

# STEEL

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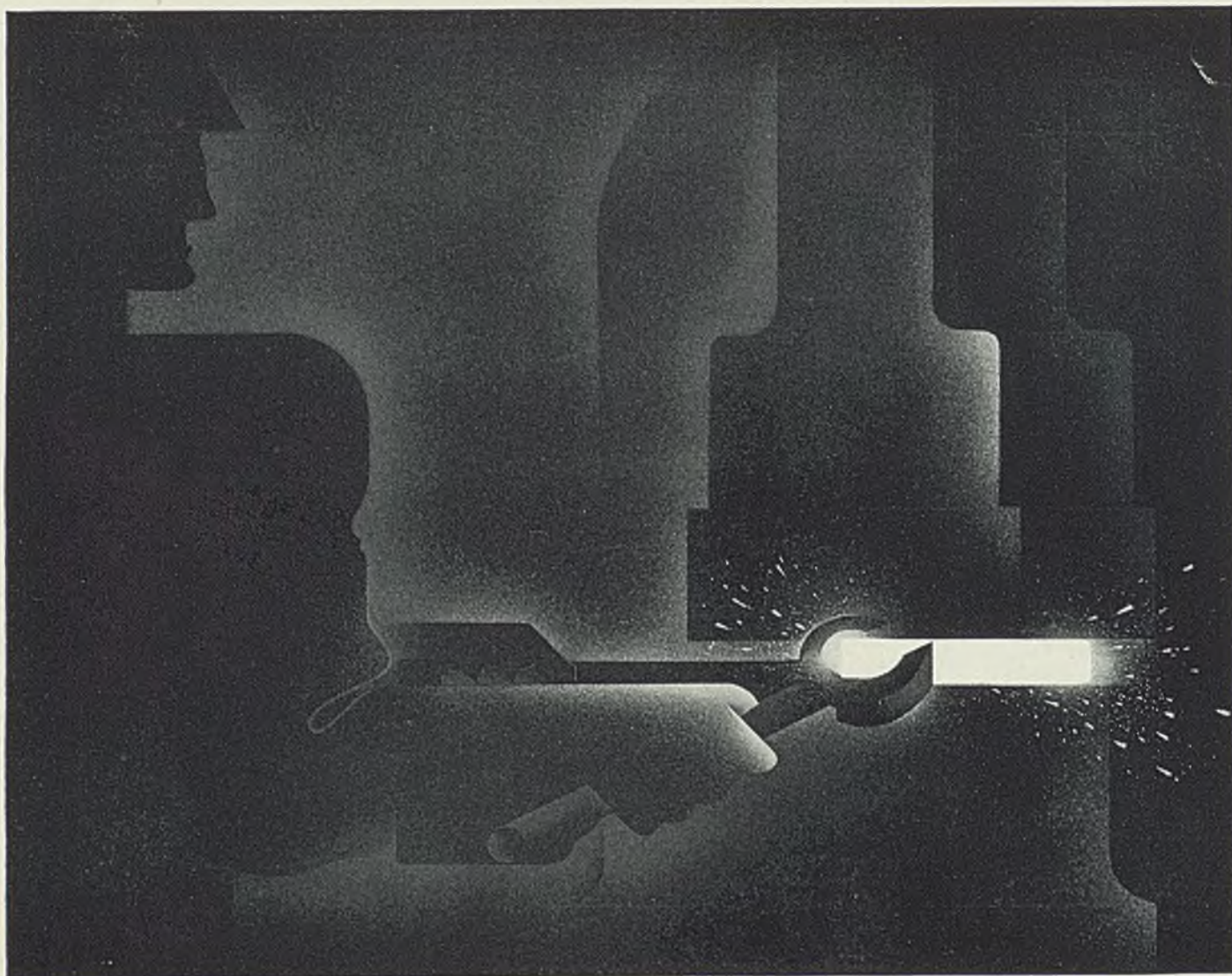
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June 1, 1936



## As the Editor Views the News

**C**RITICS who have been making capital out of the apparent inability of industrial executives to agree upon recovery measures should have spent a few hours last Thursday in the corridors of the Waldorf-Astoria hotel in New York. There they would have been convinced by the testimony of thousands that there is almost complete unanimity — at least in the great steel industry — as to what is needed to make positive progress toward sound, enduring prosperity. This agreement is significant, because only a few years ago industrialists held divergent views on many national policies. Some of them even differed on basic economic principles.

\* \* \*

No such divergence of opinion was apparent at the meeting of the American Iron and Steel institute. All seemed to agree that while the short term business outlook is good (p. 15), substantial progress is impeded by the untenable national policies pursued by the present administration.

### Industry Has United Front

All are united, in a nonpartisan spirit, against the increasing centralization of power in the federal government, the waste and inefficiency of bureaucracy, the unwarranted attacks against industry by politicians, the unforgivable crimes committed in the name of social security, the insincerity of government in labor relations policies and the unjust tax load imposed by reckless experiment.

\* \* \*

While the united front against unwise national policy was gratifying, even more encouraging was the evidence displayed that the industry is intent upon self improvement. Mr. Weir's outline of price policy, Mr. Girdler's emphasis upon profits, Mr. Irvin's warning on tariff policy,

### Steel Cannot Stand Aloof

Mr. Hook's statement of principles in labor relations and Mr. Grace's clear-cut analysis of the common interest between industry and the public — all these masterpieces of studied

logic were delivered with a view to helping the steel industry to improve its position. It was also gratifying to sense the tendency, among steel leaders, to appreciate more fully the fact that the industry no longer can remain aloof as an independent entity. Dr. Carothers was right in saying, "The policies of steel are invested with a public interest which makes ever broadening conceptions of economic philosophy necessary".

\* \* \*

One of the institute papers which is destined to arouse discussion in many quarters of the metalworking industries is that on the economic importance of iron and steel scrap. The author, Clyde E. Williams, does well to issue a warning (p. 34) that the trend toward lighter scrap, with increasing alloy content, presents new problems to scrap consumers. His suggestion that users adopt certain methods for sorting or segregating different grades of scrap naturally prompts steel producers to counter with the proposal (p. 64) that sellers of scrap grade their product more carefully. Somebody must undertake to improve this job of classification, and in the end it will fall to the agency which is able to do it most economically.

\* \* \*

As if to furnish timely emphasis on the importance of the scrap problem, the institute's latest volume of statistics (p. 92) shows that of the 20,541,751 gross tons of iron and steel scrap consumed in blast furnaces and steel-making furnaces in 1935, about half or 10,921,823 gross tons came from producers' own works. The remaining 9,619,928 tons were purchased. These data on scrap consumption represent a new service in the institute's *Annual Statistical Report*. Figures on the production of stainless steel ingots also appear for the first time in the report for 1935. The last two volumes, covering statistics of 1934 and 1935, represent a marked improvement over previous issues and reflect much credit upon Executive Secretary Tower and his staff.

### Institute Adds New Statistics

*E. L. Shaner*



# Continued Experimentation Hampers Industrial Progress

BY EUGENE G. GRACE

**W**HILE business generally has shown improvement, progress toward sound and permanent recovery is being seriously delayed by continued experimentation and failure to recognize the proper functions, needs and accomplishments of business and industry.

We are fully aware that to attain an orderly process of recovery our economic structure must be revitalized. It is not so much a question of what should be done. The chief question is how and by whom corrective measures shall be applied.

Shall freedom of initiative and freedom of enterprise survive, or shall our social and economic existence be dictated and controlled by government? This is the momentous issue confronting us.

The attempts to translate emergency measures into a permanent condition of bureaucratic domination and control by government have properly alarmed our people. With the mounting costs inevitable to an extension of governmental power, people have come to recognize that unless this condition is corrected a real and lasting prosperity is not obtainable.

## What About Relief?

One of the problems which has been used as a reason for justifying an extension of federal powers has been that of unemployment. This problem has been of first concern for the past five years and is pointed to as the chief evidence of the need for governmental interference.

Everyone is sympathetic toward the relief of the needy. It is such a vital human problem and such a millstone around the neck of recovery that it ought to be solved in the most practical and economical manner, free from politics or prejudice.

The thing that confuses the average business man about this unemployment situation is what he sees every day. In many communities where practically normal numbers are employed in private enterprises and where the private charitable organizations are doing their regular job in caring for those in actual need, there are still vast sums of federal relief money being dispensed.

As a matter of fact, as the volume

of business and employment has increased, relief expenditures have run a race to outstrip them. Here are the figures:

Relief Expenditures	Volume of business*	Volume of employment*
1933—\$ 793,000,000	64	66
1934— 1,476,000,000	66	75
1935— 1,827,000,000	76	78

\*Federal Reserve Index; base: 1929 = 100.

In other words whereas there was a betterment in both business and employment of over 18 per cent between 1933 and 1935, relief expenditures increased more than 130 per cent, or over a billion dollars.

In some quarters it seems to be a favorite pastime to shift the blame for continued unemployment to the shoulders of industry. The fact is that there are proportionately fewer unemployed in the manufacturing industries than in many other lines. In the steel industry, which is typical, the 450,000 people employed today are as many as were employed at the height of prosperity in 1929. Of course, some of these employees

are not working full time, but they are self-sustaining citizens.

There are some lines of industry where unemployment is still a major problem, particularly the construction industry which, as we all know, is still depressed for lack of investment of private capital. But there are other reasons too. For years the construction industry has been the victim of excessive costs due to the imposition of arbitrary labor demands and dictation resulting in lowered production, strikes, jurisdictional difficulties and the like.

The only sure way to cure unemployment, and solve the problem of relief, is to increase production. The only sound way to administer relief is for neighbors to pass on the needs of neighbors.

Some people have the notion that improved production methods create so-called technological unemployment. This is a fallacious idea. While labor saving devices frequently create temporary displacements, there is no basis for the claim that technological developments in industry have created a permanent class of unemployed.

## Research Stimulates Progress

Our own industry is an example of the benefits flowing from technological progress. Not only have we improved quality and stimulated new uses for steel through research and technology, but also through large investments and engineering prowess there have been vast improvements in processes and equipment resulting in increased as well as more efficient production.

Here I believe the steel industry has performed a real public service. The results of these achievements have been passed on to the consuming public and to labor. We hope the time will come when our stockholders may also receive more.

It may surprise some of the commentators on the effects of technological advances (and include with them, if you please, those who have been under the misapprehension that steel prices are unduly rigid) to know that technical progress has been the chief factor which has made possible a reduction of more than \$11 per ton in the average price of steel today as compared with the levels of 1923. As a matter of fact the reduction in price has been too great when it is realized that current wage rates are 5 to 7 per cent above the prosperity levels of 1929, and that taxes and certain other costs have advanced materially.

I do feel that industries in general, and ours in particular, have not received proper credit for the contributions which they have made in lowering prices to the public.

However, what industry has been able to accomplish in the direction of lowered costs and prices is in a large

(Please turn to Page 90)



Eugene G. Grace

President, American Iron and Steel Institute, and president Bethlehem Steel Corp.

Abstract of the address of President Eugene G. Grace at the forty-fifth general meeting of the American Iron and Steel Institute in New York, May 28.



# Steel Industry's Spokesmen Discuss National Policies Necessary for Sound Recovery

**R**EFLECTING a degree of enthusiasm and interest not matched in any previous similar occasion, the forty-fifth general meeting of the American Iron and Steel institute on Thursday attracted a record-breaking attendance.

While the registration of 1900 exceeded that of any previous session, even including the well attended spring meeting of 1929, it was estimated that at least 2500 individuals were present when the president's gavel sounded to call the assembly to order.

Judging from the consensus of opinion reflected in the addresses presented at the opening session and in corridor conversations, the minds of executives in the steel industry are focused chiefly upon government policies as they affect industry and the public. The general feeling seems to be that industry is doing a better job in working for recovery, in discharging its obligation to the public and in working for practical social security than is admitted by anybody in public life. On the other hand, industrialists are convinced that their efforts are being offset in a large measure by deficiencies in government.

This dissatisfaction with govern-

ment policy took the form of criticism against bureaucracy and the infringement of government upon private rights, complaint against taxes and other burdens traceable to reckless experimentation and needless waste of public money, and thirdly, protest against government activity in promoting strife between employers and employees.

These points were emphasized time and time again in the formal addresses presented at the morning session. They were dealt with effectively in the presidential address of Eugene G. Grace, who spoke on "Industry and the Public."

## Delayed by Tinkering

In this address, an abstract of which appears on the opposite page, the president of the institute struck the keynote of general discussion throughout the meeting when he said that while business generally has shown improvement, "progress toward sound permanent recovery is being seriously delayed by continued experimentation and failure to recognize the proper functions, needs and accomplishments of business and industry."

Discussing the important subject, "Competition from Imports of Foreign Steel Products," W. A. Irvin, president, United States Steel Corp., pointed to the fact that the tonnage of steel imports has been constantly increasing and during the first quarter of 1936

was double that for the same quarter last year.

Mr. Irvin stated that in 1935 our own markets consumed steel products originating from about 34,000,000 tons of raw steel and similarly outside markets consumed about 62,000,000 tons. "Thus our home market consumed about 35 per cent of the world's output and the markets outside the United States represented approximately 65 per cent."

"Hence with 49 per cent of the world's capacity, we had at home in 1935 but 35 per cent of the world's consumption. On this basis alone we are justified in seeking to preserve, as far as possible, our own markets for our own mills and workers."

He then compared import duties imposed on steel entering the United States with those duties imposed upon steel entering the home market of these other chief steel producing countries. Rails, for instance, pay a duty of \$2.24 per gross ton when entering the United States as against \$7.00 when entering the United Kingdom, \$10.52 when entering France and \$10.25 when entering Germany. Such comparisons, he inferred, do not bear out the contention that the United States has an unduly high protective tariff.

The speaker then compared average labor rates in the principal steel producing countries as follows: United States, 67c per hour; United Kingdom, 25c; France, 20c; Belgium, 17c; Germany, 26c; Japan, 10c; and India, 9c.

Mr. Irvin urged the steel and other

## Locale, Date and Attendance of 45 Institute Meetings

No.	Hotel and City	Date	Attendance†	No.	Hotel and City	Date	Attendance‡
1	Waldorf-Astoria, New York	Oct. 14-22,† 1910	212	24	Commodore, New York	Oct. 25, 26,* 1923	1300
2	Waldorf-Astoria, New York	May 17, 18, 1912	225	25	Commodore, New York	May 23, 1924	1300
3	Schenley, Pittsburgh	Oct. 25, 26, 1912	375	26	Commodore, New York	Oct. 24, 1924	1250
4	Waldorf-Astoria, New York	May 23, 24, 1913	350	27	Commodore, New York	May 22, 1925	1325
5	Blackstone, Chicago	Oct. 24, 25, 1913	475	28	Commodore, New York	Oct. 23, 1925	1400
6	Waldorf-Astoria, New York	May 22, 23, 1914	500	29	Commodore, New York	May 21, 1926	1350
7	Tutwiler, Birmingham	Oct. 29-31, 1914	275	30	Commodore, New York	Oct. 22, 1926	1521
8	Waldorf-Astoria, New York	May 28, 29, 1915	475	31	Commodore, New York	May 20, 1927	1550
9	Statler, Cleveland	Oct. 22, 23, 1915	675	32	Commodore, New York	Oct. 28, 1927	1600
10	Waldorf-Astoria, New York	May 26, 27, 1916	750	33	Commodore, New York	May 25, 1928	1634
11	Planters, St. Louis	Oct. 27, 28, 1916	650	34	Commodore, New York	Oct. 26, 1928	1750
12	Waldorf-Astoria, New York	May 25, 26, 1917	875	35	Commodore, New York	May 24, 1929	1850
13	Sinton, Cincinnati	Oct. 26, 27, 1917	650	36	Commodore, New York	Oct. 25, 1929	1779
14	Waldorf-Astoria, New York	May 31, June 1, 1918	990	37	Commodore, New York	May 9, 1930	1700
15	Pennsylvania, New York	May 23, 1919	1200	38	Commodore, New York	Oct. 24, 1930	1542
16	Commodore, New York	Oct. 24, 1919	1150	39	Commodore, New York	May 22, 1931	1250
17	Commodore, New York	May 28, 1920	1300	40	Commodore, New York	Oct. 23, 1931	1050
18	Commodore, New York	Oct. 22, 1920	1500	41	Commodore, New York	May 19, 1932	800
19	Commodore, New York	May 27, 1921	1050	42	Commodore, New York	May 25, 1933	1100
20	Commodore, New York	Nov. 18, 1921	1500	43	Commodore, New York	May 24, 1934	1200
21	Commodore, New York	May 26, 1922	1100	44	Commodore, New York	May 23, 1935	1700
22	Commodore, New York	Oct. 27, 1922	1300	45	Waldorf-Astoria, New York	May 28, 1936	1900
23	Commodore, New York	May 25, 1923	1400				

†Approximate registration. Actual attendance usually exceeds registration by a large margin.

‡Meeting included a tour to Buffalo, Chicago, Pittsburgh and Washington.

\*Meeting included a trip to Aberdeen Proving ground.



American industries to give more attention to the problem of imports. He stated that our present anti-dumping law should be supplanted by one which is effective and which can be put into force as soon as dumping occurs.

He declared that in the meantime the only hope seems to lie in convincing purchasing agents of the government—whether federal, state or municipal—and private buyers generally, that their best interests are served by placing their steel orders at home.

Mr. Irvin was applauded when he declared that it is a fallacy to bar immigrants but to admit their product.

#### How To Operate at Profit?

T. M. Girdler, chairman, Republic Steel Corp., who had been assigned the subject, "Problems Confronting the Industry," declared that the basic problem facing the steel industry is one of operating at a profit.

"The problem," he said, "is complicated by the factor of costs which for many reasons are high. Not only is a large initial investment required for a steel plant, but obsolescence is most rapid in the industry."

Mr. Girdler stated that the nature of present-day consumption and demand is an important factor in costs. He pointed out that today every user wants steel made according to his particular specifications. The result is that instead of scheduling a mill for weeks for uninterrupted rolling, as once was possible, the steelmaker now must make steel to many thousands of specifications and roll it in small lots.

"I strongly believe in the principle of low prices under our modern system of mass production and consumption. Prices for steel ought to be as low and as cheap as possible in order to encourage the widest possible use. That is sound business. It is only proper that the industry should pass on a share of savings from improved methods and increased efficiency to the customer in lower prices. But that is not to say prices should be below costs, or so low that a reasonable profit is impossible. That is business suicide and a betrayal of our stockholders. The problem is one of increasing volume on a basis which will yield satisfactory profits."

Mr. Girdler stated that many steel markets are reviving and new ones are developing but that progress is limited by factors influencing long-term investments. He declared that under present government policies of hostility and antagonism toward business enterprise, the confidence of investors in the future cannot be expected to display much vigor.

The speaker then discussed the threat of unsound taxation and other factors originating in Washington which continue to retard long-term projects. He declared that in 1935

the steel industry paid the equivalent of \$3.30 for each ton of finished steel produced in taxes to local and federal governments, while its earnings amounted to only \$2.30 a ton.

The tax bill was equal to over five weeks' average pay for each of the industry's employees. It amounted to \$133 for every employee and \$132 for every stockholder. For every 50 cents going to a stockholder for dividends last year, a dollar went to "tax spenders and wasters."

The chairman of Republic, touching on industrial relations in the steel industry, declared that steel mill employees have learned that they do not have to pay to get collective bargaining and that by means of employee representation plans they can secure for themselves through co-



D. M. Petty

The American Iron and Steel Institute medal for 1935 was awarded to Mr. Petty for his paper "The Economic Importance of the Replacement of Obsolete Equipment in Steel Mills," which was presented before the institute May 23, 1935. This paper was abstracted in the May 27, 1935, issue of STEEL. Mr. Petty is superintendent of service division, Bethlehem Steel Co., Bethlehem, Pa.

operation with management more than they could ever obtain by strife and warfare under the leadership of professional outside labor union agitators.

"I understand that union dues to the Amalgamated Association of Iron, Steel and Tin Workers average about \$1.50 per month. I have no idea that the more than 400,000 wage earners in the steel industry are going to be induced to pay over \$7,000,000 a year into the treasuries of the professional unions in order to get what they are getting now for nothing."

Ernest T. Weir, chairman, National

Steel Corp., speaking on "A Sound Commercial Policy for Steelmakers," defined the selling of a product as a middle link in a continuous chain of circumstances starting with the first step in the making of the product and continuing through the plant of the producer into that of the consumer and then to the ultimate consumer.

With the purchaser seeking quality and price and the producer endeavoring to recover all his costs plus a reasonable profit, Mr. Weir asserted "a sound commercial policy is one which is shaped so that every transaction that occurs under it brings an adequate return to the producer, and at the same time gives the consumer the product he wants, when and where he wants it, in the form that permits the greatest efficiency in use and at the lowest consistent price.

"If you agree upon this as a definition of a sound commercial policy, you will also agree that in actual practice commercial policies to date have been somewhat less than perfect. The blame must fall upon the shoulders of both buyers and sellers, for both have been guilty of attempting to seize an immediate advantage by violating economic law."

"A quick rule-of-thumb that might be applied to any transaction would be the question, 'Would my company survive if all its business were done on this basis?' If the answer is 'No,' then the action is obviously uneconomic in both its direct and indirect effects."

No one gets away with these kind of transactions for very long, Mr. Weir said. Other units in the industry follow suit and soon prices fall to such a level that recovery is difficult.

"Even if it does not produce such serious results, an uneconomic commercial action can never be justified," he continued, pointing out that customers, employees, stockholders and equipment might suffer in efforts to make up the loss.

"I believe then," he said, "that a fundamental of a sound commercial policy for steelmakers must be an inviolable rule that every transaction shall yield the value of the product to the producer, the value to consist of all prevailing costs plus a reasonable profit."

#### Work To Whittle Costs

Another major part of the policy, he declared, must be a determination to lower the prices at which products can economically be sold. A continuous effort must be made to reduce costs and prices all along the line, to the end that a better and cheaper finished product may be offered to consumers.

"This is the bedrock upon which our modern industrial civilization has been built. It is the only hope,



despite current political fallacies based on the thought that we can all have more by making less, that wealth will continue to be progressively more widespread in the future.

"In short, when we say that we must lower the unit price of a product, we say, in effect, that we must find a way to make more of that product with the same expenditure of human time and energy. The material progress of America, its general standard of living, is nothing but the sum of all the benefits achieved by this constant effort to improve quality, to reduce waste, and to lower costs and prices per unit."

Two ways to lower unit costs and prices, he said, are through increasing volume or by the improvement of operating methods and the reduction of costs. Greater volume of steel production must be found in new developments, in extension of the present uses of steel and in research.

"An economic reduction of per unit labor costs should never produce a reduction in wages," Mr. Weir continued. "In fact, the direct contrary should be true. \* \* \* The sound manner of reducing labor costs is to implement the worker with improved machinery and to increase the efficiency of his working methods so that he is able to turn out a greater amount of material, or better material, or both."

#### Labor Policy Is Sound

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., scheduled to speak on "Labor Relations in the Steel Industry," was unable to attend the meeting on account of illness. In his absence, his address was presented by Henry A. Roemer, president of Sharon Steel Corp. and Pittsburgh Steel Co. The author stated that his position as chairman of the institute's industrial relations committee had proved to him that no group of executives in any industry had worked harder to construct sound and fair labor programs than steel officials.

Ideal employee-employer programs, he said, consist of a satisfactory wage schedule, the establishment of safe and satisfactory working conditions and "confidence as it is affected by factors other than the two planks I have mentioned."

The steel industry, Mr. Hook continued, distributed 41 cents of the sales dollar in payrolls last year. Whereas today the average steel workman earns 65.8 cents per hour for an eight-hour day, in 1895 the average paid per hour for a 12-hour day was 21 cents. The present average hourly rate in Great Britain is only 25.1 cents, France 20 cents, Germany, 25.9; Italy, 27.6, and Belgium 17.

"In 1929 our industry was op-



**Hugh Morrow**

President, Sloss-Sheffield Steel & Iron Co., was a banquet speaker

erated at 88.5 per cent of ingot capacity, by 419,534 wage earners," he said. "In 1935, with operations only 48.8 per cent of capacity, our industry had on its payrolls 385,000 wage earners.

"Payrolls have steadily gone forward since 1933.

"The steel industry has also maintained its 56-year record of high individual yearly earnings per employee. During 1935 the average employee worked 34.2 hours per week



**Dr. Neil Carothers**

Who, in speaking at the banquet, defended the present economic system but stated that the steel industry is faced with new problems and issues and must develop a new economic philosophy. Dr. Carothers is head of the college of business administration, Lehigh University

and received \$1184. In spite of the fact that the policy of spreading work lowered the annual wages paid the average employee, we were still considerably above the average earning for all industries, which was \$1087.

"The great need today in every phase of our social, economic and political life is UNDERSTANDING. It always has been so, but today the need is even greater. We see tax legislation passed in the lower house of Congress which, if enacted into law, would in time ruin many corporations, large and small, and bring want and distress to the homes of thousands of workers.

"If men are elected to high public office who do not understand the problems of corporate business, how increasingly imperative it becomes then for management to adopt ways and means of enlightening the man on the job and all others who are in any way dependent on industry, with respect to the fundamental economics, the responsibilities and the problems of business.

Ninety per cent of the members of the institute are using the plan of employee representation which was first born in a small steel plant in the year 1904, Mr. Hook said.

#### Must Combat Propaganda

"It is my opinion," he continued, "that our efforts to build understanding should not end with employee representation. Management and men have many common interests which lie beyond the plant gates. Our employees are constantly being given false and un-American propaganda by sensationalists attempting to attract public attention and by a growing radical group which is attempting to undermine the American economic system. If we permit this propaganda to go unchallenged, it is only natural that it will be accepted as fact.

"It is just as essential that industrial management provide leadership and thought on social and economic problems as on industrial problems.

"There can be no real co-operation until there is first confidence built upon a foundation of understanding."

In reporting on institute activities, W. S. Tower, executive secretary, reminded his audience that it was just a year and a day since the Supreme Court decision in the NRA case had the effect of terminating the steel industry's code of fair practice. He stated that during the year which has elapsed, it appears from reports from members that the steel industry has done a good job in maintaining wages and hours. In the matter of maintaining standards of fair competition, "the

(Please turn to Page 91)



# Commodity Prices Show Firm Trend, Purchasing Agents' Convention Told

COMMODITY prices will not undergo marked changes in the next few months, according to a business forecast and summary presented to the National Association of Purchasing Agents, in convention last week in New Orleans.

Frederick J. Heaslip, Fairbanks, Morse & Co., Chicago, head of a committee of buyers which prepared the report, said many purchasing executives were maintaining a policy of being "well covered" on essential materials.

"The fact that this is an election year," Mr. Heaslip said, "will have no decided effect upon business. Purchasing executives, and most economists of the nation, are convinced that the upturn in industry has gathered sufficient headway to be impervious to political agitation."

## West Shows Improvement

According to the committee's summary, May business maintained the levels established in April in all sections of the country except the West, where a decided improvement in general conditions was noted. Commodity prices showed a steady trend throughout the nation. Inventories were kept to the preceding month's levels and companies showed a decided tendency to cover in advance on requirements. In the East, orders covered requirements for two to four months in advance. In the Middle West, coverage was one to three months, in the West two to three months and in Canada one to two months.

Employment is up in the West and generally unchanged in other sections, the report showed.

Comments on general business in the report included the following statements:

"Consensus seems to be that seasonal recession is to be expected through possibly the June-August period but that industry is on a definitely stable basis and both production and distribution should show considerable improvement by the time this year-end arrives.

"Buying policy suggestions in numerous reports are tempered by the intimation that 'selective purchasing' should be the vogue over the immediate future. This means that there is insufficient strength to the undertone of commodities generally to warrant an extensive buying policy at this time; in fact, a tightening-up in commitments is noticed in many circles. During the last couple of months there are many more reports of 'buying hand-to-mouth' and 'covering current needs only.' However, a firm trend in commodity price levels is anticipated generally over the next

six to 12 months and the policy of being well covered still maintains in the majority of purchasing offices."

C. A. Kelley, of the Southern Sierras Power Co., Riverside, Calif., last Wednesday was elected president of the association, succeeding Fred J. Lucas, of Purdy-Mansell Ltd., Toronto, Ont. In addition to selecting Mr. Kelley as its new president the association voted to hold its next annual meeting in Pittsburgh, May 24 to 27, 1937.

More than 1400 purchasing executives from all parts of the country and from points in Canada and Mexico attended the convention sessions. They elected the following slate of district vice presidents to serve with Mr. Kelley: Wayne R. Allen, Oakland, Calif.; H. M. Lingle, Houston, Tex.; George A. Neesham, Chicago; A. J. Mitchell, Grand Rapids, Mich.; W. Allen Traill, Montreal, Que.; Arthur J. Goetz, Monroe, Mich.; H. C. Green, Birmingham, Ala.; George M. Tisdale, New York, and George P. Brockway, Southbridge, Mass. The vice presidents, together with Mr. Lucas, retiring president, comprise the organization's executive committee for the coming year.

## Lower Sheet Prices Spur New Uses

SUBSTANTIAL reduction in the price of steel sheets and strip is responsible to some extent for the broadening use of these products. This opinion was expressed by D. Eppelsheimer, vice president, American Rolling Mill Co., Middletown, O., in addressing the annual May dinner of the iron and steel division of the American Institute of Mining and Metallurgical Engineers in New York, May 27.

In 13 years since development of the continuous strip mill, \$250,000,000 has been spent in construction of such mills, said the speaker. In the same period from 1923 through 1935, the price of steel sheets on the average has dropped 48.6 per cent.

Mr. Eppelsheimer believes many new uses for sheet and strip will be found particularly in the development of small houses to sell at low price. In this connection, he cited a 46 x 21-foot house which can be made to sell at \$1300. It contains 7700 pounds of steel.

Discussing blast furnace progress, Arthur J. Boynton, vice president, H.

A. Brassert & Co., Chicago, said he regards the modern blast furnace as a complete self-contained unit whose economy and efficiency is embodied in few other industrial units. Although he has looked at many proposed substitutes for the blast furnace, he has not yet seen any that is desirable. Mr. Boynton mentioned numerous features of blast furnace design and operation which are susceptible of improvement in the future.

In commenting upon low-alloy steels, Jerome Strauss, vice president, Vanadium Corp. of America, Bridgeville, Pa., stressed the fact that these improved steels were brought out to meet specific design requirements. He predicted increasing use for these steels.

Clyde E. Williams, director, Battelle Memorial institute, Columbus, O., and chairman of the iron and steel division of the institute, also spoke at the dinner.

## Manufacturers Call Tax Bill "Unsound and Unworkable"

Sharp criticism of the proposed \$100,000,000 tax bill as passed by the house of representatives came last week from the National Association of Manufacturers, in a statement declaring "we believe that the windfall tax should be abandoned as unsound in principle, administratively unworkable and as tending to work enormous injustices on many business concerns."

Asserting that the bill put before the senate finance committee was "clearly a penalty and not a tax," the association said individuals might justly be penalized for failure to observe federal tax laws, but the taxing system should not be used as a penalty measure.

"The bill says in substance to a taxpayer that he might as well pay a tax regardless of its constitutionality, because if he challenges it and is successful in sustaining that challenge in the courts, he will then be assessed the amount of the unconstitutional tax in a new form of tax," the statement continued.

"Not only is the tax unsound in principle, but as proposed it would be impossible to administer.

"The whole problem of determining selling price is so complicated by changes in all factors entering into such selling price, including not only the cost of materials, but also the cost of labor, insurance, taxes, etc., that it is entirely unsound to base any tax upon 'average' selling price, or to arbitrarily define selling price in such a way as to magnify the importance of some particular



factor. The question of determining whether any particular tax or any other element of cost has been passed on to consumers is impossible to determine on any sound accounting basis, and certainly cannot fairly be determined by any arbitrary rule."

## Labor

**L**ABOR disturbances at the Portsmouth, O., works of Wheeling Steel Corp., involving about 5000 of the company's employes, were generally of an orderly nature last week. A few minor clashes between pickets and some workmen were reported. Federal Conciliator R. M. Pilkington was on duty. The Wheeling Steel Corp. management made no attempt to operate open hearths, blast furnace or any of the finishing mills, which include automobile sheet, nail and range boiler capacity. Strikers asked increases in wages ranging from 30 to 50 per cent, as well as recognition of the Amalgamated Association of Iron, Steel and Tin Workers for their sole bargaining agency.

### MORE PAID VACATIONS

More iron and steel companies are announcing vacations with pay for wage earners. Following its usual custom over the past two or three years, the National Steel Co., Chicago, will give all warehouse employes one week's vacation with pay.

## Exempts Steelmakers from Registering As Public Utility Holding Companies

**U**NITED STATES STEEL CORP. and four subsidiaries were exempted from registration provisions of the public utility holding company act of 1935 in a ruling by the federal securities and exchange commission last week.

The commission held that electric power and gas companies involved in the case were operated for manufacturing purposes, with only small amounts sold to the general public.

American Sheet & Tin Plate Co., Carnegie-Illinois Steel Corp., Tennessee Coal, Iron & Railroad Co. and Illinois Steel Co. were the four named in the exemption order.

They were released from all provisions of the act which would have required them to register, because of their owning, controlling or holding with the power to vote, 10 per cent or more of the voting securities of public utilities companies.

The commission's decision said, in part:

## Predicts 30-Hour Week Would Bring Huge Annual Deficit for Industry

**U**NDER the proposed 30-hour week, industry's annual net deficit would be \$986,831,044, the National Association of Manufacturers says in a labor relations bulletin which calls compulsory work spreading "the wrong way to do the right thing."

The association's directors listed 12 reasons for believing that such a plan would defeat its own ends by causing decreased rather than increased employment.

"Business could not continue to pile up deficits approximating a billion dollars a year," said the statement. "Consequently, the selling price of manufactured products would have to be increased. The real wages of workers would remain constant and the increased cost of goods would reduce demand, curtail production and result in decreased rather than increased employment."

Referring to proposals that industry as a whole reduce hours of work per week and at the same time keep the average individual's pay envelope at least as large as it is today, the association arrived at its estimate of the probable annual net deficit by figuring, on the basis of statistics for February, 1936, that 2,311,079 addi-

tional workers could theoretically be employed 30 hours a week. The extra wage bill per year would be \$2,750,831,044, the association said. Net income for the years 1923 to 1933 for all manufacturing corporations, after taxes, was \$1,764,000,000.

The association's objections to compulsory work spreading included the following reasons:

"It fails to take into account peak, seasonal and emergency periods; attempts by legislation to provide exemptions in special cases would be unworkable; prices would be increased; workers would have to pay more for their goods, yet receive the same salary, and their standard of living would be lowered.

### Sees Large Firms Favored

"Income of salaried workers would not be affected but their living standards would be decreased through increased prices; reduced purchasing power would eventually reduce instead of increase the total amount of employment; the shortage of skilled workers in some industries would make it necessary for other departments to slow down to keep pace.

"While the cost of American goods rose, competing commodities from foreign countries where longer hours were operated would sell at a lower price; large and well financed companies would be favored at the expense of small companies because the former are better able to stand increased labor costs; increased living standards for the country as a whole can only result from an increased volume of work. This would tend to maintain the volume of work at existing shrunken levels."

## Plans Tax on Oil for Tin Plate

The senate finance committee has placed the processing tax on palm oil used in the manufacture of tin plate at 3 cents per pound. However, a further vote on the clause may be taken before the bill is reported out of committee.

Under the present revenue act there is a 3-cent tax on this oil with a specific exemption for shipments intended to be used in the manufacture of tin plate. As the bill passed the house the exemption was not altered, but the senate committee removed the clause last week in its consideration of the proposed measure.



# Carnegie-Illinois Announces Consolidation of Personnel

**F**OLLOWING preliminary announcement (STEEL, April 13, p. 14) of the merger of American Sheet & Tin Plate Co. with Carnegie-Illinois Steel Corp., B. F. Fairless, president of the latter, has declared the union effective June 1. Carnegie-Illinois apparently will absorb the Sheet & Tin Plate name, as no change in the corporate identification is planned.

Headquarters will be maintained at Pittsburgh and Chicago, with executive personnel of the enlarged corporation as follows:

Mr. Fairless, president; G. C. Kimball, executive vice president, Chicago; L. H. Burnett, vice president; C. V. McKaig, vice president and general manager of sales; J. H. McKown, assistant vice president and assistant general manager of sales; and W. I. Howland Jr., vice president, western sales, Chicago.

Other officers: J. W. Hamilton, secretary; F. C. Harper, treasurer; O. M. Havekotte, assistant treasurer, Pittsburgh; E. B. Harkness, assistant

treasurer, Chicago; William Donald, comptroller.

In operating departments: J. E. Lose, vice president in charge of operations; D. A. Barrett, vice president; W. C. Oberg, manager of operations, Pittsburgh district; R. B. Saylor, assistant manager of operations, Pittsburgh district; Walter Mathesius, manager of operations, Chicago district; H. G. McIlvried, assistant manager of operations, Chicago district; C. F. W. Rys, chief metallurgical engineer; Sydney Dillon, chief engineer; J. A. Hagan, chief industrial engineer; C. R. Miller, purchasing agent, Pittsburgh; F. J. Rief, purchasing agent, Chicago; Carroll Burton, vice president, Lorain division.

C. W. Bennett, erstwhile president of Sheet & Tin Plate, has passed the voluntary retirement age, is approaching the "must" retirement age of 70, has announced no plans for the future. It is understood he is eligible for pension under the Corporation plan.

The reorganization, as pointed out

previously by STEEL, marks culmination of another stage in the long-term revamping of corporate structure which Myron C. Taylor, chairman of the board of U. S. Steel, began to shape up shortly after he succeeded the late Judge Elbert H. Gary at the helm of the world's largest steel interest.

As a result, Carnegie-Illinois officially adds to its capacity Sheet & Tin Plate's facilities for the production of 340,000 gross tons of ingots and 1,697,050 tons of hot-rolled finished products.

The railroad materials sales department and commercial forgings department of Carnegie-Illinois have been consolidated, effective June 1. J. C. Dilworth has been appointed manager of sales of the combined divisions, and Samuel McClements Jr. assistant sales manager.

## African Mills in Compact With European Producers

South African iron and steel producers have just entered into a 5-year agreement with the international steel cartel and the British iron and steel federation, which reserves to domestic mills a larger share of the local market.

In accordance with this agreement, South African producers shall supply the requirements of the domestic market to the limit of their output, the balance to be purchased from European sources under allocations made by the steel cartel and the British federation conjointly. Prices will be stabilized at a level to stimulate purchase of the locally-made products. It is understood that the European products will be sold at somewhat higher prices than those which formerly obtained as a compensation for a lower volume of sales which will obtain under the agreement.

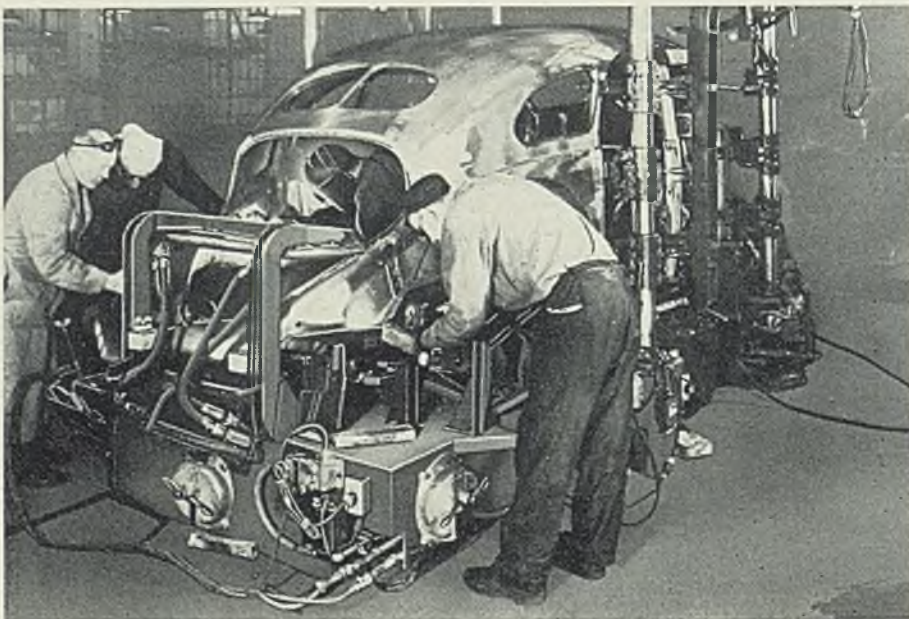
## Purchases Four Southern Blast Furnaces for Scrap

Max Solomon Co., Pittsburgh, has taken a contract to purchase and dismantle four blast furnaces formerly owned by the Sloss Sheffield Iron & Steel Co., Birmingham, Ala.

Two of the blast furnaces are located at North Birmingham, Ala., and the other two at Gadsden, Ala. Inasmuch as stoves also will be dismantled, it is estimated that about 12,000 tons of reclaimable material will be obtained.

The Max Solomon Co. about a year ago completed scrapping of two other obsolete blast furnaces formerly owned by the Sloss Sheffield company.

## Give It an Engine, and It Becomes a Zephyr



*Final welding operation on the body of a Lincoln-Zephyr motor car, in the LeBaron plant at Detroit. From there the body is taken to the Lincoln Motor Co. factory, where it is painted and trimmed, and the 12-cylinder engine and running gear installed. The body differs widely from the conventional. It is an all-steel structural unit covered with steel panels and with a steel roof integral with the side panels. The outer panels and stress members have been worked out scientifically so that greater strength is obtained with less weight. A part of the stresses is carried in the outer panels—an entirely new development in automobile design. The usual chassis has been eliminated*



# Production

NGOT production eased ½ point to 66 per cent last week, marking a gradual decline from the peak of 70 ½ per cent reached in the third week of April. Operations are expected to hold close to this level through this month. Pittsburgh, Cleveland, Buffalo and New England stepped up schedules last week; Chicago, Wheeling, Cincinnati and Colorado reported declines, while the remaining districts held fairly steady.

Further details follow:

**Youngstown**—Unchanged at 76 per cent last week, and tentative schedules at this week's opening indicate a 77 per cent rate. Carnegie-Illinois Steel Corp. lighted its No. 2 blast furnace at the Ohio Works Wednesday.

**Cleveland**—Gained 1 ½ points last week, as Corrigan-McKinney division of Republic Steel Corp. put on one additional open hearth the middle of the week to operate 10. Otis Steel Co. continued with 8 in blast, and National Tube Co. at Lorain with 12.

**New England**—Rose 2 points last week to 77 per cent, with indications of no change this week.

**Pittsburgh**—Up 2 points to 63 per cent last week, with Carnegie-Illinois operating at better than 62 per cent, Jones & Laughlin at 64 per cent, and the aggregate of smaller independent producers 60-65 per cent. If present intent of steel producers to uniformly apply the higher market with July shipments is followed, it is expected that ingot operations through the balance of June may rise sharply and reach the 70-75 per cent rate.

Thirty-five out of 60 blast furnaces are now active.

**Detroit**—Unchanged at 88 per cent last week. Fifteen out of 17 basic open-hearth continue active.

**Wheeling**—Off 19 points last week to 70 per cent, as the total number of active open hearths included 26 out of 37, compared with 33 on the week preceding. This sharp decline was due to a shutdown at the Portsmouth, O., works of Wheeling Steel Corp., owing to strike.

**Chicago**—Declined 2 ½ points to 68 per cent, the third consecutive decrease. Part of the letdown was occasioned by the necessity for repairing open-hearth furnaces, and ingot production is expected to hold near the present rate through June.

**Birmingham**—Steady at 69 per cent last week, with 15 open hearths producing. Operations have been resumed at the Rockdale furnace of the Tennessee Products Corp., idle the past 18 months.

**Central eastern seaboard**—Unchanged at 43 per cent, although a slight advance may develop over

# Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended May 30	Change	Same week 1935	1934
Pittsburgh ....	63	+ 2	36	50
Chicago .....	68	- 2 ½	43	65
Eastern Pa. ....	43	None	29 ½	45 ½
Youngstown....	76	None	48	63
Wheeling .....	70	-19	62	74
Cleveland .....	75 ½	+ 1 ½	54	79
Buffalo .....	81	+ 3	37	53
Birmingham....	69	None	54 ½	55
New England ..	77	+ 2	63	84
Detroit .....	88	None	94	100
Cincinnati .....	72	- 8	†	†
Colorado .....	50	-13	†	†
Average.....	66	- ½	42 ½	60

†Not reported.

the next fortnight as producers anticipate an increase in specifications for finished steel for delivery by the end of June, in view of the impending increase of \$2 a ton on most finished and semifinished products.

**Cincinnati**—Off 8 points to 72 per cent last week, as two open hearths were taken off, leaving 17 of 24 in the district melting. Speculative buying in response to announcement of higher prices for third quarter results in tentative schedules requiring 20 open hearths this week for percentage of 84.

**Buffalo**—Up 3 points to 81 per cent last week, with 29 open hearths active. Little change is expected this week. Rush orders for many grades of steel forced output upward to the new peak.

**Colorado**—Off 13 points last week to 50 per cent, with eight furnaces in production.

## ORIGIN OF APRIL IMPORTS

	Gross Tons			
	Pig iron	Manganese ore	Ferro-manganese	
Germany .....	160	5	.....	
Netherlands .....	1,557	.....	198	
Norway .....	51	.....	1,135	
Russia .....	4,191	.....	.....	
Canada .....	1,058	.....	1	
Hong Kong .....	200	.....	.....	
British India .....	4,765	2,113	.....	
France .....	.....	5	118	
Soviet Russia in Europe .....	.....	4,869	.....	
Gold Coast .....	.....	10,716	.....	
Chile .....	484	811	.....	
Union of So. Africa..	.....	50	.....	
Japan .....	.....	.....	21	
Poland .....	.....	.....	198	
Total .....	11,982	18,569	1,671	
	Gross Tons			
	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium .....	484	3,615	1,903	2,185
France .....	78	1,061	676	87
Germany .....	1,590	198	265	324
Sweden .....	16	.....	230	2
United Kingdom .....	11	.....	156	83
Canada .....	1	.....	54	.....
Netherlands .....	.....	136	.....	.....
Austria .....	.....	.....	15	.....
Czechoslovakia....	.....	.....	3	.....
Total .....	2,180	5,010	3,302	2,681

# April Imports Off: Pig Iron Drops

IMPORTS of steel and iron products into the United States in April, were 49,621 gross tons, compared with 56,720 tons in March and with 28,866 tons in April, 1935, according to the metals and minerals division of the department of commerce. For four months of 1936 total imports were 200,188 tons, compared with 101,936 tons for the corresponding period of 1935.

The loss of 7099 tons is more than balanced by the decline in pig iron imports from 23,743 tons in March to 11,982 tons in April.

April exports of iron and steel products were 305,080 gross tons, representing an increase of 40,743 tons over preceding month and 99,744 tons over April, 1935.

Tin plate, black steel sheets, heavy rails and skelp show sharp gains over last year. Aggregate scrap shipments amounted to 196,906 gross tons, equaling a gain of 17.4 per cent over last month and 44 per cent over April, 1935.

## UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Articles	Gross Tons			Jan. thru Apr. '36
	April 1936	March 1936	April 1935	
Pig iron .....	11,982	23,743	65,418	
Sponge iron .....	306	51	1,128	
Ferromanganese (1) .....	1,671	2,345	7,172	
Spiegelisen .....	2,740	1,295	7,500	
Ferrosilicon (3) .....	86	85	308	
Other ferroalloys (4) .....	.....	.....	.....	
Steel ingots, blooms.....	19	42	61	
Billets, solid, hollow (5) .....	64	45	232	
Concrete reinfcmt. bars....	202	86	526	
Hollow bar, drill steel....	185	134	654	
Bars, solid, hollow.....	3,362	3,844	12,726	
Iron slabs .....	.....	.....	.....	
Iron bars .....	35	77	423	
Wire rods .....	1,597	1,039	6,802	
Boiler and other plate....	.....	.....	52	
Sheets, skelp and sawplt.	2,180	1,658	7,594	
Die blocks or blanks (5) .....	80	3	88	
Tin plate, taggers' tin,terne plate .....	30	45	89	
Structural shapes .....	5,056	4,477	17,324	
Sheet piling .....	249	.....	776	
Rails and fastenings.....	1,720	334	2,571	
Cast iron pipe, fittings....	30	32	62	
Malleable iron pipe ftgs. ....	6	7	17	
Welded pipe .....	458	688	1,831	
Other pipe .....	1,221	2,126	6,226	
Hoops, bands for baling .....	29	59	88	
Other hoops, bands.....	2,681	1,706	7,564	
Barbed wire .....	1,439	2,032	7,593	
Round iron, steel wire....	233	331	1,436	
Tel. and tel. wire.....	5	26	32	
Flat wire, steel strips....	259	218	943	
Wire rope, strand.....	257	268	883	
Other wire .....	138	143	554	
Nails, tacks, staples.....	2,681	2,604	10,073	
Bolts, nuts, rivets .....	36	15	139	
Horse and mule shoes.....	35	46	123	
Castings and forgings....	60	124	362	
Total .....	41,072	49,728	169,371	
Iron and steel scrap.....	8,549	6,992	30,817	

GRAND TOTAL .....

(1) Manganese content.  
(2) Chrome content.  
(3) Silicon content.  
(4) Alloy content.  
(5) New class. No comparable figures for previous year.



# Men of Industry

CARL LAGER has been elected president of Morris Machine Works, Baldwinsville, N. Y., manufacturer of centrifugal pumps, succeeding the late Windsor Morris. He joined the organization as its chief engineer 46 years ago, and has been a leading factor in the development and application of centrifugal pumps.

Pierce J. McAuliffe has been made vice president and general manager. He joined the company in 1910 as designer of hydraulic dredging equipment.

Frank P. Summers, purchasing agent, Standard Oil Co., San Francisco, has retired after 33 years of continuous service.

Harry V. Mercer has been appointed advertising manager of the American Rolling Mill Co., Middletown, O., a newly created office. Mr. Mercer has been associated with Armeo since 1916.

Sylvester Smith has severed his connections with Samuel Stamping & Enameling Co., Cleveland, to become associated with the Ferro Enamel Corp., Cleveland, in its service department.

Walter H. Harnischfeger, president, Harnischfeger Corp., Milwaukee, has invited the Crane Institute and Electric Hoist Manufacturers association to meet at the Harnischfeger offices in Milwaukee, July 9 and 10.

Carl C. Joys Jr., vice president, A. O. Smith Corp., Milwaukee, in charge of sales to the oil industry, has departed for Europe to make a study of conditions affecting the potentialities of the market for such products.

C. R. McDonald has been elected a vice president of the International Harvester Co., Chicago, and placed in charge of manufacturing. Mr. McDonald, identified with the company for 41 years, succeeds Albert A. Jones, who has retired because of ill health.

E. B. Dukak, vice president and sales manager, C. M. Kemp Mfg. Co., Baltimore, manufacturer of industrial gas apparatus, will sail June 3 on the S. S. WASHINGTON for a six weeks' trip to England and continental Europe, during which time he will contact European associates.

L. B. Simonds has been named assistant director of purchases of the White Motor Co., Cleveland. He has

been with the White organization since 1922, prior to which he worked in the purchasing departments of the Cleveland Tractor Co., Herick Co., and the Theodore Kundtz Co.

E. J. Lees has been appointed chief engineer in charge of engineering and research for the National Tool Co., Cleveland. He formerly was associated with Lees-Bradner Co. Mr. Lees has made many prominent contributions to the machine and small tool industries, some of which include commercial gear generating grinders,



E. J. Lees

gear testing machines, a six-spindle full automatic machine for making twist drills from the bar complete, and a positive automatic micrometer stop for gear generating machines.

Livingston A. Fisk, for ten years sales manager of the New York territory for the Chicago Faucet Co., has been appointed regional manager in New York for the plumbing ware division of the Briggs Mfg. Co., Detroit. Mr. Fisk, a graduate of the Yale Sheffield Scientific school will maintain offices at 101 Park avenue.

Harry Christensen has been made manager of the special products division of A. M. Castle & Co., Chicago. He will have charge of the sale of stainless steels, hot rolled and cold finished alloys, special sheets, welding wire, wire rope, copper and brass, tool steels, and hack saw blades.

Clarence P. Walker has been appointed foundry superintendent of the Kutztown Foundry & Machine Corp., Kutztown, Pa., producer of special alloy gray iron castings. In

addition, Mr. Walker will continue as a castings broker, with headquarters at 1077 Sandford avenue, Irvington, N. J.

A. D. Heath, 1701 North Illinois street, Indianapolis, has been appointed exclusive representative in the southern Indiana territory by Ex-Cell-O Aircraft & Tool Corp., Detroit. Mr. Heath will handle all of the company's products in this territory, including those of the Continental and Machinery divisions.

M. W. Smith has been appointed manager of engineering of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Mr. Smith has been associated with Westinghouse since 1915, first as design engineer, later as a section engineer, and more recently in charge of the design of the large rotating alternating current machinery of the generator division.

Leo F. Ryan, purchasing agent, Ohio Power Co., Canton, O., was re-elected president of the Canton and Eastern Ohio Association of Purchasing Agents May 20. Other officers are: vice president, A. H. Anthony, general manager, Massillon Steel Casting Co., Massillon, O., secretary-treasurer, John F. Buchman Jr., secretary-treasurer of the Frankham Brass & Bronze Co., Massillon.

M. H. Watkins has been appointed assistant manager of tin plate sales, for the Youngstown Sheet & Tube Co., Youngstown, O., with headquarters in Chicago. Mr. Watkins was connected with the company's Cleveland district sales office for several years and has been associated with the tin plate sales department at Chicago since 1934.

George Gibbs, Gibbs Steel Co., Milwaukee, was elected president of the Wisconsin chapter of the American Steel Warehouse Association Inc. at a recent meeting. Other officers elected are: vice presidents; L. R. Moise, Moise Steel Co., Milwaukee, and R. E. St. John, Morley-Murphy Co., Green Bay, Wis.; secretary-treasurer, George Smith, Joseph T. Ryerson & Son Inc., Milwaukee. Mr. Moise was also named national director.

C. M. Tate has resigned from his position with Askania Regulator Co. to join Hagan Corp., Pittsburgh. Mr. Tate, for the past two years with the Askania company and with H. A. Brassert Co., specialized in the application of combustion control to metallurgical furnaces in the steel industry. His work with Hagan Corp. will be along similar lines. He will have his headquarters at Pittsburgh, but will co-operate with the various Hagan offices in other ter-



ritories in contacting the steel industry.

Robert Calvert, formerly associated with Price, Waterhouse & Co., has been appointed comptroller of Pittsburgh Steel Co., Pittsburgh, effective June 1.

A. L. Peterson, associated with the Detroit warehouse of Joseph T. Ryerson & Son Inc. since 1919, has been named assistant manager of the St. Louis branch warehouse of the company.

Harry W. Dietert has resigned as chief engineer of the United States Radiator Corp., Detroit, to devote more time to the Harry W. Dietert Co., designer and manufacturer of foundry control equipment.

D. V. Sherlock and L. Douglas Smith have been elected directors of the Blaw-Knox Co., Blawnox, Pa. Mr. Sherlock is vice president of Union Steel Castings Co., and Mr. Smith, vice president of Lewis Foundry & Machine Co., both Blaw-Knox subsidiaries.

Gottfrid Olson has joined the National Founder's association, Chicago, as foundry engineer. Mr. Olson recently returned to this country after being associated for the past year and a half with the Pump-Separator Co., Katrineholm, Sweden. Previously he had been identified with various foundries in the United States for about 25 years.

Thomas J. Bray Jr. has been appointed assistant manager of sales for bars, strip and semifinished products in the sales department, Pittsburgh district, of Carnegie-Illinois Steel Corp., effective June 1.

John R. Walker has been named assistant manager of the service bureau of the order division, and Bryce Murray, chief clerk of the bar, strip and semifinished material division, both of these latter appointments also being effective June 1.

A. C. Cook has been appointed district sales manager to cover New York city, Long Island, northern New Jersey and eastern New York state, by the Cumberland Steel Co., Cumberland, Md., manufacturer of turned and ground quality steel shafts. Mr. Cook was formerly connected with the Warner & Swasey Co. for over 20 years in the capacities of district sales manager of the New York city territory, general sales manager and vice president. He is now located at 30 Church street, New York.

Joseph Freisinger, superintendent of the No. 2 foundry of the main works of Allis-Chalmers Mfg. Co., West Allis, Wis., is celebrating the



Percy Ridings

New president, National Supply and Machinery Distributors' association, Philadelphia, as announced in *STEEL* May 18. Mr. Ridings is associated with the Syracuse Supply Co., Syracuse, N. Y.

completion of 50 years in the employ of the company. He started late in May, 1886, when 16 years old, with the old E. P. Allis Co., Milwaukee, as an apprentice molder. In 1903 he was appointed foreman of the foundry at the Reliance works, and was given charge of No. 2 foundry at West Allis when it began production in October, 1923.

A. H. Frauenthal, formerly assistant general manager of the Bantam Ball Bearing Co., has been elected vice president and general manager, succeeding Karl Herrmann, who has retired.

Mr. Frauenthal has been with the Bantam organization since 1930. Since that time he has spent several years in the field as sales engineer, later was made manager of the steel mill division, and was in charge of sales, engineering and manufacturing up to the time of his appointment as assistant general manager.

Although retiring from his major duties as general manager, Mr. Herrmann's services are being retained as a consulting engineer, and after a vacation he plans to enter some phase of the automotive field.

## Court Upholds U.S. Steel's Railroads

THE government was defeated in a decision of the United States Supreme Court last week in an effort to restrain the Elgin, Joliet & Eastern Railway Co., a subsidiary of the

United States Steel Corp., from transporting commodities produced by other Corporation subdivisions.

The government in its suit, begun in 1930, charged that such transportation was a violation of the commodities clause of the interstate commerce act. A federal district court in Chicago dismissed the suit and it was taken to the Supreme Court by the government and argued just a few weeks ago.

The claim is that 60 per cent of the road's tonnage comes from the Steel corporation's subsidiaries and the remaining 40 per cent from other shippers. The government contended that the road had such an interest in the commodities of the other subsidiaries of the Corporation that their transportation under the commerce clause of the interstate commerce act was unlawful.

The court's decision was 6 to 3, with Justice McReynolds writing the majority decision from which Justices Brandeis, Stone and Cardozo dissented in an opinion by the latter.

The American Short Line Railroad association, interveners in this case, declared that if the government won, many other railroads with the same relationship to corporate industries would be affected.

## Died:

CECIL MARTIN, 55, treasurer Wornden-Allen Co., Milwaukee, in Chicago, May 25. He had been identified with the company since 1909.

Henry F. Griffiths, 53, general manager of the Westinghouse International Co., foreign sales division of the Westinghouse interests, at New York, May 24.

George C. Anderson, 63, secretary and general manager of the Swift Mfg. Co., Detroit, in that city, May 23. He was associated with the company for 48 years.

Samuel Austin, 85, founder and chairman of the board of the Austin Co., Cleveland, industrial engineers and builders, in Willoughby, O., May 23.

Fred T. Moran, 81, retired industrialist and banker, at Grosse Pointe Farms, Detroit, May 19. He was one of the organizers of the Michigan Copper & Brass Co., and for years was president of the Peninsular Stove Co., Detroit.

Arthur Maskrey, 82, retired manufacturing executive, in Burlingame, Calif., recently. He was at one time district manager for the United States Steel Corp. in Cleveland, and later general manager of the American Tin Plate Co., Canton, O.





The steel used in New Departure bearings is wrought by forging

# *You'll find them tougher* ...because we forge them

Since the dawn of history blacksmiths have forged extra strength into metal. Glowing steel, caught between hammer and anvil, gains new toughness. Man's ingenuity has devised nothing that will take the place of forging. New Departure Ball Bearings are made from FORGED steel. Huge forging presses knead it with a thousand times the force of any man-swung sledge. Much metal is packed into small compass. Its

structure becomes uniform. It is longer-lived steel, because of the extra toughness that has been wrought into it.

The New Departure Manufacturing Company, Bristol, Connecticut. Engineering staffs also at Chicago, Detroit, San Francisco and London.

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Also makers of **TRANSITORQ**  
*a million speeds at the touch of a finger*



*Nothing Rolls like a Ball*  *No Other Form so Strong*

# **NEW DEPARTURE**

## **THE FORGED STEEL BEARING**



# Mirrors of

# Motor-dom

DETROIT

**G**ENERAL MOTORS, in its 1937 cars, is beginning to heed criticism from a few keen observers against the marked similarity which in the past has run through the lines of all its models from Chevrolet on up to Cadillac.

Be it in radiator grilles, body panel flare, or in general overall resemblance, there always has been a certain apparent racial strain extending through all General Motors models, these observers said.

In fact, many important parts often were interchangeable and this was a fact that General Motors was prone to confirm. It has come to be no open secret, for example, that Chevrolet parts divisions manufacture a large number of Pontiac parts, while Buick does the same for Olds and so on. Moreover, LaSalle and Cadillac are housed under one roof.

But now, with an ear to the ground, General Motors has studied this retail comment and has decided to make changes, possibly removing the likeness of Chevrolet from Buick, or the LaSalle imprint from Cadillac.

## Some Similarity Retained

A story is now current in Detroit to the effect that certain Packard advertising might have proved the deciding factor in moving General Motors to the decision to mix a little variety in its models.

This particular recent Packard advertisement showed a pair of youngsters sitting on a fence and exclaiming, "You can tell from here it's a Packard," as an automobile, barely discernible, appears over the brow of a distant hill.

From that theme, General Motors is proceeding more or less in this fashion for 1937: Certain underlying basic design features probably will be retained for all of its cars, with the result that body and panel work, only, will continue to have a similarity.

Where the big difference between models will lie is in embellishments, such as radiator shells, grilles, louvers, headlamps, running boards,

wheels and the instrument panels.

So divergent will be the interpretations placed on these items by Chevrolet, Pontiac, Olds, Buick, LaSalle and Cadillac that it will be a wise parent corporation which knows its own children, in the final analysis.

Chevrolet, for one, will have a completely restyled front end, still built around a pressed steel radiator grille, but with a more marked slope angle to radiator and windshield as outstanding features.

## Decorate Radiator Grilles

Olds is to have a front end that will involve a die-cast grille upon which is to be superimposed a bright metal covering made of eight widely spaced horizontal bands. These latter bands then in turn run to varying distances back over the hood side.

LaSalle's changes figure around a complete refurbishment that in the final analysis is something of a defensive move, for Detroit understands this car has felt Packard 120 competition keenly.

Buick, aside from coming forth resplendent in a few months with models shining more brightly than ever through the use of more stainless and chrome-plated parts, is still dallying with the idea of making a line of sixes.

The General Motors high council will not put approval on the idea, so there the sixes rest, on the Buick drawing boards. There is some logic however, in a reason Buick has for this idea.

In brief, it is this: Before long Packard will be out with a line of small sixes, priced somewhere around \$800, and, if they are even in a measure as successful as the 120, some or maybe all of Packard's competitors will feel the competition.

One big reason for the success of the 120 over the last 15 months is that no Packard 120 competitor, that is, no one in a similar price field, brought out anything to meet the new Packard job. None thought to

fight fire with fire. The result has been that no motor car maker this year can touch Packard's figure of a 494 per cent increase in sales, first quarter of 1936 against 1935.

But, as some persons reason, if such a company as Buick had a line of sixes all set to throw back at Packard, the latter's sailing wouldn't be so smooth.

There is considerable logic in this thought. Incidentally, it brings to mind a fact that has aroused wonder in Detroit: Here the industry is faced with a 5,000,000-car year, certainly in 1937 if not this year, yet, barring Packard's 120 there has not been a single new line of automobile models brought forth in several years. In fact, the number of individual makes of motor cars is far less than it was six years ago and the public has fewer cars from which to choose.

## All-Steel Fisher Bodies?

Returning to the 1937 General Motors lineup, we find that steel will be greatly favored next year through the disappearance of the last vestige of wood in Fisher bodies. As one die maker put it last week: "There's not a stick of wood in the 1937 Fisher bodies." This may be figurative but it expresses the trend toward steel's dominance.

Wood is being dropped from the doors of General Motors' subsidiaries, this affecting Chevrolet and Pontiac chiefly. Accordingly, the advance information seems to be that wood, even in a modified reinforcing capacity, is definitely out. Ford contributes to this trend by its approval on the all-steel top next year.

General Motors will continue to hold to knee-action but the report of independently-sprung rear wheels for automobiles seems to be somewhat in the future.

Molded plastics will take a share of steel's minor participation in motor car requirements next year. Chevrolet's decision to run molded plastic completely around the window trim of the door is typical. Instru-



# Mirrors of Motordom

ment panels will be predominantly plastic throughout motordom.

General Motors last week showed it is not finished yet with its 1937 plant building operations. The inquiry came out from Fisher for both a new metal storage plant and a seat and cushion storage unit to be built at Lansing. Furthermore, ground was broken on Tuesday for an 11-story research and laboratory building at Second and Milwaukee avenues in Detroit.

The latter building will have the first seven floors turned over to Fisher Body engineering and tool design divisions, leaving the top four stories for the General Motors art and color section. Chevrolet will then spread out and take over the present Fisher engineering and tool design space in the General Motors building as it stands today across the street from this addition.

There are not enough fingers on your hand to name the important General Motors expansions in just the last year. Notable have been the construction of an entirely new plant at Grand Rapids; remodeling of the Syracuse, N. Y., Brown-Lipe-Chapin division; construction of a score of parts warehouses over the country; the large assembly plants at Los Angeles, Baltimore, Indianapolis; and expansion at Saginaw, Flint, Detroit and Muncie, Ind.

## Gear Division To Be Enlarged

One piece of news for the machine tool and equipment trades to trace lies in some important plans the gear and axle division of Chevrolet has for extending its Detroit plant to include more forge shop space. This program will get under way in the fall of this year.

Chrysler Corp. has hit on a plan to take the DeSoto car out of the Jefferson avenue plant and concentrate on assemblies for this job at the West End plant on Wyoming avenue, now being greatly enlarged.

This column recently has been detailing the items of equipment bought for the West End plant, which up until a couple of years ago was owned by LaSalle. Large presses and heavy cranes indicated that a lot of sizeable Chrysler stamping work was going to originate there by next year.

The news is warm, though, that DeSoto assemblies will be shunted to the Wyoming avenue division. Motors from Chrysler and many body parts from the East Jefferson division will be fed into the assembly line of the new plant.

Chrysler has placed Harold

Hughes, formerly of Willys-Overland, in charge of the stamping shop at Wyoming avenue, although for the time being Mr. Hughes is making headquarters in the Chrysler Highland Park division.

This move will leave the Chrysler plant on East Jefferson avenue, out next to the Hudson plant, free for assemblies of the Chrysler lines proper, which next year will be almost entirely concentrated on the present "C-10" job, or as the public knows it, the largest Airflow.

Contrary to some reports, the new West End plant addition of Chrysler will not be equipped with a die shop. It seems to be a Chrysler policy to get farther and farther away from its own design and manufacture of dies. Figuring that this type of activity is only good for three months out of a year, Chrysler Corp. has recently decided to give as much of this type of work as possible to outside sources.

Strangely, though, Detroit shops have received very little, so far. Fisher has been predominant in engaging the die trade here in metropolitan Detroit and signing up suppliers on the basis of deliveries it wants, much to the discomfort of the independents which have die work to place but can't get the shipment.

The prices at which the 1937 die work is going are probably the best in six to seven years, and there seems to be a margin of profit that ought to make the diemakers smile. All of the stress is on deliveries, and

die purchasers seem not to be bearing down on costs. Furthermore, the die trade expects to be kept busy until at least November, judging from the heavy volume of work now over the dam plus what is pending.

The die business may be good now, but the tool and fixtures fellows are hard pressed for need of orders. Much of this new tool business will soon break, though, and another month will see tool and die trades, alike, well engaged.

While the die foundries, the tool shops and the fixture makers start to move along at a better clip, assemblies of 1936 cars are definitely on the wane. Last week's production was beneath the week before and this is the second consecutive week that this has happened.

For one thing, Ford's dropping of the fifth day in the week has hurt. So has the cut Chevrolet put in on assemblies. Currently, Ford is assembling about 23,000 jobs a week and Chevrolet around 29,000 to 30,000 per week. Incidentally, Ford made its 3,000,000th V-8 model last Tuesday. Ford's total output since June 16, 1903, is now more than 24,000,000 units.

## Becoming Winded

Hudson has also dropped a day a week and the same inching is true at plants of several of the other independents. As in the case of Ford, individual rates per day are not disturbed from the fast tempo of April, but dropping a day here and there each week shows the horses are becoming just the least bit winded as they break into the stretch.

Yet, Detroit last week was putting a good appraisal on Chrysler's June assemblies and from the activities of parts men serving all the motor makers, it seems that Chrysler releases for shipment this month were better proportionately than General Motors' or Ford's.

Meanwhile, following the aforementioned Ford and Chevrolet assembly rates, Plymouth, at 12,000 jobs for the past week, and Dodge, at 8800, still had a firm hold on third and fourth places.

Olds was pressing at 6000 assemblies for the week. Then came Pontiac accounting for 5200 jobs, Buick at 4325, Hudson with 2800 models turned out, Studebaker accounting for 2175, and Packard at around the 1700-unit mark on production. The Chrysler lines made 1500 models last week, DeSoto was at 1450, whereas Lincoln was off to 225 jobs.

## Automobile Production

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

	1934	1935	1936
Jan. ....	155,666	289,728	364,004
Feb. ....	230,256	332,231	287,606
Mar. ....	338,434	425,913	420,971
Apr. ....	352,975	452,936	502,775
4 mo. ....	1,077,331	1,500,808	1,575,356
May .....	330,455	361,107	.....
June .....	306,477	356,340	.....
July .....	264,933	332,109	.....
Aug. ....	234,811	237,400	.....
Sept. ....	170,007	87,540	.....
Oct. ....	131,991	272,043	.....
Nov. ....	83,482	395,059	.....
Dec. ....	153,624	404,528	.....
Year .....	2,753,111	3,946,934	.....

1935 and 1936 figures revised.

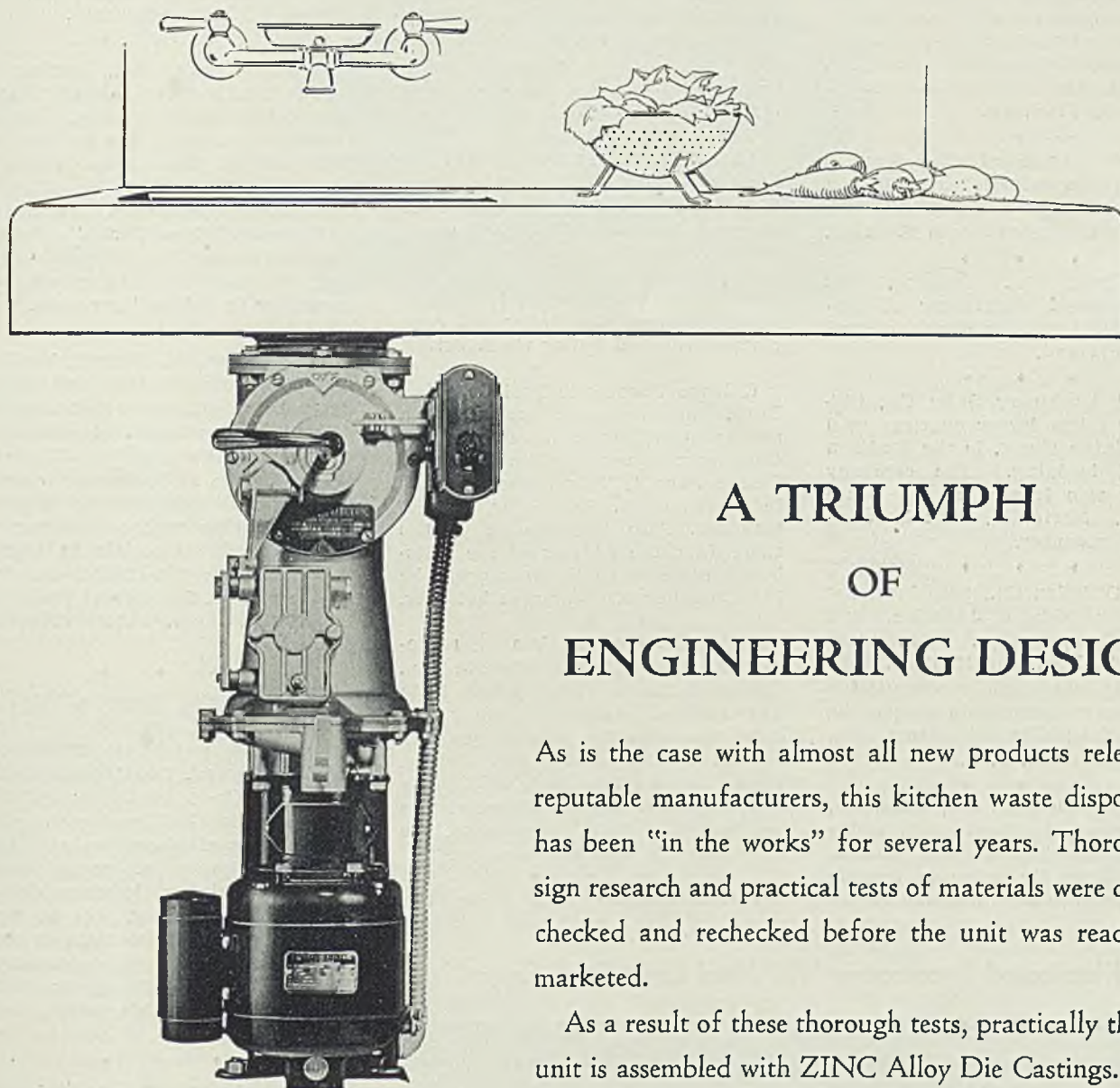
Estimated by Cram's Reports  
Week ended:

May 2 .....	118,764
May 9 .....	118,786
May 16 .....	117,156
May 23 .....	109,821
May 29 .....	108,300



The Research was done, the Alloys were developed and most Die Castings are specified with

# HORSE HEAD SPECIAL ( <sup>99.99+%</sup> UNIFORM QUALITY ) ZINC



## A TRIUMPH OF ENGINEERING DESIGN

As is the case with almost all new products released by reputable manufacturers, this kitchen waste disposal unit has been "in the works" for several years. Thorough design research and practical tests of materials were carefully checked and rechecked before the unit was ready to be marketed.

As a result of these thorough tests, practically the entire unit is assembled with ZINC Alloy Die Castings. For the housing and shredder\* they offer sufficient corrosion resistance to the soapy water exposure. And the many other parts are easily die cast in complicated shapes and always result in sharp, clean appearance.

\*The shredder is a ZINC Alloy Die Casting with Carboloy cutting elements die cast as inserts.

We try to keep abreast of the Die Casting industry in our publication, The Alloy Pot. We will gladly place your name on our mailing list to receive the literature on this subject if you so desire.

THE NEW JERSEY ZINC COMPANY  
160 Front Street  
New York City



STEEL



# Activities of Steel Users and Makers

**H**ARNISCHFEGGER CORP., Milwaukee, has received one of the largest orders in its crane department in some time from the American Steel & Wire Co., for two large mill-type cranes weighing 100 tons each for its Gary, Ind., mills. The order is valued at approximately \$100,000.

Granite City Steel Co., Granite City, Ill., has established a district sales office in New York, at 200 Fifth avenue, in charge of James M. Bried.

Jensen-Byrd Co., Spokane, has been appointed distributor of Enduro stainless steel by Republic Steel Corp., Cleveland.

Federal Machinery Sales Co., Chicago, has taken larger quarters at 9 South Clinton street, in the Madison Terminal building. The company formerly was located at 17 South Jefferson. Norton A. Booz is secretary and treasurer.

Crane-O'Fallon Co., with branches in Denver, Grand Junction, and Pueblo, Colo., Casper, Wyo., Albuquerque, N. Mex., and El Paso, Tex., has been appointed representative for the central mountain district by the American District Steam Co., North Tonawanda, N. Y.

Union Drawn Steel Co., Massillon, O., has moved its Dayton, O., office to larger quarters at 621 Mutual Home building, in order to provide better service to steel users in south-

western Ohio. Ralph Hering, who has served in the Dayton territory for the past four years, will be in charge of the new office.

American Engineering Co., Philadelphia, manufacturer of Taylor stokers, Lo-Hed hoists, Hele-Shaw pumps, motors and transmissions and A-E-CO marine auxiliaries, has removed its New York sales office from 40 West Fortieth street to larger quarters in the Evening Post building, 75 West street.

Link-Belt Co., Chicago, has appointed Industrial Supplies Inc., Memphis, Tenn., as authorized stock-carrying distributor of Link-Belt elevating, conveying and power transmitting chains and machinery; Caldwell screw conveyor and fittings; anti-friction bearing units; and complete silent and roller chain drives.

Chicago Pneumatic Tool Co., New York, announces the opening of a new sales and service branch at 2415 Commerce street, Dallas, Tex., effective June 1. This branch will be in charge of D. G. Reeder, district manager. Also effective as of the same date, the address of the Pittsburgh office of the company will be 810 Chamber of Commerce building.

Major Engineering Works, representative for Lincoln Electric Co., Cleveland, has moved its offices from 210 Jackson avenue to larger and more conveniently located quarters at 312 Second street, Des Moines, Iowa. A complete stock of Lincoln welders, electrodes and accessories as well as "Line-Weld" motors will be on display in the new location.

Cutler-Hammer Inc., Milwaukee,

manufacturer of electric control apparatus, has opened a new office in Baltimore, to provide closer contact and better service facilities to customers in the states of Maryland and Virginia. The new office, located at 10 West Chase street, will operate under the supervision of the Philadelphia district office, and will be in charge of R. A. Haworth.

Hendrick Mfg. Co., Carbondale, Pa., is handling the sale of "Mitco" interlocked steel grating, shur-site treads and armorgrids in the New York district through its branch office at 30 Church street, of which B. G. Dann is manager. Richard W. Tull, formerly New York district representative for the Mitchell-Tappen Co., for the past 11 years, will specialize in "Mitco" products.

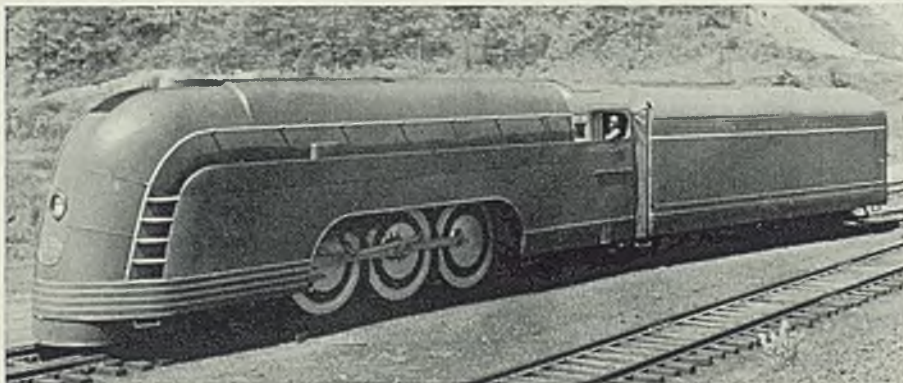
Bin-Dicator Co., Detroit, has been formed to manufacture and market devices for automatic bin level indication and control. It has taken over from the Ripley Mfg. Co., Wayne, Mich., all business pertaining to the Bin-Dicator, which is a device for indicating and controlling the level of bulk materials in bins or hoppers. The Bin-Dicator has been on the market for several years, and is now serving a widely diversified market.

Macwhyte Co., Kenosha, Wis., has just completed erection of a new branch and warehouse building at 1603 Northwest Fourteenth avenue, Portland, Oreg. to better serve its customers in the Northwest. Complete stocks of Macwhyte wire rope, including elevator cables and special ropes for mining, logging, drilling and general hoisting, will be maintained there for immediate delivery. W. J. Brett, factory representative for the Macwhyte Co. in the Northwest, will make his headquarters there.

Nashville Bridge Co. has commenced the fabrication of seven large flood gate bulkheads which are being made out of aluminum alloy plates and structural shapes, each being 128 feet long, 13 feet 10 inches deep and 4 feet 4 inches high. It is stated by the Aluminum Co. of America that these bulkheads "will be the largest aluminum structural units in the world."

The bulkheads, stacked on top of one another, are being made to form a 28-foot high cofferdam to be used for emergency repairs, maintenance, and painting of the roller gate units to the dam across the Ohio river at Gallipolis, O. Each of the aluminum bulkheads weighs approximately 28 tons, as against 44 tons for nickel steel construction and 78 tons for carbon steel.

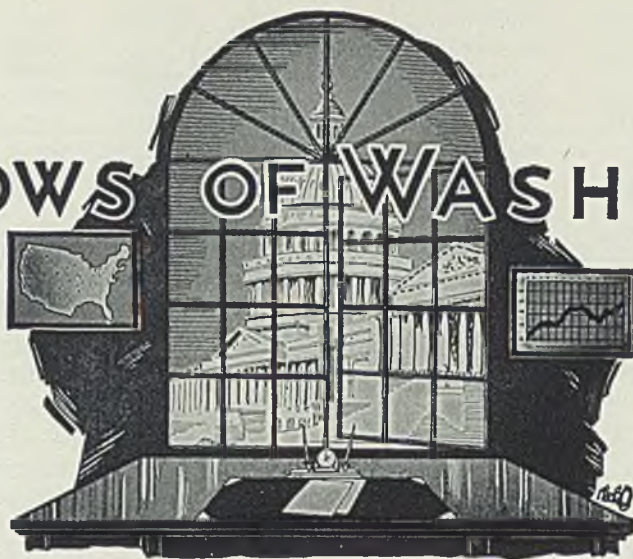
## Illuminated Locomotive Will Haul Light Steel Cars



*This locomotive will haul the New York Central's new streamlined train, Mercury, between Cleveland and Detroit. The train is notable for innovations in design and mechanical features. Its seven full dimensioned coaches will be constructed of steel, but substantially lighter than present standard equipment. It will be on a mile-a-minute schedule, with a top speed of 85 miles. At night, lights concealed beneath the cowling will illumine the 79-inch drivers and other moving parts of the engine. The locomotive was designed by Henry Dreyfuss, noted industrial designer*



# WINDOWS OF WASHINGTON



## WASHINGTON

**I**T IS a tossup now as to whether congress will be able to get away from here on Saturday, June 6, the deadline set by its leaders. Congress can move quickly and clean up a lot of work in a short time when it wants to, but, everything hinges now on whether its members are in the mood to do this. One thing is certain—if the deadline is to be met, the legislators will have to step on the gas.

Members of the senate finance committee have been having a lively time fussing around with the rewriting of the tax bill and every kind of expedient has been tried to hasten the work. It appears, however, that certain members of the committee were more anxious to turn out some kind of a workable tax bill than they were to adjourn.

A conference was held at the White House with the senate tax leaders Tuesday night and at its conclusion committee members said they planned to study ways of obtaining more revenue. It is understood that when the approval of the President is received, the bill could be rushed through the upper chamber of congress with some small hope that the senate might possibly clean up its work in another week. The relief bill is also pending in the senate at this time. It may come in for considerable discussion before it is finally passed.

### More Revenue Sought

Some members of the finance committee have been put out at the attitude of the treasury department experts because their estimates on yields as suggested by the senate committee have been very much lower than the committee members have thought they should have been. This made it necessary for the committee to try to find something new to tax.

Shortly before reporting the tax bill, the committee voted to liberal-

ize the tax on employers' trusts. Under present law, employees who receive corporate shares through a trust established for the purpose of permitting them to buy stock in the corporation are taxed at the time of receipt of such shares on the basis of their appreciation value. In other words, they pay on the difference between the value of the stock at the time they receive it, and the amount they paid for it. Under the committee's amendment they would be taxed only on the gain if and when they sell the shares and realize an actual profit.

The finance committee, also during the closing hours of its work on the rewritten bill, voted to apply its proposed 7 per cent supertax on undistributed corporate profits only to such income of corporations in bankruptcy and receivership as may be available for distribution to stockholders.

### COMMISSION WEIGHS ITS DECISION ON SURCHARGES

The interstate commerce commission now has before it final decision as to what it shall do about freight surcharges on all commodities. Extensive hearings were held in various parts of the country and the commission has heard concluding arguments.

While some steel companies filed briefs with the commission against the proposed extended surcharges after June 30, no steel representatives appeared at the final arguments before the commission.

Those who watch matters at the commission closest seem to feel that it will be two or three weeks yet before the commission announces its decision in this case. In other words, the decision may not come more than a few days before the surcharges end on June 30.

There is difference of opinion even among the corridor prophets as to

what the commission will do. One observer has pointed out, however, that the commission in its annual report this year, stated that it had had little complaint about these surcharges. In view of this the commission may not be averse to extending the surcharges for a time, at least.

### ROPER BELIEVES IN GIVING BUSINESS FREE HAND FIRST

Secretary of Commerce Roper wants to be helpful to industry. He is most insistent that the government stay out of business regulation wherever possible, and if the present administration does not do that it is because it is not listening to him.

Speaking at a recent press conference on adjustments in connection with government in business, Mr. Roper said that "the ideal way from my standpoint is to have all these adjustments made and supervised and conducted by business and those affected." Failing in this, of course, the secretary believes that the government must step in as it has done in any number of cases. However, Mr. Roper is very insistent that business be given a free hand first to try out its way.

The secretary made some interesting comments on the recent Guffey coal decision.

"We are trying to find the way to a better control of conditions in the interests of all," he said.

"With that ultimate objective and with the realization of the necessity of the ends sought, I am satisfied that the legal way will be found. In these days I am not as much wedded to mechanics as I am to the ultimate objectives in the adjustments we are seeking. I believe in any new field of endeavor we must realize that mechanics may prove inadequate and we may have to try various ways of amending the mechanics in order properly to approach the objectives.



These objectives will be ultimately sought by all concerned, and in the end they will be secured.

### **METAL TRADE LABOR LEADER ON UNEMPLOYMENT SURVEY**

John P. Frey, president of the metal trade department of the A. F. of L., is one of the labor representatives on the special unemployment committee of Major George L. Berry's industrial council.

The council has stepped in where angels fear to tread and has decided to make a running inventory of unemployment for use in efforts to get men back to work. Details of the plan have not yet been worked out but the Berry committee is supposed to co-operate with existing government departments having to do with such work.

The Berry council states that it will try to get answers to some of the following questions:

"Who are the unemployed? What are their normal occupations? Their alternate occupations as fixed by aptitudes? The magnitude of the salvage problem? The current trend of unemployment? What should be done about the untrained and inexperienced—those who have never had a job? How can the nation's youth be absorbed into private enterprise most expeditiously?"

These are only a few of the questions which the committee has propounded. It is quite evident that it has undertaken an immense task. The major makes it very plain that there are no political implications in the survey.

### **MECHANICAL "CAMPAIGNER"?**

New Dealers apparently are not satisfied with having humans talk in favor of the administration. They have now brought forth a 7-foot machine-made man to make four-minute speeches.

The machine industry, according to word received here, has evidently done a good job on this mechanical man with some 500 gadgets in his innards. He will be sent to the Texas centennial exposition as part of the department of labor's comprehensive exhibit.

In the speech which the robot makes he points out the advantages and disadvantages of machines in industry in so far as the effect on labor is concerned.

### **U. S. TIN PLATE SUPPLANTS BRITISH IN ARGENTINA**

United States manufacturers of tin plate appreciably improved their position in the Argentine market during the past year.

According to unofficial estimates, total imports into Argentina under this classification in the first 11 months of 1935 amounted to ap-

proximately 409,324 boxes, weighing on an average 100 pounds each.

Of this aggregate, the United Kingdom accounted for approximately 159,000 boxes, Germany slightly more than 131,000 boxes, the United States in excess of 98,000 boxes, while minor quantities originated in France and Italy.

The particularly encouraging feature of this trade from the standpoint of American exporters is that during 1934 and the opening months of 1935 the United States was obtaining practically none of this business, which is dominated by the requirements of the local packing companies and oil companies.

However, official exchange on shipments from the United States was arranged for the first time during March, and during succeeding months increased quantities of American tin plate were purchased on this basis.

An examination of the monthly import statistics indicates that much of the gain made by the United States in Argentina's tin plate market was made at the expense of British manufacturers.

### **GUFFEY DECISION IN EFFECT**

The Supreme Court last week ordered its decision in the now famous Guffey coal case to take effect immediately. According to ordinary procedure 25 days is allowed to permit the losers to seek a rehearing but the United States solicitor general told the court that the government had no objection to the waiver of this.

In connection with this decision also, J. R. McCarl, the comptroller general, has held that the coal commission was not ruled out of existence by the Supreme Court and therefore that the existing congressional appropriations would still be available for continuation of the commission for the time being at least.

The court will render decisions on June 1 and then adjourn for the summer.

### **DISPUTE LOOMS OVER TERM OF EASTMAN**

A fine young scrap is pending in connection with the term of office of the co-ordinator of railroads, Mr. Eastman. It is scheduled to expire on June 16.

The President at his press conferences has several times indicated that he believed that this office should be continued for the completion of some unfinished matters.

Senator Wheeler of Montana, chairman of the senate committee on interstate commerce, has introduced a joint resolution providing for the continuance of this office but it is apparently getting no place at this time.

There is a story to the effect that Chairman Rayburn, of the compar-

able committee of the house having charge of this legislation, does not favor continuance of the Eastman work.

To add to the confusion, one of the press associations broadcast a story last week that the President is willing to give up this work. There have been denials from unofficial quarters, but at this time it is anyone's guess as to what will happen to the office of the co-ordinator.

### **LEWIS TRYING TO REMOVE "THE ROOTS OF DUALISM"**

There is no denying the fact that a death battle is raging between John L. Lewis and other members of the committee for industrial organization and William Green, president of the A. F. of L., especially now that the Lewis organization has joined with the Amalgamated Association of Iron, Steel and Tin Workers in an effort to unionize the steel industry.

During the past week Mr. Lewis and other members of his committee met with a special committee of the A. F. of L. and explained their reasons for continuing the work of the industrial organization group despite the council's request that it be dissolved.

In regard to fears of dualism between the committee on industrial organization and the federation, Mr. Lewis said, "We wish to emphasize again that we are trying to remove the roots of dualism by making it possible for the millions of mass production workers now outside of the A. F. of L. to enter on the only basis they will accept—namely, industrial unions."

### **CHINA IMPORTS MORE MACHINERY**

Although the value of China's aggregate import trade showed a decline of 4 per cent in 1935 from 1934 the value of industrial machinery imports increased 19 per cent.

In United States currency, the value of industrial machinery imports into China in 1935 totalled \$20,485,000, against \$16,898,000 in the preceding year. Much of this increase was due to the continuation of the national government's 4-year industrial plan and provincial government's industrialization programs, and a large proportion of the imports represented government purchases.

### **SOUTH AFRICA TAXES PIPE**

The Union of South Africa has imposed ordinary dumping duties on wrought iron and steel pipe with an outside diameter up to 6½ inches and on wrought malleable iron and steel bends and flanges of the same sizes, on shipments leaving after March 27, 1936, from the United States and Canada.



## Protecting Employes Against Effects of Mergers

**E**VERY employer in the metalworking industries will do well to study the details of the voluntary agreement covering the treatment of employes affected by mergers which was completed recently by representatives of the nation's leading railroads and railway unions.

The pact was negotiated for the purpose of easing the shock that is inflicted upon employes when the consolidation or co-ordination of railway properties deprives them of work, reduces them to lower positions or necessitates removing them and their families to new locations.

Under the terms of the agreement, a worker, who as a result of a merger is placed in a position paying less than he was earning previously, will be paid the difference for not to exceed five years or until his salary is advanced to or above his former income.

An employe deprived of employment by a merger or co-ordination of lines will be paid a "co-ordination allowance" which is 60 per cent of his former wage. This is to be paid monthly and the period of payment will range from six months for employes who have worked from one to two years, to five years for employes who have been in the service 15 years or more. An employe with less than one year of service will receive a lump sum payment equal to 60 days' wages.

### Employes May Exercise Option To Receive Lump Sum Payment of "Separation Allowance"

An employe thrown out of employment may elect to accept a "separation allowance" instead of the "co-ordination allowance." In this case, he resigns and receives a lump sum payment ranging from the equivalent of three months' pay for from one to two years of service to 12 months' pay for service of 15 years or more. Employes with less than a year of service will receive five days' pay. Employes electing the "separation allowance" waive all other benefits of the agreement.

The settlement also provides that employes required to move from one place to another on account of mergers or co-ordinations shall be reimbursed for moving and traveling expenses. The railroads also will make good the losses incurred by employes in the sales of homes or in moving before leases have expired.

Industrialists will be quick to realize that this agreement carries far-reaching implications. Certainly it is the first pact of national scope in this country which attempts to deal with the dislocation or interruption of employment on a uniform basis for all employers. Also it is the first time that the problem has been approached on a large scale through voluntary agreement. In fact, if the railroad employers and employes had not been able to work out a satisfactory plan, it is likely strong pressure would have been exerted to pass the Wheeler-Crosser bill, which was drafted to force the payment of dismissal allowances and other settlements by law.

However, it would be a mistake to assume that the features of the agreement are new either in the history of American railroading or in the practice of American industry. Some companies constantly are in the real estate business through their efforts to relieve employes of the burden of unexpired leases or of the sale of homes necessitated by changes in residence. Many companies pay moving expenses in full or in part.

### Lack of Uniformity in Policy of Industrial Companies Encourages Lawmakers To Act

Again, some industrial concerns pursue a liberal policy in handling cases where employes are thrown out of work by merger or similar reasons. The settlement may involve a lump sum payment, payment of wages in full or in part for a certain period, or a modification of the pension plan.

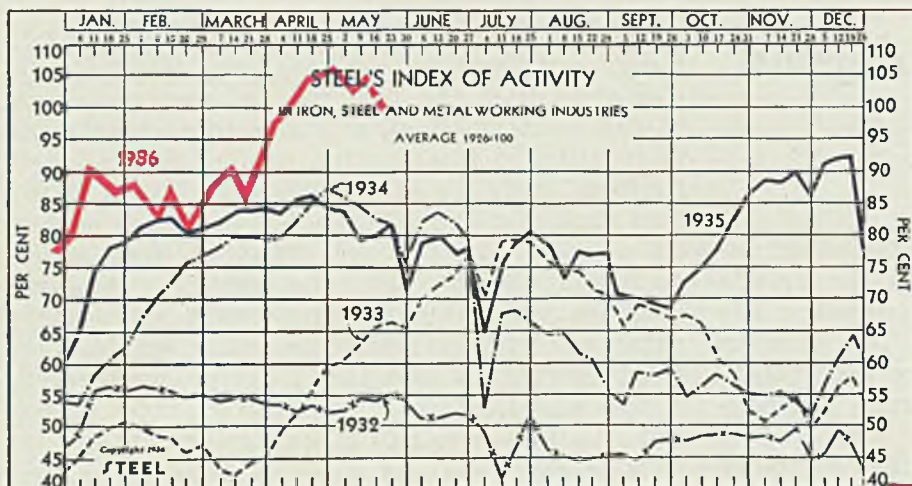
But for every company that attempts to facilitate the adjustment of employes' affairs to the requirements of corporate and economic changes, there are scores in which management gives perfunctory or no consideration to the plight of employes. It is this lack of uniformity in policy, coupled with the particularly hard-boiled, callous attitude displayed by certain employers, which arouses public condemnation against industry generally and encourages lawmakers to try to put employers in a legal strait-jacket.

The action of the railroads is not necessarily a precedent, nor does it furnish a pattern to be followed blindly by other groups of employers. The problem confronting the carriers differs from that facing industry in many important aspects.

Nevertheless, the general principles involved apply in some degree to the majority of employers in industry, who will be remiss in the discharge of their duties if they fail to sense the importance of this problem.



# THE BUSINESS TREND



STEEL's index of activity in the iron, steel and metalworking industries declined 2.7 points to 100.4 in the week ending May 23:

Week ending	1936	1935	1934	1933
Mar. 14 .....	89.7	84.0	79.9	42.7
Mar. 21 .....	86.0	84.0	79.7	44.6
Mar. 28 .....	91.2	84.3	79.3	45.2
Apr. 4 .....	96.8	83.4	79.6	49.1
Apr. 11 .....	99.6	85.4	82.2	52.6
Apr. 18 .....	103.1	86.3	85.0	55.8
Apr. 25 .....	103.6	84.9	87.5	59.5
May 2 .....	103.2	84.6	86.0	60.3
May 9 .....	103.0	79.3	84.4	62.5
May 16 .....	103.1†	80.5	82.4	65.2
May 23 .....	100.4*	82.8	81.9	66.1

†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.

## Seasonal Factors Begin To Affect Business Trend

**A**LTHOUGH industrial activity continues at a brisk pace, signs of the expected seasonal slackening were more in evidence in the closing days of May.

The first tangible indication of an easing in production was furnished by Cram's estimate of automobile assemblies in the week ending May 23. Output of 109,821 cars for that period marked the first noticeable break in a long succession of weeks in which assemblies had hovered around the 120,000 mark.

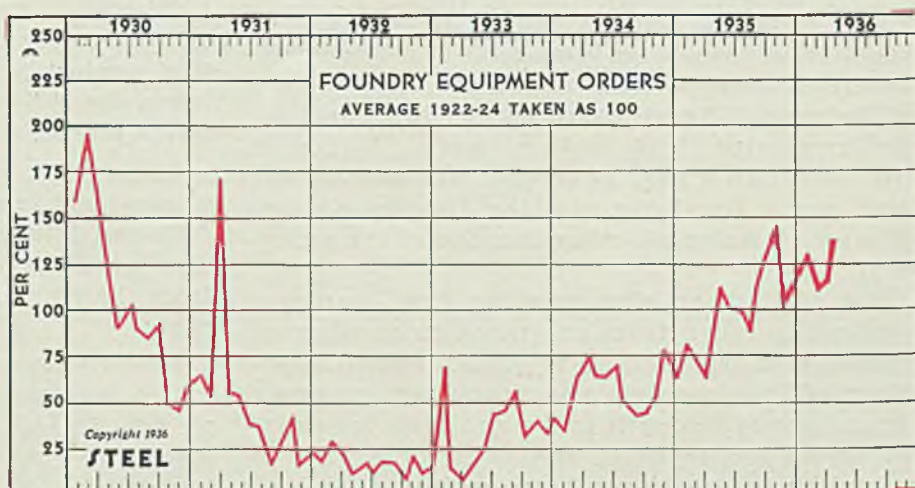
Another sign of mild recession was afforded by a two point drop in the steelworks operating rate. This is of uncertain significance because

steelmaking activity at the moment is at the mercy of at least three conflicting factors. First is the probable easing of demand from the automobile industry. Second is the apparent expansion in buying by the railroads and by other consumers in the durable goods industries. Third is the effect of the announcement of higher prices for third quarter, which may tend to stimulate purchasing in June. The strength of the last two factors may help to ease the normal summer drop in volume.

Electric power output and revenue freight traffic have been resisting the seasonal pressure with surprising emphasis. Unfortunately the record of activity in the week ending May 30 will be of little assistance in gaging the trend, because it will reflect the interruption due to the observance of Memorial day.

It will remain for the records of the weeks ending June 6 and 13 to give the first helpful hints as to the probable trend for the remainder of the quarter.

	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 ....	115.0	69.4	75.4	9.8
April ....	134.0	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





## April Commercial Failures And Liabilities Down

	Failures, Number		Liabilities, Dollars (000 omitted)	
	1936	1935	1936	1935
Jan.	1,077	1,184	\$18,104	\$18,823
Feb.	856	1,005	14,089	18,737
Mar.	946	976	16,271	18,522
Apr.	830	1,115	14,543	18,063
May	.....	1,027	.....	15,669
June	.....	961	.....	20,463
July	.....	931	.....	20,446
Aug.	.....	910	.....	17,845
Sept.	.....	806	.....	21,837
Oct.	.....	1,097	.....	22,243
Nov.	.....	927	.....	20,023
Dec.	.....	940	.....	17,442

## April Building Awards Highest Since 1931

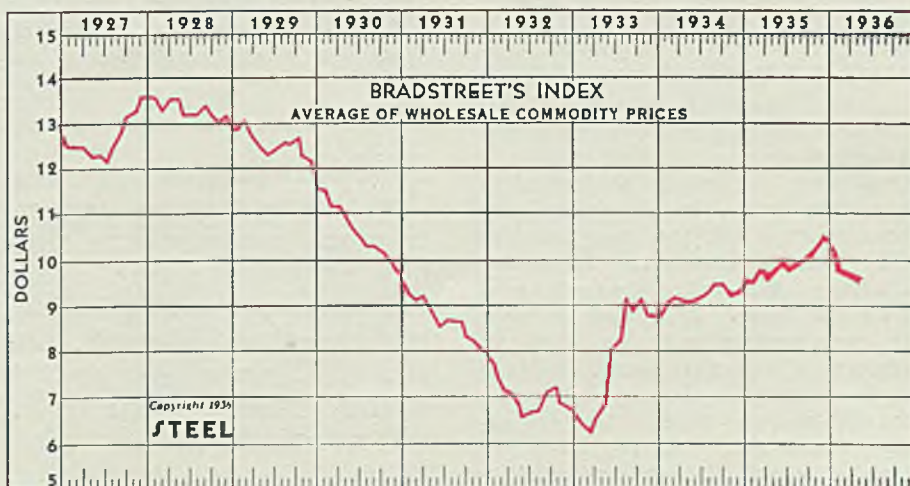
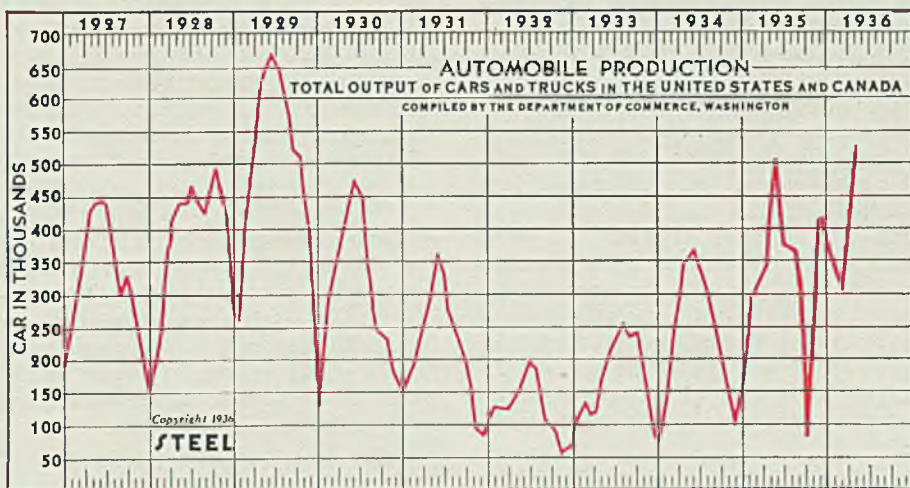
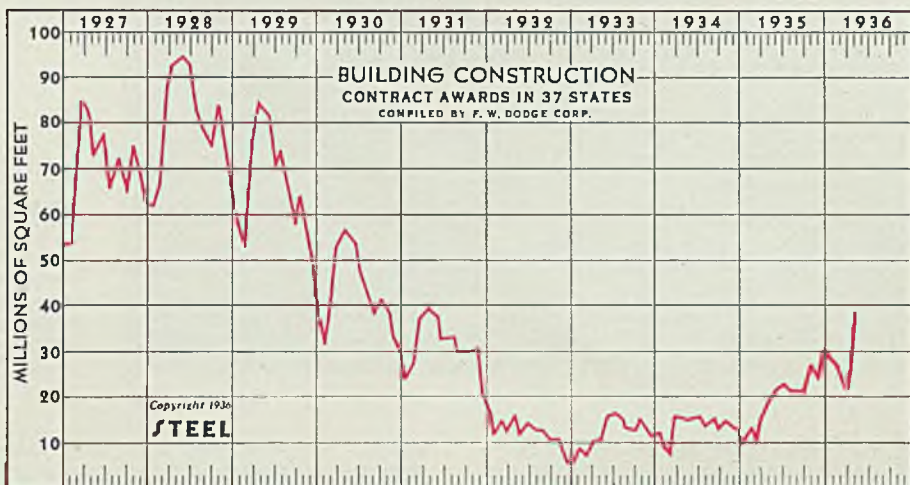
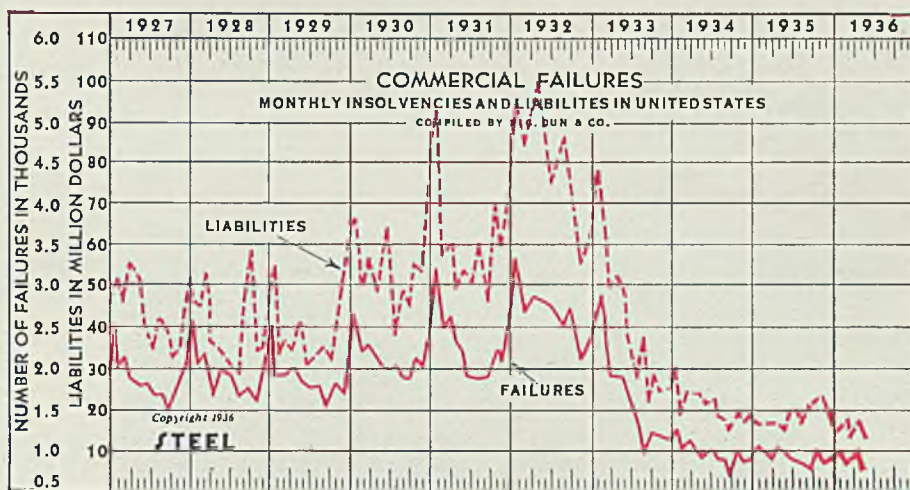
	Square Feet	
	1936	1935
Jan.	27,053,300	11,245,100
Feb.	20,856,700	9,670,300
Mar.	31,308,100	15,845,300
Apr.	37,490,200	19,917,300
May	.....	22,276,200
June	.....	22,378,800
July	.....	21,565,900
Aug.	.....	21,545,400
Sept.	.....	21,365,700
Oct.	.....	27,775,900
Nov.	.....	24,120,700
Dec.	.....	33,441,900

## April Automobile Output Highest Since 1929

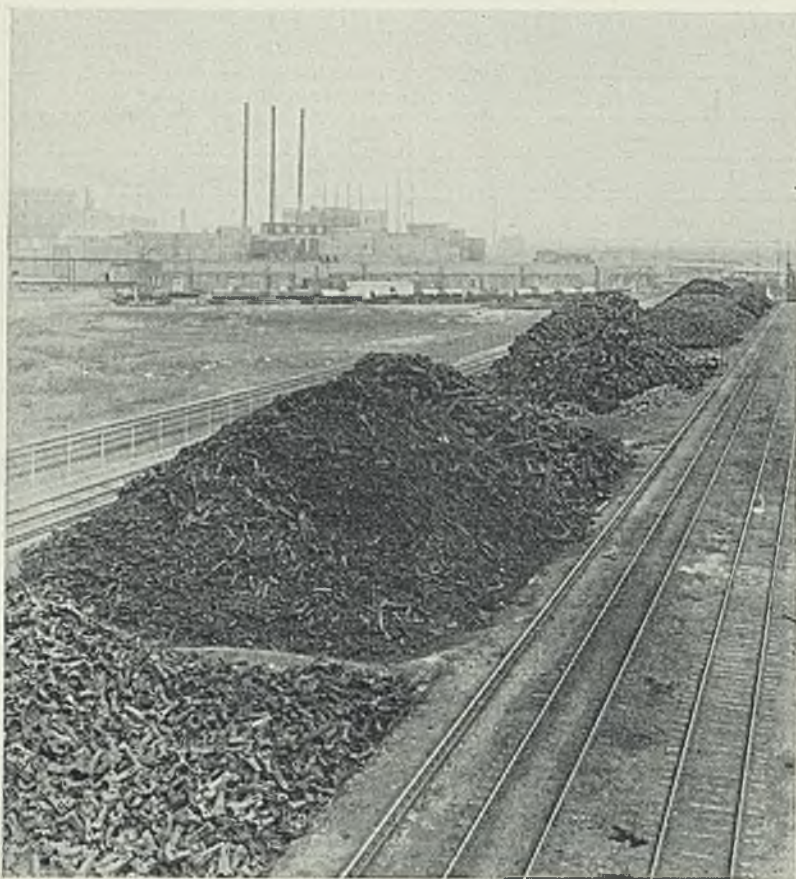
	1936	1935
January	377,306	300,325
February	300,874	350,345
March	438,945	447,888
April	527,726	477,059
May	.....	381,809
June	.....	372,085
July	.....	345,178
August	.....	245,092
September	.....	92,863
October	.....	280,366
November	.....	408,555
December	.....	418,303

## Commodity Prices Register Fifth Consecutive Decline

	1936	1935	1934	1933
Jan. 1	\$10.36	\$9.49	\$9.01	\$6.53
Feb. 1	10.02	9.78	9.26	6.53
Mar. 1	9.92	9.79	9.17	6.54
Apr. 1	9.85	9.66	9.16	6.98
May 1	9.81	9.79	9.14	8.02
June 1	.....	9.90	9.24	8.34
July 1	.....	9.84	9.32	9.01
Aug. 1	.....	9.91	9.48	8.99
Sept. 1	.....	10.00	9.45	9.05
Oct. 1	.....	10.17	9.27	8.84
Nov. 1	.....	10.28	9.29	8.81
Dec. 1	.....	10.40	9.49	8.83







**FIG. 1**—Carefully prepared scrap segregated into piles of constant and known composition. Furnace charges made up by taking definite percentages from each pile insure uniform mixtures

# Iron and Steel

## Technical and

**I**N THESE days of alloy steel, more exacting requirements for many grades of steel, and more precise control of steel quality, scrap has become a vital topic in the steel industry. Iron and steel scrap have, indeed, played an important part in the steel industry in this country ever since the inception of the open-hearth process. In fact, one original purpose of the open hearth was to produce steel from iron and steel scrap. Development of open-hearth practice along its present lines, wherein important amounts of scrap are used in the charge, undoubtedly resulted from the economic advantages connected with the utilization of the large amount of scrap available.

The technical and economic importance of iron and steel scrap may be called "new" only because of a newly developed interest in this product. It always has been important.

Predictions have been made that the steel industry is fast approaching a serious shortage of steel scrap, and that after the excess accumulation resulting from the depression has been worked off, the steel industry will face a constantly increasing shortage. The writer does not agree with this view. A marked increase in steel production in the next few years may cause a temporary decrease in the proportion of scrap used in the furnace charge. In fact, this proportion already has dropped from the high of about 63 per cent used in

1933. However, the following considerations indicate that there always will be a large return of scrap to the market. Industry should be able to look forward to a sufficient supply of scrap to care for its needs for many years to come, using an average scrap burden in the open hearth of at least 50 or 55 per cent.

### Modern Trend Produces Scrap

Major changes in our mode of living during the present century have been such as to accentuate the production of steel scrap. Steel for permanent construction connotes a relatively small return of scrap, while steel for temporary construction leads to a relatively large return.

This trend toward production of more flat-rolled, light-weight products, such as steel for automobiles and other equipment of relatively short life in relation to heavy arti-

cles, such as rails and structural shapes, will tend to increase the rate of production of scrap. Although a part of such scrap will be left at great distances from steel producing centers, it will be available for use when needed. Moreover, more scrap normally is made both in the production and in the fabrication of light than heavy material. In addition, use of the lighter, stronger steels in the transportation field, substitution of lighter-weight welded structures for heavier castings, modernization of equipment and increased use of metal packaging will increase production of scrap in relation to steel production. The fact that nearly a billion tons of steel now is in use in the United States is assurance that the rate of scrap production is not likely to decrease.

Thus, the long range view is that there will be increasing rather than a diminishing supply of scrap. An increased output of heavy steel products which will result from a revival in the heavy industries, will be supplied largely by the integrated mills that use less scrap than the nonintegrated plants. Hence, although this would tend to bring down the average ratio of scrap to pig iron used, it would not greatly affect the supply of scrap.

The tendency of foreign countries to increase their steel production during various periods may draw scrap away from this country. Scrap exports, except for the years 1928

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THE accompanying article constitutes the principal portions of a paper presented at the forty-fifth general meeting of the American Iron and Steel institute in New York, May 28. The author, Clyde E. Williams, is director, Battelle Memorial institute, Columbus, O.

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# Scrap Is Assuming New Economic Significance

BY CLYDE E. WILLIAMS  
Battelle Memorial Institute

and 1929, have never bulked large until the past three years. In each of the years 1928 and 1929, over 500,000 tons were exported. Exports in 1933 were 773,000, in 1934, about 1,800,000, and in 1935 over 2,000,000 gross tons.

Imports never large, have ranged during the past 10 years from a low of 10,000 tons in 1932 to 81,000 in 1926. Imports are largely from Canada and carry a duty of 75 cents a gross ton. Exported scrap comes chiefly from the areas contiguous to the eastern and western coasts, and most of it, in recent years, has gone to Japan and Italy.

## Scrap Exports Analyzed

The accompanying table gives exports of iron and steel scrap from the United States since 1914, as compiled by the department of commerce, also the proportions of total steel ingot and casting production that they represent. Such nations as Japan and Italy, which, in times of heavy production, must greatly increase their use of scrap, come into the market for large purchases of scrap. This results in higher scrap prices and depletes seaboard scrap supplies.

Whether much scrap is exported depends upon the relative economic conditions existing in the industrial nations. That is, the price of scrap in this country does not necessarily control the degree to which scrap is exported. Demand for scrap by the importing nation must be great

enough to warrant its paying a higher price than this country will pay. In time of war or of preparation for war, necessity dictates the price the importing nation will pay. Also, the amount of scrap exported depends upon relative rates of business activity and the resultant price levels. Thus, from the table it may be seen that in 1920 an excessive amount of scrap in relation to nearby years was

to the probable rate of flow of iron and steel scrap back to the market, the law of supply and demand largely governs the amount of scrap used in producing steel. Higher scrap prices make possible a wider radius of collection, as more money can be spent for freight. As scrap becomes less plentiful and its cost rises, collection becomes both more intensive and extensive. Ordinarily, when scrap supply increases, relatively more scrap is used in the open-hearth charge; when the demand increases, relatively more pig iron is used. This is true, especially for the nonintegrated, cold-metal plants.

## Demand Constant in Large Plants

Some of the large integrated, hot-metal plants usually do not find it economical to follow a declining scrap market by increasing the proportion of scrap used. Their practice is based on the use of relatively large proportions of pig iron. Charges on ore reserves and blast furnace and coke-oven equipment must be met and by-product gases are used in the steel mill. Thus, these plants, by continuing to use high proportions of pig iron, tend to increase the availability of scrap in relation to the amount of steel produced.

To illustrate how the law of supply and demand has affected use of scrap, estimates have been made of the amount of scrap used in the basic open-hearth furnace since 1900. Calculations are based on the annual production of basic pig iron and basic open-hearth steel ingots and castings as reported by the American Iron and Steel institute.

The amount of scrap, both iron and steel, used in the charge was deter-

## United States Exports of Iron and Steel Scrap

Year	Gross tons	Per cent of steel ingot and castings production	Year	Gross tons	Per cent of steel ingot and castings production
1935.....	2,044,498	6.24	1924.....	97,748	0.25
1934.....	1,835,554	7.03	1923.....	65,980	0.15
1933.....	773,406	3.33	1922.....	64,265	0.18
1932.....	227,522	1.66	1921.....	37,117	0.19
1931.....	135,900	0.52	1920.....	219,250	0.52
1930.....	358,649	0.88	1919.....	27,275	0.08
1929.....	557,044	0.99	1918.....	2,160	0.005
1928.....	516,139	1.00	1917.....	145,574	0.32
1927.....	239,209	0.53	1916.....	212,764	0.50
1926.....	104,647	0.22	1915.....	49,361	0.15
1925.....	82,593	0.18	1914.....	33,134	0.14

exported, yet its price was higher in 1920 than in any other year after 1918; also, in the years of this country's maximum steel production, 1928 and 1929, more scrap was exported than at any other time up to 1933 because other countries also increased their steel output.

Aside from these considerations as

mined by assuming a recovery of ingots and castings of 89 per cent, an addition of ore equivalent to 5 per cent of the pig iron in the charge, and alloy additions of 1 per cent of the metallic charge. The results may not be of a high order of accuracy and are not cited to show actual scrap consumption for a given year, but



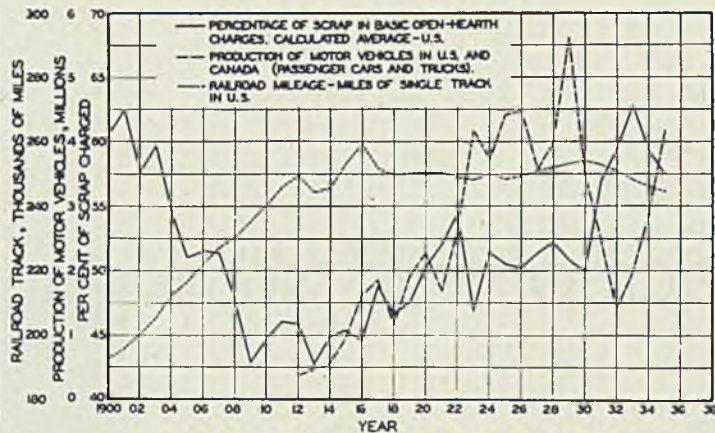
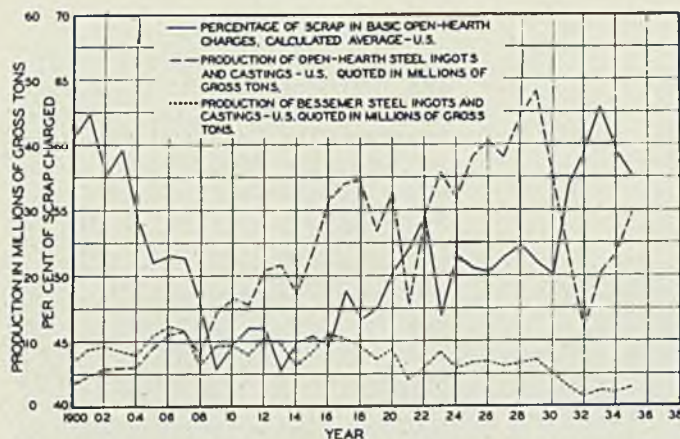


Fig. 2 (left)—Estimated proportions of iron and steel scrap in basic open-hearth metallic mixtures compared with production of open-hearth and bessemer ingots and castings. Fig. 3 (right)—Estimated proportions of iron and steel scrap in basic open-hearth metallic mixtures compared with production of motor vehicles and miles of single track rails

for the purpose of showing trends over a period of years. Although they take into account the use of bessemer-blown metal made from basic iron, they are not corrected for any bessemer pig iron that might have gone into the basic open hearth either as blown metal or as pig iron, nor do they account for pig iron that is made and stocked for use the following year.

However, the figures probably are of the right order of magnitude because the bureau of the census gave as the total scrap consumed in 1929 by steel works and rolling mills, 29,350,000 tons. Calculations, made as explained, indicate that 27,000,000 tons of scrap was used in the basic open-hearth process the same year. This figure when corrected for the probable amount of scrap used in the acid open hearth and bessemer operations is not far off from the bureau of the census reported consumption.

#### Scrap-Pig Iron Ratio Shown

Fig. 2 shows the percentage of iron and steel scrap in the metallic mixture charged to the basic open-hearth furnace, also production of basic open-hearth and bessemer steel ingots. Fig. 3 shows miles of railroad track laid and motor-vehicle production. It will be observed that relatively large ratios of scrap to pig iron were used in the early years of the open hearth, and that the ratio went steadily downward beginning in 1901.

In the beginning (Fig. 2), much scrap was available, so that the industry could readily use large amounts of high-quality scrap. In fact, one of the reasons why the open-hearth process was first tried was to utilize excess scrap that could not be used by the bessemer. Then as the open-hearth process supplied an increasing proportion of the nation's steel production, passing the bessemer production tonnage in 1908, and as the

total steel production rapidly increased, so much scrap was consumed in the open hearth that scrap of high quality became scarce, and proportionately, lesser amounts were used in the open-hearth charge until 1913.

#### Temporary Construction Increases

Also, until this time (Fig. 3), the nation was putting the bulk of its steel into long-time uses, buildings and railroads. When, in about 1916, the new light-weight products, especially automobiles, began to wear out and return to the market as scrap, the percentage of scrap in the open-hearth charge went up even though the total production of steel was on the increase. After a temporary drop in 1923 and 1924, the trend was upward again and, in general, has continued so. The sharp rise since 1930 is abnormal due to the depression. Increased output of steel and high exports in the past two years have caused the curve to point downward. As the large integrated companies begin to produce an increasing percentage of steel, the proportion of scrap used may decrease further.

Fig. 4 shows the percentage of scrap used and the prices for basic pig iron and heavy-melting scrap at Pittsburgh. These curves illustrate how scrap prices tend to follow pig iron prices and how, under normal conditions, the spread in prices governs, to some degree, the amount of scrap used in the charge.

Fig. 5 shows annual production of open-hearth steel and calculated amounts of scrap as well as percentage used in making basic open-hearth steel. It will be noted that the total amount of scrap used closely paralleled the amount of steel produced, and increased almost continuously from the beginning of open-hearth steel production until 1929, going down only during periods of excessively low production. This figure indicates that more scrap was consumed in making basic open-hearth

steel in 1934, when less than 24 million tons of open-hearth steel was made, than in 1923 when the production was 35 million tons. It also shows that more scrap was consumed in 1929 than at any other time in history, in spite of the fact that steel production was highest that year and the spread in prices of heavy melting scrap and pig iron was the lowest since 1912.

From the foregoing it is seen that more than 43 per cent of iron and steel scrap always has been used in the metallic charge in the open hearth, and that the general trend has been upward since 1909. At one extreme is the small cold-metal plant using high proportions of scrap; at the other the integrated plant using only its own scrap and either duplexing with blown metal or using high pig iron and ore charges; and between these, the operations using various amounts of cold pig iron or hot metal and relatively large proportions of scrap, depending upon local conditions.

#### Local Factors Govern Practice

Supply of raw materials, size and location of plant and type of products made dictate the practice. Pig iron and scrap will continue to be available in sufficient quantity for all these types of operation. The relative amounts of each that will be used will be governed in normal times by the law of supply and demand. Economics will require that the large amounts of scrap that will come onto the market be used. Use of such scrap will lengthen the life of our iron ore supply. Hence, it is important that the steel industry make the most of this invaluable resource by using it to secure the maximum degree of economy and the highest quality of steel possible.

Advisability of using higher charges of scrap depends upon many factors beyond the cost of the pig iron and scrap in the charge. Suit-



able comparison of operating costs between plants using different proportions and kinds of scrap cannot be made. Such variables as whether hot or cold metal is used, if furnaces are large or small, well closed-in or open, amount of insulation, degree of combustion control, whether burned lime or limestone is used, or whether ample facilities are available for charging large quantities of scrap, all exert too much influence on final costs.

### Price Differential Important

In nonintegrated plants that use high-scrap charges, the most important cost factor, undoubtedly, is the difference in the prices of scrap and pig iron. Such plants, by taking advantage of a low cost of metallic mixture, can afford to spend more money on operating costs than do plants that use relatively high pig iron ratios and hot metal. However, plants that use high-scrap ratios have designed their furnaces and have learned to adjust their operations to the use of large amounts of scrap.

The largest cost factor, when much light scrap is used, is that due to the increased time of charging. Plants that have only a few open-hearth furnaces in a line or that have been equipped with ample charging facilities have an advantage in this respect. However, the longer charging time is counteracted by the fact that light scrap melts down more rapidly than massive pieces of scrap and pig iron because of the greater exposure to the flame. In some plants, suitably equipped to handle efficiently large amounts of scrap, net time per heat is lower as percentage of scrap is increased.

Ingot yield is higher as scrap ratio increases, unless too large a percentage of the scrap is excessively light and readily oxidized. Cold-metal plants using 70 to 80 per cent scrap have ingot yields of 90 per cent or more, and often show shorter time of heats than when they use 30

to 40 per cent of pig iron if limestone is used with the latter.

With higher scrap ratios, use of burned lime instead of raw limestone results in less oxidation and speeds up the heat. With high scrap ratios, it is logical that silicon and manganese contents of the pig iron should be higher to compensate for the smaller amount of these elements added in the metallic mixture as a result of using less pig iron. Likewise, to insure the desired carbon content after the melting down stage is completed, coke often is added to the charge. By using petroleum coke or other forms of carbon of low ash and low sulphur contents, less coke can be used, sulphur content of the steel will be lower and better results will be obtained all around.

The fear that, when high ratios of light-weight scrap are used, the metal will be too highly oxidized is unfounded if proper attention is paid to slag composition. A high iron oxide content in the charge is obtained when using high pig iron charges by addition of iron ore and when using low pig iron charges by oxidation of light scrap. By adjusting the finishing slag to the same composition in either the high pig iron or high scrap charge, equivalent results should be obtained.

### Scrap Not Cause of Impurities

There is little possibility that light-weight scrap would cause the introduction of abnormal amounts of nitrogen or hydrogen into the steel, and, as stated, the oxygen content is taken care of by furnace practice. Campaigns have been reported in which as good results from the standpoint of quality were obtained with high charges of bundled light-weight scrap as with massive scrap. However, rusted scrap has been suspected of introducing hydrogen to the steel, which carries through to the ingot and causes defective steel. Such scrap, of course, can be avoided.

It is now known that the FeO con-

tent of the slag is controlled by the CaO-SiO<sub>2</sub> ratio of the slag rather than by the degree of oxidation during the melting-down period. A more highly basic slag, mainly because it is more viscous, allows the FeO content of the bath to be built up through oxidation by the furnace atmosphere. A less highly basic slag is more fluid and the FeO content of the slag does not build up to high values. Hence, the tendency toward production of high iron oxide contents in the slag in high-scrap charges may be counteracted by the use of smaller additions of lime. That is, when the CaO, whether added as limestone or burned lime, is reduced, the iron-oxide content of the bath will be lower and the slag volume less.

### Effect of Scrap on Quality

The foregoing discussion has attempted to show that steel of high quality can be made by the various types of operation regardless of amounts of scrap used, and that location of plant, availability of scrap and pig iron, and kind of product made have dictated the type of operation. Closely associated with these factors are the questions of the residual metal contents of the steel resulting from the kind of metallic charge, and their effect on steel quality.

Plants that use high ratios of pig iron are not bothered with this problem unless large amounts of scrap or impure ores are used in the blast furnace. The higher the percentage of scrap in the charge, the more important the problem becomes.

Measurable amounts of copper, nickel, chromium, tin, arsenic and antimony are to be found in practically all commercial open-hearth steels now made. Lead, zinc, molybdenum and vanadium have been detected in extremely small quantities in all the steels examined. These metals have gotten into the steel adventitiously, through the raw materials used in making the steel, and usually are determined on samples taken

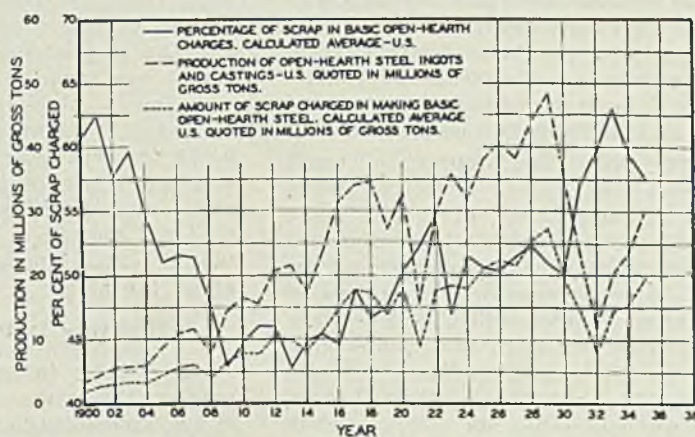
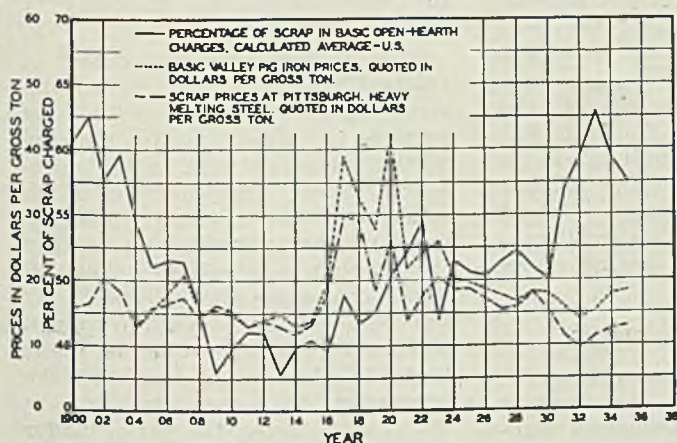


Fig. 4 (left)—Estimated proportions of iron and steel scrap in basic open hearth compared with prices of basic iron, valley; and steel scrap, Pittsburgh. Fig. 5 (right)—Estimated amount of steel and iron scrap used to make basic open-hearth ingots and castings and production of open-hearth steel ingots and castings



from the furnace prior to the addition of alloying agents. Thus, they are residual metals. Residual manganese and silicon are not included in this study for obvious reasons and aluminum is not considered because of its presence in most steels in the form of nonmetallic inclusions.

### Origin of Impurities

Copper was present in important quantities in early puddled iron and steel made in this country. Its original source was eastern iron ores. Lake Superior ores are low in copper but many other ores and pyrite cinder have continued to supply copper to steel. Since wide use of Lake Superior ores, increasing amounts of copper coming from nonferrous products such as bushings, copper wire and tubing, etc., and from copper-alloy steels and cast iron have served to maintain or even raise the residual metal contents of most steel.

Most of the residual nickel, doubt-

through iron ores, pyrite cinder and some coke. It is found in small quantities in many iron ores, being especially high in some of the southern ores and in certain foreign ores. Much of the antimony must have come from ores also, although unlike arsenic, it is now a common constituent of some nonferrous alloys, especially bearing metals and bronze bushings.

Lead comes largely from lead coated or painted steel scrap or from lead or lead-alloy (bearings and bushings) parts inadvertently charged with steel scrap. Zinc coated steel, brass and zinc-base die castings are the principal sources of zinc. Molybdenum and vanadium alloy steel scrap chiefly account for these metals although some ores contain important amounts of vanadium which may appear in the finished steel.

Practically all of the copper and nickel in the charge of the blast

antimony remain in the steel. Zinc volatilizes at steelmaking temperatures. Part of the lead in the charge vaporizes and part settles through the bath and into the furnace bottom. Only a trace of lead and zinc usually remain in the finished steel. Nearly all of the molybdenum is recovered in the steel but as yet it is present in negligible amounts. Some of the vanadium remains in the steel although much of it may be present in the form of oxide.

The residual metal content of steel varies greatly with the character of the metallic charge. Since these metals have become widely disseminated in steel, through use of scrap, it is difficult to make steel free or nearly free from these elements except by avoiding use of outside scrap entirely. In this respect, plants using high pig-iron charges are at an advantage, provided, of course, that the pig iron does not contain large amounts of the residual metals.

### Research Carried On Since 1929

The work of determining residual metals in steel has been going on since 1929. Analyses for the first two years were made by the bureau of mines, Pittsburgh station, under the direction of C. H. Herty Jr. Since then they have been made at Battelle Memorial institute. Co-operating steel companies have taken samples from the open hearth of representative heats prior to making alloy additions. These samples have been made up into monthly composites and submitted for analysis. At first quarterly, and later annually, composites were prepared from these, and analyses made.

To show how residual metal contents have changed with time, the average results based on capacities have been plotted for the ten plants that have submitted samples throughout the seven years. This is shown in Fig. 6. The values plotted are for the preceding quarter up to 1932 and for the preceding 12 months thereafter.

It is evident that the content of residual metals in steel is not increasing rapidly in spite of the large increase in recent years in the proportion of scrap used in the open-hearth charge. The character of the scrap used has a greater influence on the residual metal content than the amount. A survey of several steel companies made in 1932 showed a definite increase in copper, nickel, tin and chromium in steels made in plants that increased the proportion of automobile scrap in the charge during the period under investigation.

The variations from year to year may have been due to changes in the

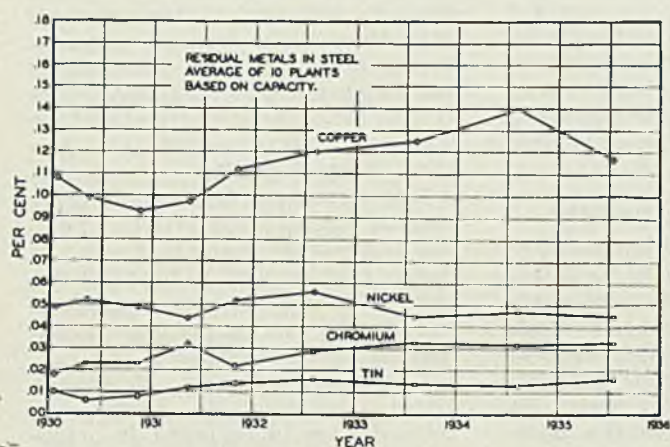


FIG. 6—Residual copper, nickel, chromium and tin in basic open-hearth steel. Average of 10 plants

less, has come from deliberate additions of the metal to steel and cast iron to improve properties. Chromium too has come largely from alloy steel scrap, also from furnace linings when plain carbon steels are made in the furnace subsequent to a chromium steel heat, although some iron ores contain important amounts, and now that open-hearth slag is being charged in the blast furnace, some chromium is coming from this source. Mill scale from rolling of nickel and chromium steels is also a source.

Tin has been found in small amounts in a great variety of steels. Undoubtedly, most of it has come from the large amounts of detinned scrap used in the open-hearth charge, to poorly detinned or often untreated tinsplate scrap or old tin cans or other utensils charged in the open hearth or in the cupola or blast furnace. Some tin also comes from babbitt, bronze and other tin alloys used in ferrous structures and from galvanized scrap.

Arsenic has gotten into steel

furnace, cupola, bessemer, electric or open hearth, is recovered in the cast metal. A high recovery of chromium is made in the blast furnace, owing to the strongly reducing conditions. Recovery of chromium in the steel in the open hearth varies with the oxidizing conditions of the bath, length of time of the refining period, carbon content of the steel and the slag composition. One operator has reported that when running on a high-scrap charge, the chromium content of the bath was 0.054 per cent after the lime was up and 0.023 per cent in the finished steel; the finishing slag contained 0.84 per cent  $\text{Cr}_2\text{O}_3$ . This small content of chromium did not adversely affect the slag.

### Recovery Is Problematic

No definite information is available to the writer on the recovery of tin, arsenic and antimony in open-hearth steel. It is probable, though, that nearly all the tin and a fairly high proportion of the arsenic and



character and amounts of scrap used in individual plants. The fact that results are not much different from 1935, when 57 per cent scrap was used in the charge, than for 1930, when only 50 per cent scrap was used, may indicate that more care is being exercised in the elimination of nonferrous alloys from the scrap.

Unfortunately, there is little definite information available as to the effects of these minor amounts of metals on the properties of steel. Tin and antimony exercise a bad influence on the surface of steel and should be kept to a minimum in rolled or forged steel. Any probable beneficial effect they may have on corrosion resistance is offset by their bad effect on surface and mechanical properties. Tin below 0.05 per cent apparently may be tolerated without affecting the surface, but above this content may cause trouble; 0.08-0.10 per cent causes minute tearing of the surface of steel during rolling, having an effect similar to higher contents of copper. Tin contents above 0.1 per cent often cause serious surface checking.

Antimony acts similarly to tin. One mill reports that 0.03 per cent antimony caused no apparent difficulty but that 0.15 per cent could not be tolerated. The effects of tin and antimony probably are additive. The few experiments that have been made indicate that the addition of nickel apparently does not correct this difficulty as it does with copper-bearing steels, and that the effect is intensified if copper is present at rolling temperatures above 2000 degrees Fahr. and lessened at lower temperatures.

#### Effects of Foreign Metals

Copper does not form a carbide but goes into the ferrite and strengthens steel. Likewise, copper aids the atmospheric corrosion resistance of steel. Its roughening effect on the surface is perceptible at around 0.35 per cent, and is especially noticeable when the steel is scaled badly before rolling either by high heating temperatures or long heating periods. Presence of nickel in amounts up to one-third or one-half of the copper content suppresses or even prevents this phenomenon.

Arsenic, in the amounts experienced, up to 0.09 per cent, apparently does not have this effect common to copper, tin and antimony. Its effects on steel may be expected to be like those of phosphorus.

Nickel, like copper, strengthens the ferrite and should be useful in improving the strength of steel. Nickel-alloy steels are known to produce a more adherent scale in rolling than plain carbon steels. Some manufacturers believe that nickel in

steel causes difficulties in butt or lap welding and place a limit of a few hundredths per cent on skelp to be used for such purposes. It apparently does not adversely affect fusion welding.

Other manufacturers believe that chromium causes difficulty in butt or lap welding of steel. Chromium forms an exceptionally stable carbide and also may go into the ferrite. Manganese behaves similarly to chromium, and in view of the large content of manganese in plain carbon steels, the effect of a variation of 0.10 per cent of this element may be as great or greater than that of a change in 0.02 or 0.03 per cent of chromium. Likewise, since a higher carbon content has a similar effect, the usual variation of this element in commercial steel may overshadow the effect of such a small amount of chromium.

#### Varying Limits Set

In view of the noted strengthening effects of copper, nickel, chromium and arsenic, it would be expected that the cumulative effect of high residual contents of each of these elements would confer markedly higher mechanical properties on steel.

Copper, nickel, chromium and tin have been variously blamed for injuring deep-drawing properties. By setting a maximum limit on copper for deep-drawing steels, some mills believe they have definitely improved results. The maximum limit set, however, varies greatly. One mill has set the limit at 0.08 per cent, another at 0.12 per cent, several between 0.12 and 0.15 per cent, and some others at 0.20 per cent. The variation may be due to different requirements for deep-drawing stock. At any rate, by setting a limit on copper, the total content of residual metals is kept to a certain approximate minimum.

The business of the collection, preparation and sale of scrap has become a sizable industry. Benjamin Schwartz, Institute of Scrap Iron and Steel, says that there are approximately 1000 scrap dealers who maintain yards or places of business where scrap is gathered. These may be termed the wholesalers of the industry. Many of these dealers handle other waste materials such as nonferrous metals, rubber, rags and paper. In larger centers, there are scrap dealers that specialize exclusively in steel and iron. In normal times these yards employ about 50,000 people in the preparation of scrap. In addition to these, there are the collectors of scrap, the "peddlers," who with trucks or wagons scour the country for waste materials. In good times as many as 150,000 people are engaged in this work. Their activity in iron and

steel scrap depends upon market prices.

Assuming that 25 per cent of the outside scrap is represented by this so-called country scrap and the balance by manufacturers' scrap, that the plant scrap amounts to 27 to 28 per cent of the ingots plus castings made, and that 90 per cent of the scrap charged in converted to ingots and castings, the relative amounts of the different kinds of scrap used in the basic open-hearth would be:

Kind of scrap	Per cent of scrap in charge	
	50%	60%
Plant scrap .....	50.0	41.7
Manufacturers' scrap.....	37.5	43.7
Country scrap .....	12.5	14.6

This method of calculation indicates that in 1934 when about 16,000,000 tons of scrap was used in the basic open hearth, 2,300,000 tons was represented by country scrap.

For the most part, scrap is prepared either at the manufacturer's plant or in the dealer's yard, according to the specifications of the purchaser. This is a highly important operation. In the case of manufacturer's scrap, it is a relatively simple matter to keep scrap of various types separate and to prepare it in a manner suitable to the purchaser. So much miscellaneous material, however, comes into the dealer's yard that the problem becomes complicated, particularly in view of the great number of specifications under which scrap is purchased. A fully equipped dealer's yard uses a "drop" for breaking large pieces of cast iron, a shear for cutting up large pieces of steel, an acetylene torch for cutting up bulky steel and a hydraulic compressor for making bundles of the lighter grades of scrap.

#### Specifications Published

The department of commerce, as a result of the work of its division of simplified practice, in 1928 published a Classification of Iron and Steel Scrap. This contains specifications which include and define eight different classes of scrap for use in blast furnaces, 26 classes for use in basic open-hearth furnaces, 17 for acid open-hearth furnaces, five for electric furnaces, 13 for iron foundries, three for bessemer converters and two for miscellaneous, 74 in all. Some purchasers use these specifications, some use them slightly changed, and some have entirely different specifications of their own. The American Railway association has another set of specifications for railroad scrap which covers 37 different grades.

The problem of the intelligent preparation of scrap has been made extremely difficult by the widespread use of alloy steel and the assembly

(Please turn to Page 64)



# Industrial Requirements Accelerate Design of New Switching Locomotives

**C**ONDITIONS under which switching locomotives are operated in large industrial plants have fostered the development of locomotives specially designed for this type of work. For economic and other reasons there has been a marked tendency to break away from the conventional steam locomotive which re-

quires extra attention on the part of a fireman and is not as foolproof as might be desired under some operating conditions.

Readers may be familiar with diesel-electric types of locomotives which have come into considerable prominence during the last few years in connection with new high-speed trains. Modifications of these locomotives are used for switching purposes, (see accompanying illustration). However, the recent developments in fireless steam and butane-electric locomotives are not so well known.

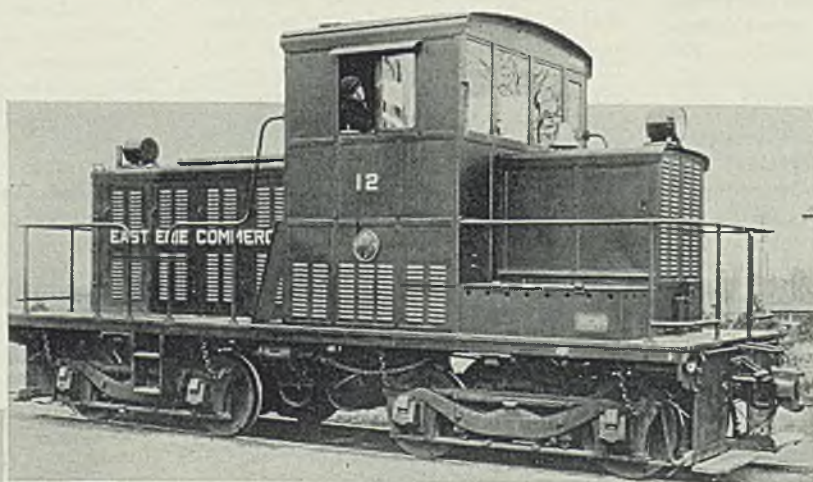
Fireless steam locomotives are not new, the first in the United States being built in 1872 for street railway

service in New Orleans. However, only since the development of large industrial plants, with the resultant necessity for intra-plant switching locomotives, have they come into any considerable use.

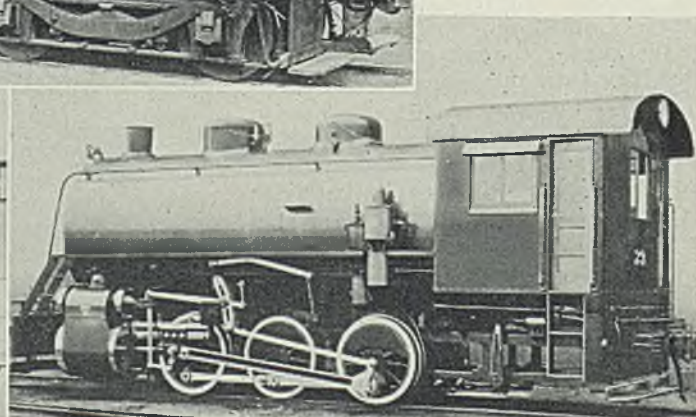
Heisler Locomotive Works, Erie, Pa., manufactures a steam locomotive without firebox or boiler. Steam for its operation is produced by spontaneous generation from a body of heated water stored in the locomotive. In the place of the boiler on the conventional locomotive, this type has a relatively large one-piece welded reservoir, equipped with a dry pipe, splash plates to keep water from surging, a charging pipe, and nozzles—nothing more. The reservoir is insulated to reduce heat losses to a minimum.

When the locomotive is ready for service the tank is filled about four-fifths full of water and charged simply by running a steam pipe from a stationary boiler to a point at the bottom of the tank where a suitable connection is provided. Thus the water is heated until the pressure and temperature in the locomotive tank are the same as in the station-

**T**HIS 57-ton diesel-electric switching unit (right) built for the East Erie Commercial railroad by the General Electric Co., is typical of the many diesel switching locomotives now in use. It is powered with a 275-h.p. diesel



**B**ELOW are shown (left) a butane-electric locomotive for steel-mill switching service, and (right) a 65-ton fireless steam locomotive for hauling ingot trains. It will average 3 hours' service on one charge of steam





any boiler from which the charge is being taken.

The energy thus stored is transmitted to the rail in the form of tractive force through the expansion of steam in the low-pressure cylinders of the locomotive. As the steam in the space above the water is drawn off to operate the locomotive, the temperature and pressure in the tank are reduced. During this reduction part of the water is turned into more steam, and this process continues until atmospheric pressure is reached and the temperature is 212 degrees Fahr. After the initial filling water is never added to the storage tank, as the steam condensed in charging continually raises the water level. In fact the reservoir has to be blown down occasionally in order to retain space for steam above the water.

#### Locomotive Easily Charged

The locomotive can be charged from any stationary boiler carrying a pressure of 100 pounds or more. It will operate from 2 to 6 hours in normal switching, depending upon the conditions of the service and the pressure available for charging. Improved apparatus developed by the manufacturer enables the locomotive to be charged in 10 to 25 minutes, depending upon the size of the locomotive, the pressure and available horsepower of the stationary boiler, as well as the quality of the steam. There is little or no danger of the locomotive running out of steam and being unable to return to the point of charging. The tank will contain sufficient steam for that purpose long after the pressure has fallen to a point where no cars can be hauled.

Locomotives of this type are built in sizes ranging from 5 to 90 tons,

designed to operate under pressures up to 350 pounds. They are built for all gages of track. Hauls of several miles in length and trailing loads of hundreds of tons offer no difficulties to the larger sizes. Maintenance and operating costs are low.

#### Butane-Electric Type Designed

A newcomer in the field of switch engines which has undergone its first years of successful test, is the butane-electric type of locomotive. The first locomotive of this type was purchased about a year ago by the Acme Steel Co., Chicago, from the Plymouth Locomotive Works, Plymouth, O. This 65-ton locomotive, powered with two Climax engines, modified for butane fuel consumption, with electric traction equipment by the General Electric Co., has the advantages of smooth and rapid acceleration and low maintenance cost. Butane was selected as the fuel because it could be purchased at almost the same price as diesel oil and could be used in equipment which was approximately 30 per cent lower in initial cost.

The design of the locomotive is such that maximum visibility is obtained by the single operator required. Overall length, exclusive of the coupler knuckles, is 40 feet; width is 10 feet; and the height over the cab is 14 feet. The two Climax engines are of the 8-cylinder, 6 by 8-inch heavy-duty type and are designed to produce 253 horsepower at 1200 revolutions per minute. A General Electric direct-current generator, having a continuous rating of 290 amperes at a nominal voltage of 500, is directly connected to each of the engines through heavy thermoid couplings. The truck motors are mounted directly under the genera-

tors, a pair to each of the two trucks. These motors develop 115 horsepower for an hour at a nominal voltage of 250. Each is connected to its axle through a single-reduction gearing of 81 to 16 ratio.

The adaptation of the Climax engines for butane consumption included a change in compression ratio and modified carburetion features. Butane is loaded into two 125-gallon fuel tanks as a liquid, but at approximately 10 degrees Fahr. and above the vapor pressure of the liquid forces the fuel, as a gas, into the mixing valve of the engine. The locomotive is reported to consume an average of 10.75 gallons of fuel and 0.1-gallon of lubricating oil per hour of heavy-duty switching service.

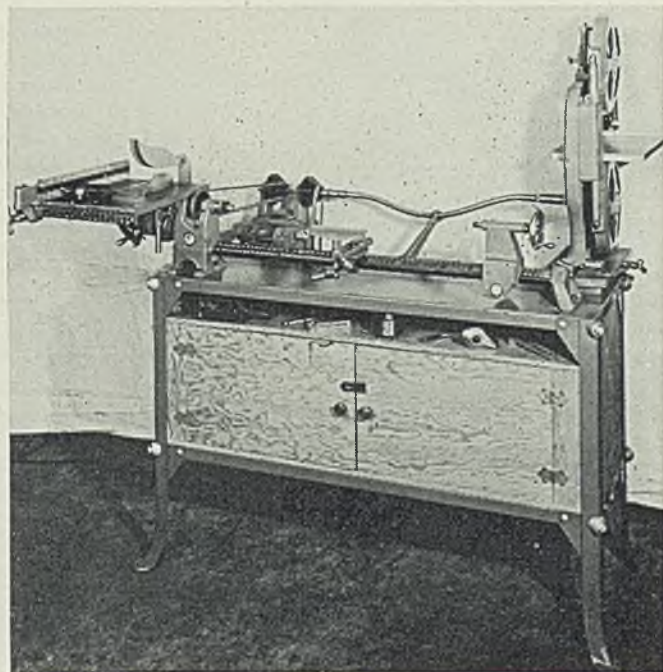
The latest type of electrical control equipment is used, incorporating safety devices which prevent abuse of the equipment. The locomotive will develop tractive efforts beyond 40,000 pounds and has a continuous tractive effort rating in excess of 13,000 pounds, the builder states. Maximum safe speed is 35 miles per hour.

## Increases Molten Metal Supply in Small Cupola

Confronted with the necessity of collecting a larger supply of molten metal in the well of a small cupola, an ingenious West Coast foundryman solved the problem by lifting the existing shell and lining from the foundation plate and inserting a cast iron ring 5 inches in height between the shell and the bottom plate. The ring then was lined with brick to conform with the remainder of the lining in the cupola.

## Die Cast Parts Feature Novel Machine

*A COMPACT workshop for the home craftsman is contained in the Walker-Turner Add-A-Tool which performs wood and metal turning operations as well as mortising, drilling, shaping, grinding, sawing, buffing, carving, boring, grooving, polishing, sanding and routing. The entire equipment is made up of units so that the user may add separate tools to his machine as his needs dictate. Liberal use of zinc alloy die castings, 39 in all, has eliminated much costly machining in the production of these machines, which are manufactured by Walker-Turner Co. Inc., Plainfield, N. J. Illustration courtesy New Jersey Zinc Co., New York*





# Surface Treatment

## Reviewing Some Pertinent Facts Concerning Aluminum Paint

**M**OST manufacturers are familiar with heat and light reflecting properties of aluminum paint. There is some confusion with regard to vehicles and the amount of aluminum powder which should be used in the vehicle. Because of the popularity which aluminum finishes enjoy, many vehicles have been brought forth, of varying quality. Unfortunately, the very virtue that makes aluminum powder such a good pigment, namely its "leafing" property, lends itself to the advantage of all vehicles, as far as initial appearance is concerned. Only after the finish begins to turn yellow, peel or the aluminum powder begins to rub off, exposing the vehicle, if there is any vehicle left to expose, does the inferior vehicle reveal itself.

### Types of Vehicles Reviewed

Several types of vehicles have stood up under the tests of laboratories and field service. The first and most rugged type is the high-bake varnish or synthetic vehicle. This type of finish is adherent, resists corrosion well, and has long life. When used in conjunction with a chemical surface treatment, it produces a highly corrosion-resistant finish on steel.

Baking, of course, is not always feasible and the use of a good spar varnish will produce a finish which compares favorably with that produced by the high-bake vehicles. For indoor finishes, many clear lacquers can be used but it is recommended that a good grade of lacquer, which

can be used by itself for a clear coat, be used. Many manufacturers have found that their best clear lacquer is the best lacquer for aluminum.

Recommendations for the amount of aluminum to put in the vehicle vary widely. One large consumer of aluminum paints conducted exhaustive tests and from them recommended a maximum of  $1\frac{1}{2}$  pounds and a minimum of  $1\frac{1}{4}$  pounds of aluminum powder per gallon of vehicle. The same proportion holds for the aluminum pastes, despite the fact that there will be a little less aluminum in the resultant paint.

### Advantages of Pastes

Aluminum pastes have several advantages over the dry powder. When the paints are mixed, the atmosphere is not clouded with floating aluminum as is the case when dry powder is used. Aluminum pastes usually have a finer texture which produces a smooth, glossy satin finish which is not possible with the dry powders. This, of course, may not be desirable in some cases. In aluminum paste the pigment is already wet and much time is saved in the mixing.

All aluminum paints lose their "leafing" properties after they have been in contact with the vehicle for a few hours. This is probably due to the "wetting" of the aluminum particles by the vehicle. This theory is borne out by the fact that certain solvents, such as ether, when added to a freshly prepared aluminum paint will immediately throw down

the pigment and the paint is in the condition that it would ordinarily require several hours to attain. There has been considerable research on this subject and some progress has been made.

By using an inhibitor to prevent the loss of leafing power, aluminum paints have been prepared which have retained this property for three months in the can with no indication that they would lose it in the near future. However, this department has not seen enough evidence, as yet, to make any definite recommendations and consumers of aluminum paints are well advised to continue the practice of mixing daily batches. The practice of mixing small proportions of the previous day's leftover paint in the fresh paint is not recommended.

Aluminum paints can be tinted to obtain pleasing effects. The following examples are for use in varnish vehicles only. By adding  $\frac{3}{4}$ -pound of white lead to a gallon of aluminum paint prepared as above, a battleship gray effect is obtained. The same amount of red lead will produce a rose tint. Six ounces of brown oxide, 18 ounces of chrome yellow or 18 ounces of chrome green each produce pleasing tints when added to a gallon of aluminum paint containing  $1\frac{1}{2}$  pounds of aluminum.

## Electric Heat Simplifies Chromium Plating Control

The chromium plating of machine parts which must be held to close dimensional limits necessitates close control of the plating conditions. To keep the plating solution at the proper concentration is comparatively simple. The same can be said for the current density.

The problem which furnishes the



# and Finishing

greatest difficulty is that of regulating the temperature of the solution. Heat is required only during the initial plating period. After the bath is in operation for about an hour, no further heat need be applied because the electrical energy in the plating process is sufficient to maintain the proper temperature satisfactorily.

A satisfactory method of applying preliminary heat is by means of electrical immersion heaters. These heaters are usually installed in the four corners of the tank and equipped with thermostatic control. To prevent attack by the chromium solutions the heater units are sheathed with lead.

Heaters of this type have been used in one plant for a year and a half with excellent results. The installation cost was considerably below the

cost of other types of heating equipment. The electrical heat, thermostatically controlled, is used only when it is needed, supplying automatic recuperation when the temperature falls below the predetermined limit.

## Process Improves Corrosion Resistance of Zinc Surfaces

A new process which, it is believed, will greatly extend the uses of zinc by insuring corrosion protection in severe applications, has been announced by the New Jersey Zinc Co., New York; the procedure to be known as the Cronak process.

The process involves the commercial production of a visible protective coating on zinc or cadmium, and on zinc

or cadmium coated metals, which materially reduces the corrosion rate and prevents the formation of white corrosion products under many conditions where they would otherwise form. The process has been patented by the company, but its use is allowed through license agreements.

The method of producing this film is simple, involving a short immersion in an inexpensive solution of sodium dichromate and sulphuric acid in water. The film gives the metal an appearance not unlike brass, with a greenish-brown iridescence. An immersion of from 5 to 10 seconds will produce a brown coating on zinc alloy die castings. A shorter immersion from 1 to 5 seconds produces a lighter iridescent coating. Fortunately for industrial production practice, the color and its corresponding weight of coating is a direct indication of its protective value.

Certain difficulties encountered in zinc alloy die cast carburetors and automobile locks were attributed to the presence of white corrosion products. The Cronak process has been used generally on these parts for over a year now and has successfully removed the factor of white corrosion products and the possible causes of this difficulty.

The principal commercial application of the process on zinc coatings is on the brake parts of the 1936 models of one of the high-production automobiles. Of course it is again, in this case, too early to forecast the added life afforded by the use of this process, but it has been of undoubted benefit through the past hard winter.

The process, however, is of considerable importance in the field of zinc coated steel. By actual test it is reported to extend the life of zinc coatings by at least 40 per cent.

## Executes Large Screen in Porcelain Enamel on Steel

**W**EIGHING 400 pounds, and measuring 9 feet high and 12 feet wide, this "Warrior Screen" depicting an African devil dance is said to be one of the largest projects ever completed in porcelain enamel. Since its completion by youthful ceramic sculptor Russell Barnett Aitken, New York, it has been on display in the Walker Gallery, same city. The vari-colored porcelain enamels are fused on Armco ingot iron manufactured by American Rolling Mill Co., Middletown, O., the work being done in a special oven in the plant of W. A. Barrows Porcelain Enamel Co., Cincinnati. The screen consists of four panels, each 3 feet wide, joined with bi-way hinges. Sides of each section have a 1-inch 90-degree flange with corners welded, making the overall metal size of each section 36 x 110 inches. Eight figures are represented; two are Africans beating tom-toms, six are warriors doing the devil dance. They are sculptured in chocolate brown, off-white, turquoise and cerulean blues, and accents of vermillion and black. In spite of the size of the panels, no warping or other difficulties were encountered in fusing the enamel to the iron.





# Engine Performance Places New Demand on Valve Steels

**O**VER the past few years, a tremendous change in automotive engine performance has taken place. Since 1925 maximum brake horsepower has increased 90 per cent; horsepower per cubic inch, 75 per cent; compression pressure, 60 per cent; revolutions per minute, 33 per cent; and compression ratio, 40 per cent. All this has been accomplished with a displacement increase of only 10 per cent.

This step-up in engine performance has made the requirements for valves and valve steels increasingly severe until the point was reached where the development of new materials became imperative. Perhaps 60 per cent of the passenger cars have experienced little valve trouble because they are never driven hard, but the remainder, and all trucks, buses and tractors, have encountered trouble.

About three years ago, when the valve problem became acute, the Ludlum Steel Co., Watervliet, N. Y., started intensive research work with a view toward improving its steel which had been standard for valve manufacture for many years. As a result of this research, the company recently announced a new series of steels under the trade name designation of Silcrome X (STEEL, March 30, page 50), to replace the standard Silcrome No. 1. Steels of this new series are now being used by Thompson Products Inc., Cleveland, for the manufacture of valves.

## Requirements Are Rigid

Some of the important properties of a satisfactory valve steel are high strength at heat; good red hardness; high critical temperature; corrosion and oxidation resistance; low coefficient of expansion; good impact value; low cost; satisfactory mill handling; ability to harden; good forgeability and machinability; and uniformity. No steel possessing all these requisites has ever been found, it is stated.

Although Silcrome No. 1 met most of these requirements, its greatest weakness was low strength at heat, and only fair corrosion and oxidation resistance as they are known today. The several steels in the new series vary greatly in properties, but each has its use in some particular field. The manufacturer drew upon aircraft experience for some of the steels, for in aircraft work the best

is used in every instance. Many heavy-duty automotive engines use aircraft steels.

Silcrome XB, one of the new series, is a steel of the ferritic hardenable type, and is claimed to be superior to Silcrome No. 1 in several properties. Its hot strength at 1600 degrees Fahr. is over 50 per cent above that of Silcrome No. 1, which is highly advantageous. It has corrosion and oxidation resistance comparable with the austenitic steels, and the tip can be hardened, as well as the retainer neck on those valves not of the tongue-and-groove type.

This steel has one peculiar property. One range of nickel and silicon produces an analysis which resists the collection of carbon and other deposits to a high degree. Varying the range of these two elements causes the steel to lose this highly desirable property.

The steel is comparatively low in price, producing valves of better quality than the present Silcrome at approximately the same price. It is recommended for automobiles and light trucks, and has the same coefficient of expansion as Silcrome.

## Pneumatic Sander



*CLEANING excess weld metal from steel rails is only one of the many uses to which this rotary sander is put in the maintenance shops of the Cleveland Railway Co., Cleveland. Built by the Cleveland Pneumatic Tool Co., Cleveland, this portable sander finds many similar uses in industrial maintenance and production*

Silcrome X-10 is an austenitic steel of the 18-8 type. Its advantages over Silcrome 1 are said to be found in strength at heat, which is about 17,500 pounds per square inch at 1600 degrees Fahr.; good corrosion and oxidation resistance; good work hardening properties; and fair seat hardness at heat. Being austenitic, it cannot be hardened by heat treatment, and has the austenitic coefficient of expansion.

In some cases, tappet clearance must be increased, but good tests have been obtained with Silcrome No. 1 clearance. Tips work harden well, and no additional tip is needed in L-head engines, but is recommended for overhead engines.

Austenitic steel is more difficult to handle in mill and shop practice. However, the steel is produced at the mill without many defects found in ferritic steels, particularly hair-line seams. Valve quality is better because of this fact. Being austenitic, the steel has no critical temperature and warpage is minimized.

Silcrome X-10 is recommended where strength is important, such as in heavy-duty automobile engines, light trucks and tractors, and light-duty diesel engines.

## High Tungsten Content

Another in the series, Silcrome X-9, is stated to be a fine all-around valve steel. It is an aircraft steel and has well over 20,000 pounds per square inch strength at 1600 degrees Fahr.; corrosion and oxidation resistance are excellent; impact value is high; and it work hardens. Being austenitic, it cannot be hardened by heat treatment, and has the austenitic high coefficient of expansion.

This steel has a high silicon and tungsten content, and is difficult to handle in mill and shop practice. It takes a stellite seat readily, which is a distinct advantage over the ferritic steels. Silcrome X-9 has a tightly adherent scale, which resists flaking up to 2000 degrees Fahr. It wears well in the guide, but must have fair lubrication. All austenitic steels indent on the seat to a greater degree, but the greater corrosion and oxidation resistance make this a superior steel.

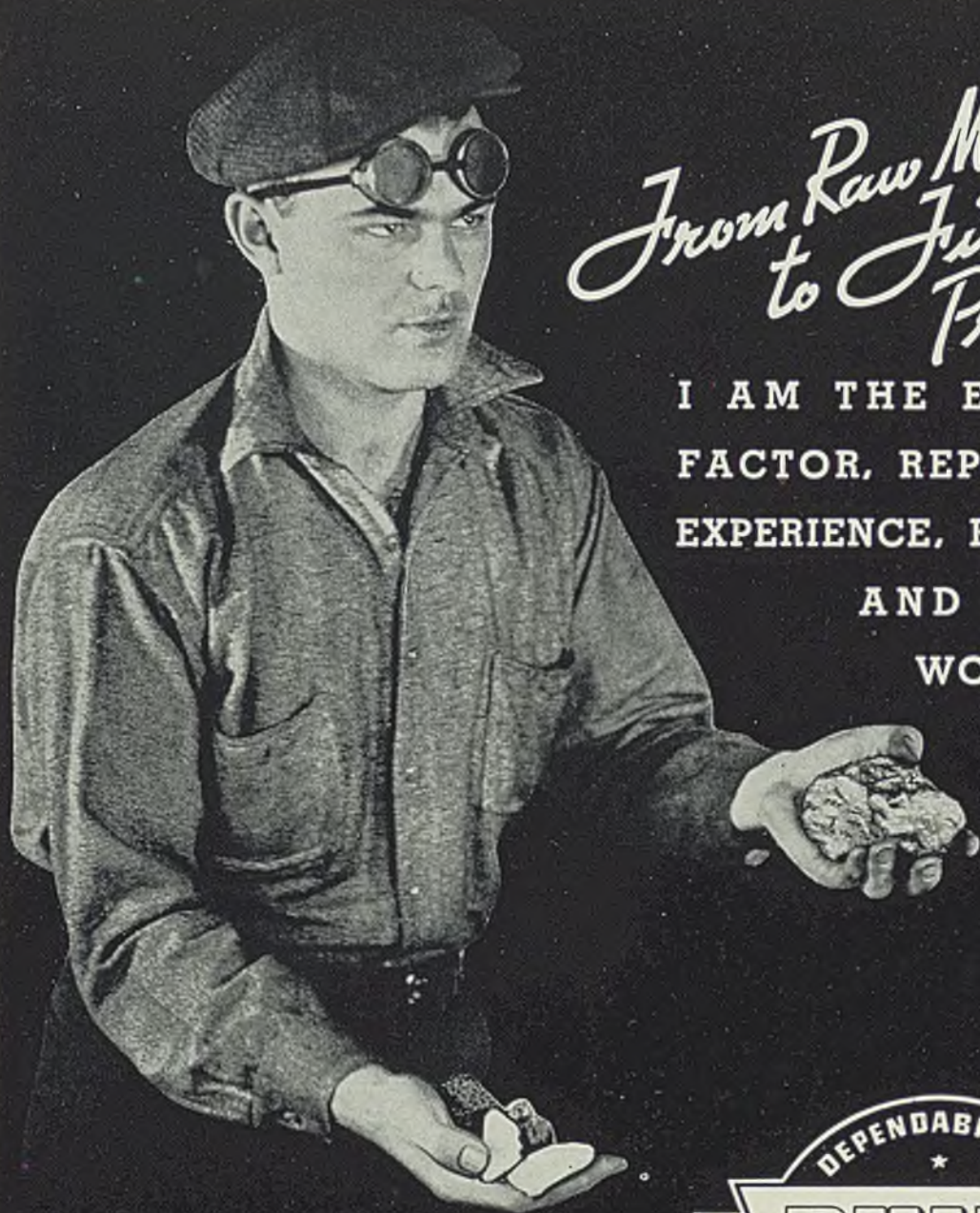
This steel has been on the market for some time as Aerotype or heavy-duty valves, these valves having a stellite seat. It is used in aircraft exhaust valves and in heavy-duty trucks and buses. It is recommended for the most severe service, and when stellite seats are used, many cases of over 100,000 miles of severe operation have been reported, with the valves still in good condition.

Although there are several variations of the Silcrome X-9 analysis, varying slightly in the range of elements, the X-9 is claimed to be the superior analysis.



*From Raw Material  
to Finished  
Product*

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EXPERIENCE, KNOWLEDGE  
AND PRIDE OF  
WORKMANSHIP



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Canton, Ohio*



# Methods and Materials



## Rapid Grinding Technique for New and Damaged Carbide Tools Demonstrated

A SERIES of educational demonstrations in various cities, showing an improved technique for grinding carbide tools, recently has been completed under the direction of Carboloy Co. Inc., Detroit. This improved technique is of interest to users of carbide tools because of the drastic reduction in tool grinding time made possible.

Examples of the short periods now required to grind various types of carbide tools are shown in the accompanying illustration. The  $\frac{3}{8} \times 1\frac{1}{4}$ -inch tool shown at A is typical of one dulled through ordinary use. It requires regrounding on the front and side clearances only. The average time required to resharpen completely a tool of this type, following the latest procedure, as shown at the demonstration, is between 2 and 3 minutes.

### Other Types of Tools Ground

A "milled and brazed" carbide tool is shown at B. Milled and brazed carbide tools are those released by the manufacturer directly after the carbide tip has been brazed to the steel shank. Such tools require complete grinding on all surfaces at the cutting end of the tool, and ordinarily to grind a  $\frac{3}{8} \times 1\frac{1}{4}$ -inch tool for example, would require from 1 to 2 hours. Under the new procedure, a tool this size can be conditioned completely in  $4\frac{1}{2}$  to 7 minutes.

This reduced grinding time is also found to be of benefit in the case of carbide tools chipped through accidental abuse, such as at C in the illustration, a  $\frac{1}{2} \times \frac{3}{4}$ -inch tool of this type chipped to a depth of about  $\frac{3}{16}$ -inch. Frequently a tool in this condition might be considered a total loss and scrapped, due to the excessive amount of time required to recondition. Using the improved technique it is stated that this tool can be completely reground in about 3 minutes.

Demonstrations revealed several

features important in making possible such drastic reductions in the time required for grinding carbide tools. These include: (1) Proper dressing of grinding wheels for rapid grinding; (2) the maintenance of constant motion of the tool while grinding; (3) the use of double or composite angles in the tools, and (4) alternate grinding on the carbide tip and steel shank when necessary to hog off large amounts of stock, as in the case of chipped carbide tools.

Regarding the first requirement—dressing the grinding wheels—the procedure followed for the roughing and semifinishing operations on the face of a cup wheel, or on the periphery of a straight wheel was to shape a slight crown about  $\frac{1}{16}$ -inch high on the wheel. The area of contact thus is held at a minimum and excessive generation of heat avoided. The face of a cup wheel dressed flat, as usual, was recommended for finish grinding.

The second factor—maintenance of constant tool motion—involved the steady motion of the tool across the surface of the wheel, and also the use of a rocking, or tilting, motion of the tool from side to side

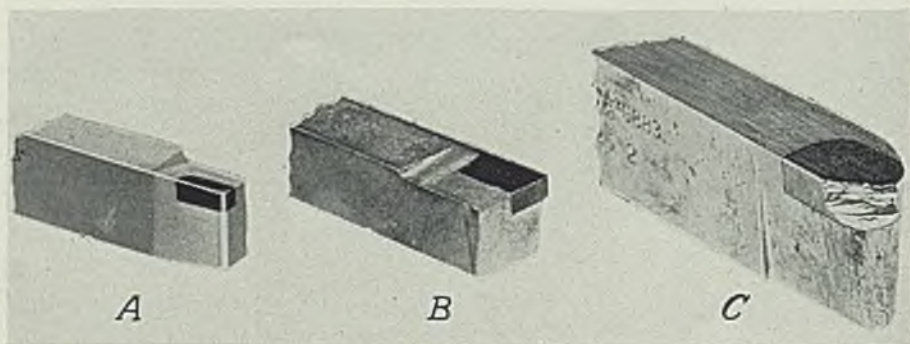
while roughing and semifinishing. This avoids excessive grinding at any one spot on the tool and provides further means of avoiding excessive heat—an important factor if rapid grinding of carbides is to be accomplished successfully.

The third requirement—the use of double, or composite clearance angles on the tool—was another feature of importance. When rough grinding, the use of an angle 4 degrees greater than the finished angle desired was recommended. Finish grinding then is completed at the desired angle, grinding on the carbide tip only. By following this procedure no finish grinding on the steel shank is required, and the wheel remains open and free cutting for longer periods. This permits more rapid grinding and tends to produce a better finish.

### Alternate Grinding Required

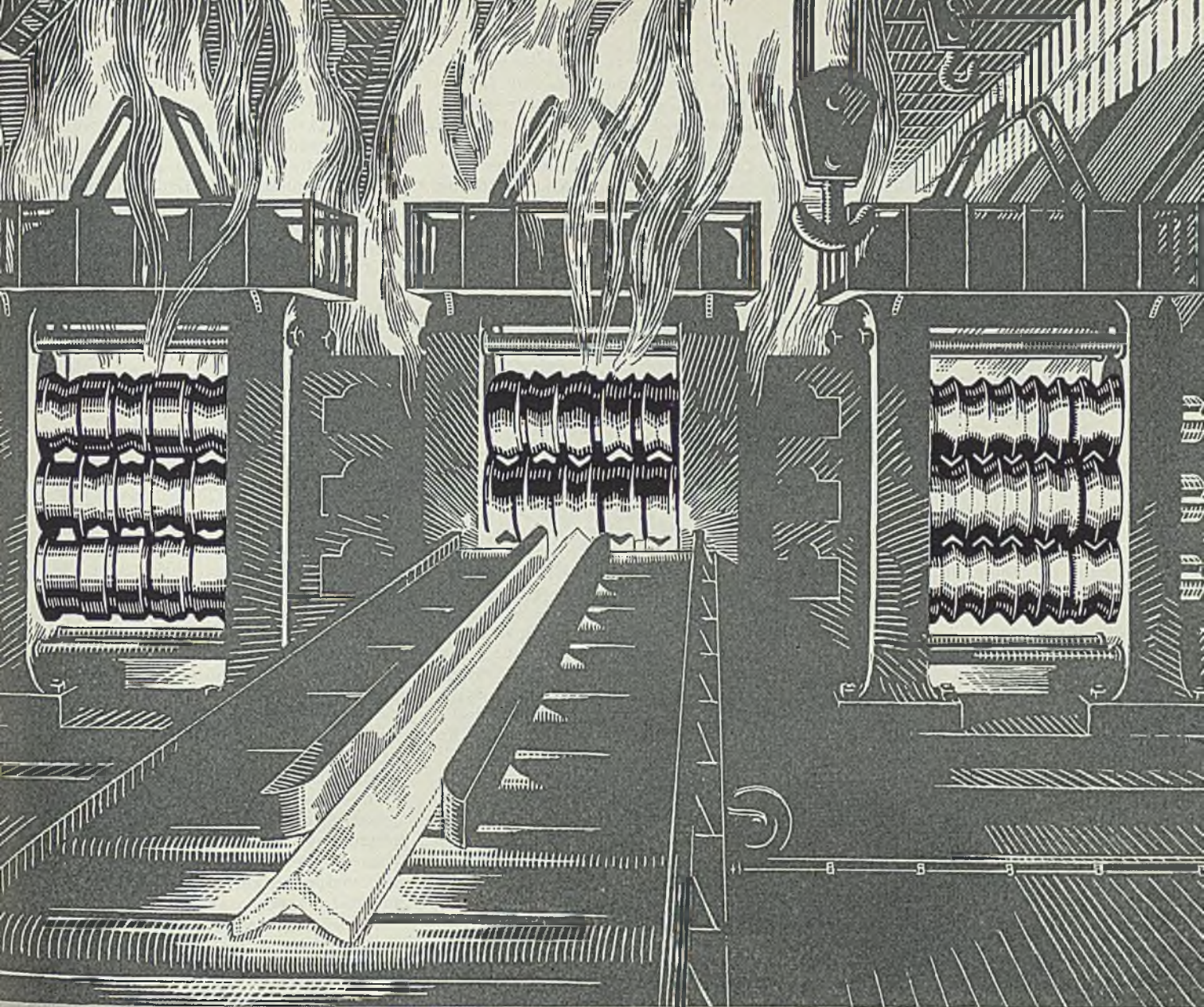
The fourth requirement—recommended when necessary to hog off large amounts of stock rapidly—involves alternate grinding first on the steel shank, then on the carbide tip, continuing in this manner until the desired amount of stock is removed. Steel naturally loads silicon carbide wheels (made specifically for grinding carbides) more rapidly than ordinary wheels, whereas carbide tips tend to dress the wheels. By alternating first on the steel shanks and then on the carbide tip, more rapid grinding is possible.

Of course, ordinary aluminum ox-



*Remarkable savings in grinding time for carbide tools such as these recently have been accomplished. The tool A is typical of one dulled through ordinary use; tool B is a regular "milled and brazed" new tool; C is a tool chipped through accidental abuse*





## PHOENIX ROLLS IN SERVICE

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PITTSBURGH, PA.





ide wheels can be used to grind on the steel shank when desired. However, in such cases, care must be used to avoid contacting the carbide tip.

Naturally, other factors are involved than the four described above, such as use of proper wheel's, correct machines, fixtures and the

like. However, the four factors described above constitute the important features of the rapid technique demonstrated on the various types of tools.

Carbology company announces that a comprehensive booklet outlining this new technique will be available shortly.

at the elevated temperatures and even a slight amount of abrasion is involved from the wear of the small parts. These conditions impose severe service requirements upon the steel.

The belts are fabricated from cold rolled stainless steel strip containing 17 per cent chromium. An interesting feature of the fabrication is the manner in which the edges are notched and the remaining portion bent up at a 90-degree angle. This forms a flange which prevents the parts from falling from the conveyor.

## Metal Counters Replace Unsightly News-Stands on Chicago Sidewalks

**C**HICAGO's news-stands are going swanky! Through the efforts of the Chicago Newspaper Publishers association, 3000 stands within the city limits—mostly wooden ones and many of them dilapidated and unsightly—are being replaced by neat, steel counters.

By purchasing the stands in large quantities and selling them at a discount to the operators on a time-payment plan, the association is able to provide a better and less expensive product than could be obtained by the news sellers through individual purchases. The association pays \$29.45 for each stand. The operator buys it from the association for \$19.45, paying 45 cents down and 50 cents a week for 38 weeks.

A change in a city ordinance last fall permits the use of a larger unit than formerly. The new stands are 50 inches wide, 32 1/2 inches deep and 49 inches high at the back. A steel canopy, hinged to the top of the back panel and dropped down when not in use, may be swung into place and, with side curtains, provides protection to papers during inclement weather.

Weighing 250 pounds each, the manufacture of this equipment will

require nearly 400 tons of steel. The stands are being fabricated by the Morton Mfg. Co., Chicago. Cold-rolled sheets make up about 98 per cent of the total weight of the units, the remainder being mostly channels, angles and pipe. The stands are formed with rounded corners both as an appearance factor and in order to prevent injury to pedestrians. An offset base is employed. The stands have a black, baked enamel finish trimmed with red striping. An additional dash of color is provided by the striped side curtains.

### Stainless Conveyor Belts Meet Severe Requirements

Stainless steel conveyor belts now are used for carrying small parts such as cap screws, dies, spikes and similar items through continuous annealing furnaces. Temperatures are high, ranging from 600 to 1400 degrees Fahr.

The belts must pass through an alternating heating cycle from room temperature up to red heat and they must withstand the constant bending stresses set up as they pass around the end rolls. They must resist oxidation

### Sealing Compound Heated With Electric Elements

In the manufacture of a refrigerator cabinet certain joints around the top are sealed with a heavy black tar-like compound. The compound is heated to about 300 degrees Fahr. and at this temperature it becomes a liquid which is poured from the ladle into the joints and seams. This operation is part of the production line and must be performed as the boxes move along a conveyor past the melting pot. One plant has five such stations at each of which a considerable quantity of compound is kept at the required temperature.

Until recently these pots were heated by a method which caused the compound to overheat and boil over. This constituted a fire hazard while the dirt, smoke and fumes from the burning compound and the escaping heat made for poor working conditions. Electric heat was suggested, but because of the poor heat conductivity of the compound it was feared the electric heating element would build up an excessive temperature.

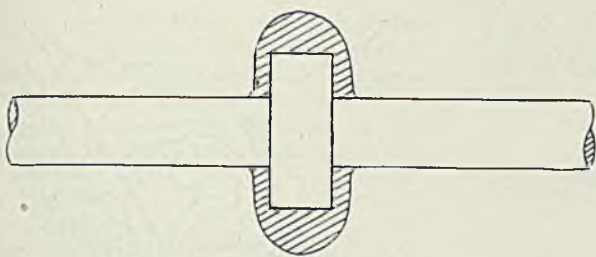
However, a 2500-watt, 7-foot tubular sheathed heating element was bent and placed in an insulated pot as an immersion heater. Sheets of heavy copper were brazed to the sheath and in this way the surface

—Courtesy Editor & Publisher



*THE unsightly type of news-stand, left, is rapidly becoming a memory as the new steel counters, right, grow in popularity*





*Two pieces of steel are resistance welded and upset to make this valve stem. The shaded portion is machined away to form the collar*

area was increased sufficiently to keep the element temperature below the smoke point of the compound.

A thermostat to control the temperature and a box on the side to hold the ladles and keep them hot completed a neat and most satisfactory melting pot. The objectionable features of the former method of heating were eliminated and the compound was held at the proper working temperature at all times.

## Piping Welds Withstand Corrosion from Inside

In many industrial piping systems, internal corrosion is as much a problem to contend with as exterior corrosion is in pipe lines laid underground. Recent laboratory tests are said to have indicated clearly that welds can be counted on as equal to the pipe regardless of whether corrosive attack comes from the inside or outside.

Records of welded piping in chemical plant service testify to this same conclusion. In mile upon mile of welded line in various plants of one large company, the welds have been forgotten insofar as they are considered as joints. In all manner of service—high pressure, high and low temperature, conditions of alternating pressures and temperatures and handling corrosive fluids—the oxy-acetylene welds are counted on for the same permanent tightness and strength as the pipe itself and meet these requirements without exception.

## Valve Stems Made By Upset Welding

ONE type of automotive valve stem which has a collar part way down the stem that is much larger in diameter than the stem itself now is being produced by upset or forge welding in an electric resistance welding machine. The method is simple and results in a substantial saving in time and material, according to an article appearing in the March issue of *Flashes*, published by the Thomson-Gibb Electric Welding Co., Lynn, Mass.

At one time it was the practice to machine the entire stem out of a

length of stock slightly greater in diameter than the finished size of the collar, and since the stems are produced in large quantities, the waste in time and metal involved in reducing the stem to size was an important item.

By the electric resistance welding method, two lengths of steel slightly

larger than the finished size of the stem are placed in a butt welder built by the Thomson-Gibb company and forced together until the ends upset or bulge enough to produce a lump large enough to provide for the collar. This is illustrated in the accompanying sketch. Only a few minutes is required to machine away the excess metal and turn out a finished stem complete with collar. The shaded area represents the upset which is machined away to form the collar.

The new type stems are claimed to be, if anything, stronger than the old one-piece type, for metal which has been resistance welded is known to be as strong and often stronger than the parent metal.

## Arc Welded Steel Saves Weight in Construction of British Diesel

DOUBLING the power of the *SILVERLARCH*, motorship, without increasing the size of the power unit was recently accomplished by J. L. Thompson & Sons, Sunderland, England. The new engine is a double-acting two-stroke four-cylinder diesel with a 27½-inch bore and 47½-inch stroke. Rated 4000 brake horsepower at 109 revolutions per minute, it actually develops 4400 brake horsepower.

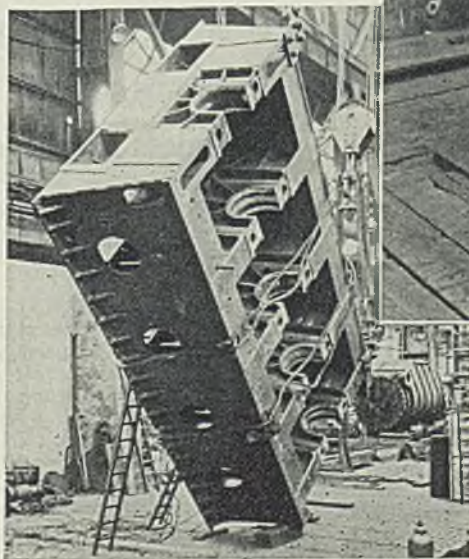
Economy of weight and size was effected by the use of arc welded steel for the major parts. In the construction of the bedplate a saving of 14½

tons was made. This piece, of the tank-top type, is 22 feet 6 inches long, 14 feet wide, and 5 feet 4 inches deep. It weighs 29½ tons.

Steel plates were welded to the cast steel bearing housings which were then fixed in place in the bedplate. The bottom plate consists of two lengths of steel plate double butt-welded together longitudinally and welded integral with the bedplate for maximum rigidity. The main columns were formed of a minimum number of steel plates welded into a unit.

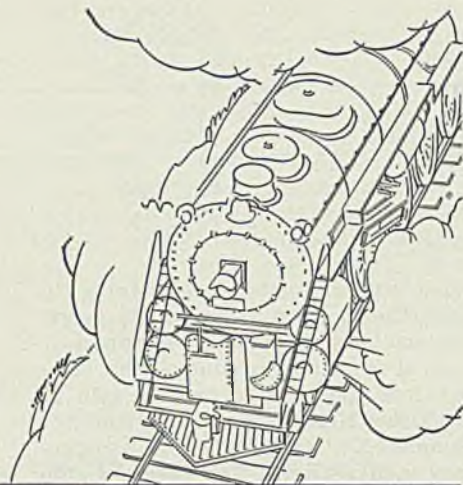
Welds were made in two passes,

*Welding steel plates (right) to bearing housing prior to installation in bedplate of new engine*



*Arc welded steel bedplate (left) for new engine with bottom, side and end plates in place and bearing housings inserted*





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with  $\frac{1}{4}$ -inch and  $\frac{3}{8}$ -inch electrodes used on the butt welds and  $\frac{3}{8}$ -inch and  $\frac{1}{4}$ -inch electrodes for all others. Welding was done by the shielded arc process on machines supplied by the Lincoln Electric Co., Cleveland.

## Test Supply Data for Improving Bridge Design

Improvement in the design of the lower chord members of the Kill van Kull Bridge to prevent danger of failure by buckling of the cover plates, was made possible by co-operative tests conducted by the Port of New York Authority and the national bureau of standards, Washington using the 10,000,000-pound compression machine in the engineering mechanics section of the bureau.

The bridge department of the Port of New York Authority, when designing this bridge, which connects Port Richmond, Staten Island, with Bayonne, N. J., used large double-box type compression members (made of carbon-manganese steel) in the lower chord. The width of these cover plates was large compared with their thickness, and as it was known that compression members of steel structures sometimes fail by buckling of outstanding legs of angles or of wide thin cover plates, the port authority requested the co-operation of the bureau in a study of the behavior of these lower chords under load, particularly to determine whether buckling of the cover plates would cause failure of the members under loads less than their estimated strength.

Two columns were tested and it was found that the lateral deflection was small until the stresses were nearly the maximum. Under a stress of about 38,000 pounds per square inch the two cover plates began to buckle for their entire length. The results were in substantial agreement with what happens when wide plates in ships are subjected to a compressive load, and the same formula applies in both cases. These tests gave the data on which to base a new design that utilized to better advantage the high strength steel out of which the bridge was constructed.

## Cadmium-Plated Forged Alloy Steel Plier Set

Four types of special forged alloy steel pliers are being produced by the K-D Mfg. Co., Lancaster, Pa. These cadmium-plated and rust-proofed pliers are  $4\frac{1}{4}$  inches long and weigh five ounces each. The standard, parrot, needle and flat nose types are offered, in a metal box. They are suitable for ignition, electrical and radio work, model making and household use.

# Welding, etc. . . .



by Robert E. Kinkead

## What Lies Ahead?

**M**ECHANICALLY inclined young men ask about future possibilities in welding, and inquire whether progress will level off as it has in the case of other technical processes. No one knows the correct answer. But engineers will need some method of fastening pieces of metal together for some time to come and welding or something analogous to it will be used. Welding knowledge shows no signs of becoming static at present.

Recently a scientist employed what has been called a "molecular hammer" to weld metals together at temperatures far below what is now called welding temperature. That very term will have to be abandoned. This idea alone might change many metalworking processes.

Ideas are being worked out to coat pipe inside and outside with chrome-nickel alloys which are noble metals to about the same degree as gold and platinum. That would change the pipemaking industry. Magnesium alloys are being welded and that has implications in aircraft. Glass is being suggested as a suitable material for houses. Welding has implications there, although glass was being welded successfully long ago.

So long as an automobile, airship, locomotive, or building cannot be made all in one piece, there will be a need for some method of fastening materials together and that will involve some form of welding, though not necessarily in the present conception of the term.

## No Discount

**N**CESSITY for discounting the behavior of welds with reference to the behavior of the original and unwelded metal is a source of serious difficulty for the mechanical designer. The best cure for the trouble is to use standard types of welds of known properties which do not need to be discounted. In carbon steels and low alloy steels, the necessity for discounting weld behavior may be eliminated, provided the welding procedure is fixed.

If weld behavior under stress has

*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.*

to be discounted at all, experience indicates that no one is capable of saying how much it has to be discounted in each of the widely different service conditions to which it may be subjected. The case of intermittent fillet welds commonly used in structural steel welding illustrates the point. Where the load is pure static, ordinary breakdown tests of fillet welds with direction of load transverse to the long dimension of the fillet will produce reliable data on which weld behavior may be predicted. The presumption here is that the fillet will break before the original members and that it may be relied on to break at some percentage of the load necessary to break the original members joined by the fillet weld.

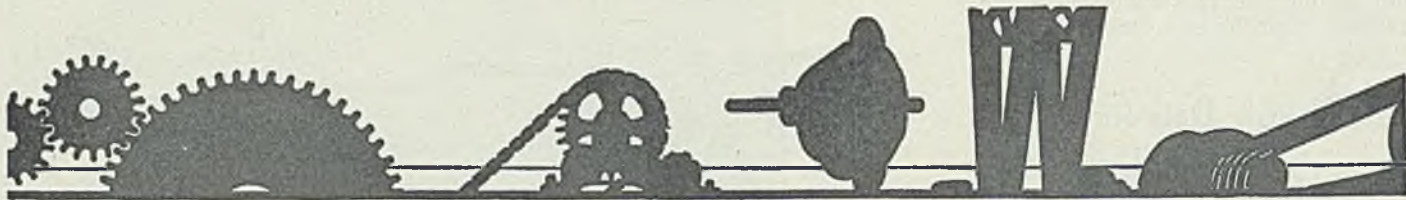
But if the element of repetition of the load is present, and it usually is to some degree, the data previously mentioned are unreliable. New data must be prepared on the basis of repetition of the load to permit proper discounting of the weld behavior. Fillet welds, repeatedly loaded transversely, have to be discounted more than if the loading is merely static.

By using only welds which do not need to be discounted with reference to the original metal, the designer may dodge complications which otherwise might be serious. It is known, for instance, that repeated application of high stress will cause a riveted joint to become "loose". The rivets work loose but the joint holds together. A welded joint does not behave that way. When the weld starts to tear, it tears completely apart.

Discounting weld behavior is the result of mental habits developed in the design of riveted structures. The plain fact is that the designer should not treat welding in the same way that he has previously treated riveting.



# Power Drives



## Power Factor Correction

**I**N PLANTS with a large number of unit induction motors installed on fluctuating loads such that the motors operate underloaded a large proportion of the time, low power factor penalty may be an additional power expense. Properly planned and designed group drives generally operate at a power factor above the penalty point.

Synchronous motors on air compressors, centrifugal pumps and other equipment where low load at starting is applicable is one of the common methods of correction. Such motors have three definite advantages although higher in first cost than induction motors:

1. They not only operate without power factor losses but also can correct power factor within capacity.
2. They operate at higher efficiency at full load than other motors, which permits operating economies on drives requiring a steady, heavy load and using considerable power.
3. They provide better voltage regulation, especially when located at the end of a power circuit feeding underloaded induction motors or carrying disturbing induction loads.

### Synchronous Induction Motors

Where synchronous motors are not applicable a special type of synchronous induction motor may be installed on lineshafts and other heavily loaded drives to give some correction. These motors have special windings which enable them to be started as induction motors, thus picking up the load, and then to be shifted to separate windings to operate synchronously. Thus these motors operate with the combined advantages of both induction and synchronous motors. Naturally it is desirable that such motors be used on drives which provide a steady full load to take full advantage of the previously mentioned synchronous characteristics. Such motors are obtainable in the range of induction motor ratings.

Where neither of these methods of correction is applicable condensers are used for correction.

The most economical method of correction, however, is to plan the drives so that they operate with suf-

ficient load to prevent causing low power factor. Even though a plant manufactures its own current, it still has the power factor losses which show up in the additional investment in increased generating and transmission capacity, even though not separately itemized as a penalty on the power bill.

• • •

## Acid on Chain

**A** DETROIT concern uses a slat conveyor for handling work through soldering operations. The acid used in cleaning surfaces to be soldered had little effect on the wooden slats, which can be replaced easily when the conveyor is idle, but resulted in short life of the conveyor chain to which the slats are fastened. As the acid ate into the chain unnoticed, links started breaking here and there in its length and interrupted operation while being replaced. After the first few failures it usually became an economy to replace the entire chain to prevent the many interruptions. Chain life was less than a year.

The solution was to attach oil-fed brushes to rub against the chains and coat the links with a layer of oil on each revolution of the chain. An even distribution of oil is obtained by piping it to the brushes from a positive, but adjustable, ratchet-feed lubricator.

Used engine oil from automobiles is satisfactory, since the coating is more for protection from the acid than for lubrication. Acid drops off the chain with surplus oil from the lower return side of the chains. This has increased the life of the chain to four or five years.

• • •

## Two-Bearing Lubrication

**S**OMETIMES the attempt is made to lubricate two bearings from the same point. Examples of this are pressure lubrication to two bearings through a hollow shaft or having a single tubing from a pressure fitting branching to two bearings. As long as both bearings have equal fit or tightness, such practice may operate fairly satisfactorily. However, such perfect conditions seldom exist

even at the time of installation; also, practically always one bearing wears more than the other.

As soon as one bearing becomes looser than the other it receives practically all of the lubricant, because of less resistance. Thus one bearing is then overlubricated while the other is underlubricated and the channel to it may become caked, thus not receiving any lubrication even after excessive wear loosens the bearing. Ultimate failure may be expected. Even when oil is fed to two bearings there is no way of knowing that both are adequately supplied.

The better practice is to supply lubricant from both ends of the shaft, which then may be hollow only to the bearings, or to supply separate feed pipes to each bearing.

• • •

## Competitive Purchases

**W**HEN making purchases of power drives it is well to obtain "comparative" prices rather than to insist on "competitive" prices. When price is to be considered as the basis of purchase too often the seller considers the least quality and quantity of product that he believes may get by. Such purchases seldom provide trouble-free operation; on the contrary, drives subjected to unusually severe operating requirements at such under-rating are common causes of high maintenance and failure in operation.

The axiom that "buyers seldom get more than they pay for" also holds true in drive purchases. Some salesmen who value their reputations and that of the products they represent refuse to submit quotations on drives which they know from experience will not be satisfactory. However, usually someone else is willing to take the order and it may take a year or more to demonstrate conclusively that the installation is not satisfactory.

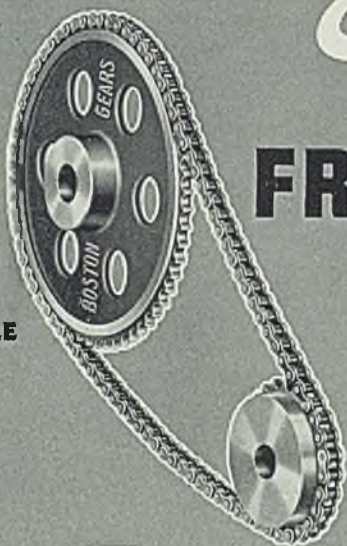
When a salesman objects to recommending his product for a drive at a competitive price it is a sign for the buyer to stop, look and listen, before continuing. No salesman wants to lose an order, therefore any hesitancy in attempting to meet competition is a real danger signal.



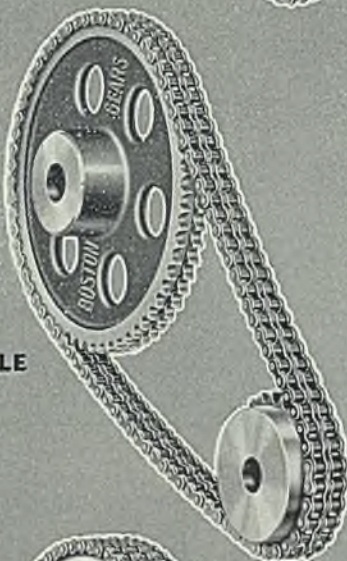
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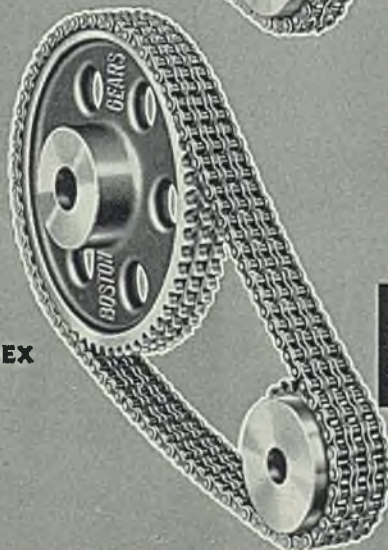
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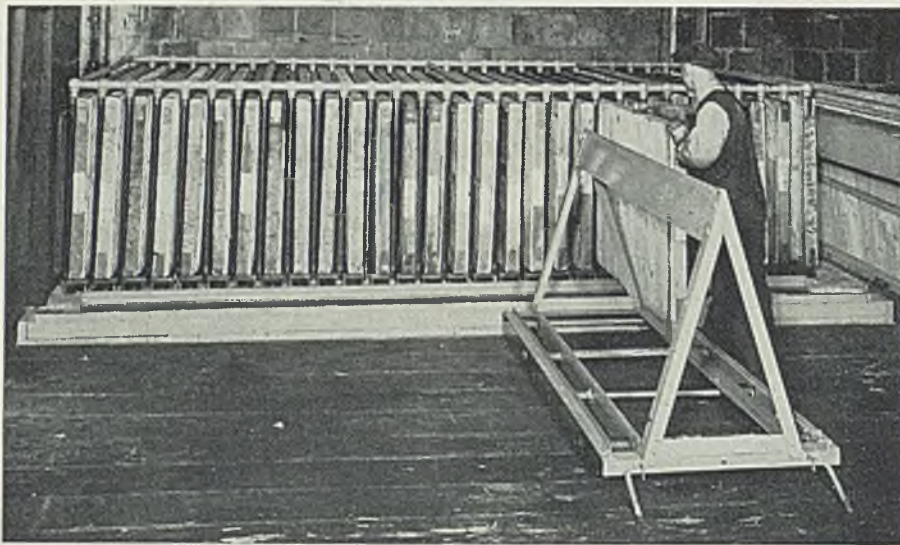
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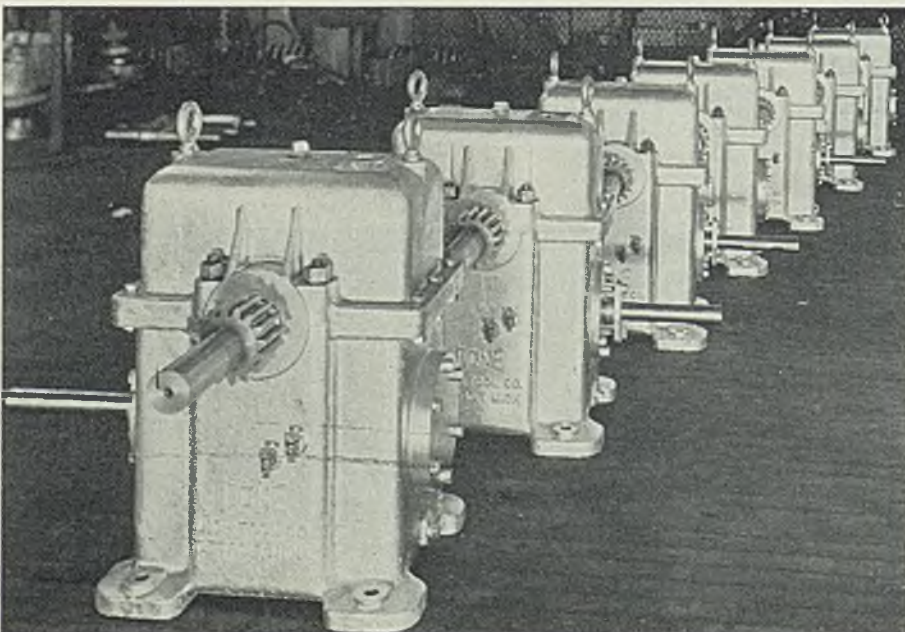
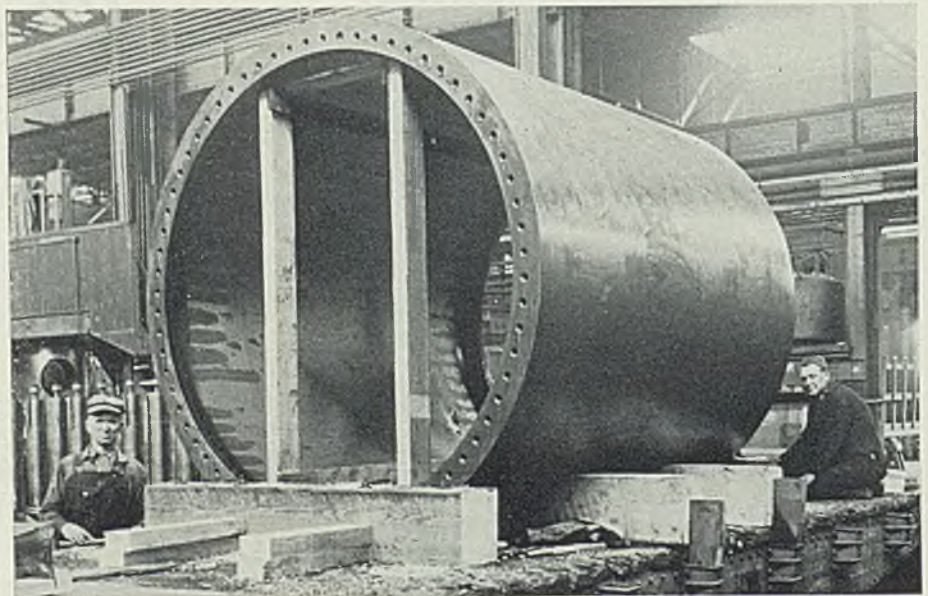


## Special Racks Make Sheet Handling Easy

*AN INGENUOUS* method of handling stainless steel sheets in warehouse stock has been evolved by Chicago Steel Service Co., Chicago. The rack and dolly shown at the left make all sheets readily available in original containers without several other pieces being moved as when the stock is stacked. In addition to time saved, safety is increased, since there is no danger of sheets or containers falling from the stack. Crates weighing from 500 to 600 pounds can be readily handled by one man with resulting savings in labor

## 15-Ton Nickel Iron Shell Casting

*THIS* large shell was cast and machined by the Allis-Chalmers Mfg. Co., Milwaukee. A special high-test nickel iron was used for the casting, which weighs 30,000 pounds. It was cast and machined in accordance with exacting specifications which required a homogeneous close grained iron



## Speed Reducers for Dam Gates

*EACH* of the unassuming units shown has the important duty of raising and lowering a dam gate weighing 500,000 pounds on a government project at Savannah, Georgia. They are Cone speed reducers incorporating the new area contacting worm gearing with a 50 to 1 reduction. Michigan Tool Co., Detroit, built the units which are claimed to be more compact for their capacity than conventional types of speed reducers



# Progress in Steelmaking



## Bearings Have Many Uses

Although the principal use of fabric base laminated bearings has been on roll necks, there are various other applications within the steel mill. They can be used with water lubrication on roll or runout tables and on centrifugal pumps. With a small amount of lubrication they can be used on cranes and for other purposes at sheet and tin plate departments where drippage of oil must be avoided.

## Unit Paints Steel Stacks

A robot painter which climbs up and down metal smokestacks, blast furnace hot blast stoves, standpipes, etc., under its own power, is described in a United States patent recently granted to a Mississippi inventor. The device looks like a four-wheeled scooter. It has an electromagnet which holds the robot fast to the stack, four magnetic wheels

and four pneumatic motor-driven traction wheels. In addition, it carries nozzles for spraying the paint, and a paint container. In operation, the machine is placed in position on the side of stack. The electromagnet is energized, thus holding the robot painter to the stack by the four magnetic wheels. Application of current to the motor starts and turns the traction wheels either forward or in reverse, causing the robot to climb the stack or lower itself. Meanwhile, air under pressure is injected into the paint container and the paint is sprayed onto the stack. Thus, climbing up and down and around the robot goes over the entire stack. Its operation is controlled by a man on the ground.

## Lines Are Made Distinct

A solution of copper sulphate to which a few drops of sulphuric acid are added, frequently will be found useful at steel plants for painting

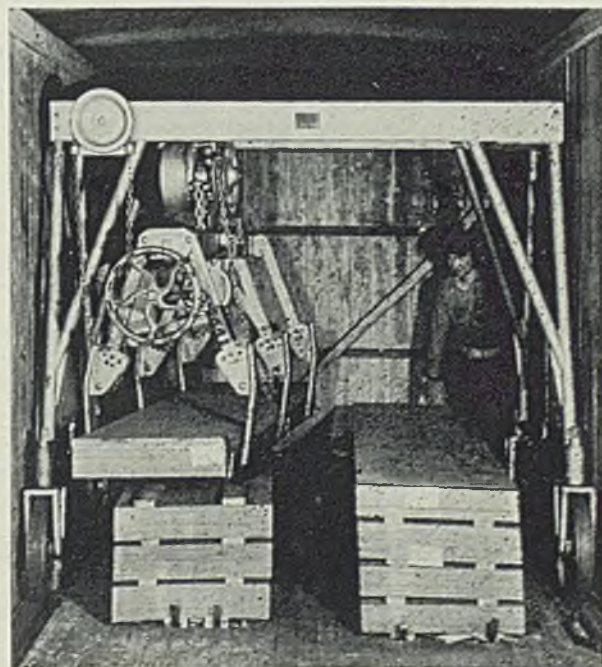
over a sheet of zinc or metal pattern to obtain distinct lines when laying out.

## Plate Assorted by Machine

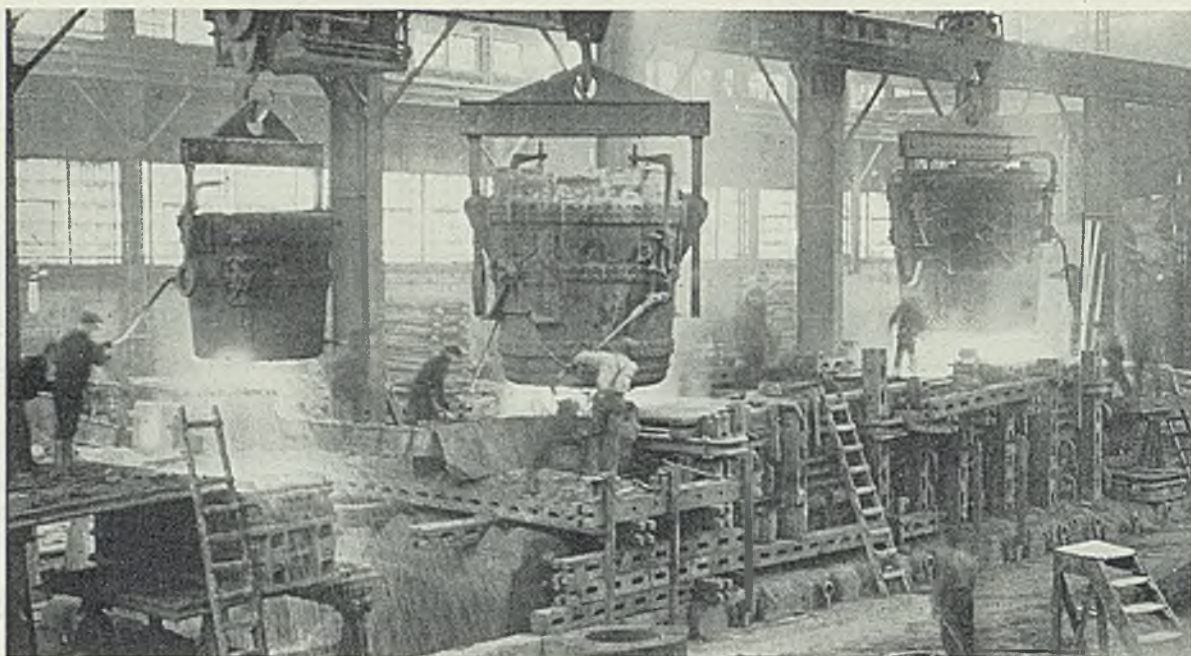
A machine for grading tin plate has been developed in England. The unit automatically feeds, weighs and discharges the tin plate into three predetermined weight groups, namely, correct, heavy and light. The machine handles standard sizes of sheets from about 10 ounces up to 5 pounds by ¼-ounce divisions. The predetermined weight first is set and then a selector gear for the desired light and heavy tolerances. The machine then will direct the tin plate into the correct group. Stock that is lighter than the preset light tolerance is sorted automatically into the light group; stock heavier than the preset heavy tolerance is sorted automatically into the heavy group. The machine handles sheets at a maximum rate of 20 per minute and performs 19 distinct operations.

## Gantry Crane and Lifter Handles Packs of Steel Sheets Weighing Up to 2 Tons

**M**ARKED economy results from the use of a recently developed gantry crane and sheet unloading device designed to handle 2-ton packs. The crane equipped with cross travel trolley mounted between the bridge members, is of welded construction. The unit is manipulated easily inasmuch as the wheels of both the gantry and trolley are mounted on antifriction bearings. Only a small space is necessary for the gantry runway which consists of two light weight channels to facilitate rolling the loaded gantry to the doorway of the box car. The gantry is spotted over a pile of sheets in one end of the box car and a pack of sheets lifted by the grab. The gantry then is moved toward the door and the sheets deposited on a dolly or truck. Among the advantages claimed for this unloader are greater reduction of handling costs, no damage to the finish or edges of sheets, any sizes of sheets can be handled, and demurrage charges are eliminated because of fast unloading. The unit is built by Cullen-Friestedt Co., Chicago







*Each housing casting was poured from three ladles simultaneously as here shown. The metal was obtained from three open-hearth furnaces*

# Pours Six 130-Ton Steel Castings for Mill Housings

BY W. G. GUDE  
Associate Editor, STEEL, Chicago

SIX steel castings produced recently by the Hubbard Steel Foundry division of Continental Roll & Steel Foundry Co., East Chicago, Ind., are believed to be the largest ever poured west of Pittsburgh. Weighing about 130 tons each, these castings comprise the housings for a new 84-inch strip mill to be installed by a Chicago district steel manufacturer.

Making large castings is nothing new for the Hubbard division, since previously it had produced a number weighing from 85 to 100 tons. Principal problems presented by the housings concerned their size. The housings are of relatively simple design and in the absence of intricate sections caused few complications in the preparation of molds or in pouring.

Each mold was made in a flask, 14 feet wide and 36 feet long, which was located in a shallow pit, with the housing pattern lying horizontally. Actually a slope of  $\frac{1}{2}$ -inch per lineal foot from the horizontal purposely was created in the flask, the top section of the housing being at the lower level. Suitable precautions were taken to strengthen the sides of the flask and to weigh down the cope.

Composition of the metal poured

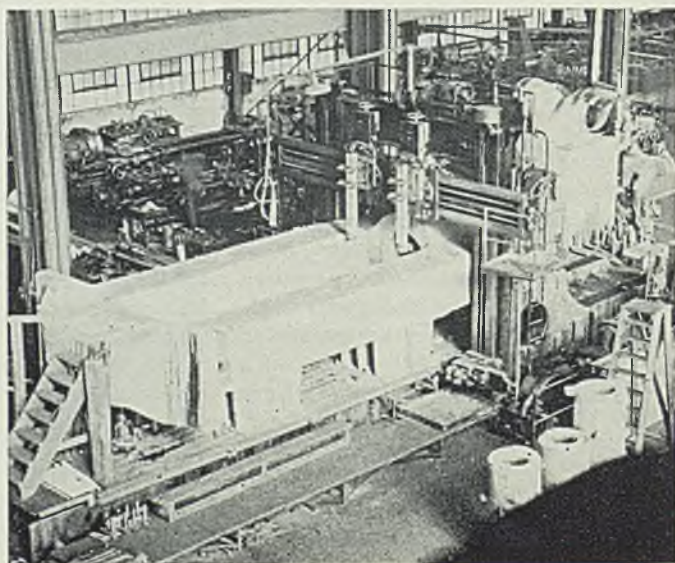
was approximately as follows: Carbon, 0.22 to 0.27 per cent; manganese, 0.65 to 0.85 per cent; silicon, 0.30 to 0.45 per cent; sulphur, 0.045 per cent and phosphorus, 0.03 per cent. Metal was obtained from three open-hearth furnaces and poured almost simultaneously from three ladles. Slightly over 2 minutes was

required for the metal to reach the risers, with an additional 12 minutes employed in feeding the risers. Total amount of metal charged in the open-hearths for the pouring was 289,000 pounds.

After  $3\frac{1}{4}$  hours 20,000 more pounds of metal was introduced into the mold, and about 2 hours later 6000 pounds additional was poured. The casting was permitted to remain in the mold 10 to 12 days for cooling before removal to the annealing oven. The normalizing operation required 16 days.

Gates and risers removed from the casting weighed 46,900 pounds. Five risers were employed, the largest being oval-shaped, 40 inches thick, 52 inches long and 39 inches high, plus an extension 40 inches in diameter and 28 inches high.

*THIS illustration shows the machining operations on one of the 130-ton housing castings*





# Clarify Problems in High And Low-Temperature Uses of Metals

**D**ESIGNERS who must appraise the suitability of alloys for service at elevated temperatures, as in oil stills high-pressure steam plants, conveyor mechanisms in heat-treating furnaces, and many other types of service, have two problems; first, finding out what the high temperature properties are as revealed by suitable tests, and, second, deciding upon a proper factor of safety for the service in question.

The second remains their own problem, but material aid is being given in respect to the first through the work of the American Society of Mechanical Engineers and American Society for Testing Materials in their joint committee on "Effect of Temperature on the Properties of Metals."

## Joint Committee Active

This committee has been established for a dozen years, in which period it has published over 1300 pages of information. It has subcommittees comprising more than 60 active workers in this field who are developing reliable methods of evaluating both high and low-temperature properties, and are applying those methods to the study of alloys of commercial importance. Although the time factor has such an influence in the stability and load carrying ability at high temperatures that many phases of the work are tedious and expensive, requiring special equipment and meticulous attention to detail, a constant flow of results is being obtained, which are reported each year in June at the A.S.T.M. meeting and in December at the A.S.M.E. meetings.

Due to insufficient knowledge as to the effect of the time factor and as to the necessary precautions for obtaining concordant and reliable results, much of the earlier data in the technical and advertising literature

is unreliable and misleading, and good data are scanty because of the cost of obtaining them, so that when the designer looks in his handbooks, or in the more specialized literature, he is dismayed by the general lack of information and by the discrepancies in published information, and is impressed by the insecurity of extrapolation from even tests of several thousand hours duration to the much longer periods of actual service.

In a field where the alloys required often are costly and their service of a type involving fire or explosion hazard, this situation calls for the sort of attention the joint committee is giving it.

Resulting from efforts of the committee, great strides have been made in codification of testing methods so that one may be sure that when tests are made according to best practice, differences observed between materials are truly differences in materials and not in test methods. This is facilitated by the availability of a specially selected lot of steel whose long and short time high and low-temperature properties are being thor-

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*THE accompanying article constitutes a statement prepared by the joint research committee of the American Society of Mechanical Engineers and American Society for Testing Materials on "Effect of Temperature on the Properties of Metals" to provide an understanding of the problems the committee is working to solve. The committee solicits comments on its program for consideration at its next meeting late in June. Dr. H. W. Gillett, Battelle Memorial Institute, Columbus, O., is chairman of the subcommittee on publications*

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oughly explored in the work of the committee, and which is available to interested parties for checking their own laboratory methods.

Full information on the results obtained in such check tests is the only recompense required by the committee. The problem of extrapolation is being attacked by carrying out tests of 3 years duration, which are now well advanced, upon typical ferritic and austenitic steels, as well as by continued attention to the basic problem of stability.

The joint committee, through its own committees, its related subcommittees, and its individual members, has been co-operating with A.S.T.M. committees that develop specifications and with various committees of the A.S.M.E. for the purpose of assisting engineers to purchase suitable materials and to use reliable data when designing steel parts to be placed in service at high temperatures. Thus far the joint committee's work has resulted in high-temperature test data only on a few selected steels.

## Data To Be Published

At a recent meeting, the joint committee decided to attack the more general problem of listing for all alloys, whether or not classified today as commercial, such temperature test data as are deemed reliable. Because this task cannot be accomplished promptly by the spare-time attention of the joint committee and subcommittee members, and because there is great present need for assembling and publishing reliable information of this kind, the joint committee voted to employ a skilled investigator to get to work at once on this task under the direction of the committee headed by P. E. McKinney, Bethlehem Steel Co., Bethlehem, Pa.

One pressing problem for industry lies in the need for accurate data that are typical of the properties of various alloys placed in high-temperature service. The primary purpose of a research group such as the joint committee is to perfect testing methods and to study the behavior of typical materials, so that a method of attack can be developed for use by producers and consumers in solving their own specific problems.

This type of testing work in the field of high temperatures is expensive, and it is necessary to use extreme precautions to avoid the danger of getting data that, instead of serving the purpose, actually mislead the engineer. There are few laboratories outside of those represented on the joint committee and its subcommittees which are prepared to deal properly with such problems. However, the list of laboratories using satisfactory equipment and methods fortunately is increasing steadily.

It may not be generally known that the joint committee has recognized



its responsibility to industry along the lines just mentioned. As a matter of fact, beginning with 1933 the committee has offered to plan and execute for each of several industrial groups experimental work to ascertain the high-temperature properties of specific alloys for specific purposes, provided that the group would adequately finance the work, and would be willing to have the testing done along lines that are believed by the joint committee to be dependable. No such specific problems can be undertaken unless the interested group will authorize sufficient comprehensive studies to favor the accumulation of reliable data.

Because there is serious need for such data by engineers in connection with specific grades of metal generally believed to have service possibilities at high temperatures, the joint committee freely places at the disposal of properly organized industrial groups the collective experience of its members.

The committee's own direct work will continue to be oriented along fundamental lines, primarily seeking further information on the control of stability and the development of test methods of engineering applicability,

through work on materials chosen as typical, rather than attempting themselves to determine the properties of every alloy that may be suggested. Several new fields of experimental activity are under discussion, among them being evaluation of low-temperature properties—a matter already being surveyed by a subcommittee—study of methods of determining resistance to oxidation, relation of tensile properties to the stresses obtaining in tubes, etc.

Definite plans will be laid at a committee meeting the latter part of June. Suggestions from those interested in the high and low-temperature fields as to topics which should receive early experimental attention will be appreciated, and if sent to the secretary of the joint committee, N. L. Mochel, Westinghouse Electric & Mfg. Co., Lester Station, Philadelphia, in time, they will be brought before the committee at its June meeting.

The new projects will be in addition to the 3-year test program now in progress, and to the continual effort to improve testing methods. The number and scope of the new projects will depend upon the financial support afforded by industry.

While the financial resources will

not be known till the final report of the finance subcommittee, headed by Maj. R. A. Bull, 541 Diversey Parkway, Chicago, preliminary returns indicate that several new lines of experiment can be undertaken. Hence the committee is anxious to get the opinion of industry as to what new projects should have preference in the order of attack.

## Map Shows Location of United States Airways

*Map of Airways of the United States*, available in two sizes, 22 x 17 inches, and 44 x 34 inches; paper, cloth back, panel board back or roll type; published by J. H. H. Muirhead, New York; supplied by STEEL, Cleveland, at prices ranging from \$1 to \$7.50; in Europe by Penton Publishing Co Ltd., Caxton House, Westminster, London.

This 1936 map, printed in black and white, shows the airways at present in operation. All stops or stations are named; stops suspended waiting airport improvement are so marked. A list of operating companies is given along with their various routes; companies are numbered and these numbers repeated on the map show which companies operate between any two cities.

Routes on which passengers, mail and express matter are carried, are shown by heavy black lines, where passengers are not carried by broken lines, and by open lines where no airmail is carried. Starting points of foreign airmail routes are given.

The different airmail routes are numbered AM1, AM2, etc., in agreement with postoffice numbers for the contract or contracts held by each company. On the map these markings are placed below or alongside the number for the company holding the contract.

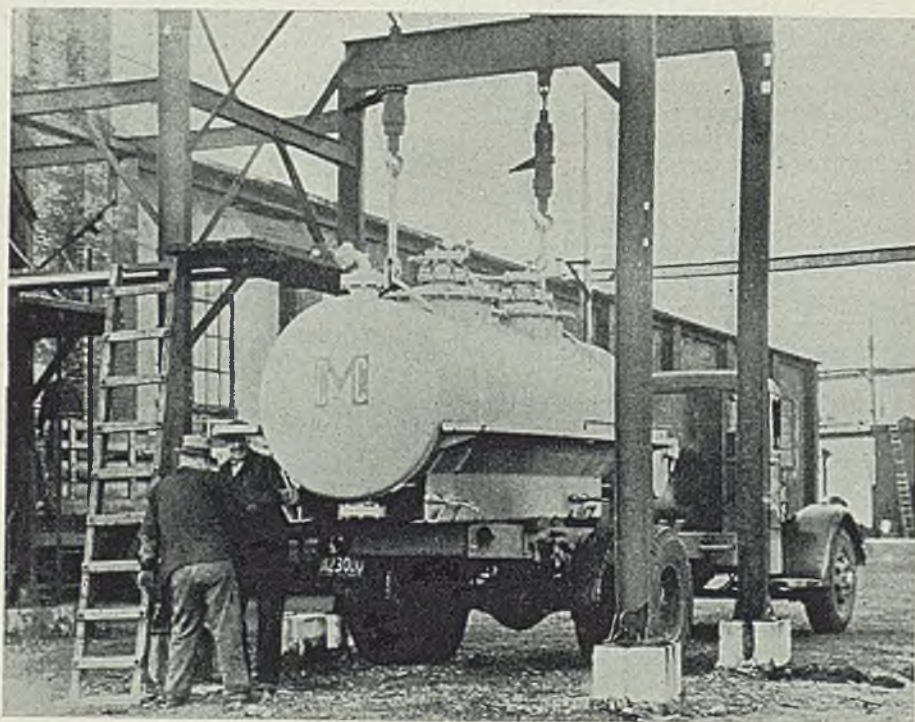
## National Power Conference Plans Expansion Program

Scope of activities of the National Power conference, which was formerly known as the Midwest Power Engineering conference, has been broadened in plans now developed. Over 60 engineering bodies with members interested in power problems have been invited to become members. These organizations extend from coast to coast and their members number over 50,000.

Interests of the conference lie in the fields of generation, distribution and use of power of large proportions and vital energy, and the annual meetings will be devoted to discussions of national aspects of power.

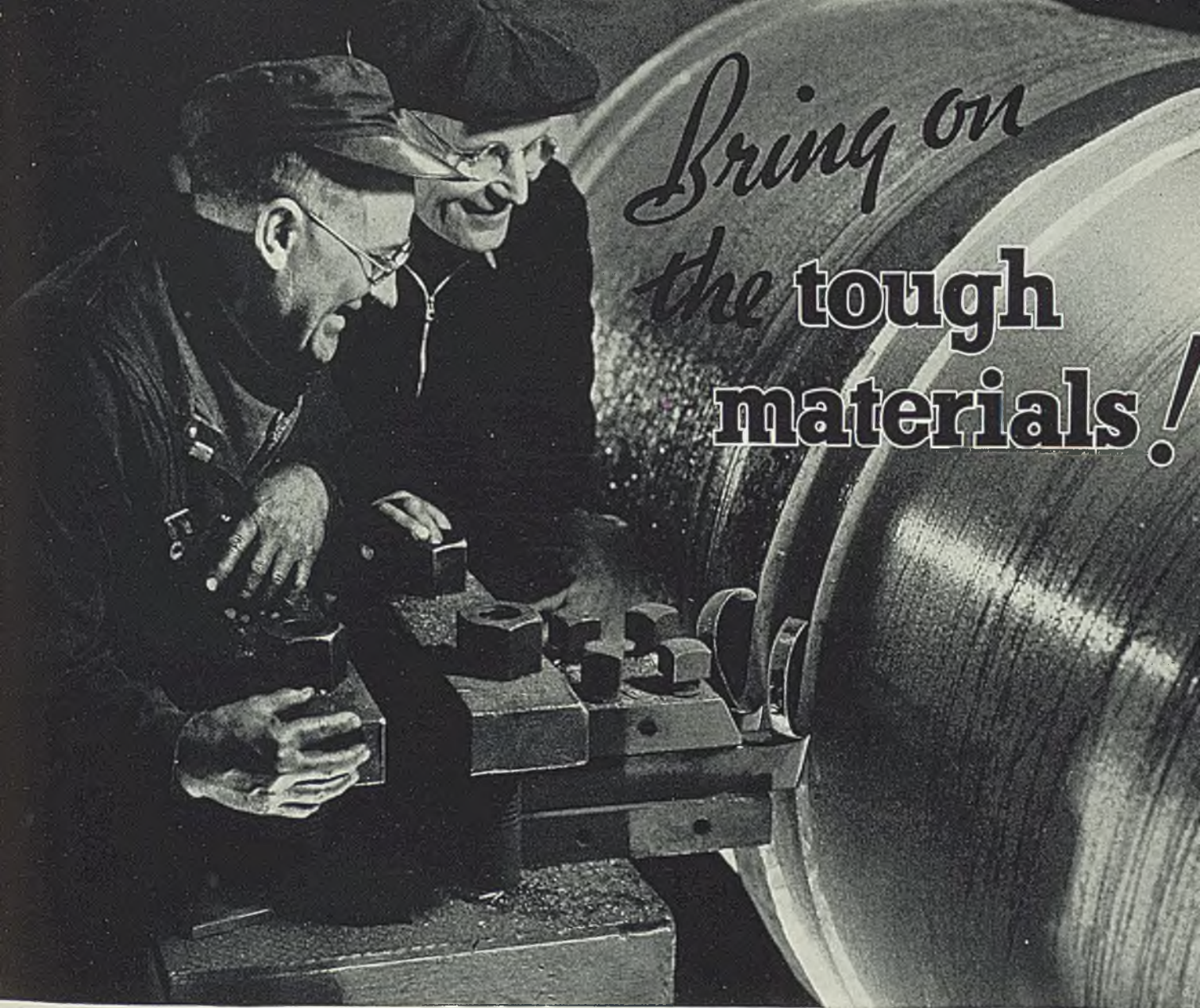
Headquarters of the National Power conference are at 308 West Washington street, Chicago, and activities are under the direction of G. E. Pfisterer, executive secretary.

## Detachable Tanks Speed Acid Delivery



**T**O SPEED up its local delivery of acid, the Merrimac Chemical Co., Everett, Mass., uses three steel truck tanks which are detachable from the truck. A tank is filled while suspended from a loading platform and is then lowered onto the truck chassis to form a complete tank truck unit, as shown in the illustration. When the truck returns from a delivery, the empty tank is removed and a full one quickly attached. This system is said to reduce loading time greatly and enables the company to maintain efficient service with minimum trucking equipment. Two of the tanks are used for sodium hypochlorite and one for muriatic acid; all three have acid-proof rubber linings supplied by the B. F. Goodrich Co., Akron, O.





*Bring on*  
**the tough materials!**

## *This Tool Steel takes them in its Stride*

**S**PECIAL STEELS, high-test iron castings and similar materials of high physical properties often make life difficult for the machine shop foreman. In many a shop Bethlehem Special High-Speed Tool Steel has saved the day when the production schedule was getting bogged down.

That's not surprising—for Bethlehem Special is produced in the plant where high-speed steel was developed more than thirty years ago. Research has been unceasing since that time and manufacturing technique consistently

improved. Today analysis and manufacturing methods combine to make Bethlehem Special a cutting steel that holds its edge at high temperatures, keeps production at a high rate and has extra stamina for unusually difficult conditions. Shop men who use Bethlehem Special for the first time are amazed by its ability to take heavy cuts at high speeds—and at the length of time between grinds.

Bethlehem Special is only one of the complete range of Bethlehem tool steels, each of which is preeminent in its own particular field.



**BETHLEHEM STEEL COMPANY**

*Special High-Speed* **TOOL STEEL**



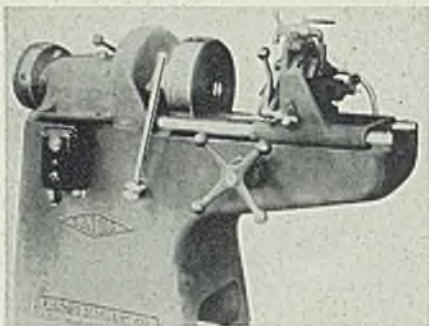


# New Equipment



## Chucks—

Landis Machine Co., Waynesboro, Pa., announces a new development for its 2-inch pipe threading and cutting machine, in the form of a lever-operated front chuck and a rear cen-



*Landis lever-operated chuck*

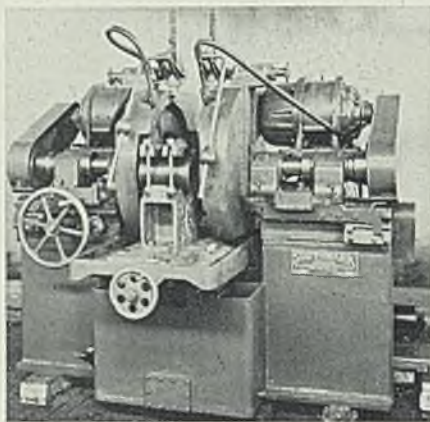
tering chuck. The front chuck, illustrated herewith, has a universal adjustment for size and can be adjusted for any size within the range of the machine, from 1/4-inch to 2-inch pipe. The chuck is graduated for all diameters and can be changed in a few seconds. The rear centering chuck is of the three-jaw universal type. It can be installed on old machines, whereas the new front chuck must be built integrally and thus can be supplied only on new machines.

♦ ♦ ♦

## Spring Grinder—

Baldwin-Southwark Corp., East Eddystone, Pa., has recently built a spring grinding machine designed for use in grinding parallel ends on helical springs. The machine can also be used for grinding square surfaces on any shapes which come within the limits of its capacity. The ma-

chine, shown here, consists of a grinding head with two motors running at the same constant speed and driving on spindles face grinding wheels 22 inches outside by 14 inches inside diameter. The wheels revolve toward the operator and either hand or automatic feed spreads them or brings them together as required. A table with an adjustable stroke, to which the part being squared is clamped, travels back and forth between the grinding wheels and is actuated by a motor. Cutting fluid is circulated by a motor driven



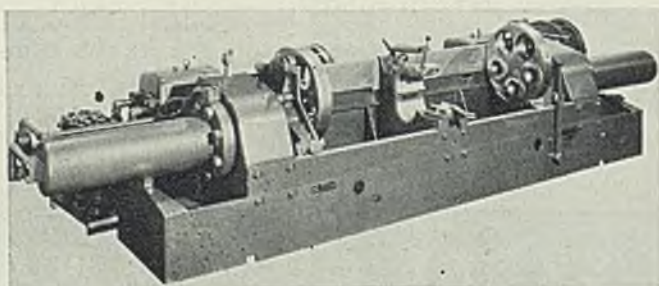
*Baldwin-Southwark grinder for helical springs*

pump, and a device for truing the grinding wheel surfaces is incorporated in the machine. Welded construction is used throughout.

♦ ♦ ♦

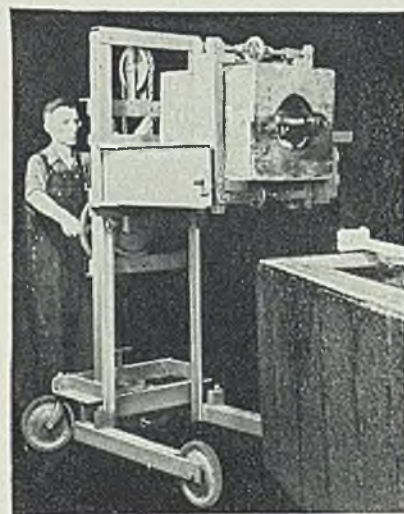
## Horizontal Press—

Oilgear Co., 1403 West Bruce street, Milwaukee, is manufacturing a new 100-ton horizontal press used for simultaneous cold swaging of both ends of steel truck housing



*Oilgear horizontal swaging press*

tubes. The housing tube is located and manually clamped in the center stationary fixture. Dies in the two opposing five-station rotary-type supports are moved forward by the crossheads and swage both ends of the tube. Each die support is indexed manually and independent of each other, the lower die being on the centerline of the cylinder ram and in position for the swaging operation. A single hand lever in front of the press controls the speed and direction of movement of both crossheads. Separate pumps mounted on independent bases and direct-connected to 50-horsepower electric motors operate each crosshead and piston. The press base is a one-piece welded steel structure and supports the two cylinders, as shown in



*Revolver carboy dumper*

the illustration. Two large rectangular steel tie bars bolted to the yokes carry the tension of the opposing rams.

♦ ♦ ♦

## Carboy Machine—

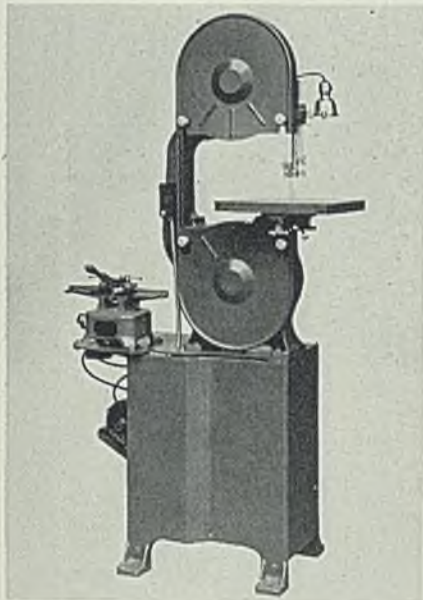
Revolver Co., North Bergen, N. J., has designed a new carboy dumper for emptying carboys into vats, in which the operator is safe from all splashing. The machine is self-loading, being brought up to straddle the carboy and then locked on by two clamping wheels. Elevating, lowering, and tilting of the



carboy is controlled by gear action. The unit is mounted on four rubber-tired wheels, and the entire apparatus is covered with acidproof paint for protection against accidental spilling.

#### Internal Bandsaw—

Grob Bros., West Allis, Wis., have recently added a metal bandsaw for internal and external sawing to their



*Grob metal bandsaw for internal sawing*

line of products. A feature of this machine is the brazier which is conveniently mounted on the saw. For internal sawing any standard metal band with a width of from  $\frac{1}{8}$ -inch up to  $\frac{1}{2}$ -inch is inserted in an opening in the work. The band is then joined together on the brazier. A special grinder is furnished with the machine to grind the weld to proper thickness. Three speeds are provided by means of a three-step pulley mounted on a floating motor and a V-belt drive. Two V-belt compound reduction drive pulleys are mounted on ball bearings directly to the frame of the base. Adjusting screws are so located that the V-belts can be tightened from the outside of the machine. The saw has a throat of 14 inches, the table is 14 x 14 inches and the distance from floor to table is 45 inches. Total height of the machine is 60 inches and the net weight is 360 pounds.

#### Hydraulic Drill—

Baker Bros. Inc., Toledo, O., has introduced a new hydraulically operated five-station drill, featuring 30-inch wide ways, a long saddle and a large size head with extreme overhang. The machine has operating efficiency based on double feed and delayed reverse, a coarse boring feed with automatic change to fine feed for facing, a positive stop allowing several revolutions before tripping which assures a square-

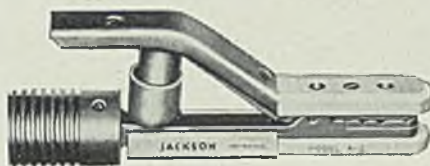
faceted surface, as well as a simplified oil gear pump rapid traverse feed. The pieces produced by this machine are one right and one left tractor link in each cycle. The operator chucks while tools are cutting. In each piece two holes are core drilled and reamed, while a large hole is rough and finished counterbored.

#### Pressure Switch—

Cutler-Hammer Inc., North Twelfth street, Milwaukee, has announced a new pressure switch for the automatic control of small compressors and fuel pumps. Features of the switch are all-metal case; flexibility of application; automatic action; ease of wiring, adjusting and inspecting. Pressure connection for S. A. E. fitting is furnished as standard, but may be converted into  $\frac{1}{4}$  or  $\frac{3}{8}$ -inch pipe fitting. Inverse time limit overload protection is provided by a relay operating directly on the contact mechanism. This relay gives protection to the motor during starting and running.

#### Insulated Electrode Holder—

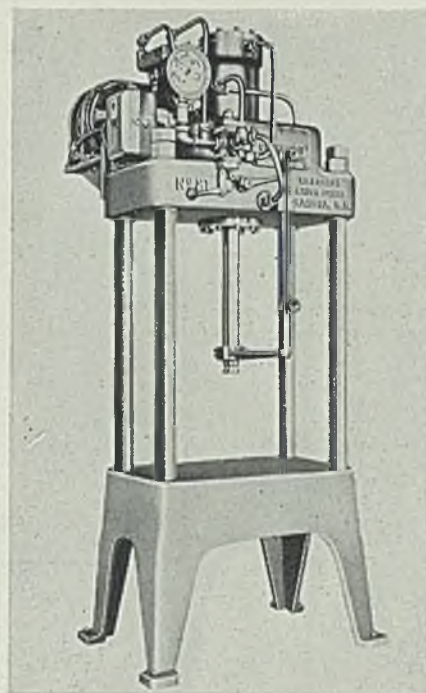
Jackson Electrode Holder Co., 6553 Woodward avenue, Detroit is introducing a new insulated electrode holder, here illustrated, which is claimed to eliminate flashes caused



*Jackson insulated electrode holder*

by contacting the electrode holder with grounded parts. Air circulation is provided between the insulation and the metal for coolness.

*Baker hydraulically operated five-station drill*

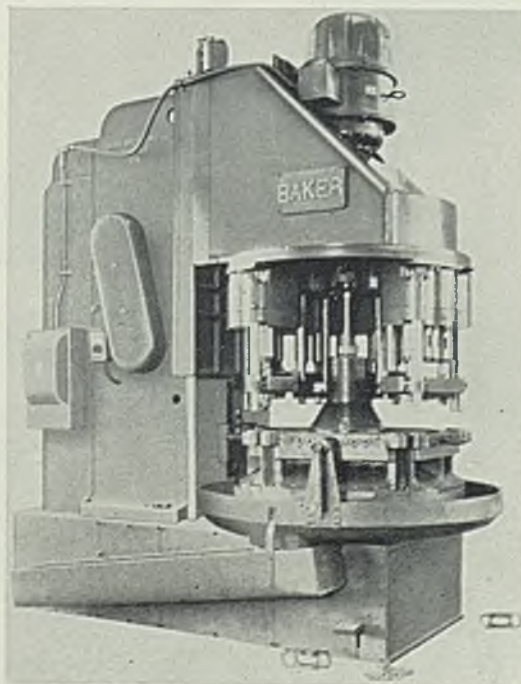


*Bartlett hydraulic molding press*

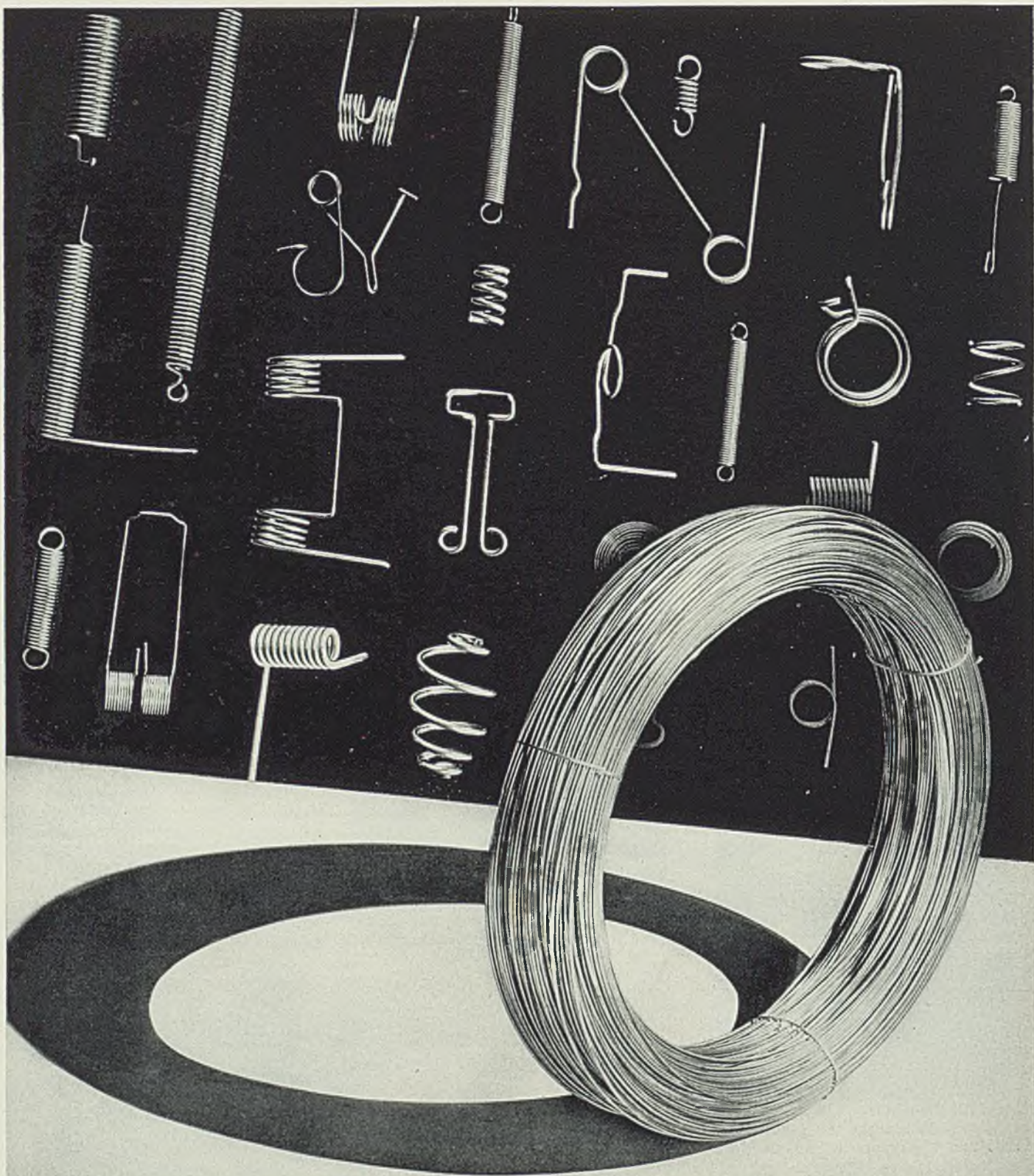
Structural parts are of a special copper alloy to keep weight at a minimum. Since the jaws receive most of the wear on the holder, they have been designed so they are replaceable. Mallory 3 metal is used for the jaws.

#### Hydraulic Press—

Edwin E. Bartlett Co., Nashua, N. H., is announcing a new model of the Greenerd hydraulic molding press. The new model, known as No. 81, is self-contained with pressure controls to 15 tons on the downstroke and 13 tons on the upstroke. The head is a special semisteel casting. The piston is steel with six cast iron piston rings. The







Increase the dependability of your springs with the uniform quality and precision standards of EAGLE Music Wire . . . Famous for half a century

**WASHBURN WIRE CO., Inc.,** 550 East 118th St., New York City



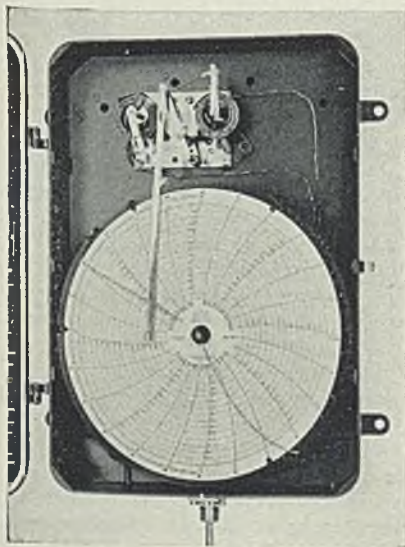
ram gland is packed with chevron-type packings. The combination low and high pressure pump is driven by a 3-horsepower motor mounted on the side of the head with tank in head. The control valve is either foot or hand operated. Automatic or manual reverse can be made at any point, and a stop rod regulates the length of travel in either direction. When the ram is at top position the pump bypasses, relieving all pressure. The press is adapted to light plastic molding work inasmuch as there is 15 tons pressure on the downstroke which may be held under even pressure until the plastic sets, then released with a 13-ton pull to open the mold.

### Orifice Meter—

Cochrane Corp., Seventeenth street and Allegheny avenue, Philadelphia, is introducing an orifice flow meter for use in measuring fluid flow through pipelines. Based on the principle of differential pressure, the meter creates this differential by means of an orifice placed in the pipe. Pressure differential on either side of the orifice is conveyed by piping to a U-tube manometer and measured in terms of rate of flow. Charts are driven by precision clocks and are available in any desired units. Meters can be supplied for indicating as well as recording and in either integrating or nonintegrating styles.

### Small-Bulb Gas Filled Thermometer—

Bristol Co., Waterbury, Conn., has recently perfected a small-bulb gas-filled recording thermometer which can be used with long lengths of connecting tubing. It is offered for measuring temperatures between -60 degrees Fahr. and 1000 degrees Fahr., where tubing lengths of 100 feet are required by the application. The small bulb is made possible by a device which compensates for temperature changes both in the case of the instrument and along



*Bristol small-bulb gas-filled thermometer*

the tubing. This device consists of two capillary tubes leading from the temperature-sensitive bulb to the mechanism shown here. Only one of these is connected to the bulb, however, and since both are subjected to the same temperature conditions, the action of the one is a balance against the action of the other.

### Duplex Tubing—

Electric Hose & Rubber Co., Wilmington, Del., has just announced a new type of rubber pressure tubing which consists of twin hose simultaneously molded with a connecting web, so that a cross-section resembles a figure 8. It is especially designed for welding or similar services requiring two hoses to feed the outlet. Bursting point of the 1/4-inch size is 2000 pounds and this heavy construction makes it possible to use varying pressures in either tube without torque or writhing. The trade name adopted for this product is Supero-Siametz. Tubes are made either both of the same color or of varying colors. The connecting web

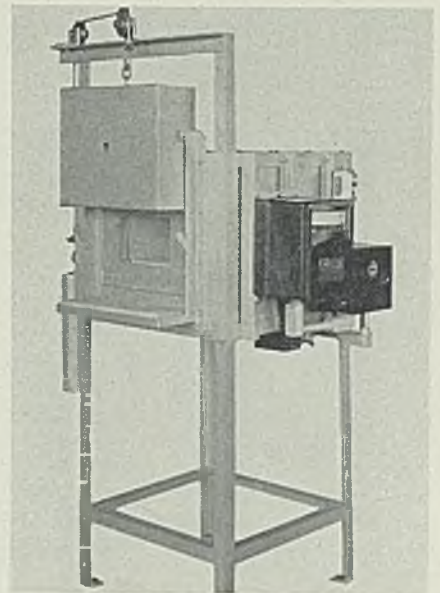


*Supero-Siametz duplex rubber pressure tubing*

may be cut down with a carborundum wheel the distance required for attaching to separate outlets.

### Electric Furnace—

H. O. Swoboda Inc., 4301 Main street, Pittsburgh, has recently placed on the market a high-temperature muffle furnace under the trade name "Falcon." The furnace is suitable for operating temperatures up to 2300 degrees Fahr. and is equipped with high-temperature metallic heating elements mounted in the hearth, side-walls, roof and rear of the furnace. The elements are of the wound type, substantially mounted in grooved refractories. The refractories are reversible for forming muffle chambers, or separate muffles can be supplied if desired as shown in the illustration. The inside dimensions of the muffle shown are 9 x 6 x 13 inches. The capacity of the furnace is 6 kilowatts. The equipment here

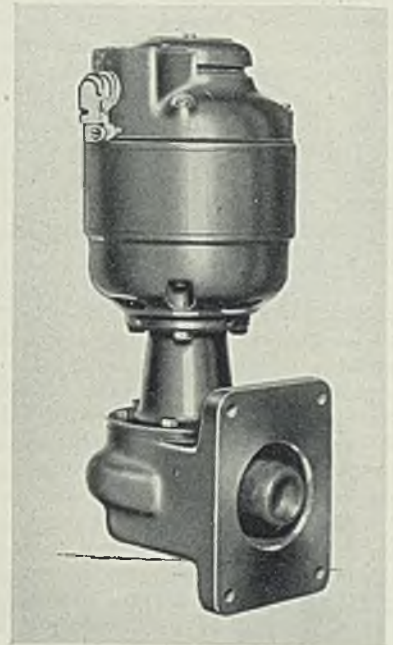


*Falcon high-temperature muffle furnace*

shown is for floor mounting, but bench models are also available. Chamber sizes vary and are available for 110, 220, or 440-volt operation in single or 3-phase types.

### Coolant Pump—

Ruthman Machinery Co., Cincinnati, has brought out a new type of machine tool coolant pump. Chief feature of this new development is a different type of internal discharge, eliminating necessity for a separate discharge pipe. The pump is of the gusher type, having independent twin suction intake and hydrostatic balance features. It is provided with a bracket which is mounted directly on the reservoir and has the discharge pipe connected inside the reservoir, from which point it is led to any part of the machine as required.



*Ruthman coolant pump*



# Iron and Steel Scrap Assuming New Technical and Economic Significance

(Concluded from Page 39)

of ferrous structures containing large amounts of nonferrous metals. The modern automobile is an excellent example of this.

Increasing use of sheet and strip and of lighter-weight structures creates the further problem of using light-weight scrap. Thus, the steel industry as a whole will have to absorb scrap which may be considered undesirable, both because of its lightness in weight and its content of alloying elements.

The steel plant that uses important proportions of outside scrap will have to adopt, as many already have done, a scientific method of piling scrap to fit into the particular practice. For example, if a steel plant buys certain grades of scrap, a well-distributed mixture of which will give the desired composition and melting characteristics, it can require that all the scrap be loose and be cut to a small size; then all the scrap can be distributed throughout a pile or a car in order to insure a good mixture. Furnace requirements can be drawn from such piles with assurance that the scrap charge for each heat will be uniform in composition and character.

## Make Up Desired Analysis

Where this method cannot be used, several piles of scrap can be maintained, each one having constant and known composition. The scrap charge can then be made up by taking definite percentages of it from each pile so as to insure a uniform mixture, and hence, the same melting characteristic and alloy composition in each heat. Fig. 1 illustrates this method of piling. For heats that require an extremely low content of residual metals, a special pile of scrap of low-alloy content, purchased under rigid specifications, can be kept.

Study of the economics of the production and consumption of steel indicates that sufficient scrap will be available to supply the needs of the industry at about the rate of consumption that has prevailed during the past 10 or 12 years. Increased demand in times of high production will bring out more scrap and this with the large existing pig iron capacity will tend to prevent a scarcity of scrap. The trend will be toward an increasing proportion of light-weight scrap that will contain high contents of the residual metals and will be contaminated with nonfer-

rous metals and alloys. While the average residual metal content of all scrap may not rise rapidly, these metals will become more widely disseminated in all scrap.

Increased attention will have to be given to the proper sorting out of nonferrous metals and to the segregation of scrap of low and of high alloy content. The plant that uses little or no outside scrap will be able to continue to produce steel of low residual content, but it will have to pay increasing attention to the elimination of alloy-containing raw materials in the charges to the blast furnace and open hearth, and to the segregation of plant and outside scrap that contains alloys.

The plant that uses relatively large proportions of scrap will have to see to it that its scrap is properly sorted for nonferrous metals

and suitably prepared to give known and uniform residual metal contents. A system of piling or of buying scrap, if it is used direct from cars, should be adopted so that the entire supply will be uniform or that various grades can be mixed to give charges uniform physically and in residual metal.

## Uniformity Chief Factor

Plants that have difficulty in making steel of the low residual metal content required for specific uses will have to use higher proportions of pig iron in the charge. But except in these instances, steel of satisfactory quality will be made from high charges of scrap, in which the content of residual metals will be quite high. In this case, uniformity of the residual metal content rather than the amount is the important factor.

For economy in raw materials and operating costs, the content of residual metals should be restricted in only those steels where it is absolutely required. Then practices can be adjusted to produce and use steel of high residual metal contents, and the lower grades of scrap can be used to maximum advantage.

## Express Objections to Stock Piling

**P**RACTICAL objections to the proposal for close sorting of iron and steel scrap at the steel plant and the maintenance of stock piles for the various grades were voiced in two written discussions of Mr. Williams' paper.

J. H. McElhinney, general superintendent, Lukens Steel Co., Coatesville, Pa., pointed out that to attempt to sort scrap closely at the mill, and to store each kind separately, has been tried with some success, but it often costs more than results seem to justify, and most mills probably do not have stock yard space enough to carry many classifications.

### Control Not Positive

To average by spreading each car over a large pile is physically feasible, and would probably be fairly effective, he said. Objections to it are that, carried to the ultimate, it would require considerable stock yard space, would add to usual handling costs, and assume technical control of the inventory volume, rather than commercial control. Further, it is not fully positive.

To be absolutely positive in maintaining uniformity of these undesired elements would involve bringing each heat up to a predetermined standard by additions, or possibly by premelting, and averaging to some extent before charging in the open

hearth. Neither of these fantastic ideas were offered by Mr. McElhinney as practical solutions to Mr. Williams' suggestion, but he stated they might possibly have some value as a stimulant to the imagination.

The dealer's yard, where scrap is cut and sorted, could meet the steelmaker's requirements with less additional cost than is involved in any of the foregoing suggestions, Mr. McElhinney continued. As Mr. Williams stated, the scrap industry has accomplished much, both in accuracy of sorting and in ethics of the business, but, as is the case with the industry to which it sells, there remains opportunity enough to satisfy the most ambitious.

J. L. Mauthe, assistant general superintendent, Campbell works, Youngstown Sheet & Tube Co., Youngstown, O., asserted that the adoption of separate stock piles for the various classes of scrap would present a difficult if not an impossible problem in many existing steel plants. Many plants unload scrap directly from cars into charging boxes, others have some stocking facilities available, but few have adequate means for taking care of so many different kinds of scrap. Therefore, said Mr. Mauthe, steelmakers must look to scrap dealers for co-operation and assistance in working out this vital problem.





## NO SHERLOCKS NEEDED

*Photograph courtesy of Ticonderoga Pencils*

● The steel industry understands all about the advantages of a steel storage battery for industrial truck and tractor work. No Sherlocks are needed because the facts are obvious. Steel batteries last 2 to 5 times longer than ordinary batteries, because steel is durable. They are less subject to damage, because steel is tough. They require less maintenance, because their alkaline electrolyte is a preservative of steel. In other words, they supply the very qualities required for heavy-duty service. ● Foremost, however, is the fact that Edison Storage Batteries do the work expected of them with minimum danger of unexpected failure. Such failure could cause thousands of dollars in delayed production. That more than 70% of the heavy-duty batteries in the steel industry are Edisons, shows that steel men regard them as outstanding examples of the suitability of steel where ruggedness, light weight, and dependability are needed.

# EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

June 1, 1936

**STEEL**



# New Trade Publications

**Grinding**—Norton Co., Worcester, Mass. A booklet on grinding and finishing with portable equipment, on large and small work, illustrated.

**Drum Controllers**—Kurnas Electric Co., West Allis, Wis. Catalog 36, on its controllers and switches, including numerous newly developed devices.

**Seamless Tubing**—Parker Appliance Co., 17325 Euclid avenue, Cleveland. Bulletin No. 41, a price list and book of technical data; illustrated.

**Keyway Cutters**—Ingersoll Milling Machine Co., Rockford, Ill. A leaflet on its tri-lock triple serrated narrow keyway or slotting cutter; illustrated.

**Die Head**—Eastern Machine Screw Corp., New Haven, Conn. A bulletin on its style TM insert chaser die head for cutting taper threads; illustrated.

**Pig Iron**—Woodward Iron Co., Woodward, Ala. A booklet giving a panoramic presentation of the company's production facilities and integrated pig iron producing capacity.

**Motors**—Lincoln Electric Co., Cleveland. A bulletin giving facts for users of alternating current motors, containing an unusual collection of data to this end.

**Bolts, Nuts**—Erie Bolt & Nut Co., Erie, Pa. A catalog describing types of fits for threaded studs and bolts, listing grades and prices of nuts and sizes.

**Alloy Steels**—Bliss & Laughlin Inc., Harvey Ill. A folder on its alloy steels, setting forth advantages of their use in parts meeting unusual stress and wear.

**Lift Jacks**—All Steel Welded Truck Corp., Rockford, Ill. A bulletin on lift-jack and platform equipment for materials handling; illustrated to show jack and platform separately and advantages of their use.

**Foundry Equipment**—C. O. Bartlett & Snow Co., 8200 Harvard avenue, Cleveland. Bulletin No. 75 on its foundry equipment line; more than 120 illustrations, 26 engineering diagrams.

**Ventilator**—American Larson Ventilating Co., Pittsburgh. A bulletin on its rotary suction type of roof ventilator, with diagrams, illustrations, charts and data tables to supplement the text.

**Switchgear**—General Electric Co., Schenectady, N. Y. A bulletin, No. 1661A, on its metalclad switchgear type MI6, for central stations, steel mills, large industrial plants and public buildings; illustrated.

**Disconnect Switch**—Schweitzer & Conrad Inc., Chicago. Bulletin No. 222-B covering engineering data on its new heavy-duty multi-contact disconnect switch, designed for easy operation, high efficiency and long life.

**Lift Truck**—Revolvator Co., North Bergen, N. J. Bulletin No. 111-A on its carboy handling machine for handling and dumping carboys; No.

112-A, tin plate handling trucks; 113-A, a 1000-pound lift truck.

**Compressors**—Ingersoll-Rand Co., Phillipsburg, N. J. Catalog No. 7502-E on its 30-inch line of industrial compressors and vacuum pumps,  $\frac{1}{4}$  to 15 horsepower, 1.2 to 102 cubic feet per minute, pressures to 1000 pounds.

**Stock Pipe-Welding Fittings**—Bonney Forge & Tool Works, Allentown, Pa. Bulletin No. WT21 describing Bonney weldolets and thredolets, especially adapted to branch pipe connections.

**Milling Cutters**—Pratt & Whitney Co., Hartford, Conn. Circular No. 421, illustrating and describing milling cutters and tracer points for Keller machines; covers latest practice in this connection.

**Speed Reducers**—Janette Mfg. Co., 556 West Monroe street, Chicago. Bulletin No. 22-5 on motorized speed reducers in various types and sizes, well illustrated to show construction and operation.

**Grinding**—South Bend Lathe Works, South Bend, Ind. Two bulletins, No. 36A, covering cutting of screw threads and No. 35 on grinding lathe tool cutter bits; illustrated; presenting subjects in easily understood language.

**Metal Heaters**—American Car & Foundry Co., 30 Church street, New York. A circular on Berwick electric type metal heaters, types L and LA, for heating metals electrically; illustrated.

**Aftercoolers**—Sullivan Machinery Co., Michigan City, Ind. A bulletin, No. 88-W, on its line of compressed air aftercoolers, showing multipass design, built-in separator for removing condensed oil and water and provision for easy cleaning of cooling tubes.

**Refractories**—Standard Fuel Engineering Co., Detroit. A bulletin, No. 37, on refractory cements, refractories, heat-treating and other furnaces and tabular material for those whose use of refractory material requires specific formulas.

**Silica Firestone**—Cleveland Quarries Co., Builders Exchange building, Cleveland. A booklet describing and illustrating the plant and product of this company and its application to industry; an unusual presentation of material.

**Chain Link**—Anchor Post Fence Co., Baltimore. Bulletin No. 94 on its Bethanized chain link fabric, which it describes as made of "zinc wire with a steel core"; illustrated to show permanence of coating and installations of fence.

**Valves**—Edward Valve & Mfg. Co. Inc., East Chicago, Ind. Catalog No. 11-A10, devoted to service requirements for high temperatures and high pressure, valve material specifications and standards; contains complete chemical analyses and physical rejection limits.

**Pumps**—Worthington Pump & Ma-

chinery Corp., Harrison, N. J. Recent bulletins, as follows: S-500-B-29, vertical four-cycle direct-injection diesel engines; W-318-B7, balanced multi-stage volute centrifugal pump for boiler feed service; W-317-B35, centrifugal pumps for underpass drainage.

**Electronic Tubes**—Westinghouse Lamp Co., Special Products Dept., Bloomfield, N. J. Data sheets describing ratings and operating characteristics of amplifier and oscillating tubes; grid glow tubes and ignitron phototubes; rectifier tubes; and miscellaneous types.

**Insulcrete**—Quigley Co. Inc., 56 West Forty-fifth street, New York. A bulletin on Insulcrete, a light-weight insulating refractory concrete, for furnace linings, door linings, and kindred uses; its thermal conductivity is only about one-third that of standard fire clay brick.

**Spectrographs**—Bausch & Lomb Optical Co., Rochester, N. Y. Catalog D-20 on instruments for spectrographic analysis, a revised presentation of data on spectrography, analysis, photometry and the instruments made by this company for these applications; a technical publication for laboratory workers.

**Stokers**—Link-Belt Co., 307 North Michigan avenue, Chicago. Three booklets on automatic firing with coal for boilers up to 300 horsepower; No. 1541 covers automatic coal burners for the home; No. 1537, commercial heating plants; No. 1538, high or low pressure process steam; covers also an air control that automatically meters air to the fuel bed.

**Stainless Fabrication**—Peter A. Frasse & Co. Inc., Grand street and Fifth avenue, New York. A booklet on fabrication and treatment of USS stainless and heat resisting steels, as a contribution of its technical staff; gives a summary of information on this subject, indexed, for general information and as a guide to engineers and shop foremen.

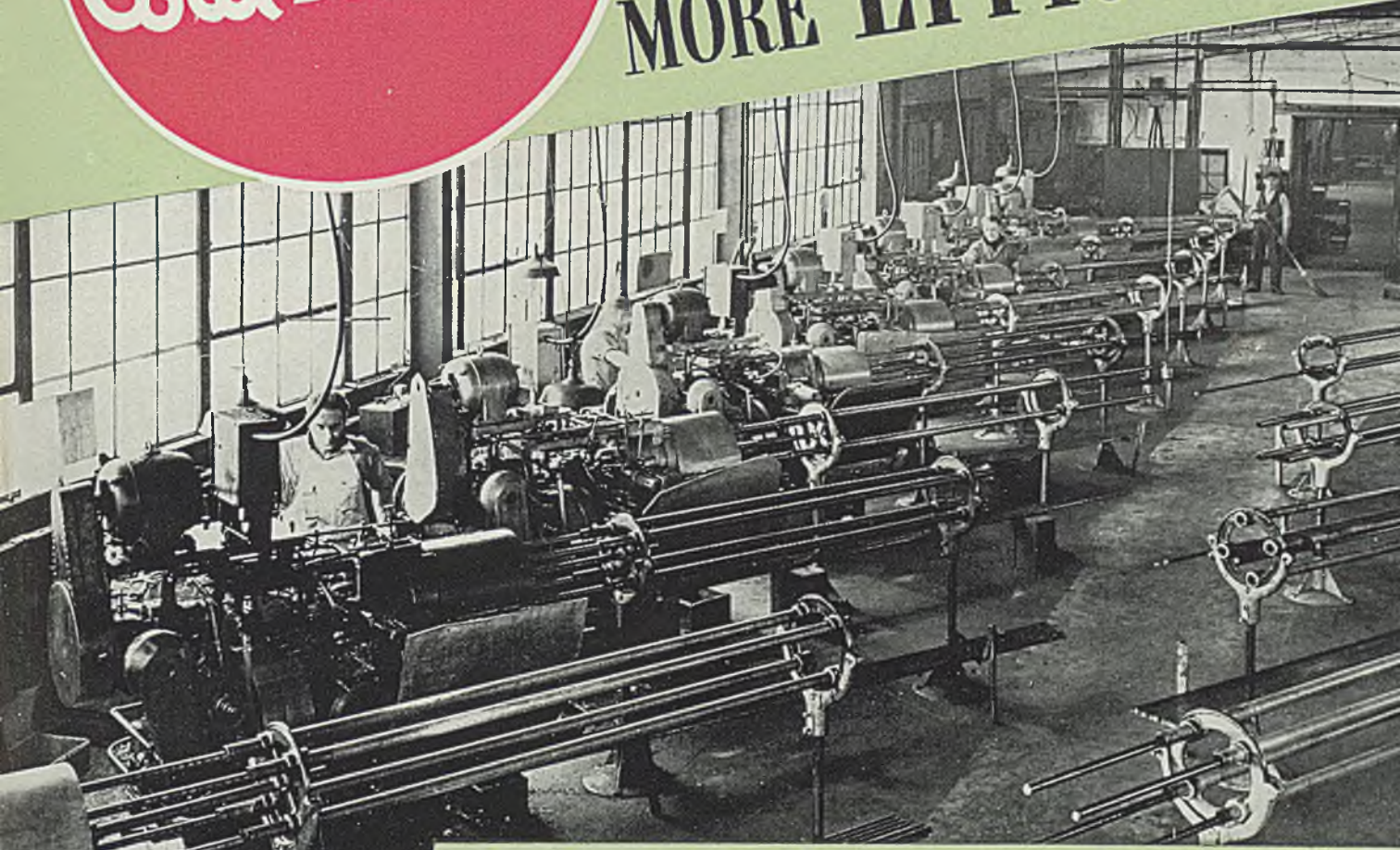
**Alloy Steels**—Heppenstall Co., Pittsburgh. Form 130, a booklet by its research and metallurgical departments on the effects of alloying elements and the physical properties of steel in forged sections; definitions of terms relating to heat treating operations, specific effects of alloying elements in steel, hardness conversion tables with corresponding approximate tensile strengths for Heppenstall carbon and alloy steels.

**Rotary Positive Blowers**—Roots-Connorsville Blower Corp., Connorsville, Ind. Bulletin 22-B12, devoted to the application of rotary positive blowers in foundry cupola service, discussing structural features of the blowers with illustrations showing operating principle and bearing construction; a table of melting capacities, speeds and horsepower; data on air ratios, height of coke bed and control equipment.



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As drills, forming and other tools go into action, the increased machinability of Union Cold Drawn Steels gives opportunity for the best operation of any type of automatic screw machine. Higher speeds are attained and power is saved. Tool grinding, tool changes and idle time are reduced. Completed parts have a smooth, bright finish. Faster and better production at lower cost is the result.

Union Cold Drawn Steels are the outcome of 47 years of effort to produce bars best suited for automatic screw machine production. Screw steels, common carbon steels and the alloys have all been improved in machinability.

UNION DRAWN STEEL CO., MASSILLON, OHIO

*Manufacturers of Efficiency Steels*

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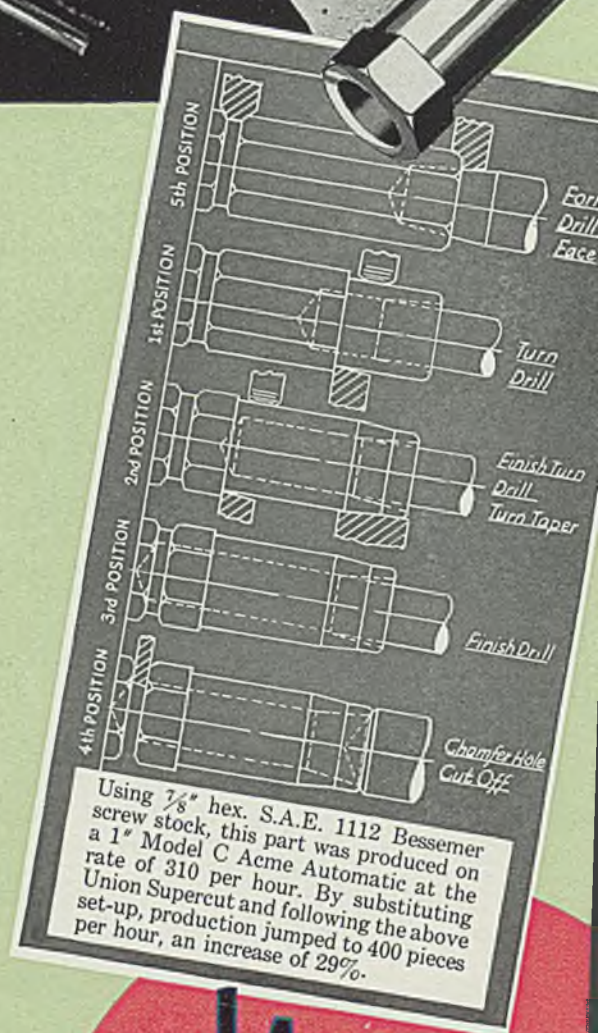
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• Plants by the hundreds have speeded up their automatic screw machines to highest efficiency with Union Supercut—reducing their operating costs radically and getting a bright, smooth surface and clean-cut threads on completed parts. Advancement in the quality of this steel, through the elimination of abrasive elements, provides an added source of profit to users. Tools last longer than ever before, tool changes and tool grinding are less frequent.

Faster speeds and faster feeds with Union Supercut, supported by reduced idle machine time, make hourly production climb by big percentages. Rates of increase from 75% to 100% over that of Bessemer screw steel (S.A.E. 1112) are common. Many go beyond that. In general practice a speed of 225 surface feet per minute and feeds about 25% above those obtainable with S.A.E. 1112 can be averaged.

Put Union Supercut to a thorough test in your plant. It is only a question of *how much* your hourly production can be increased. The attractive money-saving possibilities make that point well worth investigating.



UNION DRAWN STEEL CO., MASSILLON, OHIO

Manufacturers of Efficiency Steels



Union  
Cold Draw  
Steels



# Third Quarter Steel Price Rise General

## Large Sheet Tonnage

## For Auto Frames;

## Rate Slows to 66

**M**ORE steel products have been advanced. In addition to the semifinished materials, including blooms, billets, slabs and sheet bars, and steel bars and shapes, on which an increase of \$2 a ton was announced a week ago, sheets, hot-rolled strip, sheet piling and hot-rolled alloy steel bars have been raised \$2. Alloy steel ingots and semifinished also are up, effective July 1. Some announcement on cold-rolled strip and rails is anticipated shortly. Steelmakers are following the "open price" plan they adopted several months ago.

With all the adjustments so far made, effective July 1, STEEL's index of finished steel prices would be \$53.40, compared with \$53.70 last March, when the net result of reductions in pipe and wire nails and an increase in plain wire was to reduce the index to \$52.20. The lowest during the depression was \$45.30 in the spring of 1933.

Prices on pig iron will be announced shortly for third quarter and general belief is that no change will be made. Eastern producers meet strong competition from European iron and imports threaten to increase as the foreign price weakens. Wire prices also seem likely to be reaffirmed for third quarter.

Purchase of 65,000 to 75,000 tons of steel sheets placed by Edward G. Budd Mfg. Co., Philadelphia, with Alan Wood Steel Co., Conshohocken, Pa., for Chevrolet car and truck frames, is perhaps the largest sheet order ever placed in that district. Last year about 35,000 tons were placed with the same mill for a similar purpose. The Budd company has also placed 500 tons of stainless steel for cars for Atchison, Topeka & Sante Fe, the Republic Steel Corp. and Sharon Steel Corp. taking most of it.

Lettings of structural steel showed a slight increase at about 14,000 tons, slightly below the year's average to date. Inquiry is expected soon for about 25,000 tons for 28 schools in New York metropolitan district and 6000 tons for an extension to the West Side elevated highway, New York. A bridge at Beaumont, Tex., is estimated to require 9200 tons. A hospital in Jersey City, N. J., has been let, requiring 3100 tons.

### MARKET IN TABLOID

**DEMAND . . .** Railroad car material, tin plate active; automotive steady.

**PRICES . . .** Advances of \$2 per ton announced for third quarter on additional products.

**PRODUCTION . . .** Steel ingot rate down ½ point to 66 per cent.

**SHIPMENTS . . .** Slightly slower.

A pipe line at Little Rock, Ark., is pending, calling for 7000 tons of plates.

After the heavy buying of freight cars ten days ago railroads are doing little, but placing of steel bars, plates and other products by car builders is furnishing mills considerable tonnage. Some secondary buying of rails is expected during June.

Automotive requirements continue to shrink slowly, in line with smaller production of cars. Last week total assemblies were 108,300 cars, 1500 under the preceding week.

Operations are holding well against usual summer decline and are off ½ point for the week, to 66 per cent. Pittsburgh district last week regained the 2 points lost the preceding week, to 63 per cent; Chicago dropped 2½ points to 68 per cent; Wheeling district down 19 points to 70, Cincinnati lost 8 to 72 per cent, Colorado lost 13 to 50 per cent; Cleveland gained 1½ points to 75½, Buffalo 3 to 81, New England 2 to 77 per cent, with eastern Pennsylvania, Youngstown, Birmingham and Detroit unchanged.

Steel and iron imports for April were down 7099 tons from March. Decline in pig iron imports of about 12,000 tons from March was not balanced by increased tonnage in other products. Steel exports in April were 305,080 tons, 40,743 tons over March.

STEEL's iron and steel composite is down 4 cents to \$32.83, due solely to lower scrap prices; the finished steel composite is unchanged at \$52.20.

Scrap prices continue to recede but more slowly than for the past few weeks, STEEL's composite of steelworks scrap declining 9 cents last week, to \$13.04. This is the lowest level of this composite since mid-November, 1935.



# COMPOSITE MARKET AVERAGES

	May 30	May 23	May 16	One Month Ago April, 1936	Three Months Ago Feb., 1936	One Year Ago May, 1935	Five Years Ago May, 1931
Iron and Steel .....	\$32.83	\$32.87	\$32.94	\$33.10	\$33.48	\$32.35	\$31.07
Finished Steel .....	52.20	52.20	52.20	52.20	53.70	54.00	49.02
Steelworks Scrap....	13.04	13.13	13.38	14.39	13.83	10.27	9.31

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

	May 29, 1936	April 1936	Feb. 1936	May 1935		May 29, 1936	April 1936	Feb. 1936	May 1935
<b>Finished Material</b>					<b>Pig Iron</b>				
Steel bars, Pittsburgh .....	1.85c	1.85c	1.85c	1.80c	Bessemer, del. Pittsburgh.....	\$20.8132	20.8132	20.8132	19.80
Steel bars, Chicago .....	1.90	1.90	1.90	1.85	Basic, Valley .....	19.00	19.00	19.00	18.00
Steel bars, Philadelphia .....	2.16	2.11	2.16	2.11	Basic, eastern del. East. Pa.....	20.8132	20.8132	20.8132	19.81
Iron bars, Terre Haute, Ind. ....	1.75	1.75	1.75	1.75	No. 2 fdy., del. Pittsburgh .....	20.3132	20.3132	20.3132	19.30
Shapes, Pittsburgh .....	1.80	1.80	1.80	1.80	No. 2 fdy., Chicago .....	19.50	19.50	19.50	18.50
Shapes, Philadelphia .....	2.01½	2.01½	2.01½	2.01½	Southern No. 2, Birmingham.....	15.50	15.50	15.50	14.50
Shapes, Chicago .....	1.85	1.85	1.85	1.85	Southern No. 2, del. Cincinnati...	20.2007	20.2007	20.2007	19.38
Tank plates, Pittsburgh .....	1.80	1.80	1.80	1.80	No. 2X eastern, del. Phila. ....	21.6882	21.6882	21.6882	20.68
Tank plates, Philadelphia .....	2.00	1.99	1.99	1.99	Malleable, Valley .....	19.50	19.50	19.50	18.50
Tank plates, Chicago .....	1.85	1.85	1.85	1.85	Malleable, Chicago .....	19.50	19.50	19.50	18.50
Sheets, No. 10, hot rolled, Pitts...	1.85	1.85	1.85	1.85	Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Sheets, No. 24, hot ann., Pitts....	2.40	2.40	2.40	2.40	Ferromanganese, del. Pitts. ....	80.13	80.13	80.13	90.13
Sheets, No. 24, galv., Pitts.....	3.10	3.10	3.10	3.10	Gray forge, del. Pittsburgh.....	19.6741	19.6741	19.6741	18.66
Sheets, No. 10, hot rolled, Gary...	1.95	1.95	1.95	1.95					
Sheets, No. 24, hot anneal., Gary	2.50	2.50	2.50	2.50	<b>Scrap</b>				
Sheets, No. 24, galvan., Gary.....	3.20	3.20	3.20	3.20	Heavy melting steel, Pittsburgh....	\$14.25	15.75	14.80	12.00
Plain wire, Pittsburgh .....	2.40	2.40	2.30	2.30	Heavy melt. steel, No. 2, east. Pa.	11.25	12.70	12.00	9.25
Tin plate, per base box, Pitts.....	5.25	5.25	5.25	5.25	Heavy melting steel, Chicago .....	12.75	14.35	14.30	10.20
Wire nails, Pitts. ....	2.10	2.10	2.40	2.60	Rail for rolling, Chicago .....	14.00	15.75	15.50	11.05
					Railroad steel specialties, Chicago	14.25	15.85	15.75	11.40

### Semifinished Material

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

### Coke

Connellsville, furnace, ovens .....	\$3.50	3.50	3.50	3.60
Connellsville, foundry, ovens .....	4.25	4.25	4.20	1.60
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 (Except Galvanized)		Tin Mill Black No. 28	
Hot Rolled No. 10, 24-48 in.		Pittsburgh .....	2.75c
Pittsburgh .....		Gary .....	2.85c
Gary .....		St. Louis, delivered	3.08c
Chicago, delivered..		Cold Rolled No. 10	
Detroit, del. ....		Pittsburgh .....	2.50c
New York, del. ....		Gary .....	2.60c
Philadelphia, del....		Detroit, delivered...	2.70c
Birmingham .....		Philadelphia, del....	2.81c
St. Louis, del. ....		New York, del. ....	2.85c
Pacific ports, f.o.b. cars, dock .....		Pacific ports, f.o.b. cars, dock .....	3.10c
Hot Rolled Annealed No. 24		Cold Rolled No. 20	
Pittsburgh .....		Pittsburgh .....	2.95c
Gary .....		Gary .....	3.05c
Chicago, delivered...		Detroit, delivered...	3.15c
Detroit, delivered...		Philadelphia, del....	3.26c
New York, del.....		New York, del. ....	3.30c
Philadelphia, del. ....		Enameling Sheets	
Birmingham .....		Pittsburgh, No. 10..	2.35c
St. Louis, del. ....		Pittsburgh, No. 20..	2.95c
Pacific ports, f.o.b. cars, dock .....		Gary, No. 10 .....	2.45c
Galvanized No. 24		Gary, No. 20 .....	3.05c
Pittsburgh .....		Tin and Terne Plate	
Gary .....		Gary base, 10 cents higher.	
Chicago, delivered..		Tin plate, coke base (box) Pittsburgh	\$5.25
Philadelphia, del. ....		Do., waste-waste..	2.75c
New York, del. ....		Do., strips .....	2.50c
Birmingham .....		Long ternes, No. 24 unassorted, Pitts.	3.40c
St. Louis, del. ....		Do., Gary .....	3.50c
Pacific ports, f.o.b. cars, dock .....			

### 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.	No.
		410	430
Bars .....	17.00	18.50	21.00
Plates .....	20.00	21.50	24.00
Sheets .....	25.00	28.00	31.00
Hot strip .....	15.75	16.75	21.75
Cold stp .....	20.50	22.00	27.00

### 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

### 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

### 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. ....	2.26c-2.36c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh .....	1.90c
Chicago, Buffalo, Cleve- land, Birm., Young. ....	1.95c
Gulf ports .....	2.30c

### Wire Products

(Prices apply to straight or mixed carloads; less carloads \$4 higher; less carloads fenc- ing \$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 finer .....	4.10c
do. finer than 15 ga.	4.60c
(Per pound)	
Polished staples.....	2.80c
Galv. fence staples	3.05c
Barbed wire, galv....	2.60c
Annealed fence wire	2.65c
Galv. fence wire.....	3.00c
Woven wire fencing (base column, c.l.)	\$58.00
To Manufacturing Trade	
Plain wire, 6-9 ga..	2.40c
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth up \$2; Birmingham up \$3.	
Spring wire, Pitts.	
or Cleveland .....	3.05c
Do., Chicago up \$1, Worc. \$2.	

### Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination	
10,000 to 19,999 lbs. ....	2.10c
20,000 to 59,999 lbs. ....	2.05c
60,000 to 99,999 lbs. ....	2.00c
100,000 lbs. and over.....	1.97½c
Gary, Ind., Cleve., Chi., up 5c	
Buffalo, up 10c; Detroit, up	
20c; eastern Michigan, up 25c	

### Alloy Steel Bars (Hot)

(Base, 3 to 25 tons.)	
Pittsburgh, Buffalo, Chi- cago, Massillon, Can- ton, Bethlehem .....	2.45c
Alloy	
S.A.E. Diff. S.A.E. Diff.	
2000.....0.25	3100.....0.55
2100.....0.55	3200.....1.35
2300.....1.50	3300.....3.80
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
9200 spring flats.....	base
9200 spring rounds, squares .....	0.25

### 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 23½-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, 0.25 car- bon and under,	
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. ....	\$25.50
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, Bir- mingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932 lists:	
Carriage and Machine	
½ x 6 and smaller....	70-10-5 off
Do. larger .....	70-10 off
Tire bolts .....	55 off
Flow Bolts	
All sizes .....	70-10 off
Stove Bolts	
In packages with nuts at- tached 72½-10-10 off; in packages with nuts separate 72½-10-10-5 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 ¾-inch .....	60-20-15 off
Do., ½ to 1-inch 60-20-15 off	
Do., over 1-inch 60-20-15 off	
Hexagon Cap Screws	
Milled .....	80-10-10 off
Upset, 1-in., smaller.....	85 off
Square Head Set Screws	
Upset, 1-in., smaller.....	75-10 off
Headless set screws .....	75 off

### Rivets, Wrought Washers

Struc., c. l., Pitts- burgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
¾-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs....	
	\$6.25 off

### Cut Nails

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

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

### Pipe and Tubing

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

### Welded Iron, Steel Pipe

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

Butt Weld Steel			
In.		Blk.	Galv.
¼ and ¾.....	60	44½	
½.....	64½	55	
¾.....	67½	59	
1-3.....	69½	61½	
Iron			
½.....	31½	15	
¾.....	36½	20½	
1-1½.....	39½	25½	
2.....	41½	26	
Lap Weld Steel			
2.....	62	53½	
2½-3.....	65	56½	
3½-6.....	67	58½	
7 and 8.....	66	56½	
9 and 10.....	65½	56	
Iron			
2.....	37	22½	
2½-3½.....	38	25	
4-8.....	40	28½	
Line Pipe Steel			
½, butt weld.....	56		
¾ and ¾, 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			
½-1½ inch, black and galv. take 4 pts. over; 2½-6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8-12- inch, no extra.			

Boiler Tubes  
O. 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, in-  
clusive, and embrace 47 size  
classifications in 22 decimal  
wall thicknesses ranging from  
0.109 to 1.000, prices also being  
on a lb. and 100 ft. basis.

### Seamless Tubing

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

### Cast Iron Water Pipe

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

### Semifinished Steel

Billets and Blooms	
4 x 4-inch base; gross ton	
Pitts., Chi., Cleve.,	
Buffalo & Youngs-	
town .....	\$28.00
Philadelphia .....	34.87
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., Can- ton, Sparrows Pt.	28.00
Slabs	
Pitts., Chi., Cleve.,	
Young. ....	28.00
Wire Rods	
Pitts., Cleve., No. 4	
to 5 .....	\$38.00
Do., No. 5 to	
15/32-inch .....	40.00
Do., over 15/32 to	
47/64-inch .....	42.00
Chicago up \$1; Worcester up \$2	
Skelp	
Pitts., Chi., Young.,	
Buff., Coatesville, Sparrows Point....	1.80c

### Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur....	\$3.50- 3.65
Connellsville, fdry....	4.25- 4.35
Connell, prem. fdry.	5.35- 5.50
New River fdry.....	6.00
Wise county fdry....	4.45- 5.00
Wise county fur....	4.00- 4.50
By-Product Foundry	
Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	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	
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	7.25c
Per 100 lb. Atlantic seaboard	
Sulphate of ammonia	\$1.30
+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
Erle, 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:	No. 2 Fdry	Malle- able	Basic	Besse- mer
St. Louis, northern .....	20.00	20.00	19.50	.....
St. Louis from Birmingham .....	19.68	.....	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. ....
Pitts. dist. fur. ....	19.00 Do., del. Chicago .....
	Lylees, Tenn. ....

**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	timore bases (bags)....	40.00
<b>Fire Clay Brick</b>	Domestic dead-burned gr. net ton f.o.b. Chelwah, Wash. (bulk)...	22.00
<b>Super Quality</b>	<b>Basic Brick</b>	
Pa., Mo., Ky. ....	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Pa., Ill., Md., Mo., Ky. ....	Chrome brick .....	\$45.00
Alabama, Ga., ....	Chemically bonded chrome brick .....	45.00
<b>Second Quality</b>	Magnesite brick .....	65.00
Pa., Ill., Ky., Md., Mo. ....	Chemically bonded magnesite brick .....	55.00
Ga., Ala. ....		
<b>Ohio</b>		
First quality .....		\$40.00
Intermediary .....		37.00
Second quality .....		28.00
<b>Malleable Bung Brick</b>		
All bases .....		50.00
<b>Silica Brick</b>		
Pennsylvania .....		\$45.00
Joliet, E. Chicago....		54.00
Birmingham, Ala....		48.00
<b>Magnesite</b>		
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 Bal-		

### 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 .....	\$1.21 switching charges			
Saginaw, Mich., from Detroit.....	21.75	21.75	21.25	21.25

## Nonferrous

### METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper				Straits Tin		Lead		Alumi-		Antimony		Nickel	
Electro, del.	Lake, del.	Casting, del.	refinery	New York Spot	Futures	N. Y.	East St. L.	num 99%	Chinese 99%	Spot, N. Y.	Cath-odes		
May 23	9.50	9.62½	9.12½	45.70	44.50	4.60	4.45	4.90	*19.00	13.50	35.00		
May 25	9.50	9.62½	9.12½	45.75	44.70	4.60	4.45	4.90	*19.00	13.50	35.00		
May 26	9.50	9.62½	9.12½	45.87½	44.85	4.60	4.45	4.90	*19.00	13.50	35.00		
May 27	9.50	9.62½	9.12½	45.87½	45.00	4.60	4.45	4.90	*19.00	13.50	35.00		
May 28	9.50	9.62½	9.12½	45.25	44.50	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)	15.12½	
Copper, hot rolled	17.00	
Lead cut to jobbers	8.25	
Zinc, 100-lb. base....	9.50	
Tubes		
High yellow brass	17.37½	
Seamless copper.....	17.50	
Rods		
High yellow brass....	13.12½	
Copper, hot rolled..	13.75	
Anodes		
Copper, untrimmed	14.50	
Wire		
Yellow brass (high)	15.37½	

### OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass		
New York .....	6.00- 6.25	
Cleveland .....	6.25- 6.00	
*Chicago .....	5.75- 6.00	
*St. Louis .....	6.00- 6.25	
Heavy Copper and Wire		
New York, No. 1....	7.50- 7.75	
*Chicago, No. 1....	7.00- 7.25	
Cleveland .....	6.75- 7.00	
*St. Louis, No. 1....	7.00- 7.50	
Composition Brass Borings		
New York .....	5.75- 6.00	
Light Copper		
New York .....	6.12½- 6.25	
*Chicago .....	5.50- 5.75	
Cleveland .....	5.75- 6.00	
St. Louis .....	5.50- 6.00	

Light Brass		
Chicago .....	3.50- 3.62½	
Cleveland .....	3.25- 3.50	
*St. Louis .....	3.25- 3.75	
Lead		
New York .....	3.50- 3.75	
Cleveland .....	3.50- 3.75	
Chicago .....	3.25- 3.50	
*St. Louis .....	3.25- 3.75	
Zinc		
New York .....	3.00- 3.12½	
Cleveland .....	2.25- 2.50	
*St. Louis .....	2.25- 2.75	
Aluminum		
Borings, Cleveland..	8.50- 8.75	
Mixed, cast, Cleve...	12.00-12.25	
*Mixed, cast, St. L.	12.00-12.75	
Clips, soft, Cleve...	14.00-14.25	
SECONDARY METALS		
Brass ingot, 85-5-5-5	9.50	
Stand. No. 12 alum.	16.50-17.00	

## 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. Palmer-ton, Pa., spot....	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl. ....	69.50
Do., less carload..	77.00
Do., 75 per cent..	126-130.00
Spot, \$5 a ton higher.	
Silicomn., 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.	



# Iron and Steel Scrap Prices

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

## HEAVY MELTING STEEL

Birmingham	9.50-10.00
Boston, dock, expt.	10.50
Boston, domestic	9.50-10.25
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	12.50-13.00
Cleveland, No. 1	13.00-13.50
Cleveland, No. 2	12.00-12.50
Detroit, No. 1	10.00-10.50
Detroit, No. 2	9.00-9.50
Eastern Pa., No. 1	12.00-12.50
Eastern Pa., No. 2	11.00-11.50
Federal, Ill.	10.50-11.00
Granite City, R. R.	11.75-12.25
Granite City, No. 2	10.00-10.50
N. Y., brokers, No. 2	7.25-7.75
N. Y., brokers, barge (No. 1 for export)	9.50
Pitts., No. 1 (R. R.)	14.25-14.75
Pitts., No. 1 (dlr.)	14.00-14.50
Pittsburgh, No. 2	12.75-13.25
St. Louis	11.00-11.50
Toronto, dealers	7.50
Valleys, No. 1	14.00-14.50

## COMPRESSED SHEETS

Buffalo, dealers	12.00-12.50
Chicago, factory	11.75-12.25
Chicago, dealer	11.50-12.00
Cleveland	12.75-13.25
Detroit	10.50-11.00
E. Pa., new mat.	12.50-13.00
Pittsburgh	14.00-14.50
St. Louis	7.75-8.25
Valleys	13.75-14.00

## BUNDLED SHEETS

Buffalo	10.50-11.00
Cincinnati, del.	7.75-8.25
Cleveland	9.00-9.50
Pittsburgh	12.75-13.25
St. Louis	6.25-6.75
Toronto, dealers	4.50

## SHEET CLIPPINGS, LOOSE

Chicago	8.00-8.50
Cincinnati	5.75-6.25
Detroit	7.50-8.00
St. Louis	5.50-6.00

## STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	15.50-16.00
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	14.00-14.50
Detroit	14.50-15.00
Pitts., open-hearth, 3 ft. and less	15.75-16.25
St. Louis, 2 ft. & less	14.00-14.50

## STEEL RAILS, SCRAP

Boston	9.00-9.50
Chicago	12.50-13.00
Pittsburgh	14.50-15.00
St. Louis	12.50-13.00
Buffalo	13.00-14.00
Toronto, dealers	8.50

## STOVE PLATE

Birmingham	7.00-7.50
Boston, dealers	5.00-5.25
Buffalo	11.00-11.50
Chicago	7.50-8.00
Cincinnati, dealers	7.75-8.50
Detroit, net	9.00-9.50
Eastern Pa.	10.50
N. Y., brokers, fdry.	6.00-6.50
St. Louis	7.50-8.00
Toronto, dealers, net	5.50

## COUPLERS, SPRINGS

Buffalo	14.75-15.25
Chicago, springs	14.00-14.50
Eastern Pa.	16.00-16.50
Pittsburgh	17.00-17.50
St. Louis	12.75-13.25

## ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.75-13.25
Buffalo	14.50-15.00

## RAILROAD SPECIALTIES

Chicago	14.00-14.50
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## LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.75-15.25
Cleveland, billet, bloom crops	17.50-18.00
Eastern Pa., crops	16.50-17.00
Pittsburgh, billet, bloom crops	16.50-17.00
Pittsburgh, sheet bar crops	16.00-16.50

## FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	12.50-13.00

## SHOVELING STEEL

Chicago	12.50-13.00
Federal, Ill.	10.50-11.00
Granite City, Ill.	10.00-10.50
Toronto, dealers	6.50

## RAILROAD WROUGHT

Birmingham	7.50-8.00
Boston, dealers	7.25-7.50
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	13.00-13.50
Chicago, No. 1, net	12.50-13.00
Chicago, No. 2	12.50-13.00
Cincinnati, No. 2	10.00-10.50
Eastern Pa.	13.00-13.50
St. Louis, No. 1	10.25-10.75
St. Louis, No. 2	11.75-12.25
Toronto, No. 1, dlr.	7.00

## SPECIFICATION PIPE

Eastern Pa.	12.00
New York, dealers	7.75-8.00

## BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	11.50-12.00
Cinci., No. 1, deal	8.50-9.00
Cincinnati, No. 2	4.50-5.00
Cleveland, No. 2	8.25-8.75
Detroit No. 1, new	9.50-10.00
Valleys, new, No. 1	13.00-13.50
Toronto, dealers	6.00

## MACHINE TURNINGS

Birmingham	5.50-6.50
Boston, dealers	3.25-3.50
Buffalo	7.00-7.25
Chicago	6.00-6.50
Cincinnati, dealers	5.75-6.25
Cleveland	7.50-8.00
Detroit	5.75-6.25
Eastern Pa.	8.50
New York, brokers	3.00-3.50
Pittsburgh	9.25-9.75
St. Louis	4.00-4.50
Toronto, dealers	4.00
Valleys	9.75-10.25

## BORINGS AND TURNINGS

<i>For Blast Furnace Use</i>	
Boston, dealers	2.00

Buffalo	8.50-9.00
Cincinnati, dealers	5.25-5.75
Cleveland	8.25-8.75
Detroit	6.50-7.00
Eastern Pa.	6.50-7.00
New York, brokers	2.75-3.25
Pittsburgh	8.25-8.75
Toronto, dealers	4.00

## CAST IRON BORINGS

Birmingham, plain	4.50-5.50
Boston, chemical	6.00-6.25
Boston, dealers	3.50-4.00
Buffalo	8.00-8.50
Chicago	6.00-6.50
Cincinnati, dealers	5.00-5.50
Cleveland	8.25-8.75
Detroit	6.50-7.00
E. Pa., chemical	11.00-13.00
New York, brokers	4.00-4.25
St. Louis	4.00-4.50
Toronto, dealers	5.00

## PIPE AND FLUES

Cincinnati, dealers	7.75-8.25
Chicago, net	7.50-8.00

## RAILROAD GRATE BARS

Buffalo	10.50-11.00
Chicago, net	8.25-8.75
Cincinnati	7.00-7.50
Eastern Pa.	10.50
New York, brokers	6.00-6.50
St. Louis	7.50-8.00

## FORGE FLASHINGS

Boston, dealers	6.50-6.75
Buffalo	12.00-12.50
Cleveland	13.00-13.50
Detroit	9.00-9.50
Pittsburgh	13.00-13.50

## FORGE SCRAP

Boston, dealers	5.50-6.00
Chicago, heavy	14.00-14.50
Eastern Pa.	12.50-13.00

## ARCH BARS, TRANSOMS

St. Louis	13.50-14.00
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## AXLE TURNINGS

Boston, dealers	5.75-6.00
Buffalo	11.00-11.50
Chicago, elec. fur	12.75-13.25
Eastern Pa.	11.00-12.00
St. Louis	9.00-9.50
Toronto	4.50

## STEEL CAR AXLES

Birmingham	11.50-12.50
Boston, ship. point	11.00-11.25
Buffalo	15.50-16.00
Chicago, net	14.25-14.75
Eastern Pa.	17.00
St. Louis	13.00-13.50
Toronto	8.50

## SHAFTING

Boston, ship point	13.25-13.50
Eastern Pa.	18.50-18.75
New York, brokers	13.50-14.00
St. Louis	13.50-14.00

## CAR WHEELS

Birmingham	11.00-11.50
Boston, iron deal	8.75-9.00
Buffalo, iron	13.50-14.00
Buffalo, steel	15.50-16.00

Chicago, iron	13.25-13.75
Chicago, rolled steel	14.00-14.50
Cincinnati, iron	10.50-11.00
Eastern Pa., iron	14.00-14.50
Eastern Pa., steel	16.00-16.50
Pittsburgh, iron	14.00-14.50
Pittsburgh, steel	16.75-17.25
St. Louis, iron	11.50-12.00
St. Louis, steel	13.00-13.50
Toronto, net	8.50

## NO. 1 CAST SCRAP

Birmingham	10.50-11.50
Boston, No. 1 mach.	9.25-9.75
Boston, No. 2	9.50-10.00
Boston, tex. con.	11.50-12.00
Buffalo, cupola	12.00-12.50
Buffalo, mach.	13.00-13.50
Chicago, agri. net	10.00-10.50
Chicago, auto	11.50-12.00
Chicago, mach. net	12.00-12.50
Chicago, rail'd net	11.00-11.50
Cinci., mach. cup	10.75-11.25
Cleveland, mach	15.25-15.75
Eastern Pa., cupola	14.00
E. Pa., mixed yard	12.00
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	11.00-11.50
St. L., No. 1 mach.	11.50-12.00
Toronto, No. 1, mach., net	9.00

## HEAVY CAST

Boston, del.	7.75-8.00
Buffalo, break	11.00-11.50
Cleveland, break	12.50-13.00
Detroit, No. 1 mach. net	13.00-13.50
Detroit, break	11.00-11.50
Detroit, auto net	11.00-11.50
Eastern Pa.	12.50-13.00
New York, break, brokers	8.50-8.75
Pittsburgh	13.25-13.75

## MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	15.00-16.00
Buffalo	16.00-16.50
Chicago, R. R.	15.50-16.00
Cincinnati, agri. del.	12.50-13.00
Cleveland, rail	16.25-16.75
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	16.00-16.50
Pittsburgh, rail	17.50-18.00
St. Louis, R. R.	13.50-14.00
Toronto, net	7.00

## RAILS FOR ROLLING

*5 feet and over*

Birmingham	11.50-12.50
Boston, dealers	9.00-9.50
Buffalo	13.00-14.00
Chicago	13.75-14.25
Eastern Pa.	15.00-15.50
New York, brokers	10.25-10.50
St. Louis	13.75-14.25

## LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	12.00-12.50

## LOW PHOS. PUNCHINGS

Buffalo	14.75-15.25
Chicago	15.00-15.50
Eastern Pa.	16.00-16.50
Pittsburgh (heavy)	16.75-17.25
Pittsburgh (light)	15.75-16.25

## Iron Ore

<i>Lake Superior Ore</i>	
Gross ton, 51½%	
<i>Lower Lake Ports</i>	
Old range bessemer	\$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

<i>Eastern Local Ore</i>	
<i>Cents, unit, dcl. E. Pa.</i>	
Foundry and basic	
56-63% con. (nom.)	8.00-9.00
Cop.-free low phos.	
58-60% (nom.)	10.00-10.50
<i>Foreign Ore</i>	
<i>Cents per unit, f.a.s. Atlantic</i>	
<i>ports (nominal)</i>	
Foreign manganiferous ore, 45.55%	

iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	\$15.85-16.80
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

## Manganese Ore

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



# Warehouse Iron and Steel Prices

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

<b>STEEL BARS</b>		Cincinnati ....	3.25c	Buffalo .....	3.37c	Pittsburgh(h)	2.95c	Seattle .....	5.60c
Baltimore*.....	3.00c	Houston .....	3.25c	Chattanooga..	3.56c	San Francisco	3.35c	St. Louis .....	3.55c
Boston†† .....	3.10c	Los Ang., cl..	2.45c	Chicago .....	3.20c	Seattle .....	3.70c	St. Paul .....	3.55c
Buffalo .....	3.00c	New Orleans ..	3.50c	Cincinnati ....	3.42c	St. Louis .....	3.45c		
Chattanooga..	3.36c	Pitts., twined (h)	3.05c	Cleveland, ½-		St. Paul .....	3.30c		
Chicago (j)....	3.00c	Pitts., twisted		in. and over	3.31c	Tulsa .....	3.70c		
Cincinnati ....	3.22c	squares (h)	3.175c						
Cleveland .....	3.00c	San Francisco	2.45c	Detroit .....	3.42c	<b>NO. 24 BLACK</b>			
Detroit .....	3.09c	Seattle .....	2.45c	Detroit, ½-in.	3.65c	Baltimore*†....	3.60c	Baltimore (c)	3.73c
Houston .....	3.00c	St. Louis .....	3.25c	Houston .....	3.00c	Boston (g) ....	3.95c	Boston .....	3.90c
Los Angeles..	3.60c	Tulsa .....	3.25c	Los Angeles..	3.60c	Buffalo .....	3.25c	Buffalo (h)....	3.55c
Milwaukee .3.11c-3.26c		Young. ....	2.30c-2.60c	Milwaukee ....	3.31c	Chattanooga..	4.16c	Chattanooga*	4.13c
New Orleans..	3.35c			New York†(d)	3.40c	Chicago .....	3.85c	Chicago (h)..	3.50c
New York†(d)	3.31c	<b>SHAPES</b>		Philadelphia*	2.98c	Cincinnati ....	4.02c	Cincinnati ....	3.72c
Pitts. (h).....	2.95c-3.10c	Baltimore*....	3.00c	Phila. floor...	4.95c	Cleveland .....	3.91c	Cleveland (h)	3.50c
Philadelphia*	3.03c	Boston†† .....	3.19c	Pittsburgh(h)	3.15c	New Orleans ..	4.50c	Detroit .....	3.79c
Portland .....	3.58c	Buffalo .....	3.25c	Portland .....	3.35c	New York†(d)	3.89c	Los Ang. (f) (d)	5.85c
San Francisco	3.25c	Chattanooga..	3.56c	San Francisco	3.25c	Philadelphia*†	3.60c	Milwaukee ....	3.61c
Seattle .....	3.70c	Chicago .....	3.20c	Seattle .....	3.55c	Pitts.** (h)....	3.55c	New Orleans ..	4.30c
St. Louis .....	3.25c	Cincinnati ....	3.42c	St. Louis .....	3.45c	Portland .....	4.10c	New York†(d)	3.81c
St. Paul .....	3.25c-3.40c	Cleveland .....	3.31c	St. Paul .....	3.45c	San Francisco	4.00c	Philadelphia..	3.76c
Tulsa .....	3.25c	Detroit .....	3.42c	Tulsa .....	3.50c	Seattle .....	4.40c	Pittsburgh ..	3.50c
		Houston .....	3.00c			St. Louis .....	4.10c	Portland (f) (d)	6.15c
<b>IRON BARS</b>		Los Angeles..	3.60c	<b>NO. 10 BLUE</b>		St. Paul .....	4.00c	San Fran.(f) (d)	5.95c
Portland .....	3.40c	Milwaukee ...	3.31c	Baltimore*.....	3.10c	Tulsa .....	4.75c	Seattle (f) (d)	6.15c
Chattanooga..	3.36c	New Orleans ..	3.55c	Boston†† .....	3.30c			St. Louis.....	3.75c
Baltimore*....	3.05c	New York†(d)	3.37c	Buffalo .....	3.62c			St. Paul .....	4.02c
Chicago .....	2.75c	Philadelphia*	2.98c	Chattanooga..	3.36c			Tulsa .....	4.65c
Cincinnati ....	3.22c	Pittsburgh(h)	3.15c	Chicago .....	3.05c				
New York†(d)	3.36c	Portland (i)...	3.50c	Cincinnati ....	3.22c	<b>NO. 24 GALV. SHEETS</b>			
Philadelphia*	2.93c	San Francisco	3.25c	Cleveland .....	3.11c	Baltimore*†....	4.30c		
St. Louis.....	3.25c	Seattle (i)....	3.70c	Det., 8-10 ga.	3.14c	Buffalo .....	4.00c		
Tulsa .....	3.25c	St. Louis .....	3.45c	Houston .....	3.35c	Boston (g)....	4.65c		
		St. Paul .....	3.45c	Los Angeles..	3.75c	Chattanooga..	4.86c		
<b>REINFORCING BARS</b>		Tulsa .....	3.50c	Milwaukee ...	3.16c	Chicago (h)...	4.55c		
Buffalo .....	2.60c	<b>PLATES</b>		New Orleans ..	3.55c	Cincinnati ....	4.72c		
Chattanooga..	3.36c	Baltimore*....	3.00c	New York†(d)	3.31c	Cleveland .....	4.61c		
Chicago .....	2.10c-2.60c	Boston†† .....	3.21c	Portland .....	3.35c	Detroit .....	4.72c		
Cleveland (c)	2.10c			Philadelphia*	3.08c	Houston .....	4.40c		

## Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 27

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

	British gross tons		Continental Channel or North Sea ports, metric tons	
	U. K. ports	£ s d	Quoted in dollars at current value	**Quoted in gold pounds sterling
<b>PIG IRON</b>				
Foundry, 2.50-3.00 Silicon	\$15.56	3 2 6*	\$14.14	1 5 0
Basic bessemer.....	15.56	3 2 6*	12.11	1 10 0
Hematite, Phos. .03-.05..	17.68	3 11 0		
<b>SEMI-FINISHED STEEL</b>				
Billets.....	\$29.26	5 17 6	\$18.99	2 7 0
Wire rods, No. 5 gage....	44.57	8 19 0	36.37	4 10 0
<b>FINISHED STEEL</b>				
Standard rails.....	\$41.09	8 5 0	\$44.25	5 10 0
Merchant bars.....	1.72c	7 15 0	1.14c to 1.19c	3 2 6 5 0
Structural shapes.....	1.67c	7 10 0	1.12c	3 1 6
Plates, ½ in. or 5 mm....	1.79c	8 1 3	1.55c	4 5 0
Sheets, black, 24 gage or 0.5 mm.....	2.16c	9 15 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.61c	11 15 0	2.19c	6 0 0
Bands and strips.....	1.94c	8 15 0	1.42c	4 0 0
Plain wire, base.....	2.16c	9 15 0	1.92c	5 5 0
Galvanized wire, base....	2.55c	11 10 0	2.15c	5 17 6
Wire nails, base.....	2.66c	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)	\$17.16	260
Basic bessemer pig iron...	18.05	3 12 6(a)	12.54	190
Furnace coke.....	5.60	1 2 6	6.27	95
Billets.....	29.26	5 17 6	28.38	430
Standard rails.....	1.83c	8 5 0	2.30c	671
Merchant bars.....	2.01c	9 1 0	1.67c	560
Structural shapes.....	1.94c	8 15 0	1.64c	550
Plates, ½ in. or 5 mm....	2.01c	9 1 3	2.09c	700
Sheets, black.....	2.55c	11 10 0	1.78c	600†
Sheets, galv., corr., 24 ga. or 0.5 mm.....	3.00c	13 10 0	2.84c	950
Plain wire.....	2.16c	9 15 0	2.68c	900
Bands and strips.....	2.18c	9 16 0	1.98c	650

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

\*\*Gold pound sterling carries a premium of 66.00 per cent over paper sterling.

<b>BANDS</b>	
Baltimore*.....	3.20c
Boston†† .....	3.30c
Buffalo .....	3.42c
Chattanooga..	3.61c
Chicago .....	3.38c
Cincinnati ....	3.47c
Cleveland .....	3.36c
Detroit, ½-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

<b>HOOPS</b>	
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

<b>COLD FIN. STEEL</b>	
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

<b>COLD ROLLED STRIP</b>	
Boston, 0.100-in., 500 lb. lots .....	3.2450
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

<b>TOOL STEELS</b>	
(Applying on or east of Mississippi river; west of Mississippi 1c up)	
High speed .....	57c
High carbon, high chrome .....	37c
Oil hardening .....	22c
Special tool .....	20c
Extra tool .....	17c
Regular tool .....	14c
Uniform extras apply.	

<b>BOLTS AND NUTS</b>	
(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.



# Bars

Bar Prices, Page 70

**Pittsburgh** — Following the announcement advancing plates and structural shapes by \$2 a ton, the decision was reached early last week to mark up hot-rolled merchant steel bars \$2 a ton also. Considering the present market at 1.85c, base, Pittsburgh, for 3 to 25-ton lots, the market on July 1 will therefore become 1.95c, f.o.b. Pittsburgh, on the same basis. No change has been announced for third quarter in quantity or other bar extras. Through last week bar specifications showed no weakening. Alloy quality hot-rolled bars remain 2.45c, base, Pittsburgh, lacking any third-quarter price declaration.

**Cleveland**—Increase in steel bar specifications from fabricators, implement and refrigerator makers is noted, probably in anticipation of third quarter price advances, and June delivery is being urged in some cases. A slight recession in volume of specifications from forging and nut and bolt companies serving the automotive trade is seen, but with other general users, bar demands have increased.

**Chicago**—Bar mills are booked a short distance ahead, and with the speculative demand which is resulting from the higher prices announced for third quarter, producers anticipate heavy June shipments. Both billet and rail steel bars will be advanced \$2 a ton for third quarter delivery. Bar iron will be raised similarly to 1.85c, Terre Haute, Ind., and 1.90c, Chicago. The automotive industry gradually is reducing its consumption. Farm implement manufacturers are curtailing specifications moderately because of the approach of the end of the season for production of certain tools, though tractor builders continue output at an active pace. Estimates of the Farm Equipment institute point to a 25 per cent gain in sales, compared with 1935. This would bring the year's business to around 90 per cent of the 1928-1930 average.

**New York**—With prices scheduled to be advanced \$2 a ton for third quarter deliveries, commercial steel bar sellers are anticipating one of the briskest months this year in June. May business is characterized as having been fair, with specifications from railroads and bolt and nut manufacturers outstanding.

**Philadelphia**—Demand for bars is expected to be livelier over the remaining weeks of this quarter, in view of the scheduled \$2 advance on deliveries after June 30. Cold-fin-

ished bar demand likewise may be stimulated, with a \$3 increase contemplated.

# Plates

Plate Prices, Page 70

**Pittsburgh** — Prospective marine requirements for plates are highly encouraging to producers and list a number of imminently pending barge contracts, as well as those for seagoing vessels. In the meantime, actual plate requirements of car shops are at hand and should engage producing capacity at a satisfactory rate over the next 60 days. The present market holds at 1.80c, base, Pittsburgh, but will be advanced to 1.90c, Pittsburgh, effective July 1. For delivery within the Pittsburgh switching area the third-quarter price will be 1.92½c on steel plates.

**Cleveland**—New business in steel plates is quiet, but mill representatives express conviction that June shipments will be much heavier. Fabricators are furnishing most of present demand, with boiler shops a close second, some of the latter probably going into stock against third quarter requirements.

**Chicago**—Plate fabricators are well booked for several months and production of tanks, pipe lines and other heavy equipment requiring plates and structural shapes is expected to be at the best level in several years during third quarter. A similarly good movement of plates is in prospect. New business in fabricated products lately has been quieter, however. Municipal tank buying is light, with the approaching completion of placing of orders for PWA projects. Railroad shops, freight car builders and structural fabricators will require substantial plate tonnage during the next several months. A water pipe line for Little Rock, Ark., will take 7000 tons of plates.

**Philadelphia**—The advance of \$2 a ton in plates for third quarter will be the first revision in the east, apart from slight changes due to freight rate adjustments, since July, 1934, when a \$1 reduction went into effect. Under the new schedule sheets will be 2.00c, Coatesville, Pa., or 2.09c, Philadelphia. Producers anticipate expanding output over the remainder of this month. Recent orders have been numerous, although the aggregate volume of tonnage involved has been only fair. Some delay is expected in the award of steel for the Atlantic Refining Co.'s tanker now on order with the Sun Shipbuilding Co., Chester, Pa., as plans are being revised slightly. It is considered possible that construction on this boat, which is to be an all-weld-

ed job, will not be started before fall.

**San Francisco** — The opening of bids, on close to 8000 tons of plates, for a 36-inch welded steel pipe line for the Stone Canyon project, Los Angeles, holds the interest of the plate trade and an award is expected shortly. Bids also have been opened on a 24 and 36-inch welded pipe line for the water and power department, Los Angeles, approximately 1300 tons.

**Seattle**—Demand for plates is improving and awards to date are well in advance of the corresponding period last year. New fishing vessel construction and remodeling call for an aggregate tonnage of plates that is the heaviest in several seasons.

## Contracts Placed

1075 tons, converter flue, American Smelting & Refining Co., Garfield, Utah, to Minneapolis Steel & Machinery Co., Minneapolis.

305 tons, six 24 x 100 foot barges to Deaby Corp. through United States engineer office at Omaha.

200 tons, outlet pipe, Moon Lake and Taylor Park dams, to unnamed interest.

105 tons, tanks for steamer MAZAMA, to Commercial Boiler Works, Seattle.

## Contracts Pending

7000 tons, water pipe line, Little Rock, Ark.

1326 tons, 24 and 36-inch welded steel pipe, specification X-26, Los Angeles; bids opened.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

**New York**—An increase in bolt and nut prices, the first general advance since Nov. 4, 1935, is expected to be announced shortly, in the opinion of some trade leaders here. The scheduled higher prices for steel for third quarter, combined with increasing operating costs, contribute to the stronger sentiment at this time; meanwhile, business is coming out at a fair rate, although at the moment devoid of spectacular tonnages.

**Chicago**—Third quarter prices of bolts, nuts and rivets are scheduled to be announced this week. The market for some time has been irregular, with quoted levels not strictly adhered to. Some attempt is expected to be made to bring about more stability in prices. Business has been fairly steady lately. Railroad requirements for equipment building have been increasing, but some let-down has been noted in needs of miscellaneous users. Consumption by farm implement manufacturers is commencing to recede from its previous active rate, though tractor builders disclose no slackening.



# Transportation

Track Material Prices, Page 71

Steel demand from railroads is quiet after the unusual spurt for car buying ten days ago, but orders for steel are being distributed by car-builders to cover these needs, giving the market considerable activity.

Rail mills expect some moderate tonnages of rails to be placed soon to supplement earlier buying as a number of roads are in need of additional tonnage. Rail backlogs in some cases will continue rollings into July.

Baldwin Locomotive Works, Eddystone, Pa., is distributing steel orders for ten passenger locomotives it is building for the New York, New Haven & Hartford. Edward G. Budd Mfg. Co., Philadelphia, has awarded 500 tons of stainless steel for cars it is building for the Atchison, Topeka & Santa Fe, most going to Republic Steel Corp. and Sharon Steel Corp.

Specifications for light rails and mine ties received by producers at Pittsburgh have declined over the past week, but the generally low status of inventories in the hands of light rail dealers and consumers bespeaks an encouraging volume of specifications over at least the next 30 to 60 days. New billet quality light rails hold quoted unchanged at \$35, base, Pittsburgh, and no change in this market or in standard rails at \$36.37½ per ton, f.o.b. mill, has been announced for the third quarter. Previously there had been some discussion to advance standard rails, but apparently the market will be continued unchanged for the coming quarter.

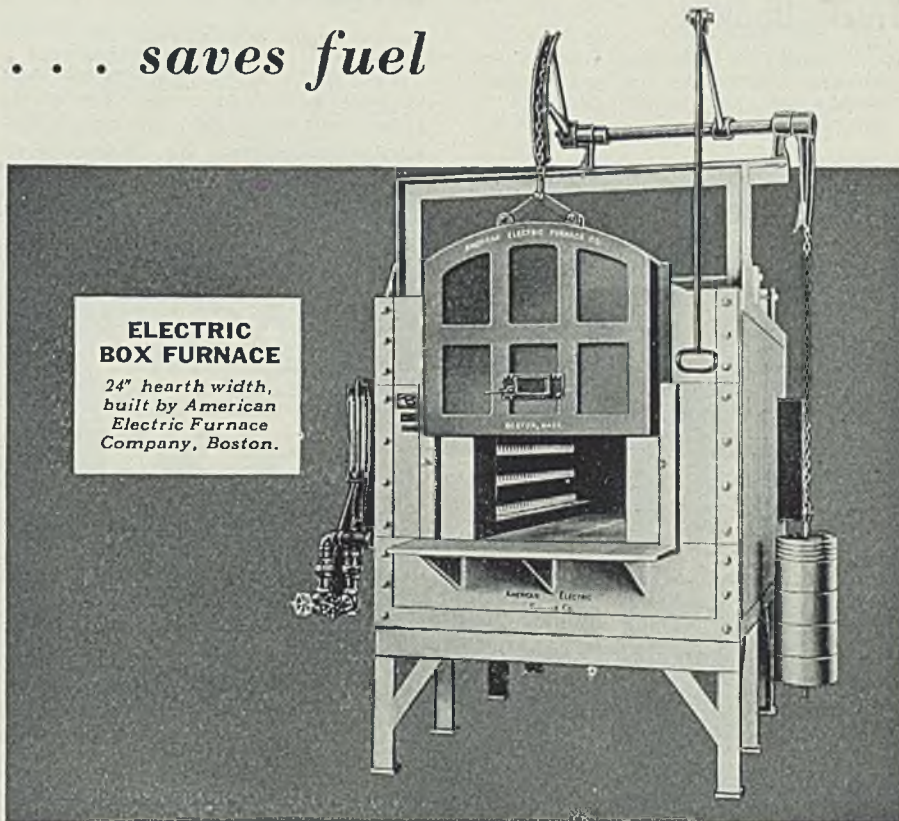
## Buses Booked

American Car & Foundry Motors Co., New York: Five 35-passenger for Boston Elevated Railway, Boston; five 30-passenger, for Chicago & Calumet District Transit Co., Hammond, Ind.; three 35-passenger, for Staten Island Coach Co., Staten Island, N. Y.; three 30-passenger, for Citizens' Rapid Transit Corp., Newport News, Va.; two 35-passenger, for Conestoga Transportation Co., Lancaster, Pa.; two 30-passenger, for Boston, Worcester & New York Street Railway, Framingham Center, Mass.

J. G. Brill Co., Philadelphia: Eight trolley buses for Peoples Railway Co., Dayton, O.

Twin Coach Corp., Kent, O.: Twenty 23-passenger for Omaha & Council Bluffs Street Railway Co., Omaha, Nebr.; fifteen 31-passenger for Spokane United Railways, Spokane; eight 25-passenger for Tacoma Railway & Power Co., Tacoma, Wash.; seven 25-passenger for Georgia Power Co., Atlanta, Ga.; four 25-passenger for Bluebird Coach Lines Inc., Chicago; three 22-passenger for Eastern Massachusetts Street Railway Co., Boston; three 23-passenger for Columbus

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Railway, Light & Power Co., Columbus, O.; three 24-passenger for Kingston City Transportation Co., Kingston, N. Y.

White Motor Co., Cleveland: 48 sight-seeing buses for national park service, for department of interior, Washington.

## Trucks Booked

White Motor Co., Cleveland: 685 White and Indiana trucks for war department and agriculture department, Washington.

Driscoll & Co., electroplaters, 1419 Carroll avenue, Chicago, have bought

a plant at Grant and Troy streets which is being remodeled, and will occupy it about Sept. 1.

## Sheets

Sheet Prices, Page 70

Pittsburgh—The \$2 a ton advance in base prices in sheets for effect July 1 will name the following Pittsburgh base prices: No. 24 hot rolled annealed, 2.50c; No. 10 hot rolled, 1.95c; No. 10 cold rolled, 2.60c; No.

20 cold rolled, 3.05c; galvanized No. 24, 3.20c; No. 10 enameling grade, 2.45c; and 20 gage enameling, 3.05c. No change will be made in the method of quoting quantity differentials adopted April 1, or in extras on size, quality, etc. The present market finds a large share of specifications originating with refrigerator and washing machine manufacturers, as well as makers of drums, automobile parts and from the jobbing trade. Last week's mill operations found common black at 72 per cent, full finished at 63 per cent, galvanized production at 59, and jobbing mills at 46.

Cleveland—While new demand for steel sheets appears to be tapering, June requirements of miscellaneous users are being urged upon mills. Northern Ohio mills are maintaining operating schedules at fairly satisfactory rates.

Chicago—Sheet mills anticipate difficulty in attempting to ship during June the speculative tonnage which some consumers are thought likely to order. Backlogs have been fairly heavy and normal requirements of users were expected to provide active production schedules during the balance of the quarter. Local producers are adopting the \$2 a ton advance for third quarter shipments.

New York—Sheet sellers experienced a good month in May and with a \$2 advance scheduled to apply on all grades of sheets, excepting electrical sheets, further brisk activity is anticipated. Sellers are finding it increasingly difficult to make deliveries, with some sellers virtually out of the market for the remainder of this quarter on cold-finished sheets. They are also well sold ahead on galvanized sheets.

Philadelphia—Placing of 65,000 to 75,000 tons of hot-rolled sheets by the Edward G. Budd Mfg. Co., Philadelphia, with the Alan Wood Steel Co., Conshohocken, Pa., this past week, is one, if not the largest sheet order ever placed in this district. Sheets are for 1937 Chevrolet car frames and will run in thickness from No. 16 gage to 1/4-inch, with widths up to 36 inches.

The sheets will be used for two types of passenger cars and three types of trucks, with deliveries extending for the life of the models. Prices, it is said, will be subject to quarterly adjustment to conform with the going market. Alan Wood Steel Co. was the successful bidder on a similar contract last June, involving approximately 35,000 tons for Chevrolet truck frames.

With an increase of \$2 scheduled to go into effect on all leading grades of sheets for shipment in third quarter, sheet sellers anticipate a further brisk miscellaneous demand. However, in cold-finished sheets sev-

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Philadelphia, Penna.

Steel Sales Corp.  
129 South Jefferson St.  
Chicago, Ill.

H. L. Brown,  
2001 Carew Tower  
Cincinnati, Ohio



eral leading sellers are already practically out of the market for this quarter. Apparently, existing sheet extras will apply.

**Buffalo**—Sheet demand is still at sufficient heights to keep local mills operating at 85 per cent of capacity. June schedules at the beginning of the month will not fall far short of the present production, it is now predicted.

**Cincinnati**—Sheet production dipped below 80 per cent during the past week, because of lighter automotive specifications. Advance of \$2 a ton for next quarter has already encouraged buying and capacity bookings for the remainder of this quarter are predicted. Demand for household equipment has been consistently heavy.

**St. Louis**—As for a number of weeks, miscellaneous demand leads in orders for sheets. Business continues extremely good, with customers pressing for delivery. Certain observers look for an advance, but their ideas have not been reflected in any broadening in current buying. Warehouse and jobbing interests have moderately increased their takings, but they are not disposed to heavily increase their inventories, buying being to take care of current customer needs and to keep up assortments.

**Birmingham, Ala.**—Mills producing steel sheets are still active. Smaller orders are being filled from warehouse stocks and necessity for keeping warehouses well assorted brings business to the mills.

## Pipe

Pipe Prices, Page 71

**Pittsburgh**—Socony-Vacuum Oil Co. Inc., through its White Eagle division subsidiary, asked for bids last week on a 178-mile 6-inch gasoline pipe line from Augusta, Kans., to Kansas City. A steady volume of specifying continues to originate in the mid-continent. Texas and Louisiana fields covering oil country goods, and included in this type of business have been some outstanding orders from the newly-developed Rodessa field in northern Louisiana. Producers have not taken a stand on third quarter prices, but it is expected that discounts on finished tubular products will carry over from their present levels.

**Chicago**—With shipments of cast pipe continuing in fairly heavy volume, and with pending business increasing, the outlook for the next several months is regarded more favorably. Evanston, Ill., placed about 1000 tons, while Milwaukee is in the market for a similar tonnage. About

6000 tons for Cicero, Ill., remains to be placed. Prices generally are steady.

**New York**—The principal development in the cast pipe market last week was an award of 1000 tons. Other inquiries and orders are restricted to small tonnages. Prices are unchanged and firm.

**Birmingham, Ala.**—Lettings are numerous, but in most cases are in small lots. A number of federal projects are still in sight. Not much iron, scrap, coke or other material is being carried on pipe shop yards.

**San Francisco**—Interest is cen-

tered around the outcome of the awards for 304 miles of plain end line pipe for the Shell Oil Co., bids on which were submitted recently. A decision is expected to be made soon in Los Angeles. United States Pipe & Foundry Co. booked 268 tons of 12 and 16-inch, class C, for San Diego, Calif., and American Cast Iron Pipe Co. took 103 tons of 12-inch class B, for Eureka, Calif. Pending business includes 190 tons of 6 and 8-inch, class 250, for Alhambra, Calif., on which R. D. Wood & Co. is low.

**Seattle**—Cast pipe is not in active

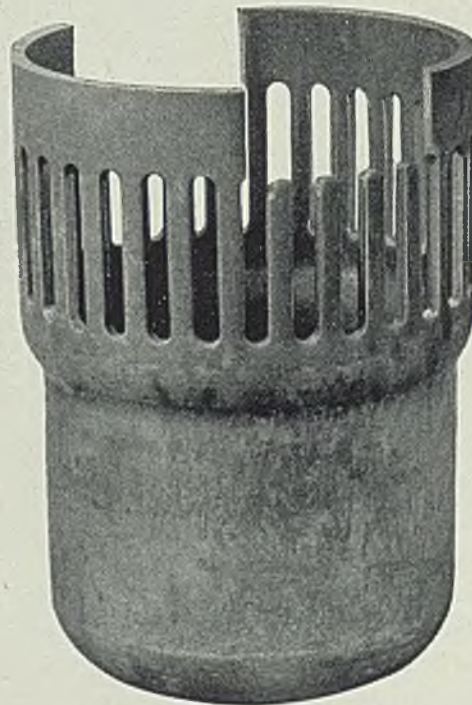
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demand, as few new projects are pending. Pacific States Cast Iron Pipe Co., Portland, Oreg., was awarded 110 tons for Elmira, Wash. Portland opened bids for 525 tons of 6, 8 and 12-inch, low figures being submitted by United States Cast Iron Pipe Co., Burlington, N. J., and Florence Pipe Foundry & Machine Co., Philadelphia.

## Cast Pipe Placed

268 tons 12 and 16-inch, class C, San Diego, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

110 tons, for Elmira, Wash., to Pacific States Cast Iron Pipe Co., Portland, Oreg.

103 tons, 12-inch, class B, Eureka, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

## Cast Pipe Pending

1000 tons, Evanston, Ill., to James B. Clow & Sons Co., Chicago.

1000 tons, 4, 6 and 8-inch to R. D. Wood & Co., Florence, N. J., United States Pipe & Foundry Co., Burlington, N. J., and Warren Foundry & Pipe Corp., Phillipsburg, N. J., for Public Service Corp. of New Jersey, Newark, N. J.

525 tons, various sizes; Milwaukee. 525 tons, 6, 8 and 12-inch, for Portland,

Oreg.; United States Cast Iron Pipe Co., Burlington, N. J., and Florence Pipe Foundry & Machine Co., Philadelphia, low.

190 tons, 6 and 7-inch, class 250, Alhambra, Calif.; R. D. Wood & Co., low. 100 tons, for White Plains, N. Y.; bids asked by procurement division, treasury department, New York.

## Strip Steel

Strip Prices, Page 71

**Pittsburgh**—Advance of \$2 a ton from the present 1.85c hot strip market to 1.95c, base, Pittsburgh, effective July 1, will encourage buying and stocking through the balance of this month. Requirements of the automotive trade and other users have been less the past week than two weeks ago; mill operations are down to around 50 per cent for both hot and cold-rolled.

**Cleveland**—Strip mills are beginning to take note of an increasing urge from users of hot and cold-rolled for shipments over the next six weeks on orders already in hand. Narrower widths seem more popular than wide material, this being particularly true of cold-rolled.

**Chicago**—Hot-rolled strip for third quarter delivery is being quoted 2.05c, Chicago or Gary, but no change has been made in cold-rolled. Strip shipments have continued heavy and the increase in hot-rolled prices is expected to stimulate the June movement. Miscellaneous consumption is holding well in most directions, though a seasonal letdown during the next several months is likely.

**New York**—While hot rolled strip is definitely scheduled to be advanced \$2 a ton on shipments after June 30, books have not as yet been opened on cold strip. Sharp competition with sheet makers in recent months present considerations which may be a factor in the delay. Nearby specifications are still coming out freely, although not up to the peak of a month ago.

## Wire

Wire Prices, Page 71

**Pittsburgh**—Plain manufacturing wire at 2.40c and spring wire at 3.05c, base, Pittsburgh or Cleveland, are expected to be carried unchanged into third quarter, but a \$2 or \$3 a ton increase on standard wire nails, woven wire fencing and fence wire is likely. It is expected that some upward revision will be announced shortly on wire rods, consistent with the general price advance in all finished steel products.

**Chicago**—While May business in

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wire and wire products dropped below the two preceding months, the letdown was anticipated and still gave a favorable comparison with sales and shipments a year ago. A further decrease would be not surprising in June, since automotive requirements are expected to slip further this month, and spring peak in shipments to farm districts appears to have been passed. Producers have delayed announcing third quarter prices; it is likely that recent quotations will be extended.

**New York**—Wire sellers have not formally opened books for third quarter, although indications point to no general revisions. Specifications over the past week, however, have shared in the buoyancy that has characterized most other markets for finished steel.

## Semifinished

### Semifinished Prices, Page 71

**Pittsburgh**—A higher third-quarter market on wire rods in at least the heaviest base gage is a strong possibility, but announcement doubtless will be deferred, according to trade reports late last week. From subsequent producers' announcements after the May 23 statement taken initially by Carnegie-Illinois Steel Corp., the rerolling billet, sheet bar and forging billet markets will be uniformly quoted \$2 a ton higher, effective July 1. Carnegie-Illinois Steel Corp. made its announcement as affecting "delivered prices within the Pittsburgh switching area" rather than an f.o.b. Pittsburgh quotation and will name \$30.50 per gross ton for rerolling billets and sheet bars, and \$37.50 per gross ton for forging billets on that basis, effective July 1. Other producers chose to announce as Jones & Laughlin Steel Corp. did last week, "an advance of \$2 per ton on rerolling billets, sheet bars and forging billets," which infers an advance based on f.o.b. Pittsburgh and other basing points. The aforementioned Carnegie-Illinois Steel Corp. prices involve a 50 cent Pittsburgh switching area charge in addition to the \$2 advance. Skelp has been reaffirmed for the third quarter at an unchanged base of \$1.80c, for both universal and grooved grades, although tube rounds based on the merchant steel bar price have been advanced \$2 a ton. The semifinished steel market is active and aside from requirements of nonintegrated tin plate rollers there have been some outstanding open-market commitments. For example, one integrated mid-western mill purchased over 5000 tons of 4 x 4-inch billets last week in the open market to accommodate its heavy requirements.

**Philadelphia**—In addition to a \$2 advance in forging billets, changes

are noted in size extras. Under the new schedule a \$2 differential will apply on sizes from 4 x 4 to under 6 x 6 with 6 x 6 to 9 x 9 inclusive, continuing as base. Under the existing schedule a \$4 extra applies on sizes 4 x 4 to under 5 x 5 and a \$2 extra on 5 x 5 to under 6 x 6.

## Tin Plate

### Tin Plate Prices, Page 70

**Pittsburgh**—Neither standard tin plate at \$5.25 per base box, Pitts-

burgh, nor tin mill No. 28 gage sheets at 2.75c, Pittsburgh, will be advanced for third quarter. Long ternes, however, will be advanced \$2 a ton for third quarter. Heavy anticipated requirements of tin plate for packers' cans continue to keep mill operations up to 100 per cent of capacity.

**Chicago Pneumatic Tool Co.**, New York, reported net profit of \$191,427 for the first quarter, as compared with \$165,423 in the similar quarter last year.

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# Shapes

Structural Shape Prices, Page 70

New York—Plans are in preparation for 28 new school buildings with the entire program to be carried out before the end of this year. Bids on some of these projects will be advertised for opening probably in July. Altogether about 25,000 tons are involved. It is indicated that the board of education, instead of awarding these jobs to contractors in the

usual manner, may proceed after the example of the New Jersey method by which contractors will be eliminated and fabricating and other contracts will be directly awarded. About 12,000 tons are involved in two additional sections of the west side elevated highway, to be advertised shortly. The largest award of the past week has been one of 3100 tons for a hospital in Jersey City, N. J. The price of shapes continues 1.90c base, Bethlehem, Pa., slated for an advance of \$2 a ton beginning July 1.

Pittsburgh—The \$2 a ton advance

for the third quarter, now announced by practically all producers, will place the standard structural market at 1.90c, base, Pittsburgh, with wide-flange material taking the usual differential of \$2 a ton, or at 2.00c, base, Pittsburgh. Inasmuch as full application of this advance will take place on shipments July 1 and thereafter, fabricators and other users are expected to stock up on anticipatory requirements through June. American Bridge Co. closed on 680 tons for a shipping building at Corning, N. Y., for the Corning Glass Co. and other contracts included a Cleveland telephone exchange, 400 tons, to Fort Pitt Bridge Works. Pending the application of a higher market next month, plain structural holds at 1.80c, Pittsburgh.

Chicago—Plain sales and specifications are heavier and with fabricators' backlogs moderately heavy, good activity in shipments is in prospect for the summer. Inquiries are in fair volume, but new awards are light. The largest of new projects is 9200 tons for a bridge at Beaumont, Tex. A fair number of private inquiries are appearing, though most of these involve only small lots.

Philadelphia—Placing of 1400 tons for factory buildings at Amcelle, Md., is outstanding among current awards. Several sizable projects are on the point of being placed, including the 2700-ton vocational school here, and with an increase of \$2 a ton scheduled for third quarter there should be a better volume of specifications than otherwise over the closing weeks of this quarter. Under the new price schedule, shapes will be 2c, Bethlehem, Pa., or 2.11 1/2c, Philadelphia. The Keebler-Weyl Baking Co. building will require 1830 tons instead of 1400 tons, as previously noted.

St. Louis—No change has developed in the rate of operations at local fabricating plants. New orders have been small individually, but represent a fair tonnage. Backlogs are still of sufficient size to insure the present rate through June. The Illinois state highway commission opened bids on bridge projects calling for approximately 900 tons.

San Francisco—The largest award

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### Stock Portfolios Reduced in March

Concretely in line with the Brookmire policy and within 6% of the top of the year-long rise, recently culminated, Brookmire repeatedly urged clients to sell stocks and to reduce sharply their investments. Of the 111 stocks included in Brookmire List, 91 were specifically eliminated during successive selling recommendations, at substantial average appreciation.

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### Shape Awards Compared

	Tons
Week ended May 29 .....	13,934
Week ended May 22 .....	13,205
Week ended May 15 .....	40,039
This week, 1935 .....	6,440
Weekly average, 1935 .....	17,081
Weekly average, 1936 .....	18,837
Weekly average, April .....	16,431
Total to date, 1935 .....	321,372
Total to date, 1936 .....	395,374



went to Minneapolis-Moline Power Implement Co. and involved 405 tons for an over-crossing near Pueblo, Colo. Unnamed interests took 344 tons for two bridges in Musselshell and Prairie counties, Montana, and 220 tons for the Eagle Mountain pumping plant for the metropolitan water district, Los Angeles. Consolidated Steel Corp. secured 150 tons for a mill building for the Pacific Oil & Metal Co., Long Beach, Calif., and International Derrick & Equipment Co. booked 150 tons for four diverter towers for the Boulder dam, Nevada.

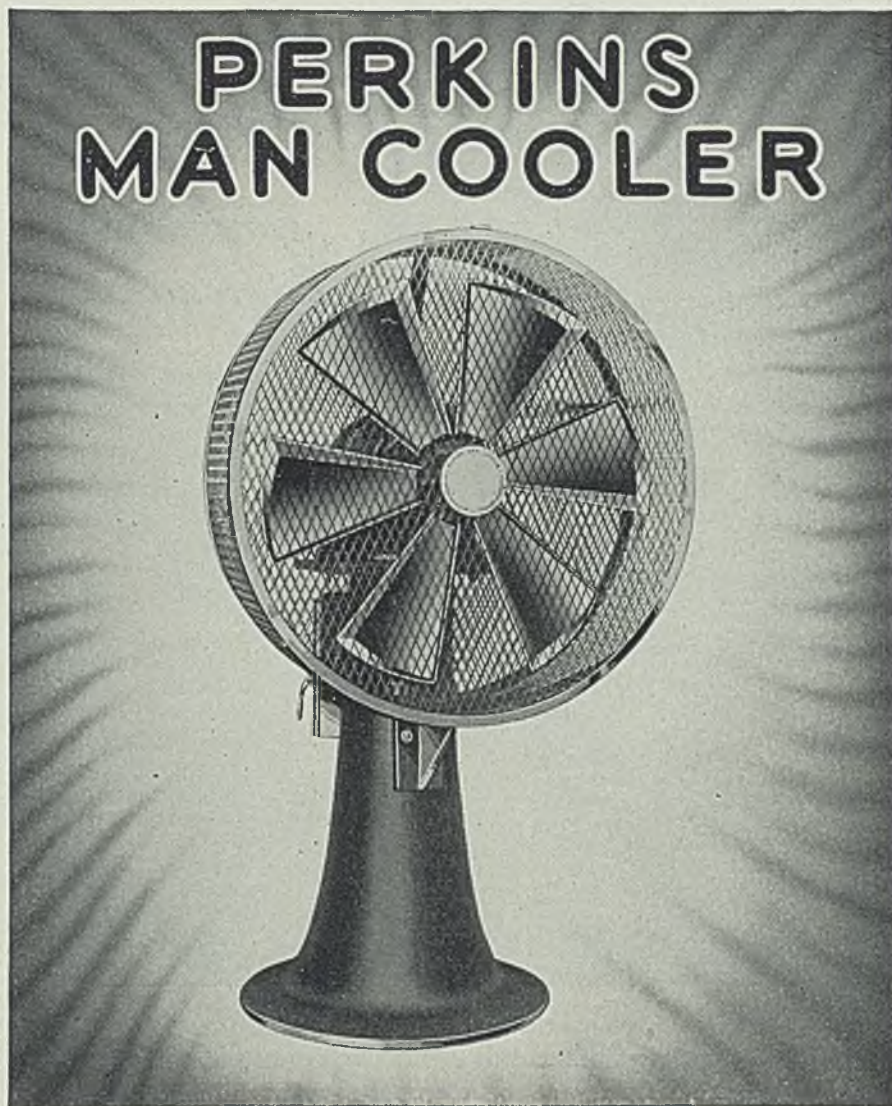
**Seattle**—Additional state projects involving shapes are up for figures. Pending tonnages are not large but local plants generally are busy. Pacific Car & Foundry Co., Seattle, has booked 200 tons involved in the state overcrossing at Renton, Wash. It is reported that Poole & McGonigle, Portland, have been awarded the subcontract for 750 tons for the Union avenue crossing, Portland, Oreg. For the 503 foot state bridge at Missoula, Mont., about 500 tons are still pending. Washington state has opened bids for 230 tons in the Kennewick-Pasco bridge.

## Shape Contracts Placed

3100 tons, hospital, Jersey City, N. J., to Lehigh Structural Steel Co., Allentown, Pa.  
 1400 tons, three buildings, Celanese Corp., Amcelle, Md., through a Cumberland, Md., contractor, to Bethlehem Steel Co., Bethlehem, Pa.; approximately 200 tons of bars will also be required.  
 950 tons, North high school, Binghamton, N. Y., to Leach Steel Corp., Rochester, N. Y.  
 680 tons, shipping building, Corning Glass Co., Corning, N. Y., to American Bridge Co., Pittsburgh.  
 500 tons, state highway bridge, Negau-nee, Mich., to Bethlehem Steel Co., Bethlehem, Pa.  
 485 tons, Edison institute recreation building, Dearborn, Mich., to R. C. Mahon Co., Detroit.  
 480 tons, state highway bridge, Delaware and Otsego counties, New York, to American Bridge Co., Pittsburgh.  
 450 tons, Caterpillar Tractor Co. addition, Peoria, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.  
 410 tons, lookout towers, various locations, for department of agriculture, to Aermotor Corp., Chicago.  
 405 tons, Ohio Bell Telephone Co. building, Lakewood, O., to Fort Pitt Bridge Works, Pittsburgh.  
 355 tons, state highway bridge, Rockville, Md., to American Bridge Co., Pittsburgh.  
 340 tons, milk distributing station for Borden Farm Products, Long Island City, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.  
 325 tons, two railroad bridges for Baltimore & Ohio railroad, Winton Place, O., and Cuba, O., to Bethlehem Steel Co., Bethlehem, Pa.  
 280 tons, state highway bridge, Cresson, Pa., to Phoenix Bridge Co., Phoenixville, Pa.  
 245 tons, G. L. F. buildings, Buffalo, to Ernst Iron Works, Buffalo.  
 244 tons, bridge and crossing in Musselshell and Prairie counties, Montana, to unnamed interest.

220 tons, plant building, Dunkirk, N. Y., for Ludlum Steel Co., Watervliet, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.  
 220 tons, Eagle mountain pumping plant, metropolitan water district, Los Angeles, to unnamed interest.  
 200 tons, state crossing, Renton, Wash., to Pacific Car & Foundry Co., Seattle.  
 200 tons, state highway bridge, Almond, Wis., to Vierling Steel Works, Chicago.  
 195 tons, bridge section, Henry county, Illinois, to Vierling Steel Co., Chicago.  
 195 tons, bridge, Mahaska county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.  
 195 tons, bridge section, Clinton county, Illinois, to Stupp Bros. Bridge & Iron

Co., St. Louis.  
 185 tons, bridge section, Vermilion county, Illinois, to Vierling Steel Co., Chicago.  
 175 tons, state highway bridge, Newfield, N. H., to American Bridge Co., Pittsburgh.  
 175 tons, Bisbreaker furnace, Atreco, Tex., to Belmont Iron Works, Eddystone, Pa.  
 165 tons, court enclosure, Peoria, Ill., to Gage Structural Steel Co., Chicago.  
 160 tons, bridge, Payne county, Oklahoma, to J. B. Klein Iron Foundry Co., Oklahoma City, Okla.  
 150 tons, mill building, Pacific Oil & Meal Co., Long Beach, Calif., to Consolidated Steel Corp., Los Angeles.  
 150 tons, four diverter towers, specifica-



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**B. F. PERKINS & SON INC., Holyoke, Mass.**  
 ENGINEERS AND MANUFACTURERS



tion 771-D, Boulder dam, Nevada, to International Derrick & Equipment Co., Los Angeles.

125 tons, bridge, Mowata county, Oklahoma, to Capital Iron Works Co., Topeka, Kans.

125 tons, bridge, Major county, Oklahoma, to J. B. Klein Iron Foundry Co., Oklahoma City, Okla.

120 tons, two I-beam spans, Blackhawk county, Iowa, to Pittsburgh - Des Moines Steel Co., Pittsburgh.

120 tons, St. Matthew's parochial school, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

100 tons, two-story building on Madison avenue and East Fifty-fifth street, New York, to Dreier Iron Works, New York.

Unstated tonnage, two state bridges in Montana, to unnamed interests.

## Shape Contracts Pending

25,000 tons, estimated, 28 school buildings in New York; bids to be taken over the next few months by the New York board of education.

9200 tons, Neches river bridge, Beaumont, Tex.

6000 tons, west side elevated highway extension, between 111th and 121st streets, New York; bids to be taken shortly.

6000 tons, west side elevated highway extension, between Eighty-sixth and Ninety-fourth streets, New York; bids to be taken shortly.

3500 tons, four double hangars, Hickman Field, T. H.; general contract to Robert E. McKee, Los Angeles.

1025 tons, flue, Garfield, Utah.

770 tons, six state bridges, New York.

767 tons, plate girder bridge, Crawford county, Pennsylvania; bids June 12 include 124 tons bars.

650 tons, bridge, Turner's Falls, Mass., for New York, New Haven & Hartford railroad.

467 tons, over-crossing, Sacramento, Calif.; date of bids advanced from May 27 to June 10.

450 tons, building for Fisher Body Corp., Lansing, Mich.

375 tons, state highway bridges, various locations, Wyoming.

375 tons, bridge, Edwardsville, Ill.

250 tons, Inglewood boulevard bridge, proposal 664, United States engineer office, Los Angeles; bids opened.

230 tons, Kennewick-Pasco, Wash., state bridge; bids in.

200 tons, two buildings, Franklin and Marshall college, Lancaster, Pa.; bids asked.

200 tons, high school, Cranford, N. J.

170 tons, state grade crossing elimination, Youngstown, O.; bids in, on which Cable Co., Canton, O., was low.

163 tons, bridge, Erie county, Pennsylvania; bids June 12 include 36 tons bars.

150 tons, bridge No. 168, Dunn county, Wisconsin; bids opened May 8 rejected; new bids close June 5.

150 tons, warehouse, Newark, N. J., for United Color & Pigment Co., Newark.

121 tons, two bridges in Crook and in Hot Springs counties, Wyoming; bids opened.

## Reinforcing

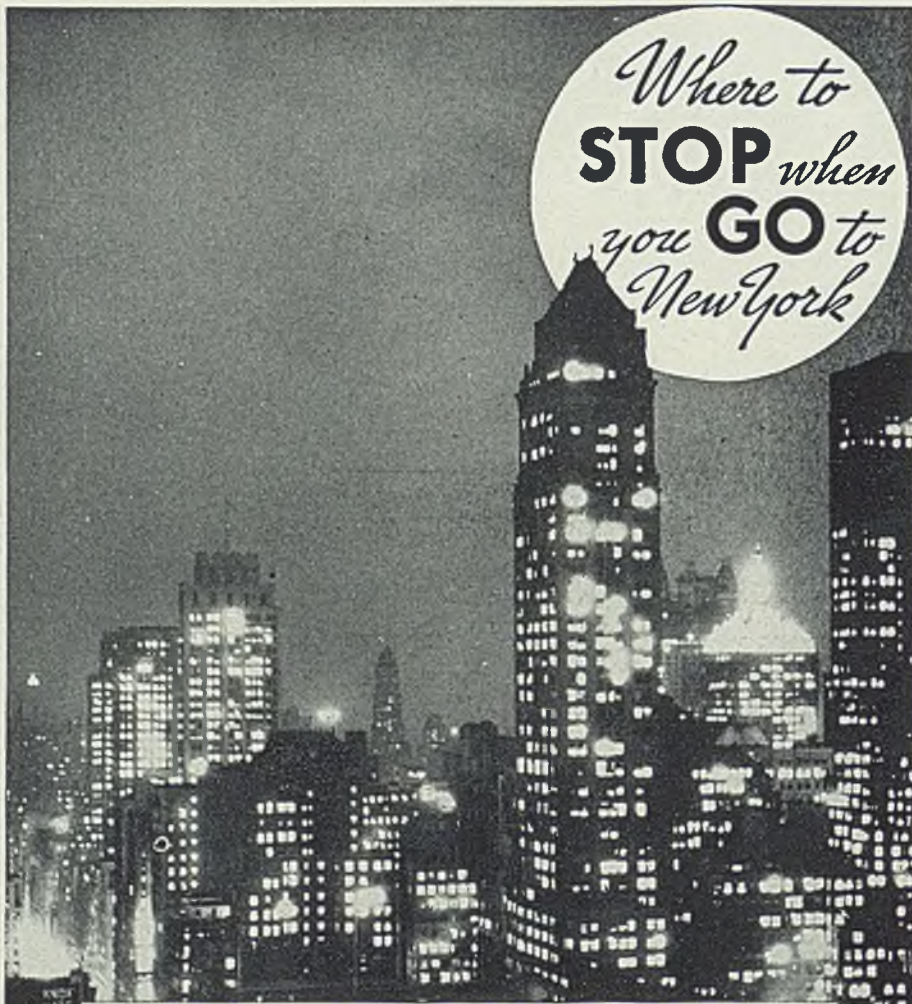
Reinforcing Bar Prices, Page 71

New York—The eastern market was featured by an award of 2600 tons. This, however, was the only sizable development, business being restricted to small tonnages and inquiries. The firmer price trend reported some weeks ago continues to be noted, although current business is not of a character to bring out a real test of the price level.

Pittsburgh—Successful contractors' bids are being announced by the Harrisburg, Pa., state highway headquarters on the May 29 letting. Con-

## Concrete Awards Compared

	Tons
Week ended May 29 .....	5,029
Week ended May 22 .....	2,739
Week ended May 15 .....	15,314
This week, 1935 .....	4,981
Weekly average, 1935 .....	6,862
Weekly average, 1936 .....	6,618
Weekly average, April .....	4,756
Total to date, 1935 .....	109,658
Total to date, 1936 .....	138,968



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## HOTEL LEXINGTON

48th ST. & LEXINGTON AVE., NEW YORK

Charles E. Rochester, Manager

National Hotel Management Company, Inc.

Ralph Hitz, President





crete Steel Co. placed an order for 1500 tons with Carnegie-Illinois Steel Corp. on a blanket requirement. Considering the more active smaller lots, the bar market, both in new billet and rail quality grades, is continuing at an active pace. New billet quality bars are quoted 1.95c to 2.05c, base, Pittsburgh, and rail steel, 1.80c to 1.90c.

**Chicago**—Producers are expected shortly to announce third quarter prices, reinforcing bars having been omitted from the new schedule announced a week ago covering most other products. Mills continue busy in completion of orders, while new business is being maintained in fair volume, though at a slower rate than deliveries. Prospective work points to a maintenance of a moderate rate of new business during the next 30 to 60 days, particularly for state bridges, highway buildings and other public projects.

**Philadelphia**—Sellers contemplate an increase of \$2 a ton from the existing official price of 2.05c, Pittsburgh, on tonnage for delivery in the third quarter and not involved in identified projects covered by protections. Early announcement as to the ultimate decision in this respect is likely. The market on billet steel bars and also rerolled bars has been firming up following a period of considerable unsettlement. Leading award involves 2600 tons for reservoirs at Allentown, Pa.

**San Francisco**—Several fair sized lots were placed including 1312 tons for the Macy street subway in Los Angeles, booked by an unnamed interest, and 389 tons for the Treasury department, same city, placed with Los Angeles Iron & Steel Co. Bids have been opened on 682 tons for the United States Irrigation Service, Los Angeles, and on 355 tons for a bridge near El Monte, Calif. Robt. E. McKee has been awarded the general contract for four hangars for Hickman Field, T. H., calling for 312 tons in addition to 3500 tons of structural shapes and 500 tons of plates for floor decking.

**Seattle**—New business is developing slowly, no important projects being up for figures. Mills are busy with previous commitments and jobbers are replenishing stocks. Ton-nages pending include 300 tons for a women's building at Washington State college, Pullman, and about 500 tons for highway projects in Washington state, figures in.

## Reinforcing Steel Awards

2600 tons, two reservoirs, Allentown, Pa., to Concrete Steel Co., New York.  
900 tons, Cincinnati waterworks department project, to Joseph T. Ryerson & Son Inc., Chicago.  
389 tons, schedule 10483, treasury de-

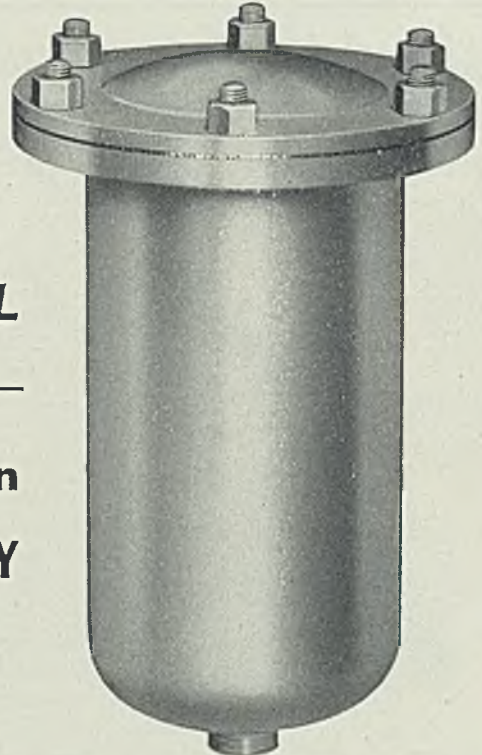
partment, Los Angeles, to Los Angeles Iron & Steel Co., Los Angeles.  
240 tons, water reservoir, Salem, Oreg., to unnamed interest.  
200 tons, grain elevator, Daniel D. Weschler & Sons, Milwaukee, to Calumet Steel Co., Chicago.  
200 tons, state road work, Illinois, to Calumet Steel Co., Chicago.  
100 tons, assembly building, John Marshall high school, Los Angeles, to unnamed interest.  
100 tons, addition to warehouse, dock 51, San Pedro, Calif., to unnamed interest.  
100 tons, mill building, Pacific Oil & Meal Co., Long Beach, Calif., to unnamed interest.  
100 tons, bottling plant for Coca Cola Co., Bakersfield, Calif., to unnamed interest.

100 tons, highway work in Maricopa county, Arizona, to unnamed interest.

## Reinforcing Steel Pending

682 tons, invitation 0250, United States irrigation service, Los Angeles; bids opened.  
312 tons, four double hangars, Hickman Field, T. H.; general contract to Robert E. McKee, Los Angeles.  
200 tons, building for Keebler-Weyl Baking Co., Philadelphia; 1830 tons of shapes also required.  
144 tons, over-crossing near Plummer, Benewah county, Idaho; bids opened.  
130 tons, stadium, Jersey City, N. J.; bids May 28.  
100 tons, building for Monroe Calculat-

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USUAL or  
UNUSUAL  
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Cold Drawn  
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This seamless tank, used in connection with grease dispensing, is cold drawn seamless. Cover is bolted down.

Special or standard requirements in: shells, shapes, tanks, bottles, etc., are met by Hackney for countless industries. A wide range of metals can be worked. This company has over 34 years' experience in the design and manufacture of metal containers.

The cold-drawing process provides the numerous advantages of seamless construction, uniformly high strength, smooth surface that permits a fine finish. Temper and thickness are uniform. The metal is free from laminations.

Send blue prints or specifications of your requirements, and Hackney engineers will be glad to study them for recommendations.

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1387 Vanderbilt Concourse Bldg., New York  
688 Roosevelt Bldg., Los Angeles, Calif.

**Hackney**  
MILWAUKEE

DEEP DRAWN SHELLS AND SHAPES



ing Machine Co., Newark, N. J.  
100 tons, over-crossing, Sacramento,  
Calif.; date of bids postponed from  
May 27 to June 10.

## Pig Iron

Pig Iron Prices, Page 72

**Pittsburgh** — Producers indicate that no price increase will be made for the third quarter. Meanwhile, shipments appear to be a shade better, but lack outstanding tonnage

individually. Both the Davison Coke & Iron Co.'s Neville Island, Pa., blast furnace and the Shenango Furnace Co.'s Sharpsville, Pa., stack continue in blast in the strict merchant classification.

**Chicago** — Sellers are opening third quarter books, with prices unchanged. Shipments and new business have been fairly steady, and May deliveries compared favorably with April, as well as being moderately ahead of the movement a year ago. Production of automotive castings is receding, but gains in some

other directions leave the average rate of foundry schedules only slightly removed from the pace of the past 30 to 60 days.

**Cleveland**—Blast furnace interests continue to report some increase in volume of May shipments compared with April. Quotations for third quarter have been announced on the reaffirmed second quarter level. Auto partsmakers still are the largest individual takers of pig iron and have indicated no recession in need for this material.

**New York**—Another dull week prevailed in pig iron, although sellers anticipate better trading during the current month, as stocks are low and foundry operations are again taking a swing upward. No change of price for third quarter is expected.

**Philadelphia**—No change in prices for third quarter is contemplated. To increase prices at this time, it is pointed out, would add only further stimulus to the purchase of foreign iron. Regardless of this, sellers look for increased activity this month, as stocks are generally light.

**Buffalo** — Demand is improving steadily. Consumers are buying for immediate use and are re-entering the market quickly after each purchase. Reports of higher prices are causing melters to keep in close touch with sellers. Lake and canal shipments are going forward with regularity. Ten furnaces are in production here.

**Cincinnati**—Pig iron shipments are steady, slightly higher than in April. Buying continues close to immediate needs. The melt is generally unchanged, although the steady upward trend appears halted, and in some instances seasonal reaction is apparent.

**St. Louis**—Trends in the pig iron market have shown no change as contrasted with the past month or six weeks. The melt as a whole is sustained at, or around recent high levels, and shipments are heavy, preliminary reports indicating a slight gain in May tonnage over the preceding month.

**Birmingham, Ala.**—Tonnage of pig iron moving from blast furnaces is not altogether slow, but confidence is expressed that there will be continued melting. Pipe and other consuming interests report fairly good backlogs. Spot orders are predominant. No change in price is indicated.

**Toronto, Ont.**—Sales dropped to around 800 tons for the past week as a result of the holiday as well as due to most melters having covered for immediate needs. The slump is expected to be of short duration, and it is understood that inquiries again are improving. Daily melt is holding

## Behind the Scenes with STEEL

### 1890 Streamliner

IN THESE days of Flying Comets, Green Diamonds, Zephyrs, Commodore Vanderbilts, Flying Yankees and other bullets on rails we all marvel at the speed and comforts of modern rail transportation. By way of contrast, it is often enlightening to hark back a few decades and recall to mind streamline transportation facilities of the gay nineties.

Always ready to come to bat with something that will knock our readers off their proverbial pins, we give to you this week an exclusive (well, sort of) view of The Cherrilyn Horsecar of



bygone days — 1890 or thereabouts. Horsecars, as such, represent nothing unusual, but here is a conveyance that must have made news in its day.

The car operated on a long hill south of Denver. When the poor old nag finally had dragged the four-wheel Toonerville to the top of the hill, he was disengaged and loaded on the front platform, as shown in the cut. The motorman, or rather the horseman, then got out, tugged at the old flyer and got her started down the hill. The grade was such that she coasted all the way down. By that time the horse was rested up for the climb again and away he trotted.

Close inspection of the car will reveal knee-action springs, semi-streamline construction of both car and horse, air conditioned interior and Old Glory flying on the forepeak. Time Marches Backward!

We are indebted to Ivan E. Houk of Denver, who took the picture, and to W. H. Spindler, editor of the *Highway Magazine* at Middletown, O., who loaned it to us.

### Errotten

SEEMS like every time we try to lean over backward and give something a plug, we slip and dent our conk on the curb. Take last week, when we mentioned the annual meeting of the

American Iron and Steel Institute in New York as being at the Commodore hotel. Bang! One of our constant readers in the research dept. of U. S. Steel at 71 Broadway immediately jabs us with the sly insinuation that someone whispered to him the meeting was at the Waldorf-Astoria.

Well, darn it, he was right, and despite the fact that the Commodore is a very nice hostelry and the Institute has been meeting there year in and year out since 1919, the steelmasters crossed us up this year and went back to the Waldorf for the first time since June 1, 1918. We hope nobody became confused by our item and sat around the Commodore in his tuxedo waiting for something to happen.

As a matter of interest, the Institute held its first meeting at the old Waldorf-Astoria (we mean the old, old Waldorf) Oct. 14, 1910. There were just 212 persons on hand. Yearly spring meetings continued at the Waldorf until 1918. The Pennsylvania was host in 1919. The old Waldorf was razed, of course, to make room for Al Smith's Empire State building which, strangely enough, is the present headquarters of the Institute.

We understand the new Waldorf is real nice—rugs on the floors, steam heat, elevators and everything. All the 2000 guests at the Institute meeting had a fine time. Hello, Oscar!

\* \* \*

### All at Sea

ONE of the General Motors Export officials set sail for Australia last Thursday and before leaving sent us a hurry-up call for the 21 issues of STEEL published since Jan. 1. Seems he wanted them for shipboard reading. And at the same time he entered a subscription to be sent to Melbourne.

On land, on sea, at home, abroad, in the air, in the subway—what are they reading for first-hand information on the steel and metalworking industries? Don't make us tell!

\* \* \*

### In Memoriam

AS A DECORATION Day gesture, we ordered a dozen roses, to be grown in 1950, which will be laid on the last resting place of some veteran to be shot down in the great World War of 1946: the bill to be sent us in May, 1950. No college kids are going to get the jump on us in this move.

—SHRDLU



between 50 and 60 per cent. Prices are firm and unchanged.

## Scrap

Scrap Prices, Page 73

**Pittsburgh**—As mill buying interest in scrap continued absent last week and as dealers' shortages were fast disappearing, the market here yielded another 25 cents a ton on nearly all important scrap classifications. Furthermore, the market is faced this week with unusually large railroad accumulations, including that of the Pennsylvania with 10,000 tons of No. 1 steel, closing June 3, and the Baltimore & Ohio with a larger list than usual, June 1.

**Cleveland**—New business in iron and steel scrap is largely confined to small lots of heavier steel grades. However, shipments on contracts are fair. Cast grades have weakened 50 cents to \$1 a ton following the recent recession in steel grades, but the market now seems to have settled, at least temporarily. Supplies of the heavier grades appear to have dried up at current price levels, with holders loath to part with stocks.

**Chicago**—A local mill has purchased a round tonnage of heavy melting steel at \$13, delivered, confirming the previous price on this grade. The trade looks for a fairly stable market, following rather sharp declines in prices the past four to six weeks. Scrap is coming out in sufficient volume to accommodate the relatively heavy requirements of mills, but steel works are content to take delivery against previous purchases before making new commitments on an extensive scale. Some grades of foundry scrap are easier.

**New York**—Export prices on scrap are unchanged here despite expectations of a reduction. This is because of the effort of brokers and dealers to get scrap of high quality for export. There is little domestic buying. Brokers' buying prices f.o.b. New York for domestic consumption have been reduced about 50 cents per ton on mixed borings and turnings, No. 1 machinery cast, grate bars, No. 2 or auto steel, foundry stove plate and machine shop turnings.

**Buffalo**—Scrap trade has dropped sharply, due to lower offers by mills, with a top bid of \$13 for No. 1 heavy melting steel. Dealers are having difficulty in getting enough material to ship on orders and do not want to commit themselves beyond their supplies. There is a good demand for radiator scrap but dealers and purchasers have been unable to agree on prices. The market continues largely nominal. Lake

and canal receipts are fairly large to date this season.

**Detroit**—The market continued quiet last week, although supplies continued to force prices lower. No. 1 steel declined 25 cents to \$10 to \$10.50 per ton, with loose sheet clippings off 50 cents to \$7.50 to \$8. Offerings by motor plants here are still in heavy volume and some are issuing supplementary lists.

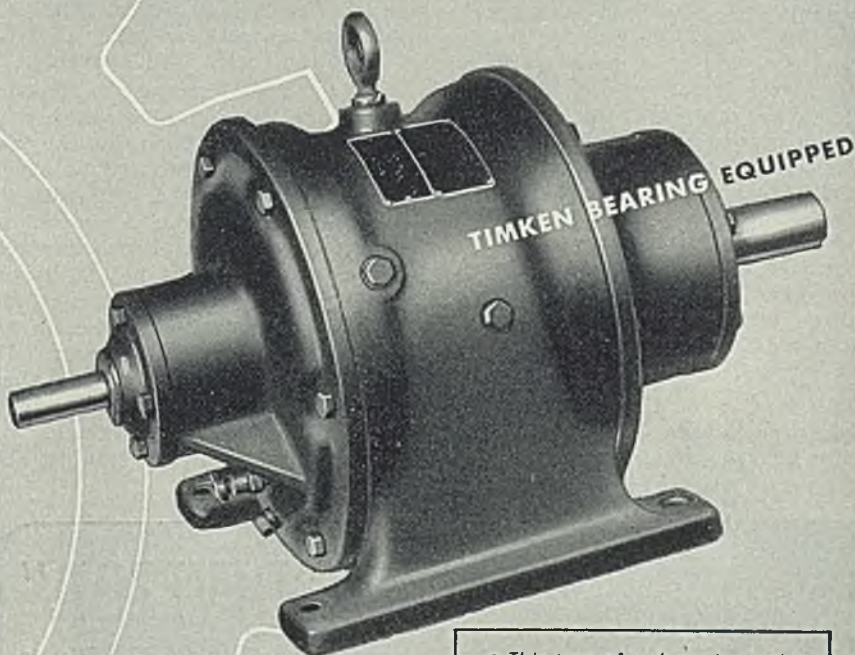
**Philadelphia**—While the buoyant tendency in finished steel prices may have a stimulating effect, scrap prices are weak, with reductions in

heavy breakable cast and axle turnings. The market on No. 1 steel and No. 2 is nominally \$12 to \$12.50 and \$11 to \$11.50, delivered consuming point, respectively. Dealers' export prices also are unchanged at \$11 and \$10, Port Richmond, on these two grades, on shipments against old contracts.

**Seattle**—Domestic demand continues active and foundry operations call for more material. The export situation has not improved, Japan still being apathetic. Exporting houses, however, believe that Orien-

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tal buyers will be back within a short time. Tidewater stocks are not large but increased shipments from the interior are noted. Prices are unchanged with No. 1 heavy melting steel quoted at \$10 to \$10.50.

**St. Louis**—The market for iron and steel scrap is characterized by weakness and entire lack of interest on the part of melters. Following the purchase last week of 5000 tons of No. 2 heavy melting steel by a leading east side melter, no transaction of any size has been reported.

Dealers are covering on outstanding contracts, and finding considerably less difficulty than heretofore in obtaining all they require.

**Cincinnati**—Without support from fresh buying by mills, the iron and steel scrap market continues weak. Some opinions are that the decline has been arrested. Movement of scrap on contracts is fairly heavy excepting to an upriver mill. Several items have been adjusted downward in harmony with miscellaneous sales.

**Toronto, Ont.**—Business is steady in the iron and steel scrap markets. Mills in the Hamilton and Montreal districts are taking regular deliveries of steel grades against contract and there is good demand for heavy melting steel, car wheels, steel axles and rails. Foundries are taking iron grades, with demand somewhat specialized. Wrought scrap has shown improvement and stove plate has limited call with little available. Prices are firm and unchanged.

Pacific Car & Foundry Co. has taken over the steel structural shop of the former Hofius Steel & Equip-

ment Co., First avenue south and Hudson street, Seattle. This plant will be operated in connection with the firm's structural and car shops at Renton, Wash.

## Warehouse

Warehouse Prices, Page 74

**Pittsburgh**—Within the next few weeks jobbers indicate they will advance warehouse prices comparable with the higher asking prices on the part of the mills for the third quarter, which is inclusive of all important finished steel items.

**Chicago**—Many sales were practically equal to those of April, in addition to showing a fairly large increase compared with a year ago. While some seasonal slackening is anticipated during the next three months, the recession is expected to be less than usual. Higher prices for third quarter are indicated as a result of the recent mill increases.

**New York**—Demand for finished steel products out of warehouse is active, with indications that the total for May will exceed that in April. Prices are unchanged, and with the exception of galvanized sheets, are firm. Competition from imported shapes and bars has not influenced the price on domestic shapes and bars. An advance in prices on hot rolled and alloy steel products, comparable to the mill advance on these products is expected to be made by jobbers the latter part of June.

**Philadelphia**—Some leading sell-

ers report an actual increase in daily bookings for the month just closed, making May the best month this year for these interests. General increases in prices on finished steel for third quarter are expected to be reflected in an upward revision in warehouse prices later, although probably not before July.

**Detroit**—May established a 1936 high point in the local jobbing trade, not only from the standpoint of total tonnage in specifications and shipments, but from the number of individual orders. Galvanized sheets, light structural shapes for building work, and bars are active trade items. Prices are unchanged.

**Cincinnati**—Warehouse tonnage in May was larger than in April. Industrial demand shows a moderate upward trend. Requirements for construction aggregate considerable volume, with other inquiries current.

**St. Louis**—Demand for practically all iron and steel items from store continues brisk, and indications point to May volume being in excess of April, which was the high month this year. Two leading interests report individual orders larger in size than heretofore.

**Seattle**—Out-of-stock items are moving in good volume to both public works and private industry. Alaska is buying heavily, and the agricultural sections are also active. Bars, plates, fire box plates, corrugated sheets and galvanized are showing the largest turnover.

## Cold Finished

Cold Finished Prices, Page 71

**Pittsburgh** — The third-quarter market on cold-finished carbon steel bars will be advanced \$3 a ton to 2.25c, base, Pittsburgh, effective on specifications placed with producers after July 1. On cold-drawn bar orders placed before June 30 but for shipment at a later date, the present market of 2.10c, base, Pittsburgh, doubtless will be used for invoicing providing shipments are completed by July 15. Extras on cold-drawn carbon bars remain unchanged as of the August, 1935, list, which was revised partially early in December, 1935. The \$3 a ton higher market for the third quarter will be extended similarly to other basing points, which include Cleveland, Buffalo, Gary, Ind., and Chicago, as well as Detroit and Eastern Michigan.

## Metallurgical Coke

Coke Prices, Page 71

Western Pennsylvania sellers of both beehive and by-product coke are



*The* "RIVITOR"  
Feeds and Sets SOLID Rivets  
Automatically

THE WORK is placed over the locator in the anvil. The rivet is fed automatically into the jaws which are carried down by the ram. The head is formed underneath the work. A gain in strength from 10% to 19% is accomplished (over that of other type rivet joints.)

May we send you literature describing further the many advantages of this machine?

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European Office  
GASTON E. MARBAIX, Ltd., Vincent House,  
Vincent Square, London, S. W. 1, England



experiencing a fairly steady demand for metallurgical grades and prices are holding fairly firmly. The market on standard furnace beehive coke is \$3.50 to \$3.65, f.o.b. Connellsville, Pa., ovens, and foundry grades, on the same basis, are \$4.25 to \$4.35, and \$5.35 to \$5.50 for premium analysis.

Chicago cokemakers are extending prices into June at the May level. May shipments were slightly heavier than in April. At Cincinnati demand holds near the peak for the year. Birmingham, Ala., users continue to take tonnage at a high rate.

## Steel in Europe

Foreign Steel Prices, Page 74

London—(By Radio)—New business in steel and iron is quiet in Great Britain. Pig iron supplies continue inadequate and exports of foundry iron have practically stopped. A general rise of prices is expected after June. Inquiry for steel for export is increasing. Tubemakers want more export tonnage but foreign competition is adverse. Trade in tin plate and galvanized sheets is dull.

The Continent reports demand for steel for export is light.

## Ferroalloys

Ferroalloy Prices, Page 72

New York—Ferromanganese sellers are expected to open books for third quarter within a fortnight; indications point to unchanged prices. The current market is \$75, duty paid, Atlantic and Gulf ports. Shipments during May will run close to those in April, the peak so far this year. Sellers are looking for another exceptionally good month in June, as steelmaking operations are expected to be well sustained. Domestic spiegeleisen, 19 to 21 per cent, is steady at \$26, duty paid, on lots up to 50 tons, and \$24 on 50 tons and over. Leading trade interests look for no change next quarter, although official announcements will probably not be forthcoming for another week or two. Specifications have been brisk, in line with the present high rate of steel production.

## Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York — Fair sales of lead and wide fluctuations in tin featured major nonferrous metal markets last week. Copper, zinc and antimony held unchanged in generally quiet trading.

**Copper** — New demand continued light but all first-hand sellers quoted firm levels on the basis of 9.50c, Connecticut, for electrolytic. Consumption of copper is holding up well and the long-term view is regarded as favorable with good prospects of higher prices before the end of 1936.

**Lead** — Sales were slightly heavier than for the preceding week. Consumers are well covered on their May requirements but still have a fair portion of their June needs to purchase. Prices held at 4.45c, East St. Louis, and 4.60c, New York, with St. Joseph still asking \$1 premium on the eastern market.

**Zinc** — A steady tone was maintained in the zinc market with prime western unchanged at 4.90c, East St. Louis. The London zinc market still exerts a retarding influence on any price strength here by continued low levels.

**Antimony** — Sales were light with prices unchanged at 13.50c, duty paid New York, for Chinese spot and 12.25c, New York, for American spot.

**Tin**—Domestic interests were disappointed Tuesday at the decision of the International Tin committee to postpone its fixing of next quarter's quotas until its June meeting.

This delay is expected to cause cautious buying by consumers between now and June 25. Prices broke sharply Thursday to 45.25c on Straits spot.

## Coke By-Products

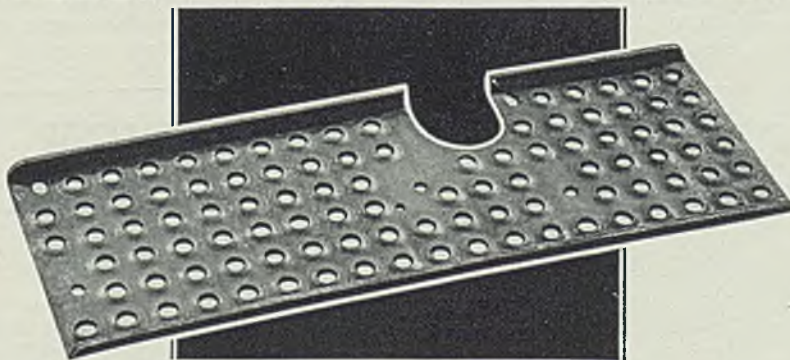
Coke By-Product Prices, Page 71

New York — Prices on principal coke oven by-products are unchanged and firm. Demand is well maintained, with the trend upward in connection with some. Continued heavy production schedules in the automobile industry have swelled the demand for some of the distillates.

## Iron Imports Moderate

Among iron and steel imports at Philadelphia during the week ended May 23 are 1173 tons of pig iron from the Netherlands and 200 tons from Norway. Other arrivals include 100 tons of ferromanganese from Norway, 167 tons of shapes from Belgium and 33 tons from France, 128 tons of steel bars and 71 tons of steel bands from Belgium, five tons of drill steel from Norway and five tons of ferrochrome from Japan.

## RAILROAD SAFETY via STAMPINGS



**R**AILROADS, as with industry in general, are looking-up to the steel stamping as a combined economic and effective method of application to their equipment or product. This freight car step—a stamping by Parish—additionally serves a major safety factor by imparting a sharp, self-cleaning tread impervious to ice, snow, grease and wet shoe soles.

Parish cites this example as but one of many improvements that have been brought about through an engineering service that likewise belongs to you . . . May we serve?

## PARISH PRESSED STEEL CO.

Specialists in difficult stamping design

Robeson & Weiser Sts., READING, PA.

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal



# Continued Experimentation Hampering Recovery of Business and Industry

(Concluded from Page 14)

measure being offset by increased taxes, an inevitable result of an extension of governmental regulation and control.

One example of where excessive taxation is leading and how industry and the consumer will be affected is the tax burden imposed by the social security act.

If this act had been fully in effect during the five year period from 1931 through 1935 the taxes for unemployment insurance and pensions alone, for approximately 70 per cent of the steel industry, would have amounted to over \$98,000,000. The net income of these companies during these years showed a deficit of over \$179,000,000. This deficit would have been nearly \$278,000,000 or about \$100,000,000 more, with these tax burdens added unless the taxes could have been passed on to the consumer. Obviously this would have added to the difficulties of everyone in a depressed market.

## Favors Practical Social Security

Let it be clearly understood that I am an advocate of social security so far as it is humanly obtainable. It seems to me that social security in the real sense must be thought of as a chance for steady work at fair wages—with adequate protection in old age and for the unfortunate.

When used in that sense the ques-

tion may be asked whether American industry will voluntarily meet its obligation towards social security and do the job which government has been seeking to appropriate to itself.

There is, perhaps, no better way to judge the conscience of an industry than to examine into its labor policies. Our own industry, steel, is an excellent example of the progressive betterment which has taken place. A little more than 20 years ago the average worker received less than 30 cents per hour. He worked 12 hours a day and seven days a week. He had no means of expressing himself; no organized means of contact or conference with his employers. His working conditions were crude and hazardous. He lived in a rented house and when his useful working days were over, more than likely he became a charge upon relatives.

Contrast these conditions with those of today. The steel worker's wage rate is about 125 per cent higher. He works eight hours a day and not over six days per week. Periodically he or his chosen representative sits around the conference table with his employer to discuss and help fix his working conditions. His health and safety are protected and cared for through company-maintained hospitals and vigilant safety programs. In

many instances he already owns or is buying his own home with the aid of his company. There is an insurance program to protect his family in case of sickness and death, and finally a company-financed pension plan to care for him in his old age.

Industry through achievement has demonstrated its belief in social security. Even though legislation may be necessary in some instances to protect employees, there are cases where employees would not be as well provided for under legislation as they are now.

An illuminating example of what happens to personal liberty when the government tries to invade the field of private and purely local employment relations is what is taking place under the national labor relations act, commonly called the Wagner act. Here is a piece of legislation that professed to protect the individual liberty of the worker and to better his conditions. Yet what do we find? In case after case throughout this country we see the curious spectacle of employees and their employer, whose mutual relations are entirely harmonious and satisfactory, forced by a hastily conceived and discriminatory law to join together and fight for their independence against an irresponsible group of professional labor organizers.

## What the Nation Needs

In summation, let me briefly state a few of our paramount necessities if we are properly to discharge our responsibilities and obligations.

We need governmental conditions encouraging free and competitive enterprise.

We need governmental policies that will strengthen our belief in American initiative and achievement.

We must have relief from excessive costs of government, in order that products may be made at minimum cost to the consuming public.

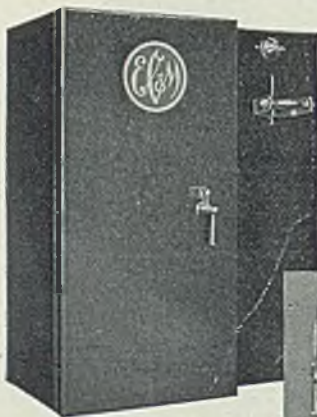
We must have guarantees of the right of opportunity of the American worker to employment without interference or coercion from any source.

We need a condition of confidence so that the investing public may feel assured of obtaining an adequate and reliable return upon their savings.

We need to have an effective and workable basis for social security and to restore relief to a sound basis of local administration.

We must be allowed to have unhampered efficiency in production so that industry may pay wages leading to an improved standard of living, and so that lower costs to the public may provide an increased purchasing power for everyone.

Above all, our people, whether they be laborers or capitalists, must be made to feel that spirit of confidence in themselves, in the institutions of the country and in their national life, which will permit them to forge onward to still higher standards of accomplishment and living.



Views of Front-Enclosed Style with externally-operated Knife Switch and of Open Style Panels.

## NEW DESIGN PROTECTIVE PANELS for CRANES

These are compact units for protecting the electrical equipment used on overhead, locomotive and similar cranes. They take the place of Knife Switches, Circuit Breakers, Fuses, etc. otherwise necessary and combine all the protective devices into one unit easily installed in the crane cab.



Important safety features include emergency stopping of all motors, low voltage protection, provision for padlocking main line knife switch and other outstanding advantages. New Bulletin 1021-A gives complete information on open, front-enclosed and completely-enclosed styles for use on cranes having from 2 to 8 motors. Write for your copy today.



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# Steel Producers Fight Oil Tax

WITH warnings that many independent firms might be forced to suspend operations, metalproducing and metalworking industries of eastern Pennsylvania last week swung into a vigorous campaign against imposition of a proposed 2-cents-per-gallon tax on all fuel oil sold or consumed in the state.

They asserted that the bill, which was introduced in the state legislature May 5, would impose a crushing burden on the small business using fuel oil; that it would bring increased unemployment and a resulting rise in relief needs, and probably force many industries out of Pennsylvania.

The proposed tax would add \$4,000,000 a year to operating costs in the eastern Pennsylvania district alone, said the opponents of the bill, estimating that more than 200,000,000 gallons of fuel oil are consumed annually by steel producers and metalworking companies in the district.

At a hearing before the house committee on the bill in Harrisburg, Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa., said his concern used 20,000,000 to 37,000,000 gallons of fuel oil yearly. For his company, he said, the proposed tax would result in an increased annual cost of \$400,000 to \$750,000, a shutdown would throw about 2500 persons out of work.

A telegram sent to Gov. Earle of Pennsylvania by Samuel Reeves, president, Phoenix Iron Co., Phoenixville, Pa., was made public, in which Mr. Reeves stated that the fuel oil tax would also cause a shutdown in Phoenixville, with loss of 2000 jobs there.

It was estimated that at least eight other important units in the eastern Pennsylvania metal products industries would be forced to close down or move, with resulting unemployment to more than 20,000 persons.

D. P. McConologue, Pittsburgh, representing Blaw-Knox Co., Pittsburgh Rolls Corp., Union Steel Casting Co., Lewis Foundry & Machine Co. and National Alloy Steel Co., also spoke at the hearing. He said it would cost nearly \$1,000,000 to change these plants back to another fuel. Even with such a change, they probably would utilize natural gas instead of coal, he said.

## Conference Board Hears Leader in Five Fields

Elements of an American program for social progress formed the general theme of the twentieth annual meeting of the National Industrial Confer-

ence board, Thursday, May 28, in New York city.

A leader in each of the five primary fields, education, science, religion, government and business, discussed how his particular field could contribute most soundly to future social advancement.

Speakers included Dr. Karl T. Compton, president, Massachusetts Institute

of Technology; Charles Nagel, former secretary of commerce and labor, and Ralph T. Flanders, president, Jones & Lamson Machine Co., and past president of the American Society of Mechanical Engineers.

The annual meeting marked the close of two decades of the board's service as a central scientific research institution of American industry.

## Steel Industry's Spokesmen Discuss Policies Needed for Sound Recovery

(Continued from Page 17)

performance seems not to have been so satisfactory."

The speaker referred to the recent softness in prices. "In the early part of this year," he said, "some members of the industry realizing that rumors may be as destructive as realities and knowing the inevitable consequences if such continued, acted on the belief that at least a partial corrective might be found in putting their own commercial practices clearly in the open. They accordingly published lists of prices, discounts, allowances and other terms and conditions of sale of their respective products. That lead was

followed progressively by other members of the industry."

Mr. Tower then reported in detail on the activity of the institute in connection with statistics, traffic, technical matters, tariff, industrial relation and publicity.

In connection with the last mentioned activity, he mentioned the booklet, "Men Who Make Steel" recently off the press and the recent approval by the board of directors of a project to produce a motion picture film of the steel industry.

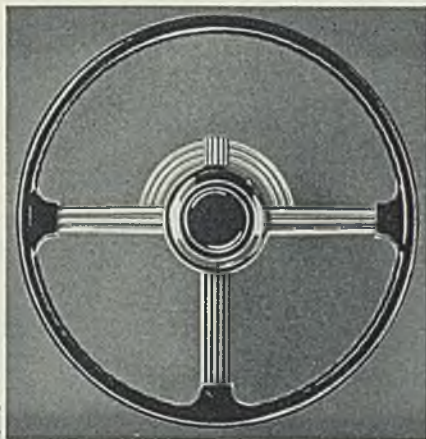
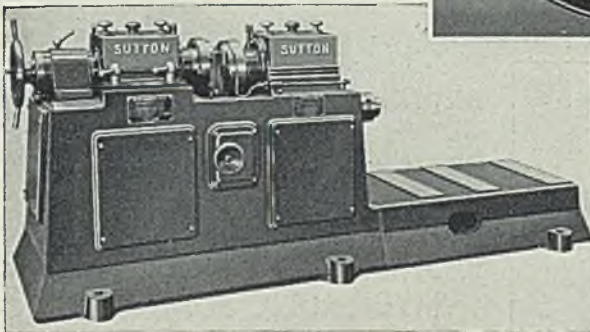
Mr. Tower reported that for the first time the number of company members of the institute exceeds 100.

At a luncheon meeting of institute

The new type Chrysler steering wheel shown at the right is not only unique in design but it presents a difficult polishing and burnishing problem.

The No. 00 Sutton Disc Type Burnishing and Surface Rolling machine seen below successfully met the requirement. It polishes and burnishes in one operation by spinning the spokes between two hardened discs. No emery belt is used.

This is the only machine of its kind on the market. Write for details.



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directors immediately following the morning session, Mr. Grace was re-elected president, W. A. Irvin and T. M. Girdler were re-elected vice presidents, H. L. Hughes was re-elected treasurer and W. S. Tower was re-elected executive secretary.

Four technical papers were presented at the afternoon session at which Quincy Bent, vice president, Bethlehem Steel Co., Bethlehem, Pa., presided as chairman. Frank R. Palmer, assistant to the president, Carpenter Steel Co., Reading, Pa., presented a paper entitled "Electric Furnaces and Their Part in Metallurgical Progress." L. F. Reinartz, works manager, Middletown division, American Rolling Mill Co., Middletown, O., spoke on "Recent Advances in Open Hearth Furnace Design and Operation." Clyde E. Williams, director, Battelle Memorial institute, Columbus, O., discussed "The New Technical and Economic Importance of Iron and Steel Scrap." Dr. Albert Sauveur, Gordon McKay professor of metallurgy, Harvard university, Cambridge, Mass., talked on "A Review of Metallurgical Progress."

Personal sketches of the four authors were presented on page 31 of last week's issue. The paper by Mr. Williams is presented in abstract on page 34 of this issue. Details from the remaining papers will appear in subsequent issues of STEEL.

The annual banquet held in the ballroom of the Waldorf-Astoria hotel, Thursday evening, was one of the most colorful gatherings in the history of the institute. Every bit of available space on the main floor and in the several decks of balconies was taxed to accommodate the 1900 members and guests of the institute who were in attendance. The seating list was the

largest in the 45 annual meetings of the institute, topping the banquet attendance at the spring meeting of 1929 by at least half a hundred.

Institute President E. G. Grace presided as toastmaster. The principal speakers were Myron C. Taylor, chairman of the board, United States Steel Corp., Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., and Dr. Neil Carothers, head of the college of business administration, Lehigh university, Bethlehem, Pa.

The American Iron and Steel institute medal, which is awarded each year to the author of the best technical paper presented at the previous gen-

eral meeting, was presented to D. M. Petty, superintendent of service, Bethlehem Steel Co., Bethlehem, Pa., The paper which won this award for Mr. Petty was entitled "The Economic Importance of the Replacement of Obsolete Equipment in Steel Mills." This paper, which was presented May 23, 1935, was abstracted in the May 27, 1935 issue of STEEL.

The committee in charge of arrangements for the forty-fifth general meeting consisted of T. M. Girdler, chairman; L. E. Block, president, Inland Steel Co.; S. E. Hackett, president, Jones & Laughlin Steel Corp.; W. A. Irvin and E. T. Weir.

## Institute Includes Data on Stainless Steel, Scrap Use in Statistical Record

**M**EASURING up in every respect to the high standard established last year, the Twenty-fourth Annual Statistical Report of the American Iron and Steel institute, just issued, covers not only the usual series of statistics but also includes important new data.

For the first time the report shows the tonnage of iron and steel scrap consumed in blast furnaces and steelmaking furnaces. In 1935 the scrap consumed in this manner totaled 20,541,751 gross tons. Of this amount, 10,921,823 tons represented scrap produced in companies' own works, 9,613,583 tons was scrap

purchased in the domestic market and 6345 tons was imported purchased scrap. The significant inference from these figures is that the 10,921,823 tons of scrap produced in companies' own works is roughly a third of the total steel ingot production for 1935, which was 33,940,445 tons.

Another innovation in the statistical report for 1935 is a table on the production of stainless steel ingots by analysis. Production in gross tons for 1935 compared with that of 1934 for four grades is as follows:


	1934	1935
18 per cent chromium-		
8 per cent nickel.....	19,777	24,711
12 to 14 per cent chromium	8,902	13,232
16 to 18 per cent chromium	8,077	12,837
All other high chromium or chromium-nickel alloys..	13,161	14,917
Total .....	49,917	65,697

The total production of alloy steel ingots and castings in 1935 of 2,119,658 gross tons compares with 1,612,275 gross tons in 1934.

The summary at the beginning of the statistical report shows that companies representing more than 95 per cent of the capacity of the industry had a total investment in 1935 of \$4,506,150,356, a slight decrease from the figure for 1934. The number of employes in December, 1935, totaled 547,112, compared with 386,345 in the previous year. Average hours worked per week advanced from 30.5 in 1934 to 35.5 in 1934. In the same period average earnings per hour advanced from 70.2c to 72.3c. The number of stockholders as of Dec. 31 increased from 490,626 in 1934 to 551,832 in 1935. It will be noted that the numbers of employes and stockholders were almost on a par in 1935.

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## Plan Air Conditioning and Heating Week Aug. 17-22

Manufacturers of warm air furnaces and air conditioning units, among the large users of steel, have banded together for the promotion of a national warm air heating and air conditioning week, Aug. 17-22.

The public will be given literature defining air conditioning and explaining its functions, operations and purpose through 15,000 dealers in the nation.

Special displays of air conditioning and warm air heating apparatus will be arranged, several new models presented and special terms and prices offered.

A speakers' bureau, operated from the National Warm Air Heating and Air Conditioning association offices in Columbus, O., will help popularize the movement before civic bodies, state and local building groups and F.H.A. home show groups.

## Convention Calendar

**May 31-June 5**—Society of Automotive Engineers. Summer meeting at the Greenbrier, White Sulphur Springs, W. Va. John A. C. Warner, 29 West Thirty-ninth street, New York, is general manager.

**June 1-4**—American Electro-Platers' society. Annual meeting and exhibition, Carter hotel, Cleveland. E. Steen Thompson, 905 West Tenth street, Erie, Pa., is secretary.

**June 5-6**—Electric Metal Makers Guild. Annual meeting at Hotel Onesto, Canton, O. J. H. Chivers, 1051 Woodberry road, New Kensington, Pa., is secretary.

**June 8-13**—Twelfth International Congress of Acetylene, Oxyacetylene Welding and Allied Industries. Meeting in London. V. A. Amodeo and A. B. Harrower, 1 Albermarle street S. W. 1, London, are joint secretaries.

**June 9-12**—Institute of British Foundrymen. Thirty-third annual conference, in Glasgow, Scotland. T. Makemson, St. John Street Chambers, Deansgate, Manchester, 3, England, is secretary.

**June 10-12**—American Steel Warehouse association. Twenty-seventh annual meeting at Edgewater Beach hotel, Chicago. W. S. Duxsey, 442 Terminal Tower, Cleveland, is executive secretary.

**June 15-20**—American Society of Mechanical Engineers. Semiannual meeting at Hotel Aldophus, Dallas, Texas. C. E. Davies, 29 West Thirty-ninth street, New York, is secretary.

**June 16-18**—National Warm Air Heating and Air Conditioning association. Semiannual meeting at Deshler-Wallick hotel, Columbus, O. Allen B. Williams, 50 West Broad street, Columbus, O., is secretary.

**June 22-24**—American Society of Heating and Ventilating Engineers. Semiannual meeting at The Inn, Buck Hill Falls, Pa. A. V. Hutchin-

son, 51 Madison avenue, New York, is secretary.

**June 22-25**—National Association of Cost Accountants. Annual convention at Netherland-Plaza hotel, Cincinnati. S. C. McLeod, 385 Madison avenue, New York, is secretary.

**June 29-July 3**—American Society for Testing Materials. Thirty-ninth annual meeting at Chalfonte-Haddon Hall, Atlantic City. N. J. C. L. Warwick, 260 Broad street, Philadelphia, Pa., is secretary.

**Sept. 7-11**—American Chemical society. Semiannual meeting in Pittsburgh. Charles L. Parsons, 728 Mills building, Washington, is secretary.

**Sept. 21-26**—Iron and Steel Institute (British). Autumn meeting in Dusseldorf, Germany. K. Headlam-Morley, 28 Victoria street, London S.W.1, is secretary.

**Sept. 22-25**—Association of Iron and Steel Electrical Engineers. Thirty-second annual convention at Hotel Statler and iron and steel exposition at Convention Hall, Detroit. Brent Wiley, Empire building, Pittsburgh, is managing director.

**Oct. 5-9**—National Safety council. Twenty-fifth annual safety congress in Atlantic City. N. J. William H. Cameron, 20 North Wacker drive, Chicago, is managing director.

**Oct. 19-23**—American Society for Metals. Eighteenth annual national metal congress and exposition in Public Auditorium, Cleveland. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

**Oct. 19-23**—American Welding Society. Annual meeting in Cleveland. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

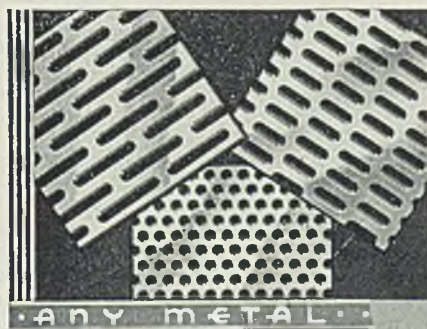
## Equipment

New York—Although many of the machine tool companies have in-

creased their capacity, most of them are unable to make deliveries sooner than three to four months. On the whole current demand shows further improvement. Quotation desks are keeping busy figuring on new inquiries. Edgecomb Steel Co., Newark, N. J., has bought some slitters, shears and other equipment. Monroe Calculating Machine Co., Newark, N. J., is placing some orders for diversified small tools. It is understood here that the Crown Cork Seal Co., Baltimore, has placed most of the requirements in connection with the machine shop which will serve its new Brooklyn, N. Y., plant.

Chicago — While machine tool sales in May for some interests were somewhat lower than the April volume, the total in general was regarded as satisfactory. Inquiries have been well maintained, pointing to good business prospects this month. Quick action usually is being taken in closing on orders following the issuing of inquiries, a factor responsible for this being the extended delivery required on most tools. Small tool and miscellaneous plant equipment buying also is holding fairly steady. Railroad shops and freight car builders lately have been better buyers of the latter than of heavier machinery.

Seattle—The mining industry is in the market for new items and replacements, while logging and lumbering interests are making expenditures. Used equipment is in good demand. Canneries are prominent in ordering new and replacement machinery, and shipyards and machine shops are active.



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# Construction and Enterprise

## Ohio

**ALLIANCE, O.**—Buckeye Twist Drill Co. has been sold to Whitman & Barnes Inc., 100 South Jefferson street, Chicago. New machinery is to be installed in the Alliance plant.

**BEREA, O.**—City has authorized William C. Kammerer & Associates, Sloan building, Cleveland, to make a survey of the light and water plants and deter-

mine the amount of new equipment necessary to increase efficiency of plants. John Baesel is mayor, and Frank Dorland, superintendent of plants.

**CLEVELAND**—Glauber Brass Mfg. Co., 7800 Finney street, manufacturer of plumbers' brass goods, brass novelties, etc., will move its brass foundry to Kinsman, O. The company is constructing a 1-story building to provide increased space at the new location.

**CLEVELAND**—City, through Frank O. Wallene, director of department of public utilities, Room 105, City hall, is investigating feasibility of establishing a light plant on west side.

**CLYDE, O.**—James J. Freeborn mayor, has authorization of village council for an 850 kilovolt ampere, steam turbogenerator, cooling tower condenser, new building and other equipment for a municipal electric light and power plant. Preliminary plans estimate cost on this locally-financed project to be \$60,000. W. C. Kammerer & associates, 823 Prospect avenue, Cleveland, is consulting engineer.

**HOLLOWAY, O.**—Village, through board of public affairs, will receive bids until noon June 4 for furnishing and placing in service cast iron water mains, valves, hydrants, turbine pump, pump house, a 75,000 gallon steel standpipe, etc. Total cost for this PWA project is \$48,500. (Noted STEEL April 13).

**PAINESVILLE, O.**—The plant of Republic Bronze Powder Corp., owned by James W. Frazer, 13834 Lake avenue, Lakewood, O., was destroyed by explosion and fire. The corporation is operated by the Sheffield Bronze & Powder Co., 300 Woodhill road, Cleveland.

**SPRINGFIELD, O.**—Ohio Edison Co., East High street, has under consideration plans for erection of transmission and distributing lines in Salem, Fairfield, Perry, Elkrum and Unity townships in Columbiana county at a cost of approximately \$85,000. Construction of a power substation is included.

**ST. CLAIRSVILLE, O.**—City council is contemplating taking definite action on the erection of a municipal electric light plant. Mayor C. B. Bradfield says city is considering corner site at Market and Woodrow avenues for the project estimated to cost \$115,000.

**TOLEDO, O.**—Barrett Co., 2762 Front street, manufacturer of asphalt roofing products, will add a number of large tanks in a factory expansion program.

## New York

**BUFFALO**—J. J. Winer, 487 Williams street, is considering installation of a 500 and a 1000-gallon steel tanks, an electrical pump, and an air compressor.

**BUFFALO**—Worthington Pump & Machinery Corp., Clinton and Roberts streets, is receiving bids for a plant expansion program estimated to cost \$40,000. E. Schwanhauser is manager.

**PLATTSBURG, N. Y.**—Municipality will erect a light plant here at an estimated cost of \$540,000.

**HUDSON, N. Y.**—Universal Atlas Cement Co., R. A. Dittmar, superintendent of plant, is converting its Hudson plant to 100 per cent electrical operation.

Equipment to be purchased includes belt conveyor, new grinding equipment, and a new diesel electric locomotive.

**LONG ISLAND CITY, N. Y.**—Nicholas Copper Co., 4309 Fifty-fifth street, is considering improvement in its plant and the construction of a crane runway. Private plans call for an expenditure of \$65,000 for the project.

**NIAGARA FALLS, N. Y.**—Union Carbide Co., Forty-seventh street, subsidiary of Union Carbide & Carbon Corp., 30 East Forty-second street, New York, is considering installation of conveyors, motors and controls, and other equipment in an expansion and improvement program estimated to cost \$1,000,000.

**JAMESTOWN, N. Y.**—Jamestown Metal Equipment Co. Inc., Allen street, is planning to let soon the general contract for a 2-story basement factory building. Private plans have been drawn for this \$100,000 project. E. Card is handling arrangements.

## Pennsylvania

**BESSEMER, PA.**—Borough of Bessemer, through its secretary, Charles B. Nord, will receive bids until June 4 for erection, construction and equipment of part of a municipal water supply system.

**FARMERS VALLEY, PA.**—Quaker State Refining Co., 6800 Kelly avenue, Pittsburgh, is planning erection of a large power plant and other additional units for its plant, here.

**LANCASTER, PA.**—Commissioners of Lancaster county, through Harry C. Brown, county controller, will receive bids until June 3 for a boiler for the county prison.

**PHILADELPHIA** — Frankford Arsenal, Administration building, Bridge street, is taking bids until June 8 on inventory 314-36-501 for a drill press.

**PITTSBURGH**—Crucible Steel Co. of America, Frick building, has received a permit to construct an all-steel building at Ridge and Lighthill streets. Cost is estimated at \$7000. W. T. Grange Construction Co., Keenan building, is contractor.

**PITTSBURGH** — Allegheny county, Robert G. Woodside, controller, will receive bids until June 4 for furnishing heavy-duty motor graders. Specifications may be obtained from contract clerk in county department of works, room 502, County Office building, Pittsburgh.

**PITTSBURGH**—Mayer Body Corp., 6461 Frankstown avenue, is receiving bids for an addition to a truck manufacturing building on Auburn street. Richard Neff, 1546 Westfield street, is architect.

**WAMPUM, PA.**—Big Beaver township school board will receive bids on different types of heating system for the Glenkirk school building until June 12 in D. M. Marshall's office.

**WILKES-BARRE, PA.**—Davis Millwork Co., 1166 Murray street, is accepting bids for furnishing a belt, or motor-driven, deep well water pump, and other necessary equipment.

## Michigan

**DETROIT**—Art Metal Works, 3795 Fourteenth street, has leased property at 6188-6190 Twelfth street, formerly occupied by Steiner Auto Trimming Co., to take care of increased orders. Joseph Dunker is president.

**DETROIT**—Square Tool, Die & Mfg. Corp., 3327 East Vernor highway, has

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1200 ROOMS

**THE  
BENJAMIN  
FRANKLIN**

SAMUEL EARLEY, Managing Director

**Philadelphia**



been incorporated to manufacture tools. Albert Schreiber, 4386 Courville avenue, is one of the incorporators.

### Illinois

**ROCK ISLAND, ILL.**—United States engineer's office, Clock Tower building, will accept sealed bids in duplicate until June 24 for the construction and installation of a power, control and lighting system at lock and dam No. 11 on the Mississippi river near Dubuque, Iowa.

### Indiana

**MARION, IND.**—United States veterans administration, L. H. Tripp director of construction, Room 764, Arlington building, Washington, will receive bids until June 23 for a deep well pump and a pumphouse.

**SOUTH BEND, IND.**—Bantam Ball Bearing Co., 3702 West Sample street, is erecting an addition to present plant, and adding new equipment in an expansion program expected to cost \$250,000. Machining and grinding equipment is being added. S. H. Frauenthal is vice president and general manager.

### Alabama

**BIRMINGHAM, ALA.**—Armour & Co., Chicago, is considering spending \$300,000 for improvements to a plant here recently acquired from the Birmingham Packing Co.

**LEEDS, ALA.**—Universal Atlas Cement Co., 135 East Forty-second street, New York, plans to purchase an electrically-operated quarry shovel with capacity of five tons per minute, a new stone crusher, new grinding equipment, and a new coal pulverizer in a program improving the plant at Leeds. L. M. Funderburg is superintendent of the plant.

### Delaware

**WILMINGTON, DEL.**—Tidewater Power Co., Wilmington, plans construction of 123.5 miles of lines in a rural electrification program in 17 counties in southeastern North Carolina. F. A. Matthes is president of the company.

### Kentucky

**ELIZABETHTOWN, KY.**—Elizabethtown White Way Co., an electric light and power concern, has been incorporated by M. L. Underwood and G. W. Skidmore.

### Mississippi

**VICKSBURG, MISS.**—United States engineer, Box 667, will receive bids until June 11 for butterfly valve frames, operating stand for valve shafts, coupling flanges, and hand wheels, delivered free on board at Monroe, La.

### Florida

**FERNANDINA, FLA.**—Container Corp. of America Inc., 111 West Washington street, Chicago, has acquired land here and plans erection of a power plant for mill service, and installation of motors and controls, machine drives, transformers and accessories, conveyors and other equipment in the company's new multi-unit paper and kraft pulp mill. George F. Hardy, 305 Broadway, New York, is consulting engineer for this \$5,000,000 project.

**PANAMA CITY, FLA.**—Gulf Oil Co. has under consideration plans for erec-

tion of an oil terminal here, including several storage tanks.

**PORT ST. JOE, FLA.**—G. H. Mead & Co., 20 Broadway, New York, is contemplating erection of a \$6,000,000 paper mill, here. Project is contingent upon deepening of Port St. Joe harbor.

### Georgia

**AUGUSTA, GA.**—Augusta Arsenal is in the market for a portable woodwork-ing unit and lathe. Bids will be accepted until June 12 on inventory W 121-36-18.

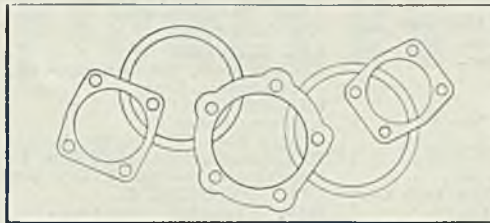
**DEMOREST, GA.**—City will receive

bids until June 9 for a waterworks system, including 4 pumps, 2 chemical feeders, gate valves, fire hydrants, pipe, etc. City funds are available and work is to begin soon after awards are announced. Robert & Co. Inc., architects and engineers, Bona Allen boulevard, Atlanta, Ga., is consulting.

### North Carolina

**CANTON, N. C.**—T. E. King, South Main street, a dealer, is in the market for a 150-200 ampere alternating current gas engine driven portable electric

*(Please turn to Page 97)*



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Norton Co., Worcester, Mass.

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Youngstown, O.

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Air Reduction Sales Co.,  
60 East 42nd St., New York City.  
Linde Air Products Co.,  
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**BEAMS, CHANNELS, ANGLES**

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Jones & Laughlin Steel Corp.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.

Republic Steel Corp.,  
Dept. ST, Cleveland, O.  
Standard Steel Works Co.,  
Burnham, Pa.

Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg.,  
Birmingham, Ala.

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Cadman, A. W., Mfg. Co., 2815  
Smallman St., Pittsburgh, Pa.  
National Bearing Metals Corp.,  
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Ryerson, Jos. T., & Son, Inc., 16th  
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Ellwood City, Pa.

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Inland Steel Co.,  
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Republic Steel Corp.,  
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Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.

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ham, Ala.  
The Stanley Works,  
New Britain, Conn.  
Bridgeport, Conn.

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Minneapolis, Minn.

**BARGES (Steel)**  
American Bridge Co.,  
Frick Bldg., Pittsburgh, Pa.

Bethlehem Steel Co., Bethlehem, Pa.  
Federal Shipbuilding & Dry Dock  
Co., Kearney, N. J.

Jones & Laughlin Steel Corp.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.

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The Udylyte Co., 1615 E. Grand  
Blvd., Detroit, Mich.

**BARRELS (Steel)**  
Petroleum Iron Works Co.,  
Sharon, Pa.

Pressed Steel Tank Co.,  
Milwaukee, Wis.

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Firth-Sterling Steel Co.,  
McKeesport, Pa.

Midvale Co., The,  
Nictown, Philadelphia, Pa.

Republic Steel Corp.,  
Dept. ST, Cleveland, O.

Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.

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ham, Ala.

Timken Steel & Tube Co.,  
Canton, O.

**BARS (Concrete Reinforcing)**  
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Pittsburgh-Chicago.

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San Francisco, Calif.

Inland Steel Co.,  
38 S. Dearborn St., Chicago, Ill.

Jones & Laughlin Steel Corp.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.

Republic Steel Corp.,  
Dept. ST, Cleveland, O.

Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.

Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg.,  
Birmingham, Ala.

Youngstown Sheet & Tube Co.,  
Youngstown, O.

**BARS (Iron)—See IRON (Bar)**  
**BARS (Reinforcing)**  
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Columbia Steel Co.,  
San Francisco, Calif.  
Inland Steel Co.,  
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\*Jessop Steel Co.,  
Washington, Pa.  
Jones & Laughlin Steel Corp.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.

Laclede Steel Co.,  
Arcade Bldg., St. Louis, Mo.  
\*Ludlum Steel Co.,  
Watervliet, N. Y.

\*Midvale Co., The,  
Nictown, Philadelphia, Pa.  
\*Republic Steel Corp.,  
Dept. ST, Cleveland, O.

Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.

The Stanley Works,  
New Britain, Conn.  
Bridgeport, Conn.

Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg.,  
Birmingham, Ala.

Timken Roller Bearing Co., The,  
Canton, O.

Weirton Steel Co., Weirton, W. Va.  
Youngstown Sheet & Tube Co.,  
Youngstown, O.

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Orange, N. J.

Electric Storage Battery Co., The,  
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**ETC.**  
(\*Also Stainless)

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Columbia Steel Co.,  
San Francisco, Calif.

Inland Steel Co.,  
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Watervliet, N. Y.

Ryerson, Jos. T., & Son, Inc., 16th  
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Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg., Birming-  
ham, Ala.

Weirton Steel Co., Weirton, W. Va.  
Youngstown Sheet & Tube Co.,  
Youngstown, O.

**BEARINGS (Ball)**  
Bantam Ball Bearing Co., The,  
South Bend, Ind.

Boston Gear Works, Inc.,  
North Quincy, Mass.

Fafnir Bearing Co.,  
New Britain, Conn.

Norma Hoffmann Bearings Corp.,  
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New Departure Mfg. Co.,  
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2816 Smallman St.,  
Pittsburgh, Pa.

Cramp Brass & Iron Foundries Co.,  
Paschall Sta., Philadelphia, Pa.

Lawrenceville Bronze Co.,  
Bessemer Bldg., Pittsburgh, Pa.

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Shenango-Penn Mold Co.,  
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New Britain, Conn.

Hyatt Roller Bearing Co.,  
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Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.

National Bearing Metals Corp.,  
928 Shore Ave., Pittsburgh, Pa.

Timken Roller Bearing Co., The,  
Canton, O.

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N. Y.

**BEARINGS (Radial)**  
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New Departure Mfg. Co.,  
Bristol, Conn.

Timken Roller Bearing Co.,  
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Fafnir Bearing Co.,  
New Britain, Conn.

Hyatt Roller Bearing Co.,  
P. O. Box 476, Newark, N. J.

National Bearing Metals Corp.,  
928 Shore Ave., Pittsburgh, Pa.

Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.

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**BEARINGS (Roller)**  
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Fafnir Bearing Co.,  
New Britain, Conn.

Hyatt Roller Bearing Co.,  
P. O. Box 476, Newark, N. J.

Norma Hoffmann Bearings Corp.,  
Stamford, Conn.

S. K. F. Industries, Inc.,  
Front St. & Erie Ave.,  
Philadelphia, Pa.

Timken Roller Bearing Co., The,  
Canton, O.

**BEARINGS (Roller Tapered)**  
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South Bend, Ind.

Timken Roller Bearing Co.,  
Canton, O.

**BEARINGS (Rolling Mill)**  
Bantam Ball Bearing Co.,  
South Bend, Ind.

Cramp Brass & Iron Foundries Co.,  
Paschall Sta., Philadelphia, Pa.

Hyatt Roller Bearing Co.,  
P. O. Box 476, Newark, N. J.

Lawrenceville Bronze Co.,  
Bessemer Bldg., Pittsburgh, Pa.

Norma Hoffmann Bearings Corp.,  
Stamford, Conn.

Shoop Bronze Co., The,  
344-360 W. Sixth St.,  
Tarentum, Pa.

Timken Roller Bearing Co.,  
Canton, O.

**BEARINGS (Quill)**  
Bantam Ball Bearing Co.,  
South Bend, Ind.

**BEARINGS (Thrust)**  
Bantam Ball Bearing Co., The,  
South Bend, Ind.

Fafnir Bearing Co.,  
New Britain, Conn.

Norma Hoffmann Bearings Corp.,  
Stamford, Conn.

Timken Roller Bearing Co., The,  
Canton, O.

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Goodrich, B. F., Co., The,  
Akron, O.

U. S. Rubber Products, Inc.,  
1790 Broadway, New York City.

**BENDING AND STRAIGHTENING**  
**MACHINES**  
Kardong Bros., 346 Buchanan St.,  
Minneapolis, Minn.

Morgan Engineering Co., The,  
Alliance, O.

Thomas Spacing Machine Co.,  
Pittsburgh, Pa.



(Continued from Page 95)

welder, complete with cable-electric holder and shield; and three belt-driven hydraulic pumps capable of producing pressure of 1000 to 1500 pounds.

**HEMP, N. C.**—City, through W. P. Saunders, mayor, and L. V. Edwards, engineer, Hemp, N. C., will take bids until June 9 for construction of a water supply works, and furnishing equipment, including pumping station, mechanical mixer, service and washwater pumps, and furnishing and erecting a 200,000 gallon capacity elevated steel water tank and tower.

**NAGS HEAD, N. C.**—Virginia Electric & Power Co., Richmond, Va., has acquired properties of the Roanoke Utilities Co. here.

### South Carolina

**BEAUFORT, S. C.**—General Phosphate Corp., William Montgomery, Woodbury, Conn., president, is to construct a portable washing and crushing plant for use in mining phosphate rock in South Carolina. Offices are located in Beaufort.

**CHERAW, S. C.**—Carolina Oil Mills' storage house and conveyor system was damaged by fire recently.

**COLUMBIA, S. C.**—State Rural Electrification authority, 1539 Main street, is accepting bids for transmission and distributing lines in a program to electrify 200 miles of outlets. Project includes erection of power substations.

### Tennessee

**JOHNSON CITY, Tenn.**—City has commissioned Lide & Adler Co., Woodward building, Birmingham, Ala., consulting engineer, to estimate the cost of establishing a city-owned electrical distributing system, including a power substation and transmission lines for connection with Tennessee Valley Authority for power.

**NASHVILLE, TENN.** — Tennessee Electric Power Co., Watkins building, has been granted a permit to construct an \$18,000 substation at 208 Tenth avenue, North.

### Virginia

**MARTINSVILLE, VA.** — American Truck & Body Corp. is planning the erection of a 1-story plant estimated to cost \$50,000.

**MINERAL, VA.**—J. E. Rowe, mayor, will receive bids until June 2 for furnishing and erecting a 60,000 gallon steel storage tank and tower, and a pumping station and other facilities for a complete water supply system. Elmer E. Barnard, 506 Law building, Lynchburg, Va., is consulting engineer.

**NORFOLK, VA.** — Radio Station WTAR has permission from the radio commission to construct three towers and install a new directional antenna system.

**NORFOLK, VA.**—City water department is in charge of a project designed to improve old pumping stations and provide for the purchase of new pumping equipment. Cost of the project is estimated at \$6000.

**RICHMOND, VA.** — Bemiss Equipment Corp. has been incorporated and capitalized at \$25,000 to manufacture road machinery and other equipment. J. M. Hurt Jr., State Planters Bank building, is correspondent.

**RICHMOND, VA.**—Richmond Engineering Co. Inc., Brook avenue, wants to purchase a small, used gasoline operated power shovel, and several used side dump cars.

### Oklahoma

**ARCADIA, OKLA.**—Oklahoma Gas & Electric Co., Oklahoma City, Okla., is considering construction of a new 13,200-volt transmission line from Arcadia to Edmond, Okla., and a line in Garfield county. Total project to cost approximately \$55,000.

**OKLAHOMA CITY, OKLA.**—City,

Tom G. Banks, water engineer, estimates \$1,500,000 will be expended for increasing facilities at the filtration plant, to make additions to smaller mains, build water towers, and to lay trunk mains. Authority has been given to expend \$100,000 for trunk main to Capitol Hill. (Noted STEEL May 18.)

**STILLWATER, OKLA.**—City contemplates the purchase soon of a 2500-kilowatt steam turbine generator set. Purchase price is approximately \$80,000. J. W. McKinnon, Stillwater, is engineer.

**TULSA, OKLA.**—Hess Tank Co. has  
(Please turn to Page 99)

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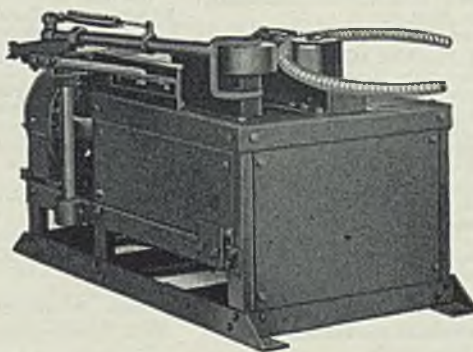
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Republic Steel Corp.,  
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The Stanley Works,  
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Washburn Wire Co.,  
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Heppenstall Co.,  
47th & Hatfield Sts.,  
Pittsburgh, Pa.  
Jones & Laughlin Steel Corp.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.

Midvale Co., The, Nicetown,  
Philadelphia, Pa.  
Republic Steel Corp.,  
Dept. ST, Cleveland, O.  
Standard Steel Works Co.,  
Burnham, Pa.  
The Stanley Works,  
New Britain, Conn.  
Bridgeport, Conn.  
Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg., Birming-  
ham, Ala.  
Timken Steel & Tube Co.,  
Canton, O.

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(\*Also Stainless)  
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Andrews Steel Co.,  
Newport, Ky.  
Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.

Central Iron & Steel Co.,  
Harrisburg, Pa.  
Firth-Sterling Steel Co.,  
McKeesport, Pa.  
Inland Steel Co.,  
38 So. Dearborn St., Chicago, Ill.  
Jones & Laughlin Steel Corp.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.  
\*Ludlum Steel Co.,  
Watervliet, N. Y.  
\*Republic Steel Corp.,  
Dept. ST, Cleveland, O.  
Standard Steel Works Co.,  
Burnham, Pa.  
The Stanley Works,  
New Britain, Conn.  
Bridgeport, Conn.  
Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg., Birming-  
ham, Ala.  
Timken Steel & Tube Co.,  
Canton, O.  
Youngtown Sheet & Tube Co.,  
Youngstown, O.

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Brosius, Edgar E., Inc.,  
Sharpsburg, Pa.  
Leeds & Northrup Co.,  
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Philadelphia, Pa.

Pollock, The Wm. B., Co.,  
Youngstown, O.  
Shoop Bronze Co., The,  
344-360 W. Sixth St.,  
Tarentum, Pa.  
Steel Industries Engineering Corp.,  
Empire Bldg., Pittsburgh, Pa.

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FURNACES (Blast)**

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Yale & Towne Mfg. Co.,  
4630 Tacony St., Philadelphia, Pa.

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359 Park Ave., Worcester, Mass.  
General Electric Co.,  
Schenectady, N. Y.  
Ingersoll-Rand Co.,  
Phillipsburg, N. J.  
Strong, Carlisle & Hammond Co.,  
The, 1400 W. 3rd St., Cleve-  
land, O.

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**BOILER TUBES—See TUBES  
(Boiler)**

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Burlington, Iowa.  
Oil Well Supply Co., Dallas, Texas  
**BOLT AND NUT MACHINERY**  
Landis Machine Co.,  
Waynesboro, Pa.

**BOLTS**  
(\*Also Stainless)  
Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Columbia Steel Co.,  
San Francisco, Calif.  
Jones & Laughlin Steel Co.,  
Jones & Laughlin Bldg.,  
Pittsburgh, Pa.  
Oliver Iron & Steel Corp.,  
S. 10th & Muriel Sts.,  
Pittsburgh, Pa.

\*Republic Steel Corp., Upson Nut  
Div., Dept. ST, 1912 Scranton Rd.,  
Cleveland, O.  
Russell, Burdall & Ward Bolt &  
Nut Co., Port Chester, N. Y.  
Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.  
Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg., Birming-  
ham, Ala.

**BORING MACHINES (Horizontal)**  
Landis Tool Co.,  
Waynesboro, Pa.

**BOSH PLATES (Copper)**  
Lawrenceville Bronze Co.,  
Bessemer Bldg., Pittsburgh, Pa.

**BOXES (Annealing)**  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Petroleum Iron Works Co.,  
Sharon, Pa.

Pollock, The Wm. B., Co.,  
Youngstown, O.  
United Engineering & Foundry Co.,  
First National Bank Bldg.,  
Pittsburgh, Pa.  
Wilson, Lee, Engineering Co.,  
1370 Blount St., Cleveland, O.

**BOXES (Case Hardening)**  
Driver-Harris Co.,  
Harrison, N. J.  
Strong, Carlisle & Hammond Co.,  
The, 1400 W. 3rd St., Cleve-  
land, O.

**BOXES (Open Hearth Charging)**  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Morgan Engineering Co., The,  
Alliance, O.  
Petroleum Iron Works Co.,  
Sharon, Pa.  
Pollock, The Wm. B., Co.,  
Youngstown, O.  
Wellman Engineering Co.,  
7000 Central Ave., Cleveland, O.

**BRAKES (Electric)**  
Clark, The, Controller Co.,  
1146 E. 152nd St., Cleveland, O.  
Electric Controller & Mfg. Co.,  
2698 E. 79th St., Cleveland, O.

**BRAKES (Press)**  
Cincinnati Shaper Co.,  
Elam and Garrard Sts.,  
Cincinnati, O.

**BRICK—(Insulating)—See  
INSULATING BRICK**

**BRICK (Refractory)—See  
REFRATORIES, CEMENT, etc.**

**BRICK (Silicon Carbide)**  
Carborundum Co., The,  
Perth Amboy, N. J.  
Norton Co., Worcester, Mass.

**BRIDGE CRANES (Ore and Coal  
Handling) See CRANES (Bridge)**

**BRIDGES, BUILDINGS,  
VIADUCTS, STACKS**  
American Bridge Co.,  
Frick Bldg., Pittsburgh, Pa.  
Belmont Iron Works,  
22nd and Washington Ave.,  
Philadelphia, Pa.  
Bethlehem Steel Co., Bethlehem, Pa.  
Columbia Steel Co.,  
San Francisco, Calif.

Ohio Structural Steel Co., The,  
Newton Falls, O.  
Petroleum Iron Works Co.,  
Sharon, Pa.  
Truscon Steel Co.,  
Youngstown, O.

**BRUSHES (Industrial)**  
Pittsburgh Plate Glass Co.,  
Rennous-Kleinle Div.,  
3221 Frederick Rd., Baltimore, Md.

**BUCKETS (Clam Shell, Dragline,  
Grab, Single Line)**  
Atlas Car & Mfg. Co., The,  
1140 Ivanhoe Rd., Cleveland, O.  
Harnischfeger Corp., 4411 W. Na-  
tional Ave., Milwaukee, Wis.  
Industrial Brownhoist Corp.,  
Bay City, Mich.  
Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.  
Wellman Engineering Co.,  
7000 Central Ave.,  
Cleveland, O.

**BUCKETS (Elevator)**  
Link-Belt Co.,  
307 No. Michigan Ave.,  
Chicago, Ill.

**BUILDINGS (Steel)—See  
BRIDGES, ETC.**

**BURNERS (Acetylene)—See  
TORCHES AND BURNERS**

**BURNERS (Automatic)**  
Kemp, C. M., Mfg. Co.,  
405 E. Oliver St., Baltimore, Md.  
Surface Combustion Co.,  
2375 Dorr St., Toledo, O.  
Wean Engineering Co.,  
Warren, O.

Wilson, Lee, Engineering Co.,  
1370 Blount St., Cleveland, O.  
**BURNERS (Fuel, Oil, Gas, Com-  
bination)**  
Best, W. N., Engineering Co.,  
75 West St., New York City.

Surface Combustion Co.,  
2375 Dorr St., Toledo, O.  
Wean Engineering Co.,  
Warren, O.  
Wilson, Lee, Engineering Co.,  
1370 Blount St., Cleveland, O.

**BUSHINGS (Bronze)**  
Cadman, A. W., Mfg. Co.,  
2815 Smallman St., Pittsburgh,  
Pa.

Rhoades, R. W., Metaline Co.,  
50-3rd St., Long Island City,  
N. Y.  
Shenango-Penn Mold Co.,  
Dover, O.

Shoop Bronze Co.,  
344-60 W. 6th Ave.,  
Tarentum, Pa.

**BUSHINGS (Oilless)**  
Rhoades, R. W., Metaline Co.,  
50-3rd St., Long Island City,  
N. Y.

**BUSINESS CARDS (Engraved)**  
Modern Card Co.,  
1153 Fullerton Ave., Chicago, Ill.

**BY-PRODUCT PLANTS**  
Koppers Construction Co.,  
1438 Koppers Bldg.,  
Pittsburgh, Pa.

**CABLE GRIPS**  
Smith Devices  
2245 No. 12th St.,  
Philadelphia, Pa.

**CADMIUM**  
The Udylyte Co., 1615 E. Grand  
Blvd., Detroit, Mich.

**CADMIUM PLATING PROCESS**  
The Udylyte Co., 1615 E. Grand  
Blvd., Detroit, Mich.

**CAR DUMPERS**  
Industrial Brownhoist Corp.,  
Bay City, Mich.

Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.

Wellman Engineering Co.,  
7000 Central Ave., Cleveland, O.

**CAR PULLERS AND SPOTTERS**  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.

**CARBIDE**  
Linde Air Products Co.,  
30 E. 42nd St., New York City.

**CARBURIZERS**  
Houghton, E. F. & Co.,  
240 W. Somerset Ave.,  
Philadelphia, Pa.

**CARS (Charging)**  
Atlas Car & Mfg. Co., The,  
1140 Ivanhoe Rd., Cleveland, O.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.

Morgan Engineering Co., The,  
Alliance, O.

Pollock, The Wm. B., Co.,  
Youngstown, O.  
Wellman Engineering Co.,  
7000 Central Ave., Cleveland, O.

**CARS (Industrial and Mining)**  
Atlas Car & Mfg. Co.,  
1140 Ivanhoe Rd., Cleveland.

Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.

Petroleum Iron Works Co.,  
Sharon, Pa.

Pollock, The Wm. B., Co.,  
Youngstown, O.

**CARS (Scale)**  
Atlas Car & Mfg. Co., The,  
1140 Ivanhoe Rd., Cleveland, O.

**CASTINGS (Acid Resisting)**  
Cadman, A. W., Mfg. Co.,  
2815 Smallman St.,  
Pittsburgh, Pa.

Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.

Farrel-Birmingham Co., Inc.,  
110 Main St., Ansonia, Conn.  
344 Vulcan St., Buffalo, N. Y.

International Nickel Co., Inc.,  
67 Wall St., New York City.

Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.

National Bearing Metals Corp.,  
928 Shore Ave., Pittsburgh, Pa.

Shenango-Penn Mold Co.,  
Dover, O.

Shoop Bronze Co., The,  
344-360 W. Sixth St.,  
Tarentum, Pa.

Wellman Bronze & Aluminum Co.,  
6017 Superior Ave., Cleveland, O.

**CASTINGS (Alloy Steel)**  
Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.

Damascus Steel Casting Co., The,  
New Brighton, Pa.

Forging & Casting Corp., The,  
Ferndale, Mich.

Industrial Steel Casting Co.,  
2237 Water Works Drive,  
Toledo, O.

Link Belt Co.,  
300 W. Pershing Rd.,  
Chicago, Ill.

Pittsburgh Rolls Corp., 41st and  
Willow Sts., Pittsburgh, Pa.

Reliance Steel Casting Co.,  
2818 Smallman St.,  
Pittsburgh, Pa.

Ryerson, Jos. T., & Son, Inc., 16th  
and Rockwell Sts., Chicago, Ill.

United Engineering & Fdry. Co.,  
First National Bank Bldg.,  
Pittsburgh, Pa.

**CASTINGS (Brass, Bronze, Cop-  
per, Aluminum)**  
Bethlehem Steel Co., Bethlehem, Pa.  
Cadman, A. W., Mfg. Co.,  
2815 Smallman St.,  
Pittsburgh, Pa.

Cramp Brass & Iron Foundries Co.,  
Paschall Sta., Philadelphia, Pa.  
Lawrenceville Bronze Co.,  
Bessemer Bldg., Pittsburgh, Pa.



(Concluded from Page 97)

been incorporated by M. H. Hess, Sapulpa, Okla., and L. D. Hess, Tulsa.

## Missouri

BEVIER, MO.—Binkley Mining Co., 230 North Michigan avenue, Chicago, will install additional machinery in a mine development program here.

FESTUS, MO.—Ozark Foundry & Mfg. Co. has been incorporated by Alfred C. Boettcher and Albert J. Sertl. Capital set at \$25,000.

MAPLEWOOD, MO.—Alco Valve Co. Inc., 2628 Big Bend boulevard, proposes erection of a plant addition. C. R. Kohlmeier, 720 Pacific avenue, Webster Groves, Mo., is architect.

ST. LOUIS—Emerson Electric Mfg. Co., 2018 Washington avenue, has leased a 2-story building at Nineteenth street and Washington avenue.

ST. LOUIS—Mississippi Valley Equipment Co., 511 Locust street, is in the market for one 50 kilovolt ampere, 25 cycle, single phase, 220-440 volt motor generator set.

## Texas

ATLANTA, TEX.—City has under consideration plans for a waterworks system, including installation of a pumping unit, fire plugs, pipe line, etc., in a \$100,000 program. F. J. Von Zuber, Atlanta & Electric building, Fort Worth, Tex., is engineer. A PWA grant has been secured.

TYLER, TEX.—City, A. H. Balch, manager, will accept bids soon for improvements in the pumping station. This is a \$15,000 PWA project. Hawley, Freese & Nichols, Capps building, Fort Worth, Tex., is the engineer.

WAELDER, TEX.—Waelder independent school district will open bids June 5 for mechanical work in the new high school building. A. S. Crozier is president of the district, which has \$10,000 available for project. Wirtz & Calhoun, Seguin, Tex., and 1305 Blodgett street, Houston, Tex., is architect.

## Wisconsin

ANTIGO, WIS.—Northwest Irrigation Co. has been incorporated to manufacture a patented pipe-coupling. The firm, incorporated by Earl Plantz, Harvey Guenther and Elza Reeve, is capitalized at \$40,000.

JANESVILLE, WIS.—Fisher Body Corp., General Motors building, Detroit, operating a large automobile body plant here has announced that it will erect a 1-story addition, 120 x 640 feet. Work is to start about July 1.

NEENAH, WIS.—Kimberly-Clark Corp., 122 East Forty-second street, New York, will spend more than \$250,000 for a 5-story addition, now under construction here at the Lake View mills, and equip it with new machinery. F. J. Sensenbrenner is president, with offices in Neenah.

RANDOM LAKE, WIS.—Village will receive bids until June 4 for water works and sewerage systems. A. E. McMahon Engineering Co., Menasha, Wis., is consulting.

SOUTH MILWAUKEE, WIS.—Line Material Co., maker of electric transmission line fixtures and supplies, is planning construction of a 2-story transformer shop, 180 x 200 feet, as part of a \$150,000 expansion program. Clarence J. Lamont is assistant general manager.

## Minnesota

NASHWAUK, MINN.—Republic Steel Corp., Republic building, Cleveland, plans installation of a new ore conveyor system here to hoist ore from lower mine levels to ground levels. Cost is estimated at \$100,000.

## Kansas

EUDORA, KANS.—Citizens voted approval of the issuance of \$55,000 worth of bonds to finance construction of a waterworks system, including construction of a tower and tank. Shockley Engineering Co., 800 Graphic Arts building, Kansas City, Mo., is engineer. (Noted STEEL, May 11).

SUMMERFIELD, KANS.—City has applied to WPA for funds to help finance construction of a waterworks system. Paulette & Wilson, 903 National Reserve Bank building, Topeka, Kans., is engineer.

## South Dakota

RAPID CITY, S. DAK.—City voted favorably for the issuance of \$90,000 worth of bonds to finance construction of a waterworks system, including the purchase of new equipment. C. Sneckenberger is manager of the project, and H. W. Zolpher is city engineer. (Noted in STEEL April 6).

## Iowa

DAVENPORT, IOWA—Tri-City Gas & Electric Co. plans an expansion program to cost \$1,900,000, including addition to power house, installation of new 28,000-kilovolt ammeter turbogenerator, erection of high pressure boiler plant to use pulverized coal, and other improvements. R. B. McDonald is president.

DES MOINES, IOWA—Wind Power Light Co., F. R. Jenkins, manager, has been organized to manufacture wind-driven electric generators.

LOGAN, IOWA—Harrison Rural Electrical Co-operative association is considering erection of 300 miles of rural

transmission lines in Logan and Harrison counties. F. H. Seabury, Pisgah, Iowa, is chairman of the committee in charge of the proposed project.

## Nebraska

OMAHA, NEBR.—United States engineer, 819 City National Bank building, will ask bids soon for 2 standard 1½ yard capacity, full diesel engine-driven crawler type dipper shovels. The shovels are estimated to cost \$25,000.

## Colorado

DENVER—City is asking bids until June 10 for a sewage disposal plant to cost approximately \$1,171,000. This PWA project is being handled through Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

## Nevada

BOULDER CITY, NEV.—Bureau of reclamation, Boulder City, is receiving bids under specifications 778-D for construction of sheet-metal work for the ventilating system for the power plant.

## Pacific Coast

LOS ANGELES—Studebaker Motor Corp., 4530 Loma Vista avenue, plans construction of an addition to its body plant. The architect for this \$1,000,000 project has not been named. C. K. Whittaker is president. (Noted STEEL May 18).

COLFAX, WASH.—Washington Water Power Co., Spokane, has under consideration plans for a new 110,000-volt power substation here. Improvements and replacements in present transmitting lines between Lind and Colfax, Wash., will be considered during a survey, recently authorized.

SEATTLE—Council has been asked by the city light department, City Light building, to grant authority for extending distribution lines at a cost of approximately \$500,000. J. D. Ross, City Light building, is engineer.

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**CASTINGS (Brass, Bronze etc.)—Con.**  
Morgan Engineering Co., The,  
Alliance, O.  
National Bearing Metals Corp.,  
928 Shore Ave., Pittsburgh, Pa.  
Shenango-Penn Mold Co.,  
Dover, O.  
Shoop Bronze Co., The,  
344-360 W. Sixth St.,  
Tarentum, Pa.  
Titan Metal Mfg. Co.,  
Bellefonte, Pa.  
Wellman Bronze & Aluminum Co.,  
6017 Superior Ave., Cleveland, O.  
**CASTINGS (Brass, Pressure)**  
Titan Metal Mfg. Co.,  
Bellefonte, Pa.  
**CASTINGS (Electric Steel)**  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Damascus Steel Casting Co., The,  
New Brighton, Pa.  
Farrel-Birmingham Co. Inc.,  
110 Main St., Ansonia, Conn.  
344 Vulcan St., Buffalo, N. Y.  
Industrial Steel Casting Co.,  
2237 Water Works Drive,  
Toledo, O.  
Link Belt Co.,  
300 W. Pershing Rd.,  
Chicago, Ill.  
West Steel Casting Co.,  
805 E. 70th St., Cleveland, O.  
**CASTINGS (Gray Iron, Alloy, or  
Semi-Steel)**  
Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Cramp Brass & Iron Foundries Co.,  
Paschall St., Philadelphia, Pa.  
Columbia Steel Co.,  
San Francisco, Calif.  
Erie Foundry Co., Erie, Pa.  
Farrel-Birmingham Co. Inc.,  
110 Main St., Ansonia, Conn.  
344 Vulcan St., Buffalo, N. Y.  
Forging & Casting Corp., The,  
Ferndale, Mich.  
Forest City Foundries Co.,  
2500 W. 27th St., Cleveland, O.  
Hyde Park Foundry & Machine Co.,  
Hyde Park, Pa.  
Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.  
Midvale Co., The, Nicetown,  
Philadelphia, Pa.  
Murray Iron Works,  
Burlington, Iowa.  
National Roll & Foundry Co., The,  
Avonmore, Pa.  
Oil Well Supply Co., Dallas, Texas  
Taylor-Wilson Mfg. Co.,  
McKees Rocks, Pa.  
**CASTINGS (Heat Resisting)**  
Driver-Harris Co., Harrison, N. J.  
Farrel-Birmingham Co. Inc.,  
110 Main St., Ansonia, Conn.  
344 Vulcan St., Buffalo, N. Y.  
**CASTINGS (Magnesium Alloys)**  
Wellman Bronze & Aluminum Co.,  
6017 Superior Ave., Cleveland, O.  
Damascus Steel Casting Co., The,  
New Brighton, Pa.  
**CASTINGS (Malleable)**  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Lake City Malleable Co.,  
5026 Lakeside Ave., Cleveland, O.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
Peoria Malleable Castings Co.,  
Peoria, Ill.  
**CASTINGS (Steel)**  
(\*Also Stainless)  
Allegheny Steel Co.,  
Brackenridge, Pa.  
Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Columbia Steel Co.,  
San Francisco, Calif.  
Damascus Steel Casting Co., The,  
New Brighton, Pa.  
Farrel-Birmingham Co. Inc.,  
110 Main St., Ansonia, Conn.  
344 Vulcan St., Buffalo, N. Y.  
Industrial Steel Casting Co.,  
2237 Water Works Drive,  
Toledo, O.  
Link Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
Mesta Machine Co., P. O. Box 1124,  
Pittsburgh, Pa.

\*Midvale Co., The, Nicetown,  
Philadelphia, Pa.  
National Roll & Foundry Co., The,  
Avonmore, Pa.  
Oil Well Supply Co., Dallas, Texas  
Pittsburgh Rolls Corp., 41st and  
Willow Sts., Pittsburgh, Pa.  
Reliance Steel Casting Co.,  
2818 Smallman St.,  
Pittsburgh, Pa.  
Standard Steel Works Co.,  
Burnham, Pa.  
Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg., Birming-  
ham, Ala.  
United Engineering & Fdry. Co.,  
First National Bank Bldg.,  
Pittsburgh, Pa.  
West Steel Casting Co.,  
805 E. 70th St., Cleveland, O.  
**CASTINGS (Worm & Gear Bronze)**  
Cadman, A. W., Mfg. Co., 2815  
Smallman St., Pittsburgh, Pa.  
**CEMENT (High Temperature)**  
Carborundum Co., The,  
Perth Amboy, N. J.  
Norton Company, Worcester, Mass.  
Strong, Carlisle & Hammond Co.,  
The, 1400 W. 3rd St., Cleveland.  
**CHAIN (Draw Bench)**  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
**CHAIN (Malleable)**  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Lake City Malleable Co.,  
5026 Lakeside Ave., Cleveland, O.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
**CHAIN (Mortising & Cutting)**  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
**CHAIN (Roller)**  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
Chain Belt Co.,  
1660 W. Bruce St.,  
Milwaukee, Wis.  
Link Belt Co.,  
307 No. Michigan Ave.,  
Chicago, Ill.  
Morse Chain Co.,  
Ithaca, N. Y.  
**CHAIN (Silent)**  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
Link-Belt Co.,  
307 No. Michigan Ave.,  
Chicago, Ill.  
Morse Chain Co.,  
Ithaca, N. Y.  
**CHAIN (Sprocket)**  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
Morse Chain Co.,  
Ithaca, N. Y.  
Peoria Malleable Castings Co.,  
Peoria, Ill.  
**CHAIN (Steel-Finished Roller)**  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
Morse Chain Co.,  
Ithaca, N. Y.  
**CHARGING MACHINES (Cupola)**  
Atlas Car & Mfg. Co., The,  
1140 Ivanhoe Rd., Cleveland, O.  
Morgan Engineering Co., The,  
Alliance, O.  
**CHARGING MACHINES (Open  
Hearth)**  
Morgan Engineering Co., The,  
Alliance, O.  
Wellman Engineering Co.,  
7000 Central Ave., Cleveland, O.  
**CHARGING MACHINES & MAN-  
IPULATORS (Auto-floor Type)**  
Brosius, Edgar E., Inc.,  
Sharpsburg, Pa.  
**CHECKS (Metal)**  
Cunningham, M. E., Co.,  
107 E. Carson St., Pittsburgh, Pa.  
**CHISEL BLANKS**  
Pittsburgh Tool, Knife & Mfg. Co.,  
7502 Thomas Blvd.,  
Pittsburgh, Pa.

**CHROME ORE**  
Samuel, Frank, & Co., Inc.,  
Harrison Bldg., Philadelphia.  
**CHROMIUM METAL**  
Electro Metallurgical Sales Corp.,  
30 E. 42nd St., New York City.  
**CHROMIUM PLATING PROCESS**  
United Chromium, Inc.,  
51 E. 42nd St., New York, N. Y.  
**CHUCKS (Automatic Closing)**  
Tomkins-Johnson Co., The,  
611 No. Mechanic St.,  
Jackson, Mich.  
**CLEANING SPECIALTIES**  
American Chemical Paint Co.,  
Ambler, Pa.  
**CLUTCHES (Magnetic)**  
Magnetic Mfg. Co., 650 So. 28th  
St., Milwaukee, Wis.  
**COAL AND COKE**  
Alan Wood Steel Co.,  
Conshohocken, Pa.  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Cleveland-Cliffs Iron Co.,  
Union Trust Bldg., Cleveland, O.  
Columbia Steel Co.,  
San Francisco, Calif.  
Hanna Furnace Corp., The,  
Ecorse, Detroit, Mich.  
Shenango Furnace Co.,  
Oliver Bldg., Pittsburgh, Pa.  
Tennessee Coal, Iron & Railroad  
Co., Brown Marx Bldg.,  
Birmingham, Ala.  
Youngstown Sheet & Tube Co.,  
Youngstown, O.  
**COAL, ORE AND ASH  
HANDLING MACHINERY**  
Atlas Car & Mfg. Co., The,  
1140 Ivanhoe Rd., Cleveland, O.  
Industrial Brownhoist Corp.,  
Bay City, Mich.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
**COKE—See COAL AND COKE**  
**COKE OVEN MACHINERY**  
Atlas Car & Mfg. Co.,  
1140 Ivanhoe Rd., Cleveland, O.  
Morgan Engineering Co., The,  
Alliance, O.  
Wellman Engineering Co.,  
7000 Central Ave., Cleveland, O.  
**COKE OVENS (By-Product)**  
Koppers Construction Co.,  
1438 Koppers Bldg., Pittsburgh.  
**COLLARS (Steel, Shaft)**  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
**COMBUSTION BULBS**  
Norton Company, Worcester, Mass.  
**COMPENSATORS (Automatic)**  
Electric Controller & Mfg. Co.,  
2698 E. 79th St., Cleveland, O.  
**COMPRESSORS (Air)**  
Allis-Chalmers Mfg. Co.,  
Milwaukee, Wis.  
Curtis Pneumatic Machinery Co.,  
1996 Kielen Ave., St. Louis, Mo.  
General Electric Co.,  
Schenectady, N. Y.  
Ingersoll-Rand Co.,  
Phillipsburg, N. J.  
Worthington Pump & Compressor  
Corp., Harrison, N. J.  
**CONCRETE REINFORCING BARS**  
—See BARS (Concrete Reinforc-  
ing)  
**CONDENSERS (Surface, Baro-  
metric, Multi-jet)**  
Allis-Chalmers Mfg. Co.,  
Milwaukee, Wis.  
Ingersoll-Rand Co.,  
Phillipsburg, N. J.  
Worthington Pump & Machinery  
Corp., Harrison, N. J.  
**CONDUITS (Electric)**  
Steel & Tubes, Inc., Dept. ST,  
224 E. 131st St., Cleveland, O.  
Youngstown Sheet & Tube Co.,  
Youngstown, O.  
**CONNECTING RODS**  
Heppenstall Co.,  
47th & Hatfield Sts.,  
Pittsburgh, Pa.  
Mesta Machine Co.,  
West Homestead, Pa.  
National Forge & Ordnance Co.,  
Irvine, Warren Co., Pa.  
Standard Steel Works Co.,  
Burnham, Pa.  
Transue & Williams Steel Forging  
Co., Alliance, O.  
**CONTRACTORS—See ENGINEERS  
AND CONTRACTORS**

**CONTROLLERS (Combustion)**  
Morgan Construction Co.,  
Worcester, Mass.  
**CONTROLLERS (Electric)**  
Allen-Bradley Co.,  
1326 So. Second St.,  
Milwaukee, Wis.  
Clark, The, Controller Co.,  
1146 E. 162nd St., Cleveland, O.  
Electric Controller & Mfg. Co.,  
2698 E. 79th St., Cleveland, O.  
General Electric Co.,  
Schenectady, N. Y.  
Square D Co.,  
710 So. Third St., Milwaukee, Wis.  
**CONTROLS (Temperature)**  
Johnston Mfg. Co.,  
2825 E. Hennepin St.,  
Minneapolis, Minn.  
**CONVEYOR BELTS (High and  
Low Temperature)**  
Cambridge Wire Cloth Co., The,  
Cambridge, Md.  
Wickwire Spencer Steel Co.,  
41 E. 42nd St., New York City.  
**CONVEYOR BELTS (Wire)**  
Cambridge Wire Cloth Co., The,  
Cambridge, Md.  
Wickwire Spencer Steel Co.,  
41 East 42nd St., New York City.  
**CONVEYORS (Apron)**  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.  
Logan Company,  
Louisville, Ky.  
Mathews Conveyor Co.,  
Ellwood City, Pa.  
**CONVEYORS (Chain)**  
Carnegie-Illinois Steel Corp.,  
Pittsburgh-Chicago.  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co., 300 W. Pershing Rd.,  
Chicago, Ill.  
Logan Company,  
Louisville, Ky.  
Mathews Conveyor Co.,  
Ellwood City, Pa.  
**CONVEYORS (Elevating)**  
Chain Belt Co., 1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co.,  
300 W. Pershing Rd., Chicago, Ill.  
Logan Company,  
Louisville, Ky.  
Mathews Conveyor Co.,  
Ellwood City, Pa.  
**CONVEYORS (Overhead Trolley)**  
Chain Belt Co.,  
1660 W. Bruce St.,  
Milwaukee, Wis.  
Link-Belt Co., 307 No. Michigan  
Ave., Chicago, Ill.  
**CONVEYORS (Wheel)**  
Link-Belt Co., 300 Pershing Rd.,  
Chicago, Ill.  
Logan Company,  
Louisville, Ky.  
**COOLERS (Copper)**  
Lawrenceville Bronze Co.,  
Bessemer Bldg., Pittsburgh, Pa.  
**COPPERING COMPOUND**  
American Chemical Paint Co.,  
Ambler, Pa.  
**COPPER (Phosphorized)**  
National Bearing Metals Corp.,  
928 Shore Ave., Pittsburgh, Pa.  
**COTTER PINS**  
Hindley Mfg. Co.,  
Valley Falls, R. I.  
Hubbard, M. D., Spring Co.,  
Pontiac, Mich.  
**COUPLINGS (Flexible)**  
Bartlett-Hayward Co.,  
Baltimore, Md.  
Boston Gear Works, Inc.,  
North Quincy, Mass.  
Clark, The, Controller Co.,  
1146 E. 152nd St., Cleveland, O.  
Electric Controller & Mfg. Co.,  
2698 E. 79th St., Cleveland, O.  
Farrel-Birmingham Co. Inc.,  
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