rapids, Mich.

MUSKEGON, MICH. — Old Dutch Refining Co., Old Grand Rapids road, plans installation of motors and controls, air compressors, electric pumping machinery and other equipment for new addition to oil refining plant for gasoline production. Cost estimated at $200,000.

SAGINAW, MICH.—Saginaw Steering Gear Co., North Hamilton street, is planning addition to plant, at cost of $37,000.

Illinois

CHICAGO—Union Stock Yards plan rebuilding of gas-generating plant, damaged recently by fire.

CHICAGO—Chicago Flexible Shaft Co., 5600 West Roosevelt road, is taking bids for a two-story, 83 x 300 feet, addition to its plant.

CHICAGO—Art Brass Foundry, 506 South Green street, has been incorporated to do a general foundry and machine business, by Oscar A. Hansen, and Helen and Goodman E. Olson.

DUQUOIN, ILL.—City will soon receive bids for constructing sewage works. Pearse, Greeley & Hansen, 6 North Michigan avenue, Chicago, are engineers.

ELMHURST, ILL. — City, through Alvord, Burdick & Howsen, engineers, 20 North Wacker drive, Chicago, will take bids soon for new sewage disposal plant.

OTTAWA, ILL. — City plans new sewage disposal plant, and will take bids soon. Pearse, Greeley & Hansen, 6 North Michigan avenue, Chicago, are engineers.

SPRINGFIELD, ILL. — State department of public welfare, A. L. Bowen director, Capitol building, will open bids soon for $95,000 improvements planned in power house at state penitentiary at Stateville, Ill., with installation of two boilers and accessories, stokers, water softener, auxiliary equipment and improvements in high pressure steam lines. C. Harrick Hammond, Springfield, Ill., is state architect.

WEST DUNDEE, ILL.—V. H. Kasser, city engineer, will receive bids soon for a sewage disposal plant. Alvord, Burdick & Howsen, 20 North Wacker drive, Chicago, are engineers.

Indiana

INDIANAPOLIS—Indiana Wheel & Rim Co., 40 West North street, plans $40,000 plant repairs.

INDIANAPOLIS — Chevrolet commercial body division of General Motors Corp., 1100 West Henry street, has started construction here of a second plant unit with 230,400 square feet. The new building will be of monitor type, 320 x 720 feet, one-story. D. M. Klausmeyer is plant manager.

LEBANON, IND. — Indestructible Wheel Co. Inc. has been organized to manufacture metal products, wheels, automobile parts and commercial trailers. Incorporators are A. M. Lofland, Will C. Davis, Harry L. Lenox, Harvey P. New and Roscoe Hollingsworth.

Connecticut

HARTFORD, CONN. — Connecticut Light & Power Co., 155 High street, is planning 1936 expansion and improvements, at a cost of approximately $3,300,000. Power plants, power substations, transmission and distribution lines and other structures are included. Line extensions for rural electrification, with installation of service facilities, are considered.

HARTFORD, CONN.—Hartford Electric Light Co., 266 Pearl street, is planning extensions and improvements in transmission and distribution lines during 1936, costing over $150,000. Substations and service facilities for new consumers will be added.

LITCHFIELD, CONN. — Litchfield Electric Light & Power Co., North street, plans transmission lines, service connections and improvements to cost $35,000.

Massachusetts

CANTON, MASS.—Town has appropriated $25,000 for water system extension, in charge of M. F. Ward, water commissioner.

LYNN, MASS.—Lynn Gas & Electric Co., 90 Exchange street, will take bids soon for a new boiler house. Stone & Webster Engineering Corp., 49 Federal street, Boston, engineer.

ROCKLAND, MASS.—Town, H. Torrey, chairman of board of selectmen, Town hall, is planning installation of $100,000 elevated steel water tank.

SOUTH BOSTON—White Fuel Corp., 900 East First street, is taking bids for construction of a bulk oil storage plant, to include steel storage tanks, piping, pumps, motors, etc. G. Dyson, 25 Huntington avenue, Boston, is engineer.

New Jersey

BORDENTOWN, N. J.—W. Warrack, mayor, and council plan to improve sewage plant, place new beds, etc. at a cost of $75,000. H. Eaton, Farnsworth avenue, engineer, is in charge.

CLIFTON, N. J. — W. N. Best Engineering Co., manufacturer of oil and gas equipment, has leased a 1-story building, here, and will move into it.

FLORENCE, N. J.—Township commission is seeking a federal grant of $100,000 for sewage system.

Pennsylvania

BEAVER FALLS, PA.—Borough is planning new sewage disposal plant at cost of $80,000. Engineer is J. N. Chester, Clark building, Pittsburgh. I. D. Lindeman, Borough building, is borough engineer.

GLENFIELD, PA.—Borough council, J. W. Schneider, secretary, of the borough of Glenfield, Allegheny county, Pennsylvania, will receive bids until 8 p.m., April 6, for construction of a water distribution system and sewer system. Contract documents and plans may be obtained at the office of John M. Rice, consulting engineer, Grant building, Pittsburgh.

LATROBE, PA. — Latrobe Electric

Steel Co., 2626 South Ligonier street, plans adding one story, 60 x 380 feet, to its present plant.

NORRISTOWN, PA. — Norristown Foundry Co., under new management, has purchased the foundry and machine shop properties at Elm and Harry streets, Conshohocken, Pa., formerly owned and operated by the Electromelt Corp. After improvements and additions to buildings and the installation of new equipment the plant will be operated as a general jobbing gray iron foundry. William S. Thomas is president and general manager of the new company.

PHILADELPHIA—Commanding officer, Frankford arsenal, Philadelphia, will receive bids until March 26 for five air filters for air compressors.

PHILADELPHIA—Crown Cork and Seal Co., Eastern and Kresson avenues, Baltimore, plans installations of motors and controls, conveyors, regulators, transformers and accessories, and other equipment in new multi-unit plant for manufacturing bottle caps and capping machinery. A new 18-acre tract for the plant has been acquired at Erie avenue and G street, Philadelphia. Total cost will be over $2,000,000.

WARREN, PA.—Valvoline Oil Co., E. H. Shepherd purchasing agent, 1761 Elmore avenue, Cincinnati, plans alterations and improvements to crude oil refinery here, and the construction of a large laboratory. Total cost will exceed $37,000. L. Calkins is engineer.

WILCOX, PA. — Elk Tanning Co., G. W. Daugherty general manager, Ridgway, Pa., is planning completion of a waste disposal system, additions to tannery, including installation of settling tanks, pumps and handling equipment, to cost between $20,000 and $30,000. Engineer is F. Moffatt.

New York

ARCADE, N. Y. — K. R. Wilson Foundry, Liberty street, Arcade, N. Y. was damaged recently by fire. Kirke R. Wilson, 295 Depew avenue, Buffalo, is owner.

DRESDEN, N. Y.—City is surveying possibilities of municipal water supply, including a 30,000-gallon reservoir, one-mile pipeline or a 30,000-gallon stand pipe. W. T. Field is engineer.

NEW YORK—American Gas & Electric Co., George N. Tidd president, is reported planning to spend $15,000,000 for improvements in 1936.

NEW YORK—Sailors Snug Harbor, 262 Greene street, will erect a one-story power plant costing $40,000 at 255 Greene street. Engineers are Corbett & MacMurray, 130 West Forty-second street.

Alabama

BIRMINGHAM, ALA.—Texas Oil Co., 3300 Fifth avenue, south, plans to rebuild storage facilities, including pump house, storage tanks, etc., damaged recently by fire.

BIRMINGHAM, ALA. — Alabama Power Co., 600 North Eighteenth street, plans expenditure in 1936 of $9,700,000 for improvements to its system, $2,500,000 for extensions and additions, and $1,200,000 for rural lines.

Kentucky

STANFORD, KY. — City board of education has appointed John W. Wilson, Lexington, Ky., architect for proposed manual training and agricultural building. WPA project. J. T. Embry is superintendent of the school.

Florida

FT. MEADE, FLA.—American Cyanamid Co., 30 Rockefeller Plaza, New York, plans installation of motors and controls, conveyors, electric pumping machinery and other equipment in a new phosphate mining and producing plant at Ft. Meade. Cost will be approximately $250,000.

MIAMI, FLA.—Southern Metals Products Inc. has been granted incorporation papers. E. J. Burkem and A. J. Henderson are incorporators.

PENSACOLA, FLA. — Gulf Power Co., Gant building, 8-10 North Palafox street, is planning extensions and improvements in plant facilities.

Georgia

AUGUSTA, GA.—Voters have authorized the city to issue $700,000 bonds for construction of a municipal hydroelectric plant. Transmission lines and other facilities are included in the project. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is consulting engineer.

Louisiana

NEW ORLEANS—City sewage and water board, 522 Carondelet street, will take bids until April 2 for equipment for sewage system in Algiers district, including motor-driven pumping machinery and accessories, underground conduit lines, transformers, switch board, and other electric apparatus. A. F. Theard is general superintendent.

Mississippi

BLUE MOUNTAIN, MISS. — Town voted to issue $22,000 waterworks bonds. A. LaQueux is mayor.

COLUMBUS, MISS.—T. W. Harris, mayor, soon will start a survey for a proposed electric distribution system. Current is to be furnished by the Tennessee valley authority.

DUCK HILL, MISS.—Voters have authorized town to issue $20,000 in bonds to help finance construction of waterworks and sewer systems. B. E. Embry is mayor.

UTICA, MISS.—Taormenia Canning Corp., New Orleans, has acquired a site in this city and is considering erection of a plant.

South Carolina

CHARLESTON, S. C. — Southern States Oil Co., L. D. Long president, P.O. Box 686, King and Mt. Pleasant streets, is receiving bids for construction of a $60,000 terminal to consist of three 10,000-barrel tanks and one 20,000-barrel tank, approximately 10,000 feet of 6-inch pipe, and approximately 3600 feet of two-bent pile capping supports for fuel pipe on waterfront.

CHESTER, S. C. — Duke Power Co. soon will begin erection of a rural electric line to serve Armenia and Capers Chapel communities in Chester county. The line is to be of the single-phase, 6900-volt type. This company has acquired and will operate an electric distribution system controlled by A. N. Keistler.

COLUMBIA, S. C.—South Carolina rural electric authority has approved plans for expansion, and will apply to Washington for $1,411,900 to finance 266 additional projects, including 1418 miles of rural lines.

Tennessee

MEMPHIS, TENN.—Tennessee Valley Authority, Knoxville, Tenn., plans 154,000-volt steel tower transmission line from vicinity of new dam at Pickwick Landing, Tenn., to Memphis,

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(*Continued from Page 90*)

with power substations and switching facilities. William J. Hayes is regional co-ordinator in charge.

West Virginia

FAIRMONT, W. VA.—Reilly Tar & Chemical Co., George F. Kucera manager, plans expenditure of $100,000 for improvements and expansion, and $50,000 will be spent at once for purchase and installation of distillation unit at its plant on Hoult road. Mr. Kucera is supervising work.

PINEVILLE, W. VA.—W. M. Ritter Lumber Co., 115 East Rich Hill street, Columbus, O., is planning installation of motors and controls, conveyors, electric hoists, loaders and other equipment in connection with development of a large tract of coal land in Wyoming county in the vicinity of Pineville. Estimated cost over $300,000.

Virginia

LYNCHBURG, VA. — Lynchburg Foundry Co. Inc., plans construction of a new shop at Radford, Va., at a cost of $420,000. Building will be 372 feet long and will house casting, cleaning and annealing departments. Pipe will be cast by the centrifugal process. New machinery is to be installed. C. Harold Owen is secretary.

RICHMOND, VA.—Virginia Electric & Power Co., Seventh and Franklin streets, is arranging fund of about $760,000 for line extensions in 1936, of which approximately $650,000 will be used for additions, improvements and replacements on city transmission and district systems, remainder for power line extensions for rural electrification in different parts of territory, with service facilities.

Missouri

CLAYTON, MO.—W. S. Smith, secretary, board of trustees, Clayton outfall sewer district, St. Louis Bank building, will receive bids soon for construction of sewer system costing $60,000. Kinsey Engineering Co., care of E. A. Fulton, St. Louis Bank building, is engineer.

KANSAS CITY, MO.—*Kansas City Star*, 916 North Sixth street, plans purchase of steam turbine and rotary pump with 500-gallon pumping capacity. C. F. Dew is engineer.

ROCK RAPIDS, IOWA—City has voted $100,000 for improving and extending municipal light and power plant and distribution systems, work to cost $185,000. Engineers are Black & Veatch, 4706 Broadway, Kansas City, Mo.

ST. LOUIS—St. Louis County Water Co., 6600 Delmar avenue, has been ordered by public service commission, Jefferson City, Mo., to file within 90 days plans and cost estimates for filtration plant for county water system.

THAYER, MO.—C. A. Reef, mayor, will spend $72,000 for a complete electric light plant. Bonds totalling $40,000 have been voted. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, is engineer. (Noted STEEL, March 9).

Arkansas

PARAGOULD, ARK.—W. C. Middleton, mayor, will receive bids until March 25 for a power plant and distribution system. Section 2 of the proposed contract calls for a diesel generator plant, including switch board, wiring, pumping and auxiliary equipment. Section 3 calls for furnishing and installing complete electric distribution system. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, is engineer.

Oklahoma

PONCA CITY, OKLA.—Continental Oil Co. plans 44-mile welded steel pipe line with daily capacity of 9000 barrels, for crude oil transmission from oil fields at Tepetate, Arcadia Parish, La., to Lake Charles, La., at an estimated cost of over $450,000. The system will include pumping plants along the route and a bulk terminal at Lake Charles, with main pumping station, steel tanks and other facilities.

SAND SPRINGS, OKLA. — Sand Springs Home Creamery, R. H. Huddart manager, plans installing pasteurizing plant in East Second street building, with new air-conditioned refrigeration rooms.

Texas

HENDERSON, TEX.—Parade Gasoline Co., Shreveport, La., is considering refinery improvements to cost $275,000.

HOUSTON, TEX.—Shell Petroleum Corp., Sterling building, will erect three buildings, including a machine shop, at Bellair and Edloe streets. Total cost of buildings will be $125,000.

HUNTSVILLE, TEX.—City, J. M. Smith, mayor, has completed plans for new power plant and lighting system to cost $151,000. Garrett Engineering Co., P. O. Box 1726, Houston, Tex., engineer.

LIBERTY, TEX. — Tom Calhoun, mayor, is receiving bids for $95,000 power plant building, including three 150-kilowatt generators. Garrett Engineering Co., P. O. Box 1726, Houston, Tex., engineer.

MELON, TEX. — Amerida Petroleum Corp. is planning erection of a number of steel tanks, 55,000 to 80,000-barrel capacity, on a 50-acre tract near here.

SAN DIEGO, TEX.—Crude Oil Pipe Line Co., San Diego, plans welded-steel pipeline from oil field near here to Corpus Christi, Tex., where large bulk terminal will be built on waterfront, including power house, pumping station and steel tanks, Cost estimated at $600,000.

TEMPLE, TEX.—Belfall's Light & Power Co. here plans power and distribution project costing $452,000, including the purchase and installation of diesel-powered generating plant, and 300 miles of above-ground power distribution lines in nearby counties.

TYLER, TEX.—East Texas Utility Corp., Tyler, is considering spending $214,000 for building 254 miles of rural lines.

YORKTOWN, TEX.—City will receive bids after March 27 for construction of $100,000 municipal power plant. Election scheduled March 27 on issuance of $55,000 revenue bonds to supplement $45,000 PWA grant. Garrett Engineering Co., P. O. Box 1726, Houston, Tex., engineer.

Wisconsin

MILWAUKEE — Wisconsin Public Service Corp., 1029 North Marshall street, is considering transmission and distribution line extensions for rural electrification early in spring, including power substations and service facilities.

WHITEWATER, WIS. — Whitnall Conveyor & Mfg. Co. has been incorporated to manufacture conveyors for coal, sand and gravel. H. E. Whitnall and associates are incorporators.

Minnesota

RENVILLE, MINN.—F. R. E. Dunwell, city clerk, will take bids soon for a $30,000 sewage disposal plant.

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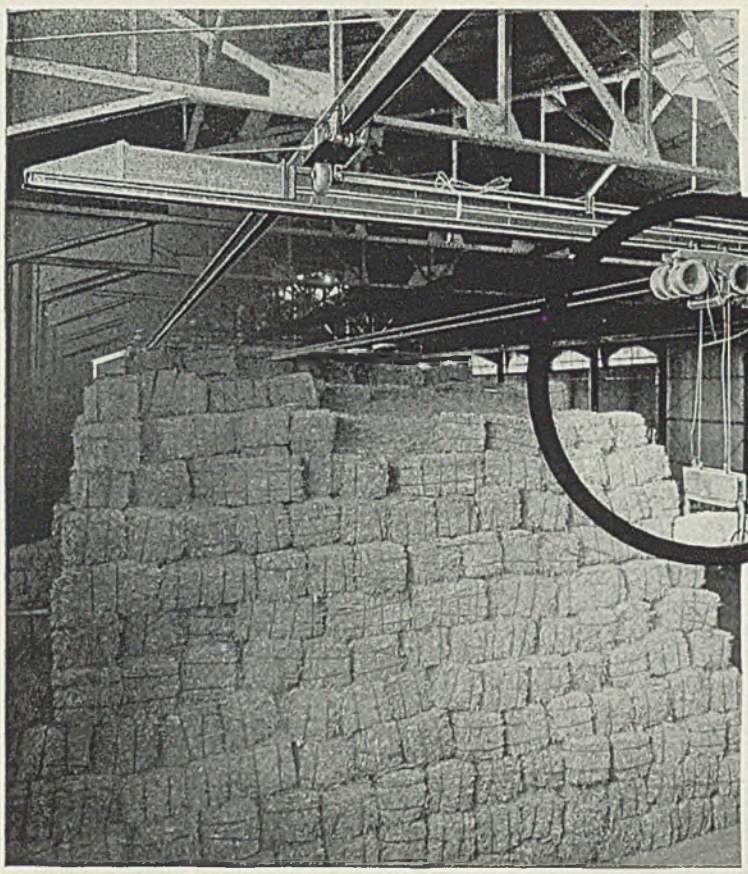

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(*Concluded from Page 92*)

M. E. Chamberlain, Montevideo, Ill., is engineer.

South Dakota

PLANKINTON, S. DAK.—City, J. E. Germann, auditor, plans installing one 225-horsepower diesel engine costing $20,000 at municipal power plant.

VERMILLION, S. DAK.—E. A. Lenhart, auditor, is taking bids for installing one 1000-horsepower engine in municipal power plant. J. W. Kolb is city engineer, City hall.

Iowa

CHEROKEE, IOWA — Iowa Public Service, Ft. Dodge, Iowa, is planning transmission line extension in parts of Cherokee county, including lines for rural electrification.

Nebraska

OMAHA, NEBR. — Herbert B. Loper, district engineer, United States engineer office, 819 National Bank building, will receive bids until 2 p. m. April 1, for six steel barges, to be delivered simultaneously afloat in the Missouri river at any point between Kansas City, Mo., and Sioux City, Iowa. Approximate overall dimensions of the barges, 100 feet x 9¾ inches x 24 feet x 1¼ inches x 5 feet.

SCRIBNER, NEBR.—Elkhorn Valley Power Co., plans new transmission and distribution lines for rural electrification project in Washington, Stanton, Platte, Dodge and other counties, at a cost of $1,500,000.

TEKAMAH, NEBR. — Burt county rural public power district is planning construction of rural electrification here, at a total cost of $400,000. Engineers are Hennington Engineering Co., 326 Union State building, Omaha, Nebr.

Colorado

COLORADO SPRINGS, COLO. — Holly Sugar Co., G. J. Dally manager, plans alterations and additions to sugar refinery at Hamilton City, Calif., at an estimated cost of $500,000, including new equipment. Engineering department of owner is in charge.

Wyoming

CASPER, WYO.—Illinois Pipe Line Co., at a cost of about $400,000, will build a welded-steel pipeline for crude oil transmission from Lance Creek, Wyo., oil field to Fort Bridger, Wyo., connecting with Standard Oil Co. of Indiana. Project will include pumping station.

Montana

TWODOT, MONT. — Chicago, Milwaukee, St. Paul & Pacific railroad power substation recently was damaged by fire, with loss to transformer room equipment.

Utah

SALT LAKE CITY — Mountain States Telephone & Telegraph Co., 56 South State street, is planning improvements and changes throughout the system this year, to cost $800,000. C. A. Alston is manager.

SANDY, UTAH—Town plans three-miles of sanitary sewers and a disposal plant, costing $40,000. Caldwell & Richards, Templeton building, Salt Lake City, are engineers.

Pacific Coast

CLAYTON, CALIF.—City is seeking estimates and information on equipment for artificial gas plant and pipe line system at Clayton and Concord. Laurence Olson, Clayton, is chairman of the committee in charge.

MARYSVILLE, CALIF.—City plans additions and improvements at municipal airport, including construction of steel frame and corrugated iron hangar, at a cost of $34,000. Phil J. Divver, city engineer, is in charge.

OAKLAND, CALIF. — Owens-Illinois-Pacific Coast Co. plans construction of new factory to occupy 22-acre site on Fruitvale avenue here. P. D. Burtt, 1855 Folsom street, San Francisco, is in charge of the engineering department of the owner.

SACRAMENTO, CALIF. — Pacific Gas & Electric Co., 245 Market street, San Francisco, is planning extensions and improvements, estimated to cost approximately $3,000,000, to properties at Sacramento and other northern California towns during 1936. A gross appropriation of $16,500,000 has been set aside for the entire system for extension of transmission and distribution lines, including service facilities for rural electrification.

SAN DIEGO, CALIF. — Consolidated Aircraft Corp. is planning a new manufacturing and engineering building costing over $150,000, at 3302 Atlantic street. Taylor & Taylor, 802 West Third street, Los Angeles, are now taking bids on structural steel.

SAN JOSE, CALIF.—San Jose Ice & Cold Storage Co. plant at 10 Center street, was recently damaged by fire.

STOCKTON, CALIF.—Flotill Products Inc. plans installation of new automatic canning equipment in its plant at Fresno and Smith avenues, at a cost of $75,000, without equipment.

SUNSET BEACH, CALIF. — PWA will finance 45 per cent of total cost of $81,000 for proposed sewer system and sewage disposal plant for Sunset Beach sanitary district.

INDEPENDENCE, OREG. — Independence Canning Co., Earl W. Scribner president, plans steam power house at new fruit canning plant for processing and other operating service. Estimated cost $60,000.

KLAMATH FALLS, OREG. — Klamath Iron Works has been incorporated to do a general foundry and machine shop business, by W. H. Beane, David R. Vandenberg, and William Ganong.

SALEM, OREG. — State has been granted $206,292 by PWA toward construction of central heating and power plant for the group of capital buildings. Total cost estimated at $405,000.

SEATTLE — Boeing Aircraft Co., 200 West Michigan street, has acquired 28 acres adjoining its plant on East Marginal Way and plans construction of assembly factory and other improvements during 1936.

Canada

KAMLOOPS, B. C.—Bond election will be held soon to approve expenditure of $26,000 for general water works improvements. R. H. Lee, City hall, is engineer in charge.

BRANTFORD, ONT.—Crown Electric Mfg. Co. Ltd., J. Trepanier, manager, plans construction of plant for manufacturing electrical supplies, at cost of $50,000.

GALT, ONT.—Beatty Bros. has purchased Galt Machine Screw Co. factory in Galt, Ont., and will remodel works for production of aluminum castings and other nonferrous products.

LONDON, ONT.—Shell Oil Co., 21 Dundas square, Toronto, Ont., plans erection of three 15,000-gallon storage tanks at district plant here on Bathhurst street.

OWEN SOUND, ONT. — Mead Oil Refineries Ltd., 45 Richmond street, West, Toronto, Ont., plans construction of one-story oil refining plant here, at cost estimated between $200,000 and $300,000, with a distributing base capacity of 1000 gallons per day. Tanks, piping, and steel supports are needed.