STEEL
FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

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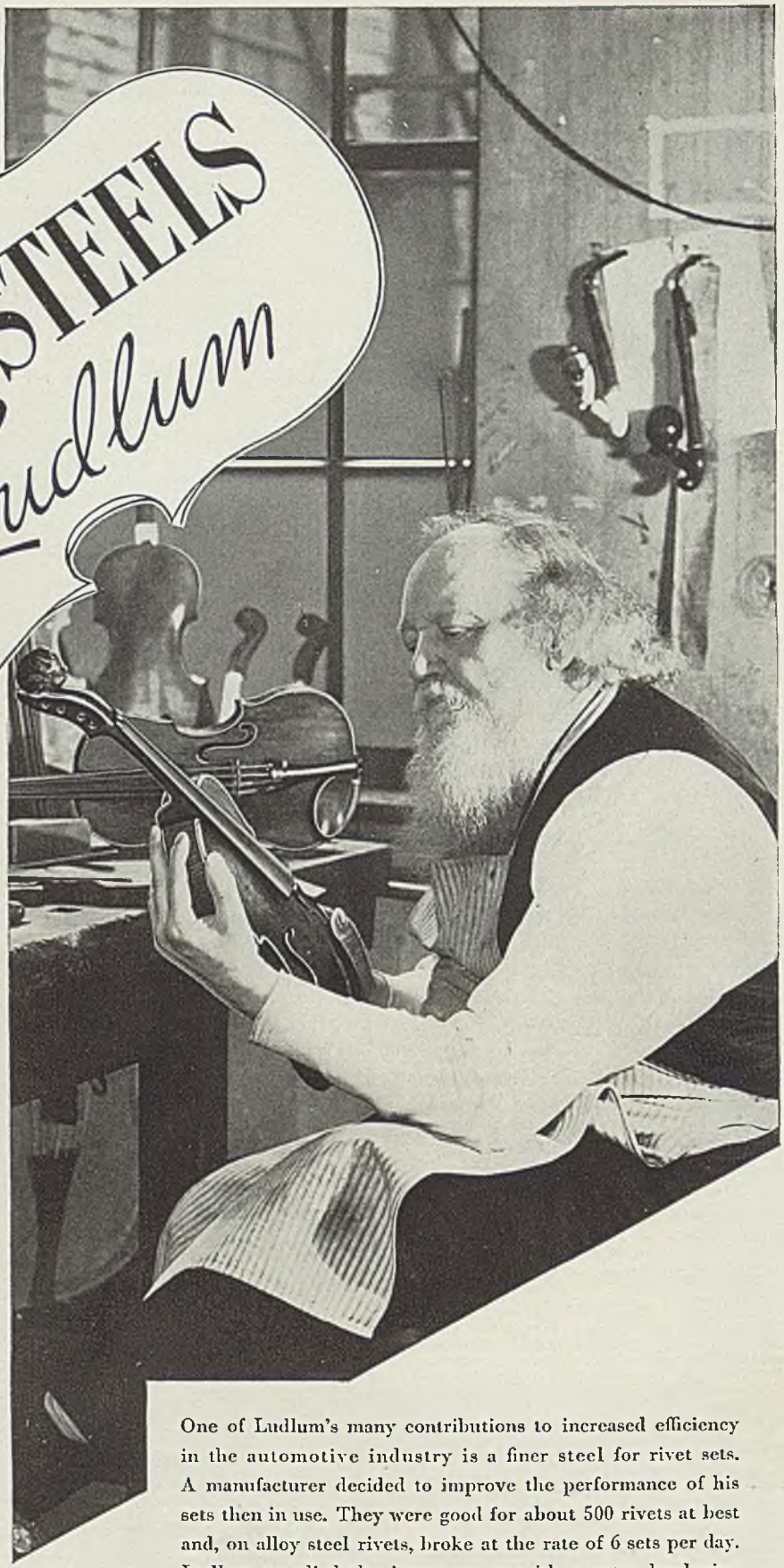
In FINE STEELS it's Ludlum



NO skilled craftsman ever selected his materials and fitted together his parts with more care than Ludlum in the preparation of its alloy steels. Like a fine violin, these steels combine high quality and exact suitability to the requirements of the user. To make sure that what a customer specifies is actually the best for his purpose, Ludlum welcomes the opportunity to consult with him on any problem. Whether the problem involves study of manufacturing processes, laboratory experiments, or extensive testing of materials, the manufacturer is assured of honest recommendations by Ludlum engineers —without charge or obligation.

The advantages of Ludlum's far-reaching service are open to *you*. Just get in touch with the Research Department, Ludlum Steel Co., 1220 B Street, Watervliet, N. Y.

One of Ludlum's many contributions to increased efficiency in the automotive industry is a finer steel for rivet sets. A manufacturer decided to improve the performance of his sets then in use. They were good for about 500 rivets at best and, on alloy steel rivets, broke at the rate of 6 sets per day. Ludlum supplied the improvement with a water hardening shock resisting steel. The new tools ran off *4500 rivets* without a hitch, and one set was used on a hand operated air gun for *6 days* with complete satisfaction.

LUDLUM

FINE STEELS SINCE 1854

TOOL · STAINLESS · CARBON · ALLOY

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

MARKET reports and news items in this issue reflect a slightly better feeling among buyers and sellers of industrial materials and products. No specific development and no outstanding orders are responsible for this change in sentiment. It has been created by signs of more active demand (p. 89) represented by small replacement orders emanating from many sources. Supporting the belief that conditions are improving is the fact that the national rate of steelworks operations (p. 27) last week showed no change from that of the previous week. This is the first interruption to declines which had been registered in every week since Sept. 11.

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This is the season when industrialists weigh prospects for the new year. Howard W. Dunbar, recently elected president of the National Machine Tool Builders' association, looks at the obsolescence of the nation's machine tools (61 per cent are 10 years old or older) and connects this condition with the fact that "more goods for more people" (p. 23) depends upon more output per man-hour. "Every industrial executive," he says, "knows that there are still thousands of places where management can greatly increase production per man-hour through better routing and planning of work, better methods of handling, better equipment and a better spirit of co-operation."

Unit Output Important

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Speaking for the durable goods industries, William J. Kelly, new president of the Machinery and Allied Products institute, presents interesting conclusions (p. 23) as to the relation of savings and investment to the American standard of living. "Money set aside for reserves can in no sense be considered lost to national purchasing power. Business savings become wages, profits for farmers, small businessmen . . . . in the same manner as income paid out immediately after it is received . . . . These savings have contributed more to consumer purchasing power than there is any prospect of them contributing under a policy of discouraging savings and legitimate speculation in new enterprises and expansion of old enterprises . . . . In the attainment of desirable social goals such as control of monopoly and equitable distribution of wealth and income, there is overwhelming evidence against an anti-saving policy and little or none for it."

Thrift Needed

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Two articles in this issue provide timely support for the arguments of Messrs. Dunbar and Kelly. One is the description (p. 44) of the new 96-inch continuous strip mill of the Jones & Laughlin Steel Corp. Plant and equipment embraced in this installation are capable of exceptionally high production per man-hour. This conforms to the idea of "more goods for more people," and the mill's contribution in this respect was made possible because the accumulated savings of many persons was available for investment in this enterprise. It is an excellent illustration of the cycle of investment, efficient production and wide distribution of product which has helped to lift the American standard of living to a high level.

Savings Built Mill

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The second article is a resume of the technical discussion at the recent annual production meeting of the Society of Automotive Engineers. Experts touched upon details of scores of operations in forging, heat treating, machining, molding, scheduling of production, etc. (p. 50) in which almost unbelievable feats in the control of accuracy, uniformity, etc., have been reduced to routine in mass production. These accomplishments have been a big factor in making automobiles so good and so cheap that 25,000,000 persons can afford to own one. Also, the accomplishments were made possible because individuals and companies had accumulated savings for investment. It is a case of the old successful cycle mentioned previously. It is a wonderful formula for social and economic progress. We should not discard it.

A Good Formula

* * *

To all a Merry Christmas!

E. L. Ohaver

Like Making Your Own Steel In Your Own Plant

Here's the answer to today's more difficult forming problems and increased machine speeds so necessary to low manufacturing costs:

Bring the blast furnace, the open hearth, the hot mills, cold mills, annealing furnaces into closer step with the various operations and finishing process in your own plant.

Example after example from the daily experiences of Inland field men and metallurgists prove the need of this closer teamwork between steelmaker and steel user.

Inland's teamwork with customers has developed to an unusual degree of practical effectiveness. It includes not only a field man or metallurgist willing to spend time in your plant . . . but also quick response from mill officials able to follow through.

Inland's well co-ordinated organization in effect becomes a department of your own production facilities—vitally interested in the success of your business.

You can use this Inland teamwork profitably.

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What 1938 Should Bring to Industry;

Two Views with Co-operative Keynote

BY H. W. DUNBAR

(As Expressed to STEEL)

■ Out of the many controversies that have surrounded the policies of the New Deal administration and its program of recovery and reform, a great many citizens have derived a broader understanding of American

Howard W. Dunbar

President, National Machine Tool Builders' association, and vice president, The Norton Co., Worcester, Mass.

industry and of the forces that control it.

It has been an expensive education, but if we emerge as a nation that better understands its own problems and has learned to think clearly about them, the depression may have proven a blessing in disguise.

In so large a country, with so many diversified industries, the industrial structure is extremely complex, and changes made in one part of it, with the best of motives, may have unfavorable repercussions in very unexpected places. . .

One fundamental fact has been proven again by recent experience. We cannot attain a widespread or substantial prosperity by deliberately adopting shorter hours of work, establishing higher rates of pay, restricting production, or destroying a surplus. The inevitable result of any of these acts or of all of them in combination, is to increase prices.

We may be able to raise wages by law, we can restrict the hours of work by law, we may even try to sweep back the ocean of rising prices with our legal broom, but we certainly cannot force people to buy things if they don't want to. So the net result of this course of action is higher prices, reduced sales, and an increase in unemployment.

If, however, we can increase the efficiency of our plants, increase output per man-hour, by the use of better methods and better equipment and by a better understanding between management and workmen, we can, without raising our prices, increase wages and shorten working hours. That this is no mere theory is borne out by the fact that the most efficient industries are alert to adopt better equipment and pay the highest wage rates today. In the less efficient industries the reverse is true.

The measure of technical efficiency of an industry—the degree of

(*Please turn to Page* 24)

"Encourage Business Savings, Rational Investments"

■ Business buying must be encouraged if payrolls are to expand and consumer purchasing power is to increase, William J. Kelly, president, Machinery and Allied Products institute, Chicago, declared as the institute released a report of a study on "Savings and American Progress."

"National policies which discourage the accumulation of capital for launching new industries and improving and expanding old ones are largely responsible for the halting pace in the revival of consumer purchasing power," said Mr. Kelly.

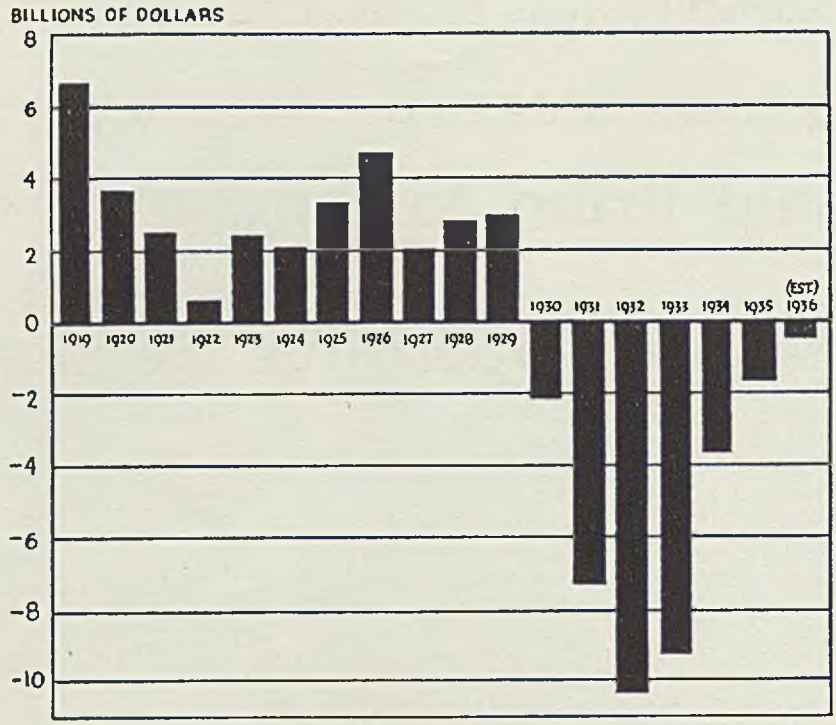
"The durable goods industries, whose principal customers are business and industrial enterprises rather than individuals, are furthest behind in recovery. They have the greatest potentialities today for providing jobs, wages and goods to improve the standard of living. Their revival is dependent upon business and industry being permitted to use its profits for the purchase of new equipment and being encouraged rather than discouraged from issuing securities to obtain funds from the public for such purchases."

Following are the conclusions reached by the institute in its study of the relation of savings and investment to the American standard of living:

1. Legislation such as the undistributed profits tax of 1936 and phases of the administration of the securities exchange acts of 1933 and 1934 have discouraged business and industrial savings and investment in

William J. Kelly

President, Machinery and Allied Products institute, and president, Arthur J. O'Leary & Son Co., Chicago



How Business Savings Cushion Depression

■ **Net savings of business enterprises, 1919 through 1936. In the 11 years 1919 to 1929 business savings totaled 34 billion dollars. This was 4.59 per cent of the national income distributed as income to individuals. During the following six years 1930 to 1935, when savings by business were impossible, 34 billion dollars plus another half billion dollars were paid out, and this use of business savings accounted for 10.07 per cent of national income received by people of the country in those years. Courtesy Machinery and Allied Products Institute**

capital equipment.

2. Increased consumer purchasing power is essential to greater business and industrial profits, as well as to a higher standard of living.

3. Money set aside for reserves can in no sense be considered lost to national purchasing power. Business savings become wages, profits for farmers, small businessmen and other producers of raw materials and handlers of finished products in the same manner as income paid out immediately after it is received.

4. Since the principal uses made of business savings have been to weather periods of unprofitable operation and to maintain and expand wealth-creating facilities, these savings have contributed more to consumer purchasing power than there is any prospect of them contributing under a policy of discouraging savings and legitimate speculation in new enterprises and expansion of old enterprises.

5. On the attainment of desirable social goals such as control of monopoly and equitable distribution of wealth and income, there is overwhelming evidence against an anti-saving policy and little or none for it.

6. The savings of business and industry had little or no relation to the inflation of stock values and the market crash of 1929.

7. Allowing for obsolescence and numerous other factors involved, there is no convincing evidence that American industry has great excessive capacity. The need for increased investment in production facilities and other capital and durable goods is greater today than ever before in history.

8. Wages of industrial workers and per capita income of farmers are highest where savings in the form of capital equipment are greatest.

9. National well-being is highest in the countries where a large percentage of the income is saved and invested in wealth-producing facilities.

10. Progress in America's future, as in its past, will depend largely upon activity in the durable goods industries—iron and steel, machinery and equipment manufacture, building construction and the like—and activity in these industries is dependent upon the flow of funds into them, from business and industrial savings and from new capital issues of private business.

The report stated that since the beginning of civilization thrift has been considered a virtue and that it is only within the last few years that national government policy in the United States has been based on the view that less should be put away for a rainy day or invested in wealth-creating enterprise.

Dunbar Article

(*Concluded from Page* 23)

mechanization, or, if you please, the overall skill of management, is in the value added to the raw material by the process of manufacture. According to "Rucker's Index," the highest standing goes to the newspaper printing, petroleum refining, chemical, automobile, electrical manufacturing and steel industries, to mention only a few. It is in these industries that we find the most marked increase in employment. It is no coincidence that these industries are among those paying the highest hourly wage.

Every industrial executive knows that there are still thousands of places where management can greatly increase production per man-hour, through the better routing and planning of the work of the shop, through better methods of handling work, through better equipment and through a better spirit of co-operation. Arbitrary increases of wages and reduction of output are still crippling many of our industries, notably in the construction field.

If organized labor once comes to the understanding that "more things for more people" depend on more output per man-hour we will finally be on the road to a substantial prosperity and can extend the benefits of our industrial civilization further down into that one-third who are in the words of the President, "ill-housed, ill-fed, and ill-clad."

Many Machines Obsolete

Fortunately for the machine tool builder, his own best interests lie directly in line with the best interests of the nation. He can provide industry with the better machine tools that will increase production per man-hour. A recent survey indicates that 61 per cent of the machine tools in use in industry are today ten years old or older. It is a matter of common knowledge that a great many machine tools installed during the World war and therefore about 20 years old, are still in use. It is obvious that we have barely begun the task of eliminating obsolete equipment and bringing American industry up to a satisfactory plane of efficiency.

The march of progress has continued through 1937, nothing spectacular and nothing startling, but a steady, sure advance in developments of better machine tools, better products from those machine tools,

and from the machines made by the machine tools. . .

Development and research work now being carried on in machine tool experimental departments will provide a continuation of developments in the inventions of the future. The final result of such progress involves more and better products of lower prices, which spells a wider market for the luxuries of yesterday which become the necessities of today.

Governmental departments show every indication of being large consumers of machine tools in 1938. The indications are that the present congress will be less of an obstacle to industry than it has been in the past few years.

Just a little encouragement for general business will bring in many equipment buyers who have been out of the market many years.

Machine Tool Exports Exceed Domestic Sales

■ Machine tool orders index declined sharply in November to 127.7, compared with 152 in October, according to the National Machine Tool Builders association. Most marked recession is in domestic orders which, at 63.3, dropped back to the summer of 1935 level.

Orders for foreign shipment are well sustained and at 64.4 is slightly above the domestic orders index.

Institute Will Limit Sessions to Members

■ Directors of the American Iron and Steel institute have decided to limit attendance at the general meeting May 26, 1938, to individual members of the institute. Decision followed criticism by members of the crowded conditions at the general meeting last May and at previous meetings. The limitation will be applied to all sessions, and members will not be permitted to invite guests to the annual banquet.

Wheeling Steel Abandons Nine Obsolete Mills

■ Wheeling Steel Co. has abandoned seven sheet and two jobbing mills at Portsmouth, O., in line with modernization plans. No announcement regarding replacements at Portsmouth had been made late last week.

Abandoned mills were obsolete and had operated at very limited capacity during the past year. Other departments at the plant are being continued.

SWOC Leaves Leading Issues Open; Industry-Wide Pacts, Its Objective

■ STEEL Workers Organizing committee in convention in Pittsburgh last week reaffirmed delegation of unrestricted power to its mine union heads, virtually scrapped proposed peace proposals with the American Federation of Labor, denounced all SWOC's enemies.

Negotiations for new contracts with iron and steel companies scheduled for February remain in the hands of the present executive officers and the national wage scale committee.

The convention adopted without dissent the wage committee's report which leaves open the question of future pay scales. Union executives, it was said, will approach companies in February uncommitted on wages, closed shop, checkoff, seniority rights or other controversial issues raised in 837 individual convention resolutions.

Leave Everything to Committee

The wage committee took no action on demands for wage increases ranging from 5 cents an hour to 20 per cent, and a $6 daily minimum. It also ignored proposals to abolish tonnage and piecework rates, establish an annual wage, abolish geographical differentials, establish 30-hour week, and gear wages to steel prices. All these were left to the discretion of union negotiators.

Chairman Philip Murray assured delegates that lodges will have individual representation on the wage committee in negotiation with their respective employers. SWOC objective is described as industry-wide agreements, through negotiations with trade associations of the companies, instead of negotiating separate contracts with each.

Pre-convention murmuring from local SWOC officers and lodges that steelworkers are capable of self-government and should occupy SWOC offices evaporated in the heat of the convention. Lewis appealed for retention of Philip Murray, Van A. Bittner and John Mitch, "loaned" by the miners' union to attempt organization of the steel industry.

Decision to make no compromise in peace parleys with the AFL was reaffirmed by unanimous vote. AFL leadership was labeled "reactionary bureaucrats."

Also excoriated were congress, the national labor relations board (only for unfavorable rulings), heads of nonunionized steel companies, Governor Davey of Ohio, Mayor Shields of Johnstown, Pa., "unfriendly" newspaper publishers, and law enforcement agencies blamed for obstructing SWOC's campaign.

STEEL WAGE, RAW MATERIAL COSTS ABOVE 1926 LEVEL

Wages and the cost of major raw materials of the steel industry have increased substantially more since 1926 than the volume of steel produced, while steel prices have increased only half as much, according to the American Iron and Steel institute.

In the first 11 months this year, an average of 1,007,000 tons of steel ingots has been produced per week, 13 per cent more than the weekly average of 893,700 tons in 1926, a year sometimes referred to as "normal."

Earnings of the wage-earning employes are estimated to have averaged $70,150,000 per month in the first 11 months of 1937, or 21 per cent above the monthly average of $57,831,000 during 1926.

Cost of raw materials also has risen sharply. A composite price of such important raw materials as iron ore, steel scrap, tin and zinc indicates that in the first 11 months of 1937 the prices which steel companies paid for these commodities was about 17 per cent higher than in 1926.

By comparison, the composite price of finished steel so far this year, 2.55 cents a pound, is only 6 per cent above the 1926 average of 2.41 cents per pound.

8068 Employes Enroll In Inspection Course

■ To acquaint employes with inspection methods of the Caterpillar Tractor Co., Peoria, Ill., the company is offering an 8-week course by the inspection division. Construction of a temporary theater in the company's showroom was necessitated when 8068 of the approximately 11,000 employes enrolled.

Lectures by plant officials present information on inspection of various parts, processes and assemblies and stress the inspection responsibilities to manufacturing.

■ Toledo Pressed Steel Co., Toledo, O., has announced distribution of a Christmas bonus of $50 to each of its 90 employes to be made Dec. 15. Those who will share have been with the company a year or more.

Girdler Urges Law, Policy Changes For Speeding Business Recovery

■ REVISION of the governmental policies that have undermined business confidence is needed to speed recovery from the current business recession, declared Tom M. Girdler, chairman, Republic Steel Corp., Cleveland, before the fortieth annual banquet of the Illinois Manufacturers association in Chicago last week. More than 2000 attended.

At present there are no basic economic causes making for a prolonged recession. On the contrary, widespread need for the building of homes and for rehabilitation programs by the utilities and the railroads are elements that make for prosperity, said Mr. Girdler.

Suggestion that industry deliberately is encouraging the recession to embarrass the national administration and that capital is staging a sitdown strike was dismissed by Mr. Girdler as "a preposterous idea" and "a product of twisted thinking."

"Not only is it not true, but I am convinced that every enlightened business man in this country stands ready to put his shoulder to the wheel, to co-operate in every possible way in any practical effort to speed up industry and make more jobs."

Wagner Act Equity Needed

Revision of the Wagner act, cessation of new experiments in government control, tax reform and balancing of the budget were cited by the steel chieftain as essentials for recovery.

"To my mind the very first step which should be taken to curb the current recession and get more men back to work again is to revise the Wagner act so that both parties to collective bargaining—employers as well as employes—will get a square deal.

"At present the law says that employes should have the right to bargain collectively without interference, restraint or coercion from the employer. That is a sound provision. But employes should also be free from coercion or intimidation from labor organizers. What we want is protection against coercion or intimidation from any source," he averred.

"Most of the labor disturbances this year were the result of a daring effort to fasten a labor dictatorship upon the workers and upon industry. The medium was to be an industrial union. The demands in the vast majority of cases did not involve grievances on the part of the workers themselves, collective bargaining or even wage increases or better conditions of work for them.

"Dictatorship and autocratic control by the state, or by some insidious power that grows up in the state is something we must resist with all our resources if we would preserve democracy.

"And I say that dictatorship may come upon us in ways that we do not expect. That is why we should resist with all our might the efforts of any man or any group, to get autocratic control over all the nation's workers.

Industrial Unions Cause Classes

"To establish one big industrial union in this country would mean a stratification of our economic life. It would make for regimentation, for a rigidity which will bring on more rigidities. This would limit the opportunity for a man to get ahead in the world, to get a better income and improve the living standards of his family. And when that comes we will have a whole negation of the great advances which have marked American industry and which have made America the leading industrial nation of the world. We must be free. We must have that very real sense of freedom which is our birthright.

"That is why the CIO has been considered a menace. Its objective of 'one big union' is no different in effect from the objectives of the long-discredited Knights of Labor and I. W. W.'s and similar movements which have appeared at various times in our history.

"The men who lead these movements, having no connection with industry, seek to attach themselves as leeches to the workers and build up political and economic power for themselves. These men are not leaders of labor; they are mis-leaders, like the Pied Piper of Hamlin."

Mr. Girdler recommended certain basic principles that should be incorporated in any labor legislation. These include:

Employes should have the free right to bargain collectively with their employers through representatives of their own choosing, without coercion from any source.

No employe should be forced to pay dues to a union.

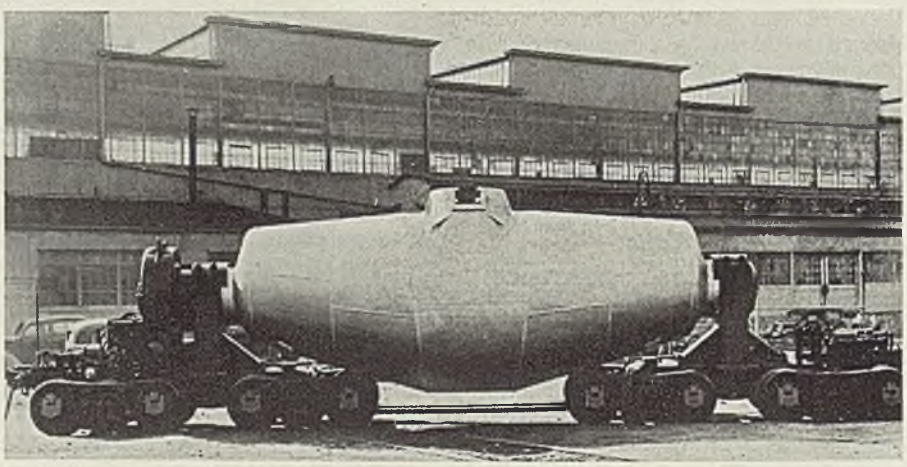
All employes should be permitted to take a vote by secret ballot on whether or not they want to strike.

Responsibility of a union in any contract or agreement should be equal to the responsibility assumed by the employer.

"The problem of industrial relations has become a major concern of management, and over the coming years the test of successful management will be increasingly its ability to hold the loyalty and co-operation of its employes. There are no trick ways to solve that problem. Signing up with the CIO and calling it a day won't do it. Mere collective bargaining of any kind will not do it alone.

"There must be the will and the earnest, constant endeavor on the

Taper Gives Greater Capacity in Hot Metal Car



■ Greater taper below the ladle axis in this self-dumping hot metal transfer car results in reduced length for a given capacity and pouring spout height. Car ladle in the closed mixer type, all welded with cast steel heads and pouring spout and a rolled steel shell. Molten metal capacity is 125 long tons and length, from center to center of spherical trunnions, is 28 feet. It was developed by Koppers Co., Bartlett Hayward division, Baltimore. Alan Wood Steel Co., Conshohocken, Pa., received the first of the new cars

part of management, from the top executive to the foreman in the plant, to understand the problems of employes—the human problems and economic problems—whether they be large or small. Who can hope to know these day-to-day problems so well as management itself, which is in day-to-day contact with the men? And once those problems are understood they must be met and dealt with squarely, honestly, patiently, fairly. If we adopt that formula and work at it, most of our labor problems will dissolve in the air."

Revision of the national labor relations act and further definition of rules of collective bargaining, said Mr. Girdler, is only one of the steps that must be taken to reverse the trend of business back toward better times. Other recommendations:

"We must make a real effort to balance the national budget and wipe out the threat of ruinous inflation. To move forward, business must, above all else, have confidence in the future. How can we have confidence when we are uncertain of the credit standing even of our own government?

Drastic Tax Revision Needed

"We need a drastic revision of our present methods of taxation. The undistributed profits tax as now set up is directly contributing to unemployment. The tax penalizes the retention of earnings in a business for the purpose of installing new machinery and equipment. This means less business and less employment in machinery and equipment industries.

"The capital gains tax should be revised. As the tax stands today, it places a heavy penalty on prosperity.

"The social security plan should be revised. As it stands today, it places an unduly heavy burden of taxation upon both employes and employers, without guaranteeing the security which it was designed to provide . . . .

"And above all else, let us have no more experiments in government control. I don't care what the purposes of these proposed new plans may be—the very fact that they propose still more of the same old medicine is proof enough that they can do this country no good, and may do it still further serious harm. The very idea of more governmental encroachments upon the freedom of doing business is in itself enough to hamper and discourage enterprise . . . .

"This is no time for recriminations. It is a time for universal cooperation to save industry and the country. That is a job that can be done if the government will strike off the shackles."

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Dec. 18	Change	Same week 1936	Same week 1935
Pittsburgh ...	19	None	80	40
Chicago	24	None	77	60.5
Eastern Pa...	29	None	50.5	35.5
Youngstown..	30	+ 6	79	56
Wheeling	24	— 6	92	78
Cleveland	36	+ 5	78	82
Buffalo	16	— 5	84	50
Birmingham..	45	None	76	56
New England	30	— 6	77	83
Cincinnati ...	54	+25	96	†
St. Louis.....	16	— 4	80	†
Detroit	52	None	95	88
Average....	27	None	79.5	52

†Not reported.

PRODUCTION

■ WITH the production rate unchanged at Pittsburgh, Chicago and in eastern Pennsylvania and adjustments balancing in other producing areas the national operating rate is unchanged at 27 per cent. This is the first time since the week of Sept. 11 that the rate has not shown a decline.

Cleveland — Up 5 points to 36 per cent, two open hearths being added.

Pittsburgh—Unchanged at 19 per cent with expectation of the same rate for this week. A lower rate during the holidays is likely, though schedules have not been outlined that far ahead.

Wheeling — Down 6 points to 24 per cent, with the same schedule expected for this week. Holiday weeks are expected to be lower.

Chicago — Unchanged at 24 per cent, the lowest rate in more than three years. Some mills expect to continue this rate through the holidays, piling semifinished steel.

New England — Off 6 points to 30 per cent, one steelworks withdrawing all open hearths early last week. This week the rate is scheduled for 28 per cent.

Buffalo — Down 5 points to 16 per cent, two open hearths being dropped. At present seven of 43 open hearths are active.

Detroit — Unchanged at 52 per cent, with 11 open hearths active.

Birmingham, Ala. — Unchanged at 45 per cent, with nine open hearths active.

Cincinnati — Up 25 points to 54 per cent on accumulation of orders. This week a lower rate will be in effect.

Central eastern seaboard — Unchanged at 29 per cent, two furnaces being added by one interest, balanced by shortened operations by others.

St. Louis — Down 4 points to 16 per cent as additional open hearths have been dropped.

Youngstown — Advanced 6 points to 30 per cent. This week the schedule probably will be 18 per cent as a result of Ohio works of Carnegie-Illinois Steel Corp. being shut down. All bessemers in the district will be idle, with 20 open hearths and seven blast furnaces active. A complete shutdown of all plants is possible for next Friday.

Per Capita Ingot Capacity Now Lowest Since 1929; Industry's Repair Costs Total $227,900,000

■ ANNUAL steel ingot capacity in the United States now is equivalent to 1204 pounds per capita, lower than at any time since 1929, the American Iron and Steel institute calculates.

Aggregate capacity of 63,067,500 gross tons in 1929 was equivalent to 1162 pounds per capita. In the first half of that year the industry actually operated at 96 per cent of capacity, indicating need for enlargement. Peak of steel capacity per capita came in 1913 when it was 1236 pounds. Since then capacity per capita has dropped 2½ per cent, while output per capita has almost doubled.

Although aggregate capacity has been increased 300,000 tons to 69,534,200 tons since the beginning of 1937, this increase has failed to keep pace with the increase in population and has resulted in a decline of four pounds per capita to the present figure.

Maintenance and repair bills of integrated steel companies in 1936 totaled $227,900,000, equivalent to more than 9 per cent of their sales volume, the institute estimates on data from companies with 88.6 per cent of total ingot capacity.

Cost of repairs and maintenance was entirely separated from the $135,000,000 reserved for depreciation and depletion of equipment and properties, yet alone amounted to 50 per cent more than the companies' net earnings. In addition to the expenditures for repairs, the steel industry spent $216,000,000 for new equipment last year.

Reflecting the higher rate of steel output in 1936, charges for repairs and maintenance were more than 40 per cent larger than the 1935 total of $161,500,000.

Supply Manufacturers, Distributors Discuss Merchandising Problems

■ NEED for continuance of close co-operation between manufacturers and distributors, and for improving merchandising practices, was emphasized at the meeting of members of the National Supply and Machinery Distributors' association and the American Supply and Machinery Manufacturers' association in Rye, N. Y., Dec. 9. This was a joint conference, for the New England and Middle Atlantic states.

Highlights of the sessions were an address on "The Miller-Tydings Act," by William P. Jeffery, counsel for the Hack Saw Manufacturers association, New York; a prediction by four representative manufacturers that prices will not decline in the near future (STEEL, Dec. 13, p. 33); complaint expressed by Charles E. Curtis, second vice president of the National association, against a growing tendency on the part of some manufacturers to upset selective distribution; and a concise presentation of effective sales assistance by Percy Ridings, general manager, Syracuse Supply Co., Syracuse, N. Y.

Plan Mill Supply Convention

On the preceding day, Dec. 8, executive committees of the two associations and representatives of the Southern Supply and Machinery Distributors' association completed tentative plans for the annual mill supply convention in Pittsburgh, May 9-11.

R. C. Duncan, R. C. Duncan Co., Minneapolis, president of the National association, who presided, in his opening remarks, said all distributors should strive for better merchandising. Next Roger Tewksbury, Oster Mfg. Co., Cleveland, president of the Manufacturers' association, emphasized the close working relationship that exists between the two organizations to attain mutual understanding. He also stressed the importance of individual action in impressing on congressmen the needs of business. Other groups have been bringing pressure to bear in support of their ideas, he said, while too many small business men have refrained.

Reports on the two associations' current activities then were presented. H. R. Rinehart, secretary-treasurer, National association, said great progress has been made toward obtaining definite statements of sales policies from manufacturers, no less than 870 of the latter now being listed with the association.

R. Kennedy Hanson, secretary-manager, Manufacturers' association, asserted that one way in which distributors can be of great assistance is by retaining individual manufacturers' suggested resale prices. He pointed out that distributors are a definite part of the manufacturers' organizations. This status merits maximum co-operation.

New Literature Release Seen

As one new step in the direction of definite service to the distributive branch of the industry, Mr. Hanson announced that within four months the association hopes to initiate a new method of distribution of manufacturers' literature. Saving over present methods of individual distribution is estimated between $250,000 and $500,000 a year.

Pointing out that as a result of a recent court decision, resale agreements may now be said to have "some validity," Mr. Jeffery indicated some of the possibilities that are open under the Miller-Tydings act, and also some of the limitations of the law.

Whereas under the old anti-trust laws, such price agreements were not permissible, today resale price agreements are legal insofar as contracts between seller and buyer affect resale terms. This privilege applies only to branded or trade-marked goods, and the latter must be in competition.

Such agreements are protected only in such states as have fair practice acts. Contracts cannot have clauses which would be construed as contributing to unfair competition. It is important to understand that resale privileges do not permit distributors to act in concert. The law sets forth individual rights.

Approximately 42 states have fair practice acts, and while they vary in detail, generally they are along the lines of the federal law. It is up to the individual manufacturer who makes a resale agreement to secure compliance.

In Mr. Jeffery's opinion, it is not necessary for a manufacturer to draw up separate individual resale contracts with each and every seller of his products, nor does he believe it necessary to draw up individual contracts for each of the states having a fair trade act.

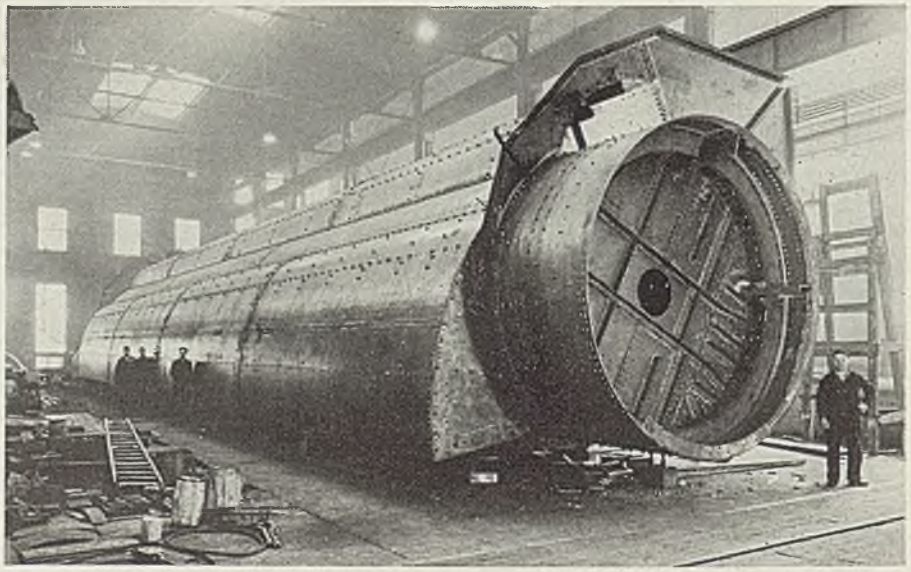
Knowledge of the existence of such resale prices as stated in a single contract may be spread by advertising and similar means. It appears that such knowledge of a manufacturer's resale prices may bind the seller the same as though he had an individual written contract with the manufacturer.

General discussion of Mr. Jeffery's address elicited the information that no manufacturer present had as yet drawn up any resale agreement under the act.

In a discussion of "The Present

(*Please turn to Page* 109)

Steel To Control Floods on Mississippi



■ Drum of this flood control gate is 109 feet long, 12 feet in diameter, and weighs 150 tons. It is one of three large roller gates recently completed by Allis-Chalmers Mfg. Co., Milwaukee, for use in United States dam No. 13 on the Mississippi river at Fulton, Ill.

FINANCIAL

AYRES SEES UTILITIES AS RECOVERY HOPE FOR 1938

■ ELECTRIC utilities may provide the stimulus for recovery in 1938, Col. Leonard P. Ayres, vice president, Cleveland Trust Co., declared last week in making his annual business forecast.

If peace were made between the utilities and the administration, the former could increase expenditures by about one billion dollars a year. This in turn would increase traffic of railroads to a point where, coupled with freight rate advances, the carriers could spend a half billion and possibly more for materials and improvements, he said.

Iron and steel industry would benefit from both while all three would stimulate the automobile industry and operate as a general stimulus to building and other industries.

DIVIDENDS DECLARED

Directors, National Steel Corp., Pittsburgh, declared a quarterly dividend of 62½ cents per share on the capital stock, and in view of the federal surtax, authorized an additional payment of 50 cents per share. This is the same dividend that was declared for the previous quarter. There are 2,167,877 outstanding shares of stock and payment will be made Dec. 24 to stockholders of record Dec. 17.

♦

American Rolling Mill Co., Middletown, O., declared the regular quarterly dividend of $1.12½ a share on the 4½ per cent preferred stock, payable Jan. 15 to record Dec. 20. No action was taken on common for payment in January.

♦

Laclede Steel Co., St. Louis, declared a dividend of $1.25 a share on capital stock, payable Dec. 27 to record Dec. 17. This makes total dividends of $2 a share for 1937, compared with 90 cents in 1936.

♦

Directors of M. A. Hanna Co., Cleveland, declared the regular quarterly dividend of 25 cents per share on common stock, and authorized an additional payment of 35 cents per share. Payment will be made Dec. 24 to record of Dec. 17. This makes a total of $1.35 per common share paid this year. To simplify the corporate structure, directors authorized liquidation into the parent company of two subsidiaries, Hanna Coal Co., a Delaware corporation, and Monongahela Securities Co.

♦

Cleveland-Cliffs Iron Co., Cleveland, will pay a dividend of $1.25 per share on the preferred steck

Harry M. Moses

and an extra of $1.50 a share against accumulations, on Dec. 24 to holders of record Dec. 18. On Oct. 5 a dividend of $1.25 per share was paid. Total disbursements this year amounted to $6.50 per share against $3 in 1936.

♦

Directors of the Valley Mould & Iron Co., Hubbard, O., have declared a dividend of $2 per share on the common stock, payable Dec. 24 to record Dec. 17. A dividend of like amount was declared earlier this year.

♦

American Brake Shoe & Foundry Co., New York, declared a dividend of $1.40 a share on common stock, payable Dec. 24 to record of Dec. 20. The company paid an interim dividend of 75 cents a share Sept. 30.

♦

Consolidated Steel Corp., Los Angeles, has declared a dividend of 50 cents against preferred stock arrearage, to be paid Dec. 18 of record Dec. 4.

♦

Granite City Steel Co., Granite City, Ill., declared a dividend of 25 cents a share on common stock, payable Dec. 23 to record Dec. 13.

♦

Continental Steel Corp., Kokomo, Ind., has declared an extra dividend of 50 cents a share on common stock, payable Dec. 22 of record Dec. 15. This brings total common dividends for 1937 to $1.50 a share.

♦

Chain Belt Co., Milwaukee, declared a dividend of 30 cents per share on common stock, payable Dec. 27 to record of Dec. 16. On Nov. 15 a dividend of 25 cents was paid on the new common following a three for one split-up.

♦

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., declared a dividend of $2 per share on preferred and common stock, payable Dec. 21, to stockholders of record Dec. 7.

H. M. Moses Frick President

■ DIRECTORS of the H. C. Frick Coke Co. and its principal coal-mining subsidiary, the United States Coal & Coke Co., last week elected Harry M. Moses president of both companies, effective Jan. 1. He will succeed his father, Thomas Moses, who recently was elected vice president in charge of raw materials of the United States Steel Corp. of Delaware. The elder Mr. Moses has been president of Frick and the corporation's coal-producing subsidiaries since 1927.

The Frick company is the first major subsidiary of the United States Steel Corp. to witness a change in top executives due to formation of the Delaware operating corporation.

Charles L. Albright, now secretary of Frick Coke, was elected vice president and secretary of Frick Coke, and also vice president of United States Coal & Coke Co.

Harry Moses is between 38 and 40 years old, showing the corporation's trend toward promoting young men. He began his business career in the coal-producing subsidiaries of the corporation, was made assistant mine foreman in 1919 and held various supervisory positions until 1933 when he was named general superintendent of Kentucky and West Virginia operations, United States Coal & Coke Co.

Mr. Albright has served coal producing subsidiaries in various capacities since 1905 and was named to his present position in 1935.

Associates Honor Bool, With Company 50 Years

■ Samuel E. Bool, partner of Pickands, Mather & Co., Cleveland, was honored by his associates last week on the fiftieth anniversary of his joining the company. Letters and telegrams from friends and business associates from many parts of the country and large baskets of flowers greeted him on arrival at his office.

The company's entire staff gathered to congratulate him. Henry G. Dalton, senior partner, who hired Mr. Bool as a clerk Dec. 15, 1887, made a brief speech.

Mr. Bool, a lover of horses, was presented a bronze figure of a mare and colt by the office force.

■ Wage earners' living costs declined 0.6 per cent in November from October, according to the National Industrial Conference board. Most significant change was a decline in rents, the first since January, 1934.

MEN OF INDUSTRY

■ WILLIAM R. SPINDLER has been appointed manager of exports, Jones & Laughlin Steel Corp., with headquarters in New York. Mr. Spindler entered the employ of Jones & Laughlin in 1919 in the order department at Pittsburgh. A year later he joined the wire sales department, remaining there until 1925 when he was assigned to the export department. Since 1928 he has been a member of the tube sales department and much of his time the past year has been devoted to the sale of tubular products for export.

William R. Spindler

♦

Clarence Wittmer has been named national service manager, Emerson Electric Mfg. Co., St. Louis. He succeeds W. A. Devlin, resigned.

♦

Max Schlossberg, of M. S. Kaplan Co., Chicago, was elected president of the Chicago chapter of the Institute of Scrap Iron and Steel Inc., at its annual meeting, Dec. 15.

♦

Byron L. Smith has been named district sales representative in Missouri for the Continental Steel Corp., Kokomo, Ind., with headquarters in Columbia, Mo.

♦

A. S. Zaytoun and H. J. Scheid have been named district sales representatives for Newport Rolling Mill Co., Newport, Ky., with offices at 916-917 Harrison building, Philadelphia.

♦

Gordon M. Jackson has become affiliated with Struthers-Wells Co., Warren, Pa., as New York district manager of the heat exchanger division, with headquarters at the company's office at 30 Rockefeller plaza, New York.

♦

Joshua L. Miner, technical director, Atlas Lumnite Cement Co., New York, subsidiary of Universal Atlas Cement Co., has been elected director and vice president of that company, succeeding the late Maj. C. R. Hulsart.

♦

H. B. Ayers and T. M. Evans have been appointed trustees of the H. K. Porter Co., Pittsburgh. The company is being reorganized. Mr. Ayers is president of the company, and Mr. Evans is associated with Gulf Oil Corp., Pittsburgh.

♦

E. T. Harris, president, Payson Mfg. Co., Chicago, was recently elected an honorary life member of the board of directors, Mississippi Valley association, in recognition of many years of active endeavor in waterway development.

♦

S. E. Graeff, assistant general superintendent at the East Works plant of American Rolling Mill Co., Middletown, O., for the past seven years, has been named assistant general manager of Richard Thomas & Co. Ltd., in England, with whom Armco is now associated. Mr. Graeff will be in charge of all sheet production for the English company, which is building a new continuous mill under an Armco license for operation about June, 1938.

S. E. Graeff

♦

Dr. E. H. Leslie has been appointed consulting chemical engineer of the technical staff of Blaw-Knox Co., Blawnox, Pa. Dr. Leslie will generally supervise the design and fabrication of operating units for the chemical process and oil refining industries.

♦

J. W. Dunbar, formerly in charge of magazine advertising for the incandescent lamp department of General Electric Co., Nela Park, Cleveland, has been appointed assistant to C. H. Lang, advertising manager of the company, with headquarters at 570 Lexington avenue, New York.

♦

George B. Fletcher has been named sales engineer in the Pittsburgh territory for the Cambridge Wire Cloth Co., Cambridge, Md. He will cover West Virginia, eastern Ohio, western Pennsylvania and western part of New York. Mr. Fletcher will maintain headquarters in the Investment building, Pittsburgh.

♦

Col. Henry L. Doherty, scientist, engineer and president of Cities Service Co., will receive the Anthony F. Lucas gold medal at the annual dinner of the American Institute of Mining and Metallurgical Engineers Feb. 16. The medal honors Colonel Doherty's "distinguished achievement in promoting efficiency and economy in the petroleum industry."

♦

Charles M. White, vice president in charge of operations, and Joseph A. Voss, director of industrial relations, Republic Steel Corp., Cleveland, have sailed to Europe for a short visit in England and the Continent, where they will study new developments in iron and steelmaking processes, labor conditions and industrial relations.

♦

Otto Wilhelmy, formerly in charge of the machinery department of Joseph T. Ryerson & Son Inc., Philadelphia, has announced the establishment of Otto Wilhelmy & Son to act as manufacturers' representatives for the sale of machine tools and allied lines, with headquarters at 1268-69 Commercial Trust building, Philadelphia.

♦

T. M. Robie, associated with Fairbanks-Morse & Co., Chicago, since 1919, serving in numerous capacities in the manufacturing and sales division, has been named manager of the diesel sales division. Since 1932

T. M. Robie

he had been in charge of diesel sales to resale manufacturers and prior to that was associated with the New York branch office, the Dallas, Tex., office and was employed at the factory on diesel engine designing.

♦

Dr. Francis C. Frary, director of research, Aluminum Co. of America, since 1918, has been honored with the Pittsburgh award for 1937 by the Pittsburgh section of the American Chemical society. The award will be given Dr. Frary for distinguished research in many fields, and formal presentation will be made at a meeting of the section in February.

♦

Christopher Leece, supervisor of the rejection room at the Newburgh plant of American Steel & Wire Co., Cleveland, since May, 1935, is retiring on pension after 53 years' service at that plant. He started as a weigher for the Cleveland Rolling Mill Co., which later was absorbed by the United States Steel Corp.'s subsidiary. He became a wire drawer in July, 1888, and in 1905 was

Christopher Leece

made a gager. He served as foreman of No. 3 and No. 4 cleaning cranes and the annealing house from 1910 to 1916.

♦

James L. Wick Jr., president, Falcon Bronze Co., has been elected a director of the industrial division, Youngstown chamber of commerce, while George C. Brainard, president, General Fireproofing Co., Frank Purnell, president, and J. C. Argetsinger, vice president, Youngstown Sheet & Tube Co., have been reelected directors of the industrial division.

♦

Dr. Robert F. Mehl, director of the metals research laboratory at Carnegie Institute of Technology, Pittsburgh, has been elected chairman, Institute of Metals, American Institute of Mining and Metallurgical Engineers. For several years, Dr. Mehl was chairman of the papers

Dr. Robert F. Mehl

and publications committee of the Institute of Metals.

♦

Robert J. Lynch, secretary to Edward R. Stettinius Jr., chairman of the finance committee, United States Steel Corp., New York, was guest of honor at a dinner given by his friends in the Steel corporation and its subsidiaries Dec. 15 in that city, in recognition of his services as president of the Welfare club and as presiding officer of the United States Steel Luncheon club.

♦

Edward A. Johnson, vice president, International Harvester Co., Chicago, has been named by the American Society of Agricultural Engineers as the 1938 recipient of the Cyrus Hall McCormick medal. The medal is awarded for "exceptional and meritorious engineering achievement in agriculture." Mr. Johnson has done extensive work in the development of a mechanical cotton picker for many years.

♦

Ben Kramer, Modell Iron & Metal Co., Detroit, has been elected president, Detroit chapter, Institute of Scrap Iron and Steel Inc. Harry Goldman, Riverside Scrap Iron & Metal Co., Detroit, has been made vice president; Milton Mahler, Morrow Steel Co., Detroit, secretary, and Abe Kasle, A. Kasle Co., Detroit, treasurer.

♦

Charles E. Wilson, associated with General Electric Co., Schenectady, N. Y., since 1917 and since 1930 vice president in charge of the appliance and merchandise department, has been elected to the newly created position of executive vice president. Philip D. Reed, who entered the employ of the company in 1926 and since 1934 general counsel of the lamp department, has been named assistant to the president.

♦

Gano Dunn, president, J. G. White Engineering Corp., New York, for 24 years, has been awarded the 1937 Thomas A. Edison medal of the American Institute of Electrical Engineers, for "distinguished contributions in extending the science and art of electrical engineering, in the development of great engineering works, and for inspiring leadership in the profession". The presentation ceremony will be held Jan. 26 in connection with the annual four-day winter convention of the institute in New York.

DIED:

■ WILLIAM E. TAYLOR, 59, vice president, American Can Co., New York, in Chicago, Dec. 9. Mr. Taylor had been associated with the American Can Co. since its organization in 1901. He also was vice president and director, Metal & Thermit Corp., New York.

♦

E. F. Zitzewitz, president, Aetna Ball Bearing Mfg. Co., Chicago, in that city, Dec. 10.

♦

Samuel Moore, 68, general superintendent of service and erection, Allis-Chalmers Mfg. Co., Milwaukee, Dec. 14.

♦

Bernard Neacy, 79, for many years an executive of the Filer & Stowell Co., Milwaukee, until his retirement in 1927, Nov. 27.

♦

Prof. Emory D. Roberts, 47, head of the civil engineering department of Marquette university, Milwaukee, and recognized as an expert on reinforcing steel construction, Nov. 24.

♦

John G. Reising, pioneer in the electrical tool business and general manager, Cincinnati Electrical Tool Co., Cincinnati, in Cincinnati, Nov. 27. He had been associated with the company nearly 30 years.

♦

Floyd E. Badger, 47, sales manager, Detroit Steel Products Co., Detroit, in that city, recently. He previously had been factory manager of Standard Parts Co., Cleveland, and a vice president of Armstrong Spring Co., Flint, Mich.

♦

Timothy Burns, who retired in the fall of 1936 as general manager of the Lackawanna works of Bethlehem Steel Co., but continued with the company in an advisory and consulting capacity, at Bethlehem, Pa., Dec. 11. Mr. Burns had been associated with Bethlehem many years, first at the Maryland plant, Sparrows Point, Md., then as superintendent of the Saucon plant, South Bethlehem, Pa., and later for 12 years as general manager of the Lackawanna plant.

Activities of Steel Users and Makers

■ KROPP Forge Co., Chicago, recently dedicated a $250,000 modern machine shop in commemoration of the 100th anniversary of the company's founding. The addition is adjacent to the present plant and will be used in finishing diesel engine parts and other railroad equipment. The company was founded in 1837 in Sweden by the grandfather of the present head, Roy A. Kropp.

♦

Foote Bros. Gear & Machine Co., Chicago, has appointed Walter A. Hoppe, 948 South Grand avenue, Los Angeles, as representative in southern California.

♦

Frazier-Simplex Inc., Washington, Pa., announces the opening of a Chicago branch office at 310 South Michigan avenue, in charge of S. B. Gamble.

♦

Portland Stove Foundry Co., Portland, Me., has introduced a new line of ranges. Three sizes are for oil and gas in combination while two are for straight oil, or coal or wood ranges.

♦

Morris Machine Works, Baldwinsville, N. Y., has appointed Lang Co., Salt Lake City, as its representative in that locality, handling sales of Morris centrifugal pumps and hydraulic dredges.

♦

Penn Metal Co., maker of expanded metal lath, rib lath, channel iron, etc., Boston, has established two new sales offices and warehouses, one in Philadelphia, in charge of L. S. Golden, and one in Chicago, with C. H. Faeller in charge.

♦

Congdon & Carpenter Co., Providence, R. I., dealers in steel sheet metals, and industrial supplies, has opened a new branch warehouse at Fall River, Mass. The warehouse is 100 x 210 feet and is modern in design and equipment.

♦

Allis-Chalmers Mfg. Co., Milwaukee, has opened an office in Syracuse, N. Y., at 943 West Genesee street, with George H. Carden as sales engineer in charge. This office will operate as a branch of the company's Buffalo district office.

♦

Edward G. Budd Mfg. Co., Philadelphia, has purchased a building containing approximately 61,000 square feet of floor space. The structure, utilized for some time by the Budd company, contains the specialty department which produces small steel stampings of a varied nature. The property included one two-story unit and another single-story unit, totaling in all about 64,800 square feet.

♦

International Business Machines Corp., New York, has introduced a new parcel post scale, specially designed to facilitate straight-line handling of mail matter. The scale has all working parts enclosed and below the platform, but with accessible adjustments.

♦

J. I. Case Co., Milwaukee, has awarded contracts for building an addition to its tractor plant at Racine, Wis., and a warehouse in Burlington, Iowa. The Racine plant addition, costing approximately $100,000, will provide 32,000 square feet of production space.

♦

Hammond Machinery Builders, Kalamazoo, Mich., has named W. J. Bach, 1400 Tenth place, Birmingham, Ala., as its representative in the sale of grinders for foundry use in Tennessee, Georgia, Alabama, Florida, Louisiana and North and South Carolina.

♦

Thomas Prosser & Son, New York, importers, engineers and dealers in steel, mechanical specialties and machinery, and American representatives since 1851 for the Krupp Steel Works of Germany, moved Dec. 11 from 15 Gold street, where they had been located 92 years, to larger and more modern offices at 120 Wall street.

♦

High Speed Hammer Co. Inc., Rochester, N. Y., has recently appointed Dowding & Doll Ltd., Greycoat street, Westminster, London, S.W.1, England, as its exclusive representative on the British Isles for its full line of high speed riveting hammers and tools. The English firm will also handle the high speed precision drilling machine, model R-53.

♦

On Dec. 15, 1936, the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., packed in one of its standard cartons, the two millionth CS meter socket. This socket was lost and a reward of $50 was offered to anyone finding it. The socket has recently been returned to the company by Jack E. Sederholm, 617 Third avenue, West, Seattle, who will receive the reward.

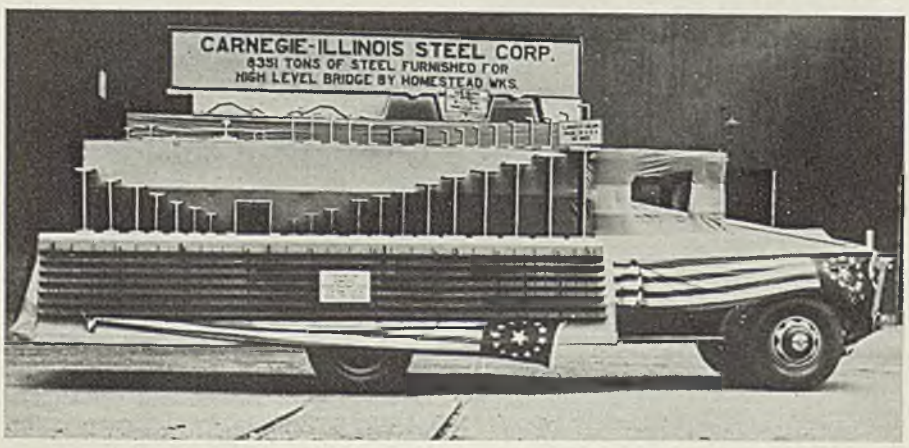
♦

Trane Co., La Crosse, Wis., manufacturer of heating, cooling and air conditioning equipment, has established a new transportation department at 852 Rush street, Chicago. The great advances in transportation air conditioning and the increasing demand for such equipment have made this step necessary. Jim Whalen, formerly of the Trane Chicago branch, and Jerry Hicke, of the LaCrosse air conditioning department, are in charge.

♦

Youngstown Steel Tank Co., Youngstown, O., has been incorporated to take over the assets and activities of the Youngstown Boiler & Tank Co., and will continue to operate the present plant at Youngstown. New officers are: President, R. E. Hunter; vice presidents, Philip W. Frieder and C. E. Stenson; secretary, G. F. Hammond; treasurer, Walter E. Meub; assistant secretary, S. J. Collins; assistant treasurer, C. E. Stenson.

Telling the Public About Steel in Bridge



■ Workers at the Homestead works, Carnegie-Illinois Steel Corp., constructed this float to tell their neighbors how they helped to build the new high-level bridge over the Monongahela river at Homestead, Pa. The float informed parade spectators at the recent opening that the bridge required 8351 tons of steel and showed many of the shapes used

South Training Steel Workers

■ TO counteract a shortage of skilled workers, Tennessee Coal, Iron & Railroad Co., United States Steel Corp. subsidiary, has launched a broad program of apprentice training at its Birmingham, Ala., plants.

An apprentice advisory committee consisting of engineers, superintendents of shops, and master mechanics from the manufacturing, mining and transportation divisions developed training schedules which include practical experience in many operating departments and classroom instruction. A four-year course has been installed totaling 8000 hours, based on a 40-hour week, for 50 weeks a year.

Shop training will require 7200 hours and related subject training 800 hours. The only exception is in the brick mason apprenticeship which covers three years, or 6000 hours. Eight nominal six-month periods, each consisting of 900 shop-work hours, with a work schedule for each trade, comprises the regular practical training.

Under the plan, foremen are responsible for proper rotation of the training experience and must report to the department superintendent the progress of each apprentice after 500 hours have been completed.

Supervised instruction supplementing the practical training includes such subjects as vocational mathematics, mechanical drawing, special trade drawing, reading of blue prints, trade techniques, elements of mechanics and strength of materials, design of construction, trade practices, economics and English.

Employes taking this course attend the centrally located apprentice training center four hours each week, receiving the same rate of pay in the classroom as in the shop. To help himself attain the status of a skilled workman, the registrant must subscribe to a correspondence school apprentice course to be paid for in monthly installments. Fifty per cent of this cost will be returned in the form of a bonus at the end of the training period.

An apprentice co-ordinator, qualified under the state department of education, division of vocational education, which pays part of his annual salary, will supervise the instruction phase of the training.

Christmas Displays Feature Stainless

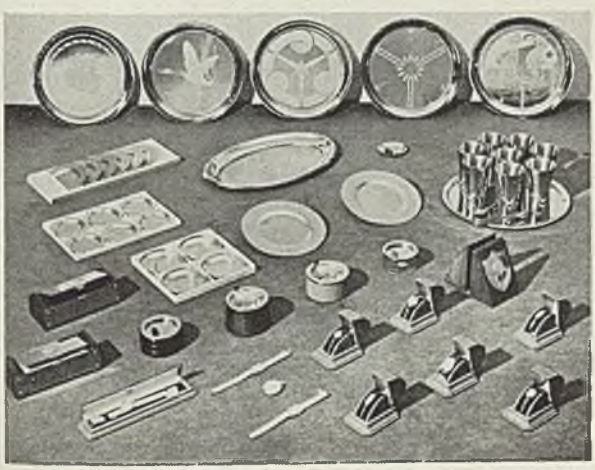
■ A RECENT Christmas display in the offices of Republic Steel Corp., Cleveland, emphasizes the unusual versatility of stainless steel in applications ranging from ash trays and wrist watches to cooking utensils and quality tableware.

All articles in the display were fabricated either wholly or in part from stainless steel, and significant is the fact that this metal finds application in such humble objects as a sink strainer right on up to etched stainless steel serving trays, dinner plates, candlesticks and giftware for even the most discriminating. Recent literature prepared by the company lists 53 uses for stainless steel in the kitchen.

These include practically every kitchen utensil known to the housewife — kettles, pans, pots, skillets, ladles, roasters, platters, and pitchers. In fact, it is readily apparent a modern kitchen can be stainless steel-equipped from wastebasket to kitchen sink and drainboard.

In the dining room, fabricators offer stainless steel flatware in modernly-designed knives, forks and spoons. Casseroles, vegetable dishes and baking dishes are available with covers and heatproof trays all of the same metal. Dinner plates and platters are enhanced by decorative etching, and, when the refreshment hour is at hand, a new stainless steel "mint julep" set is calculated to glorify the beverages.

For other than kitchen or dining use, stainless steel Christmas gift suggestions include modernistic cigarette humidors with rounded walnut end pieces, the cover and side panels being of steel. Bookends of polished walnut are offered with stainless steel shields for decoration, surmounted by etched monograms. In ash receptacles, a great variety is available, ranging from the simple but useful tray to the more complex and decorative hopper-bottomed affairs. For those not addicted to selecting gifts of a particular domestic utility, wrist and pocket watches with stainless steel cases show an attractive yet practical finish.



Typical display of stainless steel Christmas gift suggestions includes a beverage set, etched trays and plates, humidors, ash trays and watches with stainless steel cases

MEETINGS

KETTERING TO SPEAK AT ANNUAL MEETING OF S.A.E.

■ PROBLEMS of the automotive, aircraft and diesel transportation industries are principal topics scheduled for the annual meeting of the Society of Automotive Engineers at the Book-Cadillac hotel, Detroit, Jan. 10-14. C. F. Kettering, vice president in charge of research, General Motors Corp., Detroit, will address the dinner meeting on "The Diesel Engine's Place in Modern Transportation."

Production will be the subject at one session at which Joseph Geschelin, Detroit, technical editor, *Automotive Industries*, will present a paper on "An Appraisal of Current Progress in Automotive Manufacturing," and Ralph Upson will contribute another on "Use of the Self-Tapping Screws in Mechanical and Structural Assemblies."

Modern equipment of prominent automotive and machine tool manufacturers will be shown in an engineering exhibit to be held in conjunction with the meeting.

Convention Calendar

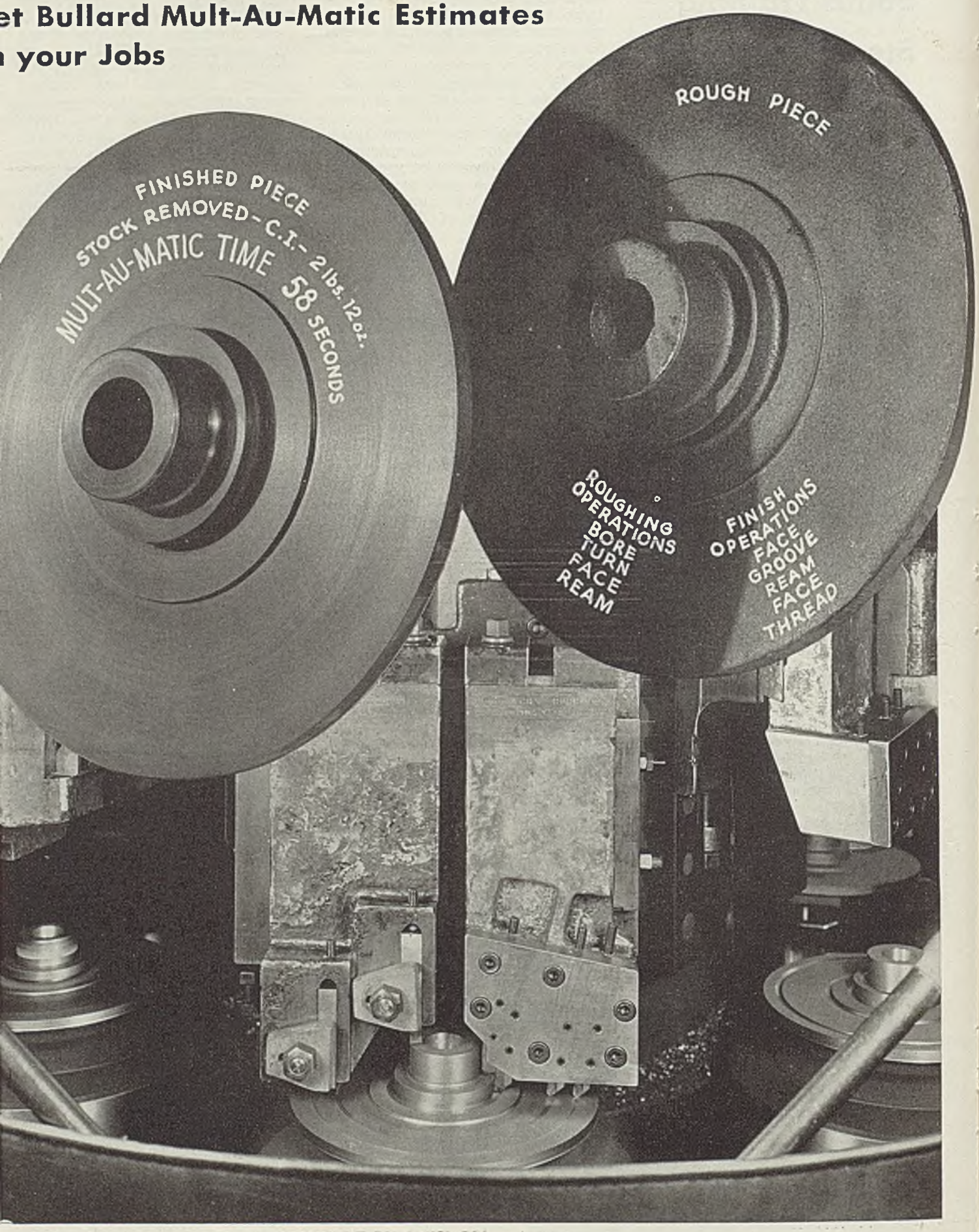
Jan. 10-14—Society of Automotive Engineers. Annual meeting at Book-Cadillac hotel, Detroit. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary and general manager.

Jan. 12-14—Institute of Scrap Iron and Steel. Tenth annual convention at Ambassador hotel, Atlantic City, N. J. Benjamin Schwartz, 11 West Forty-second street, New York, is director general.

Jan. 13-15—American Engineering council. Annual meeting at Mayflower hotel, Washington. F. M. Felker, 744 Jackson Place N. W., is executive secretary.

Jan. 17-21—American Road Builders association. Annual convention and exhibit at Public Auditorium, Cleveland. Charles M. Upham, 952 National Press building, Washington, is secretary.

f Others can Profit . . . *So can You.*
et Bullard Mult-Au-Matic Estimates
n your Jobs



THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT

MIRRORS OF MOTORDOM

DETROIT

■ BEST source of Christmas cheer (forgetting local sales offices where seasonal largesse is flowing freely) is the vast domain of Ford Motor Co., so with an eye on the date it may be fortunate to take another look at what is going on at the Rouge.

The easiest way to get the general picture is from an airplane, so let's charter one for a bird's-eye view. Peering down through the murk on the east side of the plant the observer will see workmen busy on a new battery of coke ovens; a little further north a third blast furnace soon will take shape, between the two present stacks. Directly west is the enormous 30-acre foundry to which an 8-acre addition is being attached.

The latter will be known as the alloy foundry and in it will be equipment for expanding the production of cast steel parts for use by Ford. Included will be several electric arc furnaces for holding metal at heat.

Experiment With Steel Castings

Casting methods will center around a centrifugal system such as used by Campbell, Wyant & Cannon. One part probably to be cast by this method is a small transmission cluster gear, now forged from steel. Experimental work on connecting rods, brake drum and axle housing and other parts indicates worthwhile savings.

Some changes also are being proposed in the method of casting the crankshaft, to improve its properties and to cut costs.

Bank the plane now to the west, pass over the motor building, the jobbing foundry, "B" building and the glass plant, and you approach another scene of construction activity adjacent to the spring and upset building. Here is the site of the new press shop (so called, but more likely a body building plant) contract for which was let formally last week. This structure will cover

BY A. H. ALLEN
Detroit Editor, STEEL

an area of 300 by 1200 feet, will be of one-story type, steel, concrete and brick with ornamental brick front. Major portion of the walls will be steel sash, providing ample lighting within.

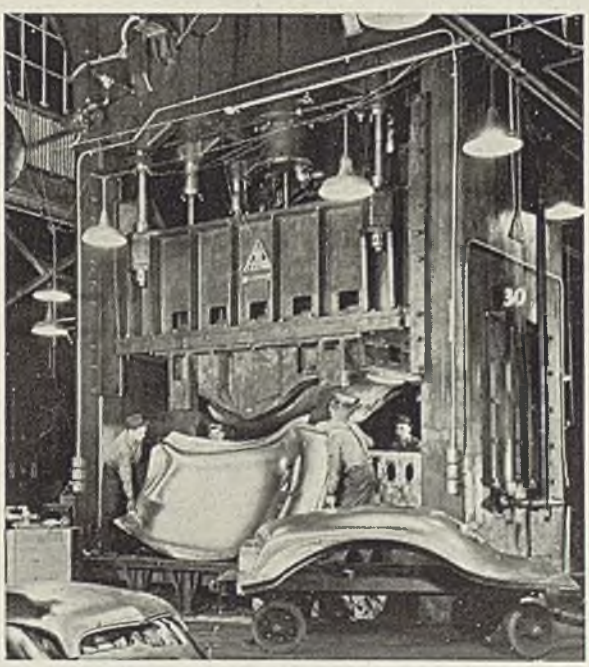
It is considered more than a possibility that when this building is finished, the spring and upset division will be moved into it, and the body lines will be installed in the present spring and upset building which is adjacent to the pressed steel building, thus making a more logical arrangement for transfer of material from pressed steel to body assembly departments.

Now bank again to the left and direct the plane over the transfer building and the rolling mill. To the west of the rolling mill is the new central tool and die shop on which work has been resumed. It will be recalled Mr. Ford ordered work on this building stopped this spring for some reason, but has decided to proceed and the new facilities for tool and die making soon will be consolidated and expanded in this new location which will be convenient to the pressed steel division.

Continuing south in our air tour brings us over the open-hearth building at the south end of which two more bays are being added to house bessemer converters (two probably) which will be used in connection with duplexing open hearth heats to save time in refining. Obviously it will not be possible to duplex all steel made at the plant, and for the present, at least, the du-

Massive Press Forms New Steel Tops for Packard

■ Steel tops appeared on Packard models for the first time this year, and for their fabrication new presses were installed in the Packard shop. Here is one of the largest, measuring over 200 inches between uprights. Operators are removing a formed top for a coupe from the massive dies. The press itself is so high that a portion of the roof of the plant had to be removed



MIRRORS OF MOTORDOM

plexing idea will be carried out on a more or less experimental basis until it is determined just what can be accomplished with it.

One final glance back to the northeast will spot the new tire plant on which finishing touches are being applied. This, in brief, is the picture at the Rouge plant itself.

Further, Ford announced last week the construction of a new assembly plant just outside St. Louis on a 374-acre site where foundation tests already are in progress. Architects have been working on details of the structure for the past three months. It will be the equal of the largest branch assembly plant of the company with capacity of 800 cars per day, employing 4000 to 4500 men. Ford likely will develop another model community in the district to house employes.

Plans were also made public last week for the projected construction of 4000 homes in various price classes in Dearborn under the aegis of Ford capital.

■ ELSEWHERE the picture is not so bright. As far as new construction goes, there has been a general cancellation or postponement of work both in process and on drafting boards. Chrysler, for example, has suspended practically all new construction work, including the new Dodge truck plant on Mound road here, which is on the verge of completion. One explanation heard for this cessation of construction is the effect of the much-berated capital gains tax. In other words, if companies are forced to dip into surpluses for new plant work, they will think twice before authorizing the expenditure, since later additions to surpluses would be taxed.

The air here is filled with recrimination against administration policies, and it appears that until some definite decision on such matters as the above tax, amendments to the Wagner act and balancing of the budget is made, industry is pretty much at a standstill. The next 60 days are regarded as a critical period in industrial history and the outcome rests squarely with Washington.

Business men in general are in as much of a quandary as to what the current "recession" is all about as the person attempting to get their views on the matter. For the long range, they refuse to be anything but optimistic and it is felt in some quarters that the dying days of December will provide a substantial foundation for improvement next year.

Automobile Production

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

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,909
Aug.	245,075	275,934	405,064
Sept.	92,728	139,820	175,620
Oct.	280,316	230,049	337,979
10 mos.	3,292,944	3,691,517	4,292,992
Nov.	408,550	405,799	*350,000
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:	
Nov. 20	85,757
Nov. 27	58,955
Dec. 4	86,848
Dec. 11	85,765
Dec. 18	82,025

	Week ending Dec. 18	Dec. 11
General Motors	30,825	31,800
Chrysler	15,850	19,600
Ford	25,115	22,615
All others	10,235	11,750

*Estimated

■ FROM an UAW official's lips comes a rather disparaging view of the future of that organization. This official has told friends that numerous UAW members are showing a disposition to consider carefully just what their union affiliation means to them as far as their own progress is concerned. They reason thus: The UAW has not brought higher wages, which would have come anyway; strikes in some cases certainly have meant the loss of Christmas bonuses this year; a membership in the UAW for the furloughed worker will not help him to get work elsewhere, since it is not the "badge of skill" which membership in a craft union might be; the UAW, because of its newness and as a result of large-scale layoffs in recent weeks, is coming into serious financial straits through which passage is going to be hazardous to say the least; the campaign to organize Ford is going nowhere fast; and much of the early "gang enthusiasm" in the UAW has burned out.

■ JOINT program of engineering and metallurgical research has been formulated by a group of aluminum cylinder head manufacturers, with the purpose of correlating progress in engine design and materials in relation to cylinder heads.

Laboratory work will be conducted on a co-operative basis by Aluminum Co. of America, Bohn Aluminum & Brass Corp., Aluminum Industries Inc., Advance Aluminum Castings Corp., National Bronze & Aluminum Foundry Co. and the Permold Co. Engineering phase of the program will be devoted to a study of the adaptation of thermal qualities of aluminum alloys to present and future engines; metallurgical phase will delve into problems connected with alloys used in cylinder heads, chemical and electrolytic reactions of cooling water in various sections of the country, advantages of various types of gasket materials and other data particularly concerned with circulating systems and cooling agents.

It is understood some startling innovations in aluminum cylinder heads have been effected in an experimental way, with practical application only a matter of months.

■ AT A DINNER signalizing formal reopening of General Motors of Canada plant at Regina, Sask., H. J. Carmichael, vice president and general manager, cited some interesting figures on GM's Canadian production over the past ten years. Output totaled 596,727 cars with a net profit to sales of 2.77 per cent, or about $20 per car, compared with production in this country for the same period by GM of 13,947,475 cars at a net profit to sales of 15.19 per cent. He said the answer to lower car prices in Canada depends solely upon expanding production there, and not upon any further manipulation of tariff structure.

■ SKID of nonferrous metal prices has led to demands from automobile builders for lower prices on parts made from these metals. Unfortunately, many parts suppliers have heavy stocks of metal taken in at higher prices and they are now faced with the difficult task of determining how to meet requests for lower prices with high-priced metal stock.

SAE 1112

An Old Friend in a New Guise

IF you have been using the common ordinary grade of this Bessemer screw stock, you will get a thrill in running the new B & L grade of SAE 1112 on your automatics.

It's like meeting an old friend who has come up in the world, and seems like a different person . . . for this "Daddy of screw stocks" has really been brought up-to-date by putting it through the modern, closely supervised methods of production in B & L mills.

Its machinability has been stepped up about 10 per cent. Its uniformity and physical properties have been materially improved. It behaves better under the tool, cutting smoothly without the chips "ganging up" on the face. The finished parts show good character, and respond satisfactorily to liquid hardening treatments.

Why not give this B & L grade of SAE 1112 a try-out on your machines? Let it prove itself for you just as it has done for scores of other satisfied customers. B & L engineers will be glad to make a test run for you to demonstrate its fabricating qualities.

What is Your Problem?

For slower speed, older type machines, B & L SAE 1112 is the ideal screw stock. For modern high-speed automatics, B & L ULTRA-CUT gives maximum production. Tell us your requirements.

Cold Drawn Bars and Shafting
●
Ultra-Cut Steel
●
Extra Wide Flats
●
Special Sections
●
Alloy Steels

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

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Automotive Equipment

Air Brakes
Anti Rattlers
Auto Bodies
Brakes
Brake Bands
Brake Rods
Brake Shoes
Carburetors
Clutch
Curtains
Generators
Grease Cups
Head Lights
Hood Hooks
Horns
Ignitions
Mufflers
Odometers
Oil Cups
Shock Absorbers
Speedometers
Stabilators
Starters
Stop Lights
Tail Lights
Timers
Tire Connections
Transmissions
Valves
Windows

Aviation

Aeronautical Equipment
Antennae Reels
Brakes
Carburetors
Clutch
Fuel Pumps
Ignitions
Oleo Strut Shock Absorbers
Parachutes
Push Rods
Starting Equipment
Super Chargers
Tail Skids
Valves
Variable Speed Propellors

Diesel Equipment

as developed and in process of development

Electrical Appliances

Brushes
Cords
Curling Irons
Curling Iron Holders
Electric Light Sockets
Electric Light Switches
Electric Light Switch Washers
Heaters
Irons
Motors
Pneumatic Tools
Pneumatic Tool Clips
Telephones
Toasters
Vacuum Cleaners
Vibrators
Washing Machines

Furniture

Cabinet Fil
Chairs
Desks
Dis y
a s
ow
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Machinery, Miscellaneou

Bread Machinery
Can Opening Machines
Drills
Drill Presses
Floor Surfacing Machines
Knitting Machinery
Moving Picture Machines
Shoe Machinery

Miscellaneous

Berths
Bicycles
Bicycle Bells
Bicycle Brakes
Bicycle Pants Guards
Bracelets
Cameras
Cars
Car Windows
Cigarette Cases
Clocks
Door Checks
Elevators

Exercisers
Fare Registers
Fire Extinguishers (Small Parts)
Fire Extinguishers
Gas Cocks
Gas Engines
Gas Heater Washers
Gas Meters
Gong Bells
Governors
Guns
Hair Curlers
Headbands
Heat Regulators
Hinges
Implements
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Levers
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Mo s
or
Precision Instruments
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Pumps
Pump Valves
Punches
Sashes
Scales
Sewing Machines
Shade Rollers
Shears
Spray Guns
Steam Pumps
Stethoscopes
Surgical Instruments
Suspenders
Taximeters
Ticket Punches
Toys
Trolleys
Trolley Catchers
Trusses
Truss Attachments
Vibrators
Window
Window Screens
Window Screen Lifts
Window Shades
Wrenches
Wrench Washers

Musical Instruments

Automatic Pianos
Bellows
Cornets
Horns
Organs
Phonographs
Pianos
Player Pianos
Saxophones
Traps

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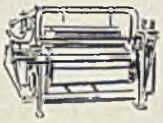
ddressing Machines
Auto Calls
Cabinets and Files
Cash Registers
Check Protectors
Comptometers
Dictaphones
Drawing Instruments
Envelope Sealers
Loose Leaf Books
Mailing Machines
Numbering Machines
Stamp Affixers
Staplers
Time Clocks
Time Locks
Time Recorders
Typewriters

Radio

Battery Clip Parts
Binding Posts
Jacks
Plugs
Springs
Spring Washers
Stampings

Textile Machinery



Bobbin Rings
Card Repeaters
Dobbies
Head Motions
Looms
Lubrication
Picker Sticks
Reversing Mechanisms
Shuttles

WINDOWS OF WASHINGTON

BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ THERE is no discounting the fact that the administration is worried about the business situation. Perhaps some of the President's advisers are more concerned about it than he is.

Certain of his friends here who try to keep him advised are of the opinion that if he would only come out with a strong statement to the effect that he would not only welcome industrial co-operation but make a sincere friendly gesture toward business, much of the present situation would be cleared. This, plus some help in the tax situation, which is certainly in the offing, might just turn the trick.

However, as Emil Ludwig says in his biography of the President, when the latter gets his mind once set on a thing he follows it through thick and thin.

The writer has been told by one who is in a position to know that the President is changing his mind toward business and industry generally, either because he wants to or feels it expedient and that this will be manifest in a definite way soon.

It is certain that the President has called in business men to discuss the situation with them. Whether he will take their advice is another thing.

Business Signs Look Up

Secretary of Commerce Roper has several times taken business men to see the President to talk over matters. The latest of these conferences was last week when Averill Harriman had a long conference with the President and Secretary Roper at the White House. While Harriman cannot be called an industrialist he certainly knows what is going on and has many close friends in industry. He is also at present chairman of the Roper business advisory council. There are strong intimations that council may be called upon to do some constructive work for the President.

A somewhat better feeling was evidenced here last week in government circles, based partly on good reports of Christmas retail trade in various parts of the country.

Last week also, Secretary of Commerce Roper stated at his press conference that information in the hands of his branch of the government shows that in a number of the major industries production is now running below the actual needs of the country.

STETTINIUS NOW MEMBER OF ROPER ADVISORY COUNCIL

E. R. Stettinius Jr., now chairman of the finance committee, United States Steel Corp., and elected to succeed M. C. Taylor April 5, as chairman of the board, has been appointed a member of the Roper business advisory council to take the place of Mr. Taylor. Mr. Stettinius has been sitting in at the monthly council meetings for some months in place of Mr. Taylor.

INCREASED COAL PRICES ATTACKED IN SENATE

Senator Walsh, Massachusetts, made an attack on the national bituminous coal commission on the floor of the upper house last week in connection with its action in raising prices on bituminous coal without public hearings.

"The increased prices," said the senator, "impose new burdens upon the railroads and industry and indeed upon almost all of the consumers of coal and will result in increasing the nation's annual fuel bill by hundreds of millions of dollars."

Senator Walsh pointed out that these increased prices were decreed by the commission without public hearings and without disclosure of the facts or the figures upon which the commission bases its orders, "and without any apparent justification, in the absence of detailed information."

Referring to the increases the senator said that "it is alleged that the prices in many cases are excessive, discriminatory and ruinous and utterly without warrant."

Senator Walsh practically advocated the abolition of the commission if it does not hold up enactment of its order. "It is perfectly apparent that the course which the commission has elected to follow in itself fixing minimum prices in secret and undertaking to put them into effect on short notice, without any advance hearing is wholly contrary to the intent and spirit of the act," said Senator Walsh, "and very possibly is contrary to the letter of the law, although that is for the courts to say."

AFL HOUR AND WAGES BILL DEFEATED IN LOWER HOUSE

Decisive defeat was meted out to the hours and wages bill sponsored by the American Federation of Labor in the lower house last week, an adverse vote of 162 to 131 being registered. This followed spirited debate. While this is regarded as in some measure supporting the administration bill, which is favored by CIO, it is true also that part of the opposition came from representatives who desire no hour and wage bill of any sort. Defeat of this bill, introduced as a substitute for the administration measure, leaves five other substitute measures to be disposed of and the President's bill to be acted on.

William Green of the A. F. of L. came out in flat opposition to the amendments of the labor committee of the house, substituting a single administrator for a five-man board, as originally set up by the house labor committee.

In a letter on the subject which Mr. Green sent to Mrs. Mary Norton, chairwoman of the house committee, he charged that the bill gave to a single man, instead of a board, life and death powers over industrial or-

ganizations, communities, labor unions and collective bargaining agencies.

MADDEN DEFENDS NLRB ACTION ON WEIRTON STORY

J. Warren Madden, chairman of the national labor relations board, has taken exception to printed stories that his board is trying to muzzle the press. This criticism came about, it will be recalled, through action by the board in connection with the editor of a small daily paper and with the editor of an industrial paper.

Mr. Madden took exception to criticisms that have been made and in defense said that "freedom of the press, which is guaranteed by the Constitution, is, broadly, the right to gather and print information and opinion without submitting to censorship in advance of printing and without being penalized for publication unless the matter published is obscene, libelous, or otherwise in violation of some valid law or regulation. And it certainly does not mean that if the publisher himself, either knowingly or unwittingly, permits the writing and printing to be used as a part of a course of conduct which is in violation of the law he may not be asked to give evidence as to what he knows about that course of conduct."

Altogether this whole situation is being taken seriously, not only in Washington, but among publishers in various parts of the country and it is a foregone conclusion that if it is ever followed through that the publishers will stand strongly behind the editors against whom accusations have been made.

JAPAN EXPANDING STEEL FACILITIES BY EVERY MEANS

Latest information in the hands of the metals and minerals division of the department of commerce states that this year Japan definitely curtailed its export trade in iron and steel products because of the unusual local demand.

At the same time, it is pointed out, output of pig iron and steel ingots was expanded with an equivalent advance in rolling mill production. Imports have likewise been following an upward trend, the United States benefiting to an important extent.

It is pointed out that in Japan proper iron ore deposits are quite poor. Even when combined with ore from deposits in Chosen, it is not possible to produce quantities sufficient to supply local blast furnaces. Consequently it has been necessary to turn to outside sources for iron ore.

The information indicates also that Japanese iron and steel producing units are dependent upon scrap iron and steel to an important degree. Japan has now a joint association of six companies for the cooperative purchase of iron and steel scrap. During the first seven months of this year scrap imports into Japan were approximately double the amount received in the corresponding period of 1936.

TRADE WITH ORIENT IN OCTOBER SHOWS GAIN

Scretary of Commerce Roper at a press conference last week stated that preliminary statistics of our trade with China and Japan in October reveal a substantial net gain in the value of domestic exports over September and a slight net gain in the value of imports for consumption.

Export commodities showing the greatest increases in quantity and value in our trade with Hong Kong during October included tin plate, unfabricated iron and steel plates. Tin plate exports increased $509,000 over September and unfabricated iron and steel plate $88,000.

Shipments to Japan of steel ingots, slabs, blooms etc., each increased about one million dollars over September figures.

During October exports of unfabricated iron and steel plates increased $268,000 over September exports.

ICC PUSHES FREIGHT RATE HEARINGS TO EARLY END

Two weeks hearings in connection with the request for a 15 per cent freight rate increase of the railroad carriers, were concluded last week by the interstate commerce commission.

The next hearings will be opened in Atlanta, Ga., Jan. 6. Following that, hearings will be held in various parts of the country.

The commission has announced that final hearings will begin in Washington in this case Jan. 17, following which oral arguments will be held. This is an effort to speed up a decision in the case as much as possible.

There has been considerable interest in this case in view of the fact that at a recent press conference Mr. Roosevelt said that he hoped for a quick decision to help the roads out of their financial difficulties. That same afternoon the commission refused to grant the petition of the roads that an immediate 15 per cent increase be granted and that the case go ahead.

NORWAY BUYS MORE STEEL

Norway in the first ten months of this year offered a growing market for iron and steel products of American manufacturers, according to a report from the American consul general at Oslo.

Shipments from the United States to that country during those months amounted to 7758 gross tons in comparison with 1218 tons in the corresponding period of last year. Various reports received indicate an active desire on the part of Norwegian importers to depend increasingly upon the United States for such materials, particularly, in view of the high demand which has prevailed in the local markets of the various European producers for some months.

AMERICAN MACHINERY LEADS IN WORLD EXPORT RACE

L. M. Lind, chief of the machinery division of the department of commerce, is calling attention to the fact that machinery exporters have gained heavily during the past three years and that the United States is now in the lead.

"Five years ago England exported a little more than we did, and Germany twice as much", said Mr. Lind. "By a year ago last March England was far behind, and we exceeded Germany's foreign sales of machinery for the first time in years. This October our shipments were about $8,000,000 in excess of Germany's $25,000,000."

He says that high quality and energetic selling did part of it. He points out that "the preoccupation of our competitors with other urgent matters tended to make victory easier than seemed possible five years ago. These countries temporarily even became some of our best customers." He is suggesting that American manufacturers consolidate their position for the future.

PIPE STANDARD REAFFIRMED

The division of simplified practice of the bureau of standards has announced that the simplified practice recommendations for eaves trough, conductor pipe, conductor elbows and fittings have again been reaffirmed without change by the standing committee of the industry.

This simplified program, which is concerned with sizes and gages of metal eaves trough and conductor pipe, became effective July 1, 1925, and has been reaffirmed without change nine times since.

AUSTRALIA OPENS IMPORTS

The Australian minister of trade and customs has announced that import license restrictions have been removed on a number of items. Included are plain iron and steel plates and sheets; iron and steel wire of No. 15 or finer imperial standard gage; and tinned iron and steel plates and sheets.

Self-Initiated Drive for Recovery Will Enhance Industry's Prestige

DURING the past few weeks more than a score of industrial leaders have delivered addresses pertaining to the problems of recovery. They have spoken to trade association audiences, to chambers of commerce and to the public at large. Some of the speeches have received wide distribution through the daily press and the radio networks.

It is gratifying to note that the speakers have couched their messages in language of moderation. They have managed to be convincing as to the sincerity of their remarks. Also they have tried, and in a large measure have succeeded, to convey an attitude of co-operation and helpfulness in joining with others in a common effort to lead the nation back to the road to recovery via the shortest detour.

Public Is Looking to Industry for Constructive Action in Solving Problems of Present Recession

We believe the utterances of these industrialists are timely. The present recession already has brought great hardship to many people. Each day that it continues will wear heavily upon the patience of those who suffer from loss of work or reduction in income.

Unless industry displays an unmistakable interest in helping to solve the present problems, and unless it contributes something more tangible to their solution than carping criticism, the patient public will conclude that industry is wilfully obstructing recovery. The anti-business element among politicians and bureaucrats would like nothing better than to sway public opinion to this conclusion.

The consequences of such an eventuality would be serious. Further discrediting of industry by the public at this time undoubtedly would lead to demands by certain powerful minorities for even more drastic regulation of business. Nationalization of certain industries might easily be encouraged.

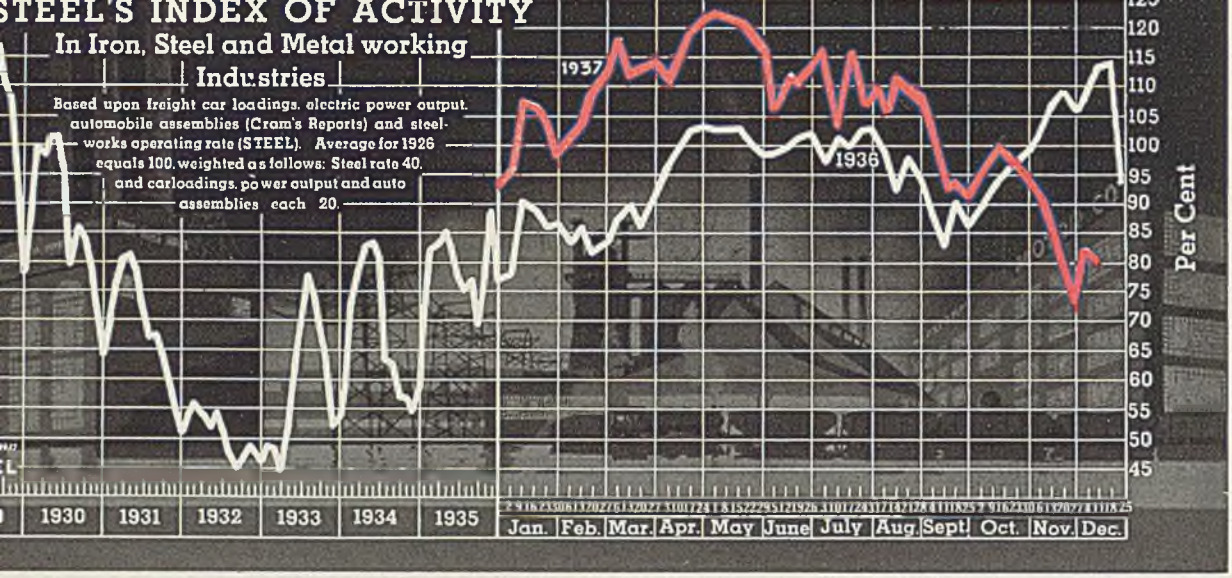
Display of Initiative by Industry Will Assist in Hastening Action by Congress on Remedial Legislation

Therefore industrial statesmanship is well advised in taking the initiative for promoting recovery. It should exhaust every resource in marshalling forces to break the present stalemate.

Intensive activity along this line will do more to induce favorable action in congress on needed remedial legislation than any other method available to industry.

Nothing succeeds like success. If industry can inaugurate its own plan for recovery and can carry it along until signs of progress begin to appear, millions of middle-of-the-roaders will jump onto the band wagon.

The spot light is on industry!



The

STEEL'S index of activity declined 0.9 points to 80.6 in the week ending Dec. 11:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Oct. 2	96.0	89.0	73.3	54.7	67.4	47.7	62.4	81.0
Oct. 9	99.0	83.4	74.9	56 4	66.0	48.4	61.5	79.4
Oct. 16	101.8	95.9	77.4	58.2	60.9	48.7	57.9	77.5
Oct. 23	97.5	97.1	82.4	56.3	58.0	48.7	58.2	78.5
Oct. 30	95.7	99.1	86.4	55.0	52.3	48.4	59.2	72.5
Nov. 6	82.4	102.1	88.4	54.9	50.7	48.5	56.0	71.5
Nov. 13	86.5	107.9	88.8	55.2	52.6	47.7	55.5	73.0
Nov. 20	84.9	109.9	90.9	54.4	55.4	49.2	54.8	71.0
Nov. 27	72.7	105.2	86.0	51.9	49.7	47.5	54.4	66.9
Dec. 4	81.5†	108.4	91.7	56.8	52.6	45.3	52.9	69.2
Dec. 11	80.6*	113.9	91.8	60.6	56.0	46.6	53.1	68.2

*Preliminary. †Revised.

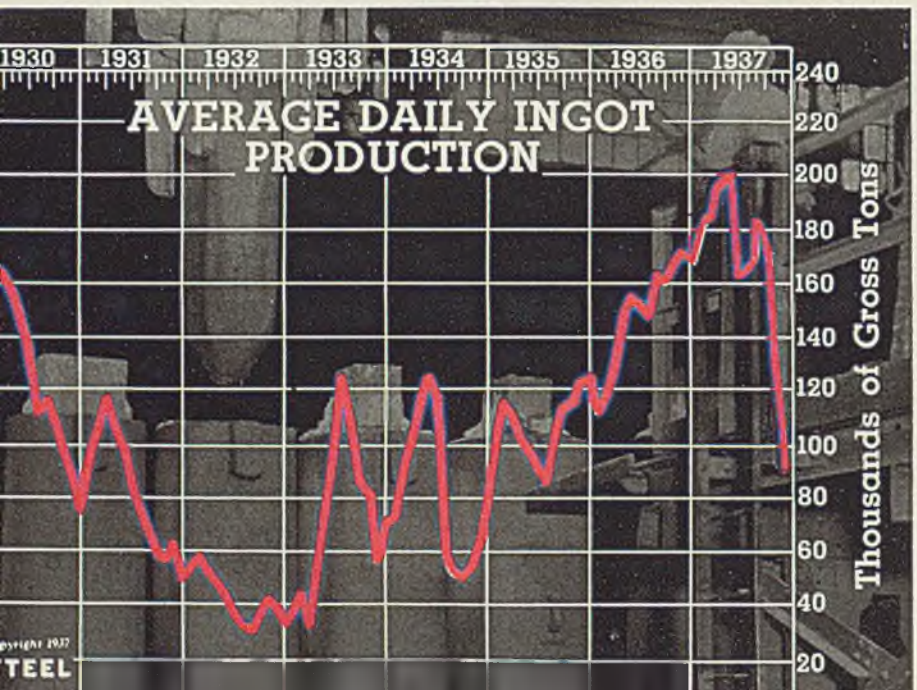
Fluctuations in Activity Are Less Pronounced

INDUSTRIAL activity has settled down to a slow, but steadier pace than has been manifested in many weeks. Fluctuations in the principal barometers were of a minor character in the week ending Dec. 11. As a result, STEEL's index shows only moderate change from the preceding week. It stands at 80.6, as compared with 81.5 in the week ending Dec. 4.

The slight recession is due largely to a further decline in the rate of steelworks activity. At 27 per cent of capacity, steelmaking was at the lowest level recorded since the week ending Nov. 3, 1934.

Automobile output was off only slightly from that of the preceding week. Revenue freight car loadings were expected to equal or possibly exceed those of the week ending Dec. 4. A modest upturn in electric power output carried the weekly figure up to the highest point since the week ending Nov. 6. However, power output and car loadings are substantially below the levels for the corresponding week of 1936.

Activity, as measured by STEEL's index now is about 35 per cent below the peak of last May. Then the index touched 123.9; today it stands at 80.6.

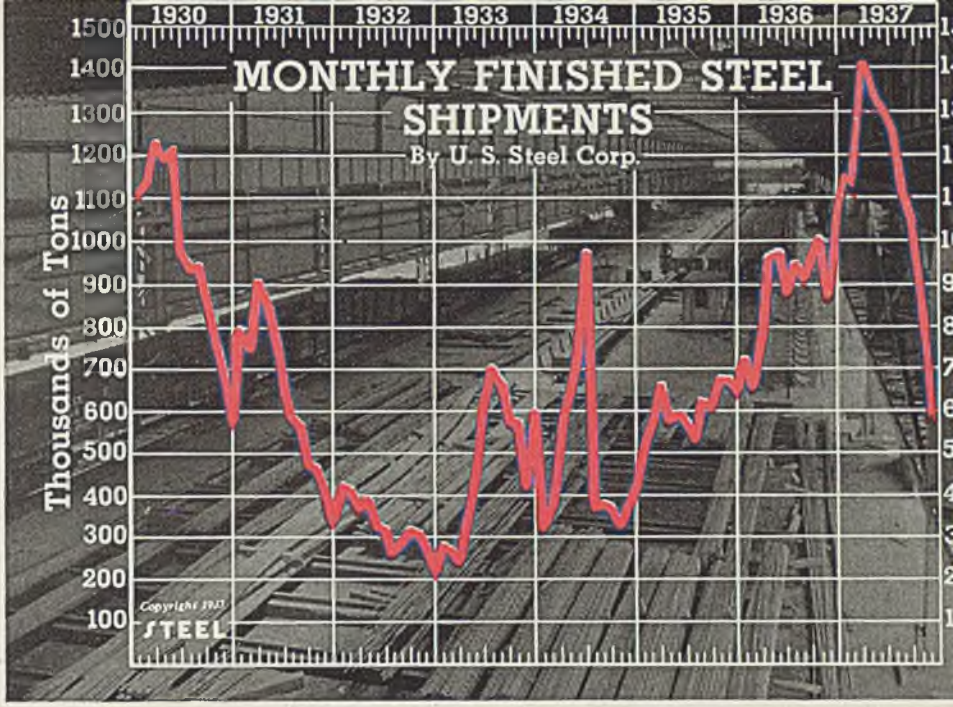


	Gross Tons		
	1937	1936	1935
Jan.	182,181	112,813	106,302
Feb.	184,361	118,577	115,595
March	193,209	128,576	110,204
April	195,072	151,625	101,562
May	198,213	155,625	97,543
June	160,914	153,263	90,347
July	168,763	150,874	87,224
Aug.	186,992	161,351	1079,97
Sept.	172,075	160,043	113,000
Oct.	130,488	168,333	116,398
Nov.	86,151	173,496	121,170
Dec.	.....	170,448	122,936

BUSINESS TREND

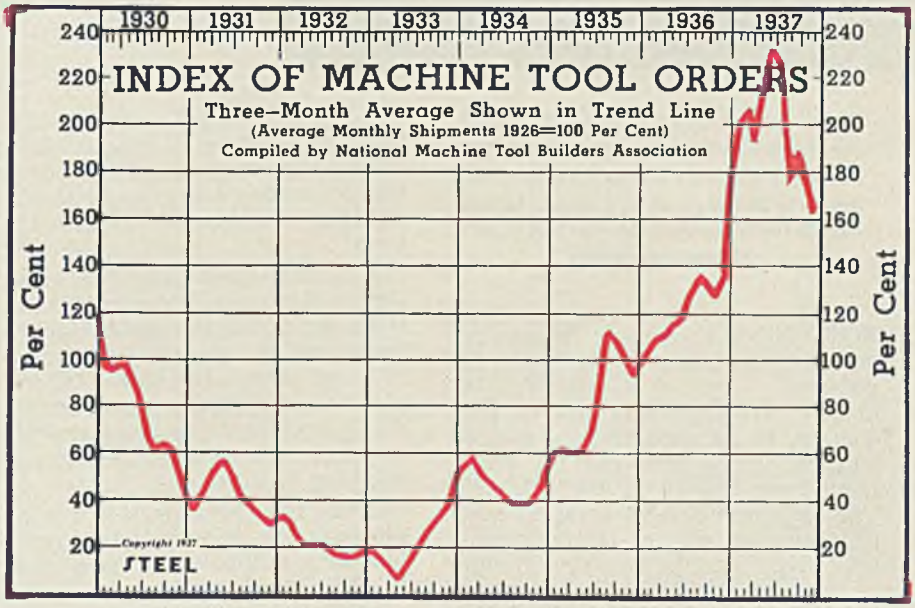
Steel Shipments Decline Sharply in November

	Gross Tons		
	1937	1936	1935
Jan.	1,149,918	721,414	534,055
Feb.	1,133,724	676,315	583,137
March	1,414,399	783,552	668,056
April	1,343,644	979,907	591,728
May	1,304,039	984,087	598,915
June	1,268,550	886,065	578,108
July	1,186,752	950,851	547,794
Aug.	1,107,858	923,703	624,497
Sept.	1,047,962	961,803	614,933
Oct.	792,310	1,007,417	686,741
Nov.	587,241	882,643	681,820
Dec.	.....	1,067,365	661,365



Machine Tool Index Down 17.3 Per Cent in November

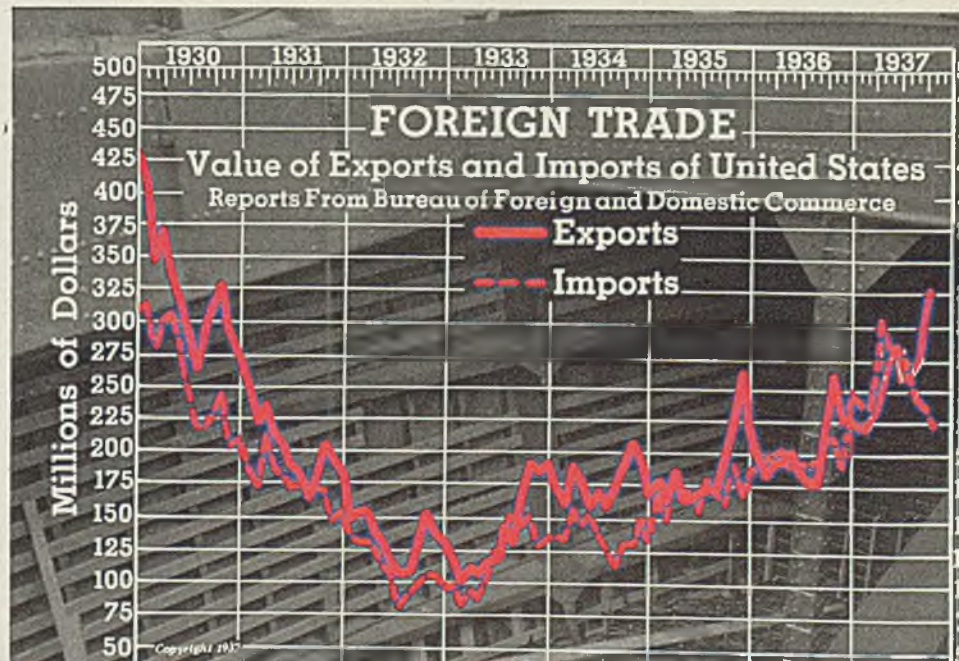
	1937	1936	1935	1934
Jan.	201.7	102.6	61.3	56.5
Feb.	207.7	107.1	61.5	58.2
March	192.4	109.4	60.3	50.9
April	219.8	114.4	60.3	48.5
May	234.2	116.6	67.1	46.8
June	227.6	124.5	76.7	42.6
July	190.5	132.6	94.7	38.6
Aug.	180.9	135.5	112.2	37.1
Sept.	187.2	132.0	108.5	37.4
Oct.	180.8	127.5	102.9	40.5
Nov.	163.5	134.0	93.8	44.2
Dec.	.....	180.4	89.9	54.1



Favorable Trade Balance Increases Through October

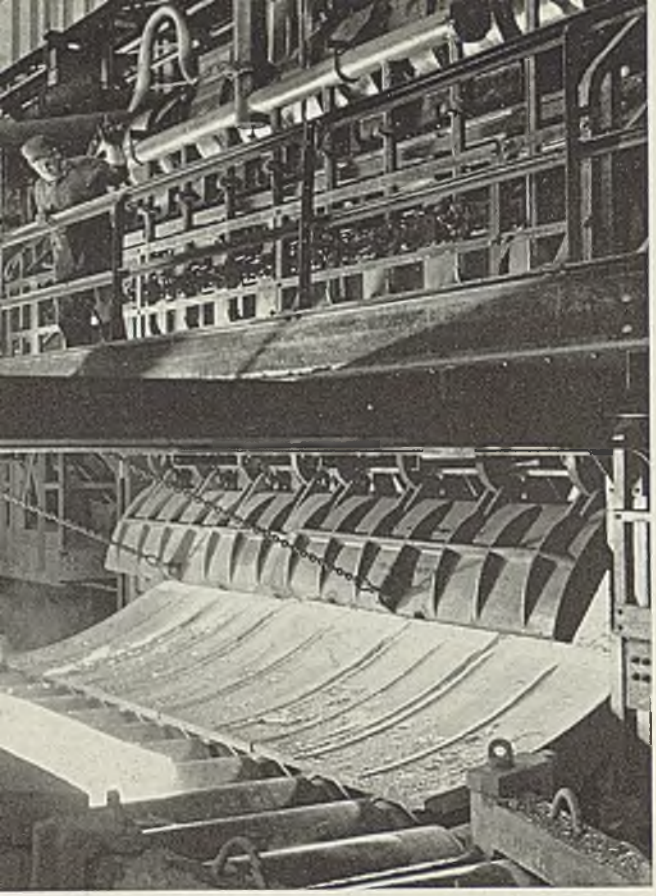
Dollars (000 omitted)

	1937		1936	
	Exports	Imports	Exports	Imports
Jan.	221,550	240,396	198,654	187,482
Feb.	232,504	277,805	182,024	192,774
March	256,390	306,699	194,790	198,686
April	269,171	287,252	192,795	202,779
May	288,924	285,038	201,042	191,110
June	265,341	285,925	185,188	192,233
July	267,185	265,349	178,324	193,409
Aug.	277,668	245,707	178,249	195,016
Sept.	296,713	233,362	220,539	215,701
Oct.	333,136	224,391	264,708	212,001
Nov.	.....	.....	225,766	196,423
Dec.	.....	.....	229,739	244,321



Continuous

Now in Full



White-hot steel slab, heated to the correct rolling temperature of 2250 degrees Fahr., slides from the heating furnace onto a roller table which will convey it to the first rolling operation

■ KEEPING pace with the requirements of the nation's steel using industries, Jones & Laughlin Steel Corp,. Pittsburgh now has in production, in all departments, the 96-inch continuous strip mill for which ground was broken on April 27, 1936. The mill occupies 23 acres of land on the north side of the Monongahela river, and is the newest unit of the company's Pittsburgh works. Manufacturing facilities will be extended to supply all major products in the range of carbon steel commodities.

The new strip mill has a monthly capacity of 60,000 gross tons, and is supplying a complete line of the various grades and finishes of hot and cold rolled sheets and wide strip to the trade. It is being operated to produce also light plates of superior quality and finish for sale to the trade, lightweight hot-rolled strip coils for the tin plate department and wide skelp for the Aliquippa works tube mills, as well as for sale.

The entire plant is of the latest design and incorporates every approved feature for the production of highest quality flat rolled products. It consists of two electrically-operated divisions, as follows:

1. A hot rolling division consisting of a 4-high roll-type hot mill train with a full complement of heating furnaces, tables, shears, trimmers, levelers, pliers, coilers and other necessary equipment for finishing and shipping hot rolled material.

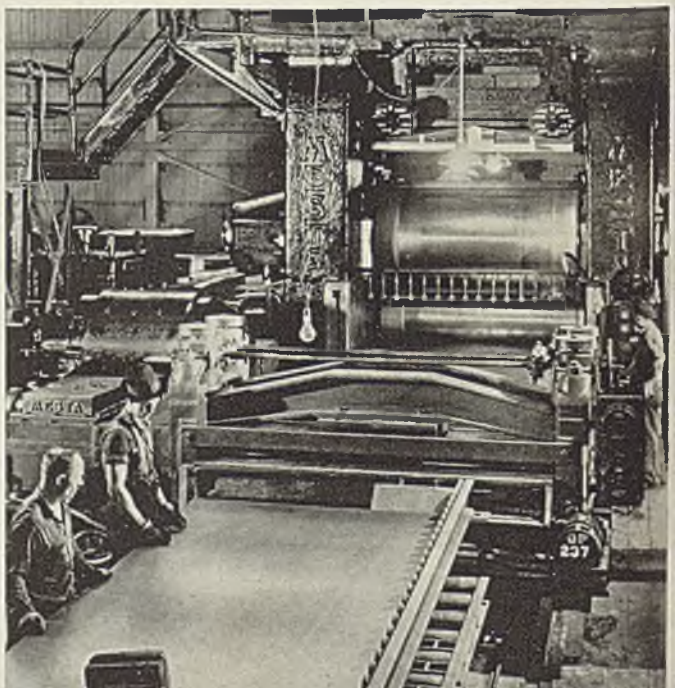
2. A cold rolling division consisting of 4-high roll-type cold rolling mills set in tandem and 4-high roll-type and 2-high roll-type temper mills set singly, and with a full complement of finishing equipment, including picklers, heat-treating furnaces, shears, trimmers, levelers and shipping facilities.

Slabs for the new mill are supplied by the new 44-inch reversing blooming mill recently completed at the Pittsburgh works.

Electrical energy necessary for the operation of the mill is controlled through equipment in the motor room. This parallels the hot mill and houses 12 motors developing a total of 39,000 horsepower, which drive the scale breakers, roughing and finishing stands of the hot mill. In this layout is included also the electrical converting and generating equipment necessary for the operation of cranes, all other motors, lighting and general electrical service. As a protection against flood damage, the entire room is sealed with welded steel plates to a height of 12 feet above the floor level.

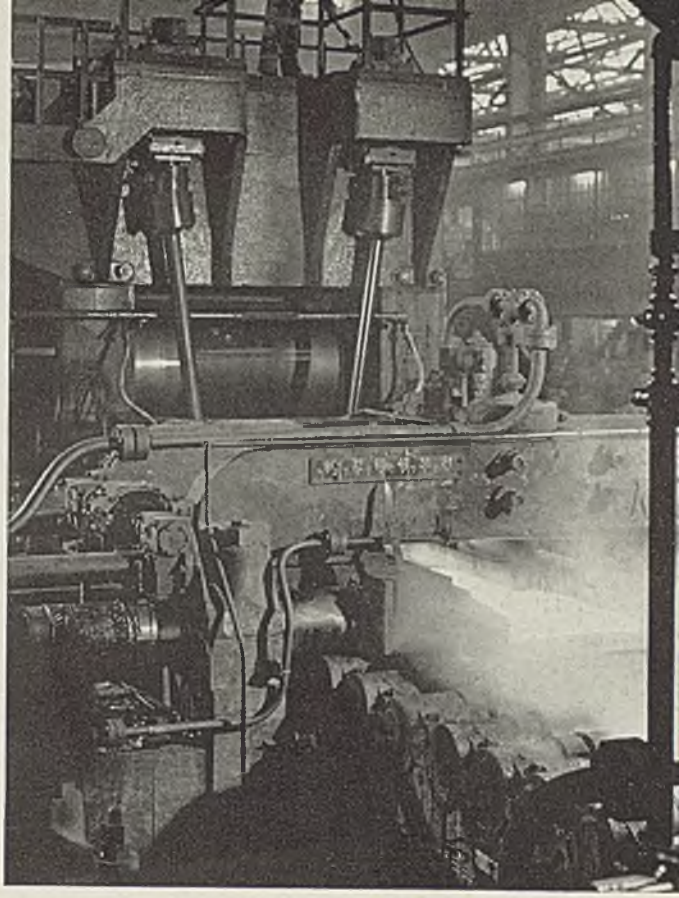
Slabs of steel are transported in cars from the 44-inch blooming mill, across the Monongahela river, on an especially constructed bridge, to the strip mill slab yard, which is situated in the rear of the hot mill and adjacent to the heating furnaces. This building provides ample space for storing and handling thousands of tons of slabs.

The slabs in stock have been rolled to specifications of individual cus-



Sheets are passed through the roller-leveler to flatten any slight variations and eliminate any bends that may have resulted from handling

96-Inch Mill Operation



After the spreading to width operation, and before the slab is given a second reduction, it is leveled and squared under tremendous hydraulic pressure in the slab squeezer

tomers and the grade, length, thickness and width, based on the quality and dimensions of the finished product, are plainly marked on each. Here all slabs are carfully inspected and prepared for charging into the triple-fired heating furnaces.

Three gravity discharge furnaces of most advanced design are used to reheat the slabs to correct rolling temperature. Each is 18 feet wide by 87 feet long and contains two sets of water-cooled skids running its entire length. When slabs are less than 9 feet in length, they are charged in two rows in each furnace. Slabs more than 9 feet in length, necessary for rolling extra long strip, are charged in a single row. These furnaces are triple-fired, having burners at the top, bottom, and along the sides. They will heat to rolling temperature 150 tons of cold steel per hour.

Slabs to be heated are deposited by crane in the magazine charger, which is situated to the left of the charging doors of the three furnaces. They are fed from the magazine charger to the charging table and then pushed into the proper furnace by means of electrically-controlled machines on signal from the head roller of the hot mill.

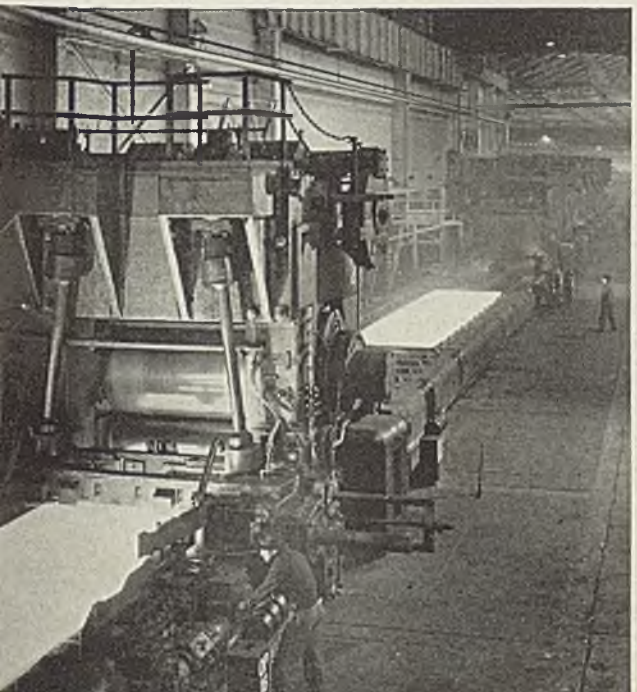
As a cold slab is charged, all slabs in the furnace are advanced and the one at the discharge end, heated to just the right temperature, drops to the roller table, in position to start through the hot mill.

The outstanding feature of these furnaces is the precision control which enables the heater to develop exactly the right temperature for best results in rolling. The twelve burners in each furnace, six above the slabs and six below them, are easily capable of bringing to proper heat quickly the largest slabs, measuring 52 inches wide, 16½ feet long and 6 inches thick, required for strip and sheet products 90 inches wide. Each furnace is regulated separately from the others, and from his control board, the heater increases or decreases the heat depending on the size of the slabs and speed with which they are moving through the furnace. The last 18 feet that the slabs travel through the furnace is a soaking chamber.

Temperature of the steel is checked periodically by use of an optical pyrometer as the slabs are discharged from the heating furnaces onto the rolling table. This is a further safeguard of quality in the product of the hot mill.

The roller table starts the slab on its way through the mill. It moves steadily forward in a straight line until it has been rolled into a finished product of the hot mill.

Before the rolling operation takes place, however, the slab must be freed of primary scale which has accumulated during the heating process in the furnace. This is done by passing the slab through the Number 1 scale breaker which is a mill having two large rolls between which the slab is squeezed just enough to crack the scale. The loosened scale is then removed by applying water, at a pressure of



A slab of steel enters the last of the four roughing stands of the hot mill while another slab, just emerged from the roughing stand, is approaching the finishing train of the hot mill, where the final rolling will take place. This final rolling will reduce the slab in thickness and greatly extend it in length

Trained operators control the manipulation of the hot mill finishing train from a pulpit built above the level of the upper part of the stands of rolls. From this vantage point, these men can see the progression of the steel through the mill, and regulate speed of the mill for best possible results in rolling

1200 pounds per square inch, on all sides of the slab simultaneously.

The spreading mill is the first of the four-high roughing stands. The working rolls, between which the slab is reduced, are comparatively small. The backing-up rolls, one above and one below the working rolls, apply the tremendous pressure needed to reduce the steel and prevent springing of the working rolls from the resistance and heat of the slab. Each of these giant backing-up rolls weighs 55 tons. Only the top backing-up roll and the working rolls are visible, the bottom backing-up roll being below floor level.

Starting the Slabs

The position of the slab on entering this mill depends on the width of the finished product being rolled. When the finished product is to be less than 48 inches wide, the slab enters the spreading mill in the same position that it passed through the scale breaker. If the finished product is to be wider than 48 inches, however, the slab is halted over a turn-table raised and turned 90 degrees, entering the spreading mill "sideways". A powerful pusher, operating between the scale breaker and the spreading mill, is used to start the slab through the rolls of this mill.

Before a slab which has been cross-rolled in the spreading mill moves to the next operation, it is returned to its original position by means of another turntable which is located at the delivery side of the spreading mill.

It is only a few feet from the second turntable to the hydraulically driven squeezer. Here, by tremendous pressure, the entire slab is leveled and the sides are trued. This is necessary because the slabs have uneven edges and surfaces after being rolled in the spreading mill. While this operation only takes a few seconds, it is of special importance in producing a finished hot mill product of the highest quality and uniformity to specifications.

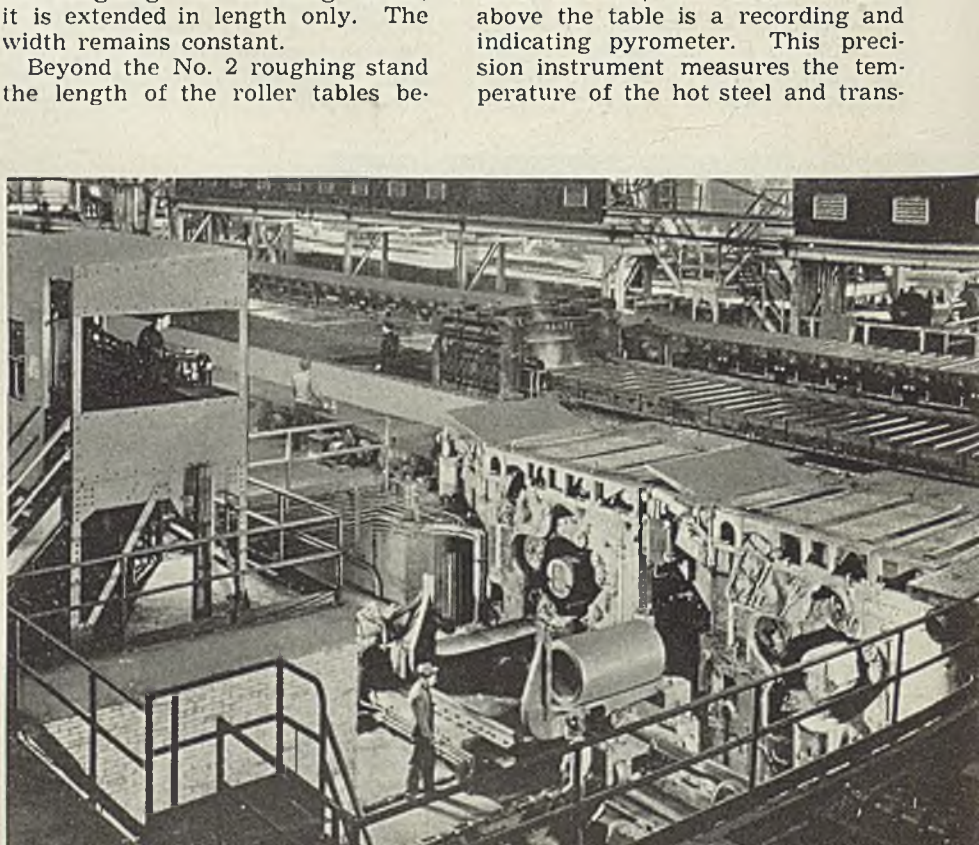
The jaws of the squeezer release the slab and the rolls of the table move it into the No. 2 roughing stand. This mill is similar to the spreading mill, except that it has vertical edging rolls on the entry side which maintain the width of the slab as it was established in the squeezer. Therefore, as the slab is reduced in the succeeding stands in the roughing and finishing trains, it is extended in length only. The width remains constant.

Beyond the No. 2 roughing stand the length of the roller tables between each pair of stands increases. These distances are so calculated that the lengthening steel is engaged in only one roughing stand at a time.

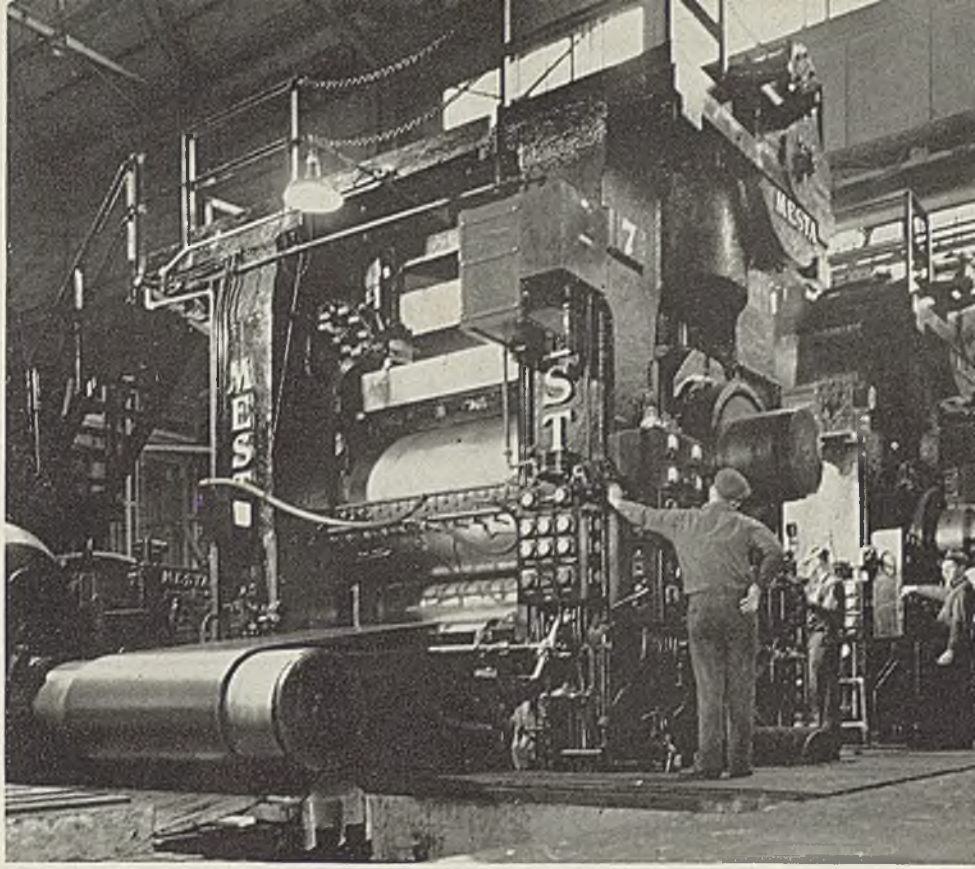
At the delivery side of each of these roughing stands, of which there are four including the spreading mill, water, under high pressure, plays upon the surfaces of the slab to remove any loose scale which may have formed since the first descaling at the No. 1 scale breaker.

As the slab emerges from the rolls of the fourth and final roughing stand, it has been reduced approximately 75 per cent in thickness and greatly extended in length. The width, which was established in the squeezer, has been maintained by the vertical edging rolls located on the entry side of each of the roughing stands.

After the steel leaves the delivery side of the No. 4 roughing stand, ready for rolling in the finishing stands, it moves on a 100-foot roller table of the same design as the roller tables between the roughing stands. The slab moves rather slowly on this table because the temperature of it must be checked before final rolling in the finishing train. Located halfway between the last roughing stand and the No. 2 scale breaker, and about 10 feet above the table is a recording and indicating pyrometer. This precision instrument measures the temperature of the hot steel and trans-



Most of the hot rolled strip steel that is coiled becomes material for reduction in the cold mills, and since the cold mills roll the steel in a continuous operation, the coils are of great length



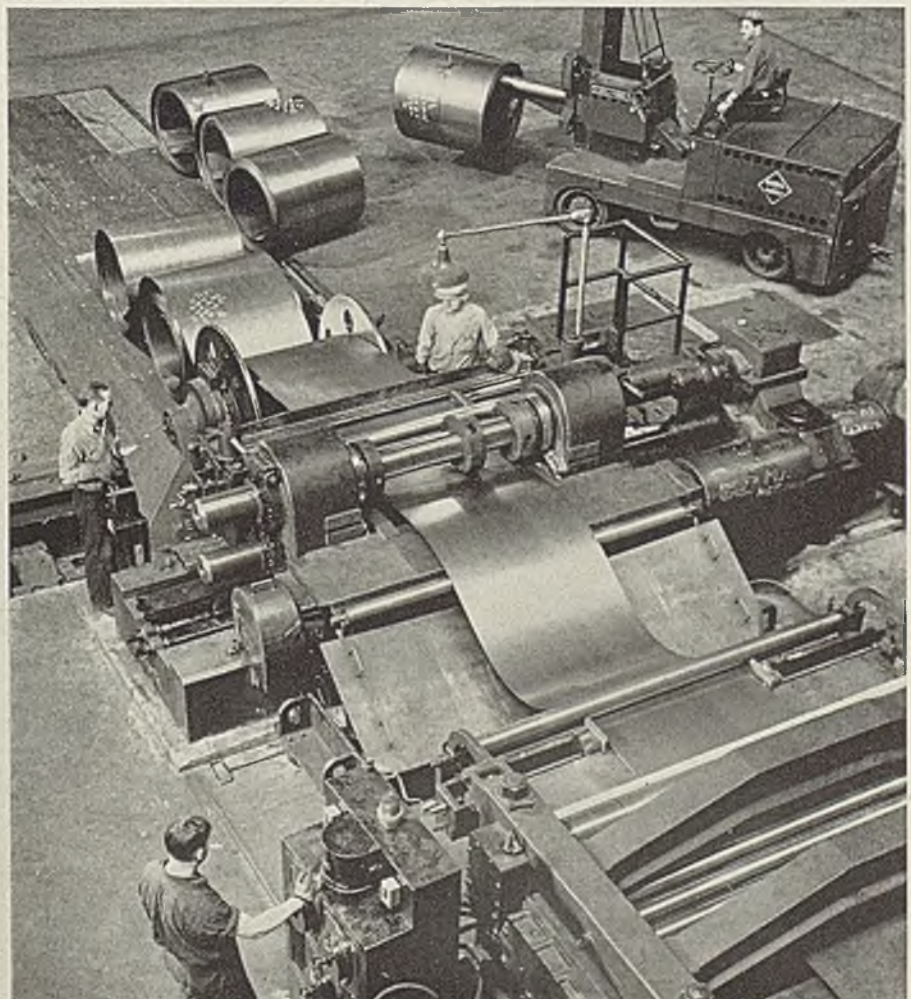
The 93-inch cold rolling mill, a four - high three - stand tandem mill, rolls the cold strip in one operation. A heavy reduction in the thickness of the steel is customary for full cold rolling on this mill. Should the order being rolled call for sheets, the material is cut to the required length and given what further finishing and processing the specifications require

mits it by an electrical system to a dial in the finishing train operating pulpit and to a recording mechanism situated on the furnace control board. The speed operator, stationed in the operating pulpit, watches the reading of the indicating dial and, if the steel is too hot for best rolling in the finishing train, he allows the slab to remain on the roller table until it has cooled slightly to the desired temperature. However, the slab does not remain still. The rolls of this table are reversible and by manipulation of the controls the partially reduced slab is moved forward and backward, always remaining under the recording and indicating pyrometer.

All of these operations are controlled electrically by the experienced operators in the pulpit who have a clear vision from their vantage point opposite and well above the level of the finishing train in the hot mill.

The head roller, under whose supervision the slabs are rolled, is stationed at the master control board located at the last stand in the finishing train.

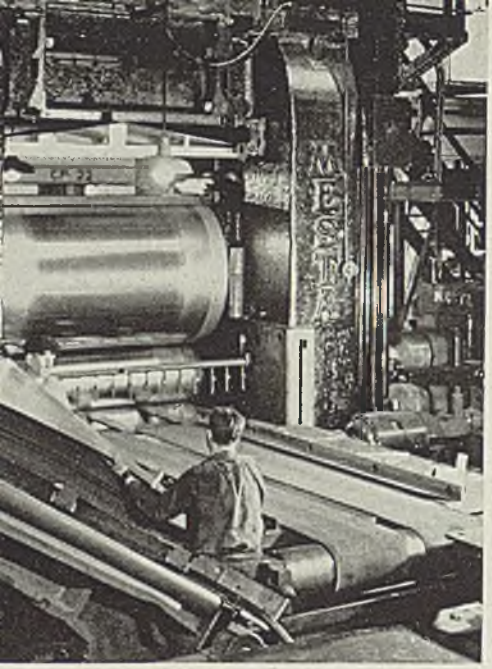
In the finishing train, the reduction from slab to strip steel is made in rapid order. Before entering the first finishing stand, however, the slab is given another thorough descaling and cleaning at the No. 2 scale breaker. The scale-free slab then enters the first of the six finishing stands, all 4-high mills of the same general design as the roughing stands. The stands in the finishing train are spaced 18 feet from center to center. Due to rapid elongation as it advances, the steel is quickly engaged between the reducing rolls of all stands of the finishing train at one time. Motor-driven looper tables, placed between the stands, maintain the desired tension on the strip. This is accomplished by the raising or lowering of the friction rolls on the loopers. The manipulation of the rolls is controlled by the operators in the pulpit who look directly into the finishing train.



Roll Surface Important

The surface of the contact rolls in the finishing stands, between which the steel is reduced, is of paramount importance to the surface quality of the finished products. Hence, these rolls are never allowed to remain in service more than eight hours. Frequently, they are changed after they have been in operation for only two to three hours, for it is from these rolls that the rolled strip receives its smooth and even surface. The contact rolls in the roughing stands, because their influence on the final surface is so slight, generally keep a good working finish

After the steel in coil form has been cold rolled, the coils are delivered to the cutting-up unit, where they are side trimmed, roller-leveled, and then cut into sheets of specified length by means of a rotary flying-shear



To prevent stretcher strains from forming and to provide the right stiffness in the finished products, the steel is given a temper pass or "skin pass", as this process is sometimes called. In addition to tempering the steel, the surface is also smoothed and polished to a high finish in these mills

for as long as a week at a time. Next in importance are the top and bottom rolls—the pressure rolls—in the finishing train stands. Since they do not come directly in contact with the hot steel, they are not changed nearly so often.

When rolls are removed from the stands they are sent to the roll shop where they are reground and the surface polished to a high finish. They are then returned to the dressed roll stand, which is located near the reducing stands in which they will be used. The roll stand for the finishing trains is by far the larger, for it is in these mills that the roll changes occur most frequently.

As the strip steel emerges from the last stand of the finishing train, it is of the specified gage and width and is ready for the finishing operations required to meet the customer's needs.

On its way to the plate finishing department, the product of the hot mill is transferred from the main hot mill runout table to a secondary table, then to a roller leveler, where it is both smoothed and leveled. It then goes on to the shear where it is cut to the specified lengths.

The long strip of steel is cut into plates ranging from 3 feet to 50 feet in length, depending upon the specifications of the individual customer. The plates are no longer cherry red, having turned to the gray of newly rolled steel, but are still quite hot. The cut plates next move forward from the plate shear to a point where they are transferred to the cooling table which will move them slowly, in the opposite direction, to the kickoff and stacking racks in the plate finishing department. From the stacking racks the plates are moved to the cooling bay where they will be allowed to become cold gradually.

This cooling may take as long as 24 hours depending upon the thickness of the plates. After they are sufficiently cold for further handling, the plates are passed through certain of several sequences of finishing operations, depending upon the customer's requirements. These operations may include cutting to smaller dimensions, side trimming, roller leveling and resquaring.

Treatment of Sheets

Material which will be finished into either hot or cold rolled sheets comes through the hot mill in much the same fashion as the slabs that are to be converted into plates. The principal difference in the two classes of product is in thickness. Plates produced on the continuous strip mill range from ¾ to 3/16-inch, while sheets may be rolled as light as No. 10 gage in widths to 91½ inches, and as light as No. 19 gage in widths to 46 inches.

When sheets are being rolled, the steel is cut into multiples of the finished length as it emerges from the last stand of the hot mill finishing train. This is performed by a flying shear that operates only 5 feet from the last stand of rolls. Lengths into which the steel may be cut vary from 11 feet to 22 feet. The flying shear is not operated, of course, when the customer's order calls for sheets finished in coils.

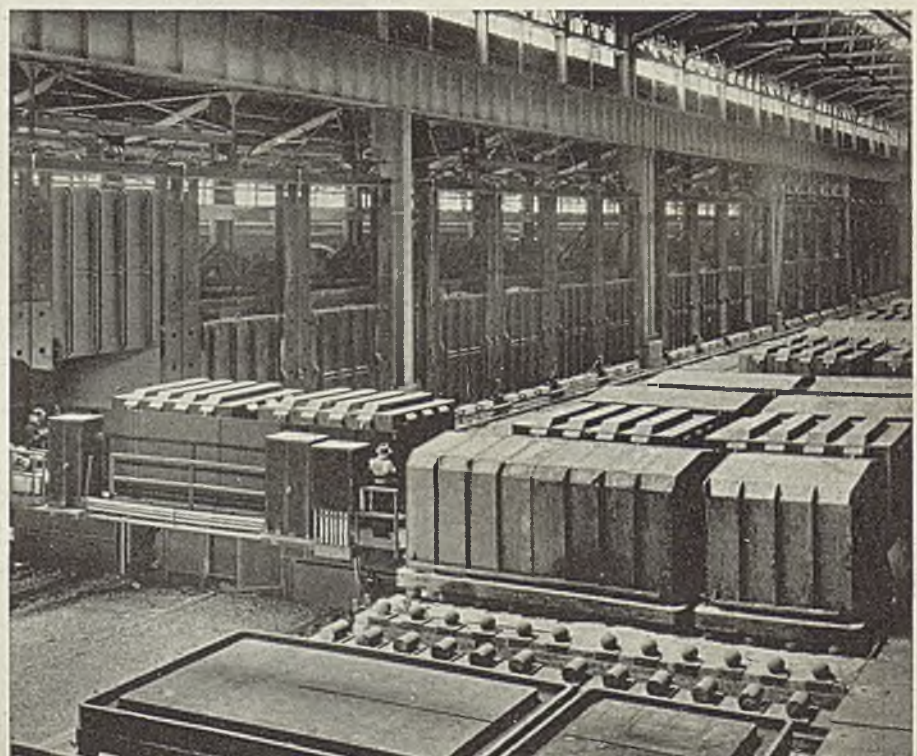
The operation of the flying shear at the end of the finishing train is synchronized with the rolls of the last finishing stand, so that the steel as it emerges is cut into exactly the lengths desired for finishing regardless of the speed at which it leaves the last set of rolls.

The cut sheets are advanced rapidly on the runout table to either the No. 1 or No. 2 sheet piler.

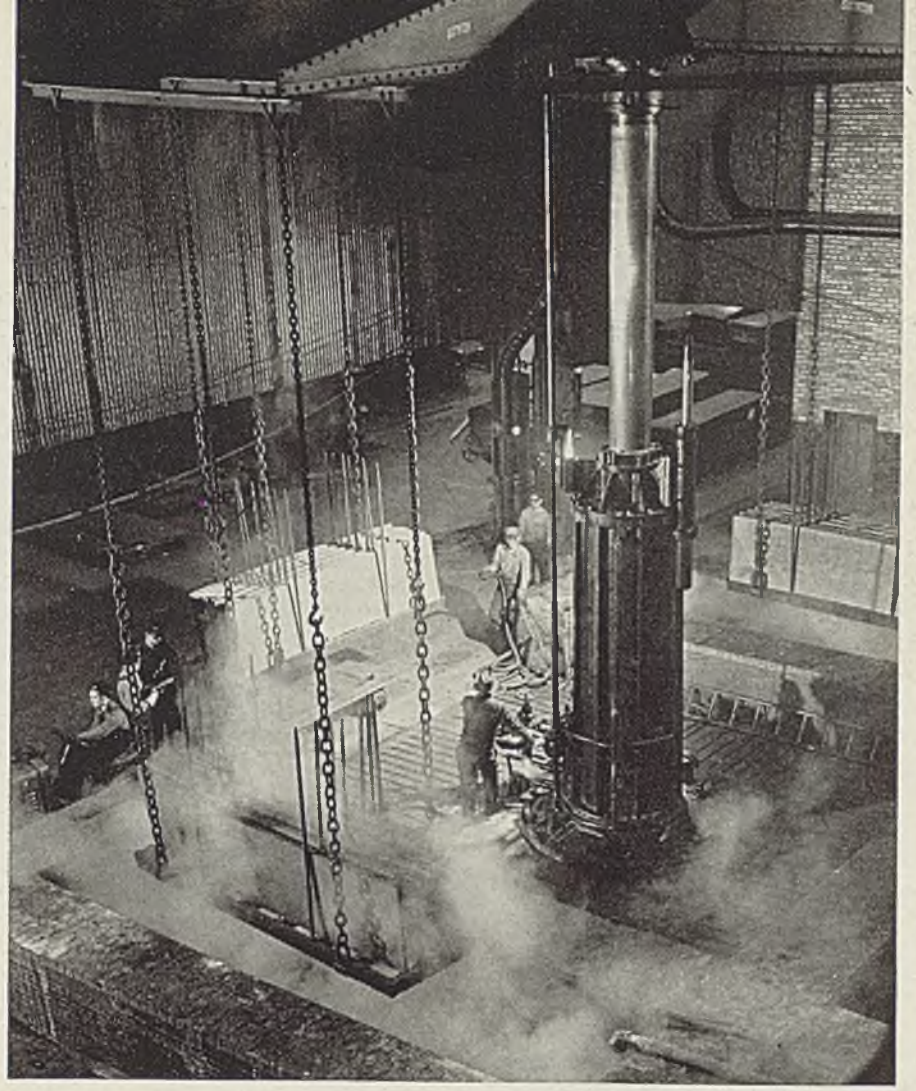
The No. 1 piler is located at a point about midway of the runout table, while the No. 2 piler is at the end of the runout table. If the sheets are of light gage, they must be piled while still hot so that the stack will retain heat for self-annealing. In this case, the No. 1 piler is used, because of the shorter travel from the finishing train of the hot mill. If the sheets are of 12 gage and heavier, the No. 2 piler may be used.

After the sheets are stacked in the piler, they are picked up by a crane having a specially designed sheet-lifting rack and delivered to the cooling bay where they are allowed to become cold before further finishing.

Depending on the specifications of the customers which vary with their manufacturing operations, sheets may go through almost any combination of processes in the hot mill sheet finishing department. All are described in order in the following paragraphs. Should the order call for normalized material, the sheets go to the normalizing furnace, where they are treated to about 1750 degrees Fahr. in a continuous opera-



The annealing furnaces produce the right physical properties for forming and drawing sheets and strip into finished products by relieving all of the strains in the steel resulting from cold reduction



Pickling vats, of which there are three, remove all surface scale and leave the sheets and strip with a clear finish. Two of these vats contain acid and the third contains water. The acid serves as a cleaner while the water bath acts as a wash to remove the acid that would cause damage if left on the steel

tion that takes only 15 minutes for them to travel the length of the heating zone of the furnace.

The sheets are transferred from the delivery end of the normalizing furnace to the cooling bay. When cold, they may go to the sheet picklers. There they will be loaded in crates made of acid-resisting metal and then placed into the pickling vats, of which there are three. Two of the vats contain acid and the third water. The acid removes all surface scale and leaves the sheets with a clear finish, the water serving as a wash to remove the acid.

Drying the Sheets

The sheets are then delivered by specially designed trucks to the scrubber and dryer. Here, each sheet is submerged in a circulating water cleaning bath and then passed between rubber wringer rolls which remove excess water. Next, brush rollers dry the sheets, removing any remaining traces of the acid from the pickling operation, and leaving them with a clean surface. Following this, the sheets pass through a roller leveler.

The next process in the sheet finishing department is a rolling operation. While the equipment is not of the great size of the stands in the roughing and finishing train in the hot mill, this rolling is important because it gives the sheets their final finish and physical characteristics.

After sheets have been normalized and pickled, this final rolling comes as a tempering operation, often referred to as a "skin pass". This mill has two rolls, one placed above the other, and the sheets are passed between them. The amount of reduction, or draft, is regulated to give the individual customer a product having the exact degree of ductility or stiffness required. This rolling also gives the sheets a smooth, bright surface.

Located at the delivery end of this mill is a roller leveler, used to make the sheets perfectly flat. Following this processing, the sheets may be resquared, oiled, or cut to smaller sizes, all of which is governed by the customer's specifications. Inspectors, working under the supervision of the metallurgical department, carefully check the results of each operation, samples being taken from the production line for laboratory analysis and test.

With scientifically controlled quality of steel for the strip mill and the most advanced facilities for rolling and finishing, every precaution is taken to make sure that the finished product will reach the customer in the best of condition. Where surface quality must be preserved, sheets are carefully wrapped in tough, waterproof paper and all lifts are securely strapped with steel bands or wire, preventing deteriora-

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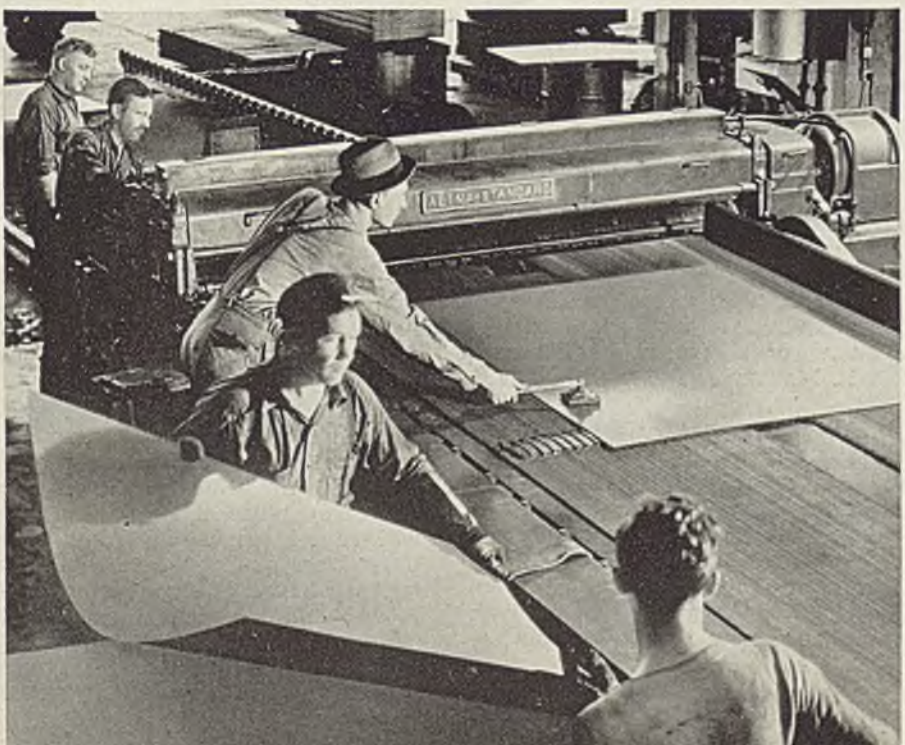


Before material is released from the mill for shipment to the customer, it is thoroughly inspected and oiled. The oiling prevents any damage caused by bad weather conditions or rust

Panorama of Activity in Motor Plants Is Presented Automotive Engineers

■ A WIDE RANGE of technical subjects came up for discussion at the annual production meeting of the Society of Automotive Engineers, Dec. 8-10, held for the first time in Flint, Mich. Three days of technical sessions and plant visitations gave those attending an interesting panorama of the engineering activity in motor plants. Ten prepared discussions of divergent phases of manufacturing practice were presented and discussed.

Being the home of A. C. Spark Plug, Chevrolet, Fisher Body and Buick, Flint was an ideal choice for the meeting which drew hundreds of engineers from the nearby automotive centers of Lansing, Pontiac and Detroit.

High spot of the three-day assemblage was an informal dinner on the last evening at which Arnold Lenz, production manager, Chevrolet Motor Co., was the featured speaker. Chairman was C. A. Chayne, chief engineer of Buick Motor Co., who also headed the various Flint committees which arranged details of the meeting.

Casting and machining of steel pistons were reviewed in detail by W. F. Pioch, Ford Motor Co., Dearborn, Mich. Of interest from the casting side were the special molding systems developed which maintain accuracy to within 0.005-inch. The molds have no internal supports and flasks and pattern equipment are maintained to working limits as low as plus or minus 0.001-inch. Sand is packed in internal pockets by a simple, mechanical method not used prior to this application.

Heat Treatment Explained

After casting, the pistons are given a heat treatment involving an initial heat to 1650 degrees Fahr. for 1 hour, an air cooling to 1200 degrees, a reheat to 1400 degrees for 1 hour and furnace cooling to 1000 degrees. This gives a brinell hardness of 207-241.

Summarizing the machining operations, first step is broaching of casting fins, done at a rate of 1600 pieces per hour. Broaching tools yield 50,000 pieces between grinds. Six-spindle horizontal machines turn the dome of the piston and the outside diameter at a rate of 115 per hour, stellite tools being used. Next is a centerless grinding operation on the outside diameter, removing 0.015-inch of metal. This is done at the rate of 750 per hour. Succeeding operations include drilling piston pin holes, finish machining of the dome, line reaming the piston pin hole, chamfering the inside of pin bosses and the outside ends of piston pin holes, grooving for piston rings, drilling oil holes in pin bosses, drilling 8 holes in the lower ring groove, four grinding operations on the outside diameter and reaming the piston pin hole after plating.

Use Indicator Gages

Turning tools are held to plus or minus 0.0001-inch and set in place with indicator gages which are part of the machine set up. By use of a paraffin cutting oil, tools run, at these close limits, as high as 10,000 parts between grinds instead of only 100 when using soda water as a coolant.

Tungsten carbide tools are used for grooving the piston and give 10,000 pieces between grinds with an accuracy of not over 10 scrap pieces in 30,000. Porosity of the casting is checked mechanically by forcing 30 pounds of air pressure into the piston as it is submerged in water. Final weight of the piston must be held between 304 and 308 grams. Special equipment has been devised to provide an accurate check on the various machining operations as the piston moves through the department.

History and present development of precision forging practice were summarized by L. A. Danse, metallurgist, Cadillac Motor Car Co., Detroit. Wednesday evening the session was devoted to two papers on welding, one dealing with the fundamentals of welding by Comfort A. Adams, Edward G. Budd Mfg. Co., Philadelphia, whom many regard as the father of present-day welding practices; the second being concerned with recent developments in resistance welding by J. S. Williams, P. R. Mallory & Co. Inc., Indianapolis.

Mr. Danse recalled that Cadillac in 1921 started to make gear forgings by the upset method and found that the strength was increased and the uniformity of tooth contour and spacing greatly improved, due to the evenness of the flowlines. This upset method of making gears took hold until now it has become the accepted method. Precision forging calls for close regard for the laws of plastic flow, close control of surface dimensions being secondary.

Proper forging temperature and die-to-die sizing will afford dimensional tolerances which are classed as precise. For instance, automotive connecting rods can be produced to plus or minus 0.007-inch and weight tolerances held to less than 3 ounces on a 5-pound rod. However, a die life of only 1000 or 1500 forgings would obtain if weights were held within 2 ounces, and 5000 with a tolerance of 2½ ounces—using alloy steels. With carbon steels, die life of 5000 forgings can be had with 2-ounce tolerance, 10,000 with 3 ounces and 30,000 with 4 ounces.

Wash of hot metal over the die during the plastic flow of the forging operation causes the die to wear, the contour to change and the weight of forgings to increase. The answer is better die steels, improved heat treatments and use of die inserts of nitralloy steel, high-speed steel, high-carbon high-chromium steel, and the like.

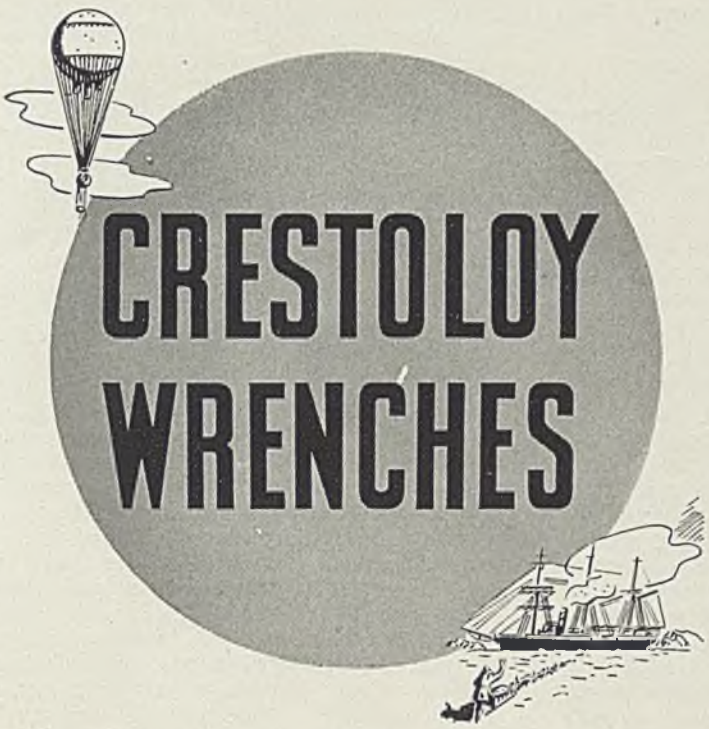
Theoretically, Mr. Danse concluded, the flow of metal in a forging should follow exactly the surface contour in highly stressed areas and should follow the main form of the forging throughout. There should be no flash, nor other extruded waste metal, except at unstressed areas of the forging. Practically, this perfect result is usually too costly; careful judgment must be exercised in compromising, so that reasonably good flow lines counter stresses where needed and yet costs are not excessive.

Reports Tests

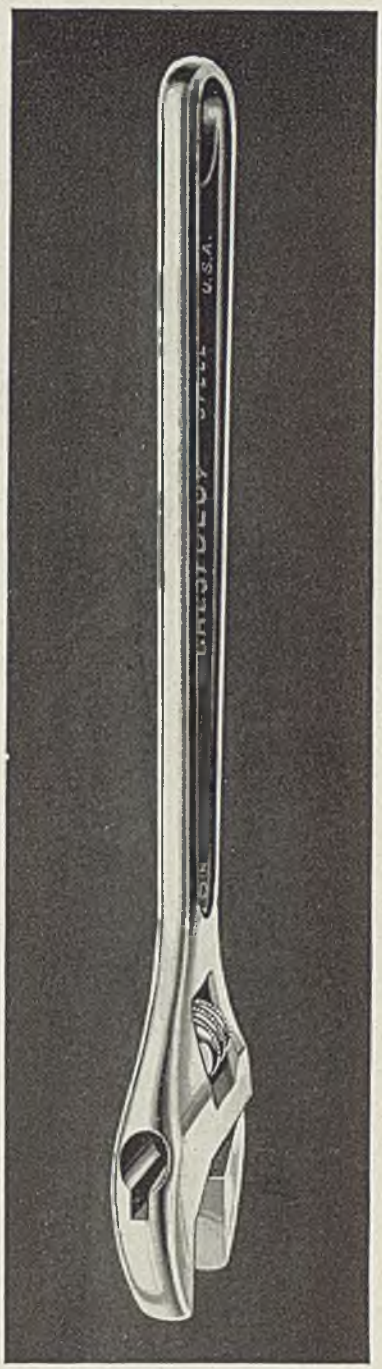
Tests showing the importance of proper synchronization of current timing and pressure dwell in spot welding of sheet metal were reported by Mr. Williams. Data were presented to show certain conditions which exist during the welding cycle which have a bearing on the microstructure of the metal and physical properties of the resultant welds.

If conditions of current timing and pressure dwell are not properly established, the welds will show inconsistent physical properties and will reveal porous and only partially recrystallized area in the microstructure. Current dwell can be set and maintained accurately with respect to the applied pressure

UP IN THE *Stratosphere*... DOWN AT THE *South Pole*



CRESTOLOY WRENCHES



Crestoloy Wrenches are made by Crescent Tool Co., Jamestown, N. Y.

...are *30%* thinner...*200%* stronger...they're

VANADIUM STEEL

You can get a Crestoloy wrench into tight places where an ordinary wrench would not go — because Crestoloys are 30% thinner than ordinary wrenches. A Crestoloy wrench will stand up in any service to which wrenches can be subjected—because it is 200% stronger than a wrench of the conventional type. Such are the quality and reputation of the Crestoloy wrench that Crestoloys were part of the equipment of the Byrd Expedition to the South Pole and Captain Stephens' Stratosphere flight.

All Crestoloy Wrenches are made of Chromium-Vanadium Steel, selected for its high strength, toughness and resistance to fatigue.

Metallurgists of the Vanadium Corporation of America will be glad to work with you in the selection or development of a steel that will enable you to build greater strength and dependability into your product. A request for information or for metallurgical assistance involves no obligation.

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FOR STRENGTH · TOUGHNESS · DURABILITY

METALS VANCURAM ALLOYS

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of vanadium, silicon, chromium, and titanium, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

by making use of a simple synchronization circuit in conjunction with a cycle recorder.

Experience with use of synthetic resin enamels on Ford and Lincoln Zephyr cars was cited by J. L. McCloud, Ford Motor Co. The resin used is an oil by-product, related chemically to some of the plastics now widely used in industry. In making the enamel this resin is combined with soya bean oil and chinawood oil. Successive coats of the material are baked on, using heat from moving batteries of infrared lights. Base, thinners and pigments are all new and have been developed to the point where the lighter colors retain their luster for much longer periods of time than heretofore. Also, a reduction in time required for application is obtained.

Devise Universal Oven

The enamel is sprayed on bodies and applied to some small parts by dipping. In the baking process, Ford engineers devised an unusual "oven," consisting of a series of double clamshells carrying lights so spaced as to heat the bodies and bake the prime coat in 7 minutes. The bodies travel on an overhead conveyor which carries them between two synchronized conveyors on which the lights travel. The temporary assembly of lights and body travels together for the required 7 minutes and then the body emerges with the lights traveling back to surround the next body. After spray application of the final coat, the bodies are baked at 250 degrees Fahr. for 1 hour.

The maze of detail attendant to the purchasing, planning and scheduling of parts for multiple-model automobiles was presented by D. A. Wallace, in charge of manufacturing, Chrysler Corp., Detroit. Key to successful operation is highly concentrated effort between planning and production departments, as well as between engineering, purchasing, sales, planning and production divisions. Chrysler has a definite program for meeting this problem:

1. The sales department throughout the building year estimates the number of cars required and how many are to be built daily, 90 days in advance.
2. These estimates are forwarded to the general production manager who, after consulting with the management, issues a material releasing authorization to the planning department, setting up a manufacturing schedule that will insure maintenance of the estimated sales volume daily without making commitments for material which might later prove excessive.
3. This detail schedule forms the basis on which all materials are released for manufacture within the plant or for delivery by vendors.
4. Against this authorization, the sales department releases to the planning department a building schedule for the first month's production and a tentative schedule for the second month.
5. The sales department follows by furnishing daily in detail the particular colors and trim required for their individual customers and carload combinations 7 days in advance of shipping date.

At the beginning of a new model program the planning department, to protect building dates, must:

1. Follow the engineering department and make sure that long-time items on the automobile are designed first.
2. See that blueprints on these long-time items are released to the purchasing department first and remaining releases follow without unnecessary delay so that the business can be placed by the purchasing department.
3. Follow the purchasing department so that immediately after the business is placed a copy of the purchase order is furnished the planning department.
4. Contact vendors and obtain date for completion of tools, dies, etc. and date that sample as well as production parts will be available.
5. Maintain an accurate record of component parts of the automobile showing full pertinent data which tell the complete story of progress on each model.
6. Notify management of dates when various materials will be available so that manpower can be provided for the various operations.

Controls Plant Operation

A centralized scheduling department, a unit of the planning division, controls the entire operation of the plant, starting and stopping each producing division. The scheduling department works with the shop and with management in arranging a schedule mutually agreed upon and endeavors to co-ordinate the different units to the ultimate consummation of the schedule, tying in and regulating the hours to prorate the month's business on a daily basis.

An inventory and order control department, entirely separate from the planning division, has the responsibility of constantly checking usage and inventories to insure that they kept within the original quantities authorized for a given period and in direct relation with the daily building schedule. A complete monthly check is made to see that quantities released are strictly in accordance with the authorized calculated quantities, assuring a balanced inventory.

Detailed insight into the mechanics of the grinding process was given by Roland V. Hutchinson, Olds Motor Works, Lansing, Mich., who subdivided his analysis into various classifications including grinding wheels, materials ground, geometrical considerations, conformity of surfaces, heating of work, wheel keenness, influence of wheel diameter on dressing, function of the coolant, cam profile grinding and general wheel characteristics. From data presented, Mr. Hutchinson listed a number of conclusions, among which were:

1. Heating of both work and wheel increases at a much faster rate than does dulling of the grain.
2. Tendency to wheel breakdown increases with depth of cut.
3. Heat developed at the work surface may be somewhat reduced by climb-cut grinding.
4. In grinding materials prone to heat checking, it is of first importance to keep the work surface cool and free from violent temperature changes. Rather than attempt this with copious use of coolant, in some instances it may be better to cool the wheel separately by air blast or spray, at the same time using a hard and strong abrasive grain in a fairly weak bond with structure open enough to accommodate easily the chip volume per grain. To attain good wheel life it may be necessary to run at high surface speeds.

Discusses Machining Problems

Some of the machining problems peculiar to the automatic transmission available on Buick and Olds models this year were discussed by F. C. Pyper, master mechanic, Buick Motor Division, Flint, Mich. With an understanding of the problems involved and not being restricted to the use of machines already on hand, mechanical equipment for producing this type of transmission was selected as follows:

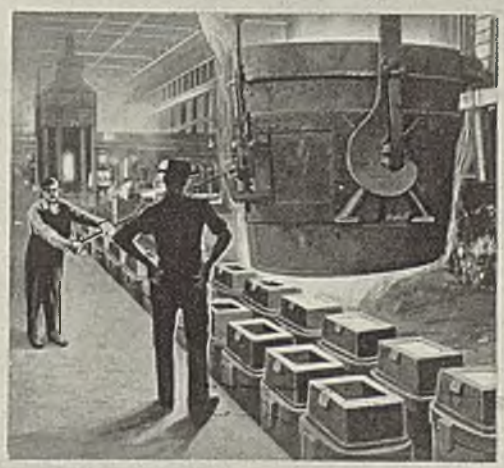
1. Proved standard machines with latest improvements for turning, milling, cutting and grinding of ordinary parts.
2. Specially-designed automatic machines for combined operations on related functional surfaces.
3. Specially-designed equipment mounted on standard machines to provide accurate locating and indexing from finished surfaces to surfaces on which operations are to be performed.
4. Latest designs of hardening equipment insuring the utmost in the prevention of distortion.
5. Air and temperature controlled inspection rooms with the newest types of inspection equipment.

Mr. Pyper outlined briefly some of the details of machining the transmission case, drive gear front

(*Please turn to Page* 86)

ZLATOUST and HARRISBURG—
Steels that Carved Higher Standards

With Europe waddling in the long depression that followed the Napoleonic Wars, the bear of Russia grew to be lord of the continent. It was to arm the conquering Cossacks of Nicholas I that General Anossoff developed at Zlatoust, deep in the Ural Mountains, amazing blades so keen and hard they would cleave nails without causing a gap. Above, one is shown piercing a cuirass. General Anossoff died and took his secret with him. . . . At Harrisburg, amid the Blue Ridge Mountains, steels are being produced today that are also setting new standards of service. Indeed here at "Harrisburg" the development of steels that will carefully fill the metal requirements of specific products is a tradition. . . . The accumulated experience of generations of "Harrisburg" experts in meeting metal specifications and obtaining desired physicals—small fifty-ton furnaces where relatively tailor-made heats are run—close collaboration between metallurgists and mechanical engineers—these are decisive factors that establish the superiority of the metal and the engineering of Harrisburg Steel Corporation products.



Harrisburg : : Pennsylvania

ALLOY AND CARBON STEELS · DROP AND HOLLOW FORGINGS · PIPE FLANGES, COUPLINGS, BULL PLUGS · PUMP LINERS · CYLINDERS · COILS, BENDS

Emphasize Training to Correct Waste of Time, Energy and Materials

■ TO INCREASE overall plant efficiency, industrial workers must be trained carefully and thoroughly in elimination of wasted time, energy and materials. The need for this type of training was emphasized during the fifty-eighth annual meeting of the American Society of Mechanical Engineers in New York, Dec. 6-10.

At a session devoted to the subject of time and motion study, Spencer Miller Jr., secretary of the Worker's Education Bureau of America, New York, declared although labor had objected to certain applications of these studies, the "objection usually turns on the manner in which the time and motion study is used rather than on the study itself."

G. S. Dierstein, Duncan Electrical Mfg. Co., Lafayette, Ind., and G. I. Gardiner, Forstmann Woolen Co., Passaic, N. J., declared that training the worker today in the methods of eliminating the waste of time, energy and materials constitute one of the major problems in industry. Teach executives, supervisors, foremen and their assistants and employes the methods of work simplification and the resultant savings to the organizations will prove well worth while, they declared.

Explain to Employe

They urged that work simplification be introduced to the employe, by "the common sense method of telling them what it is, of allaying all the fears he has of it insofar as it affects his job, his earnings and the amount of work he has to do and he immediately becomes understanding and cooperative."

Dr. L. D. Bristol, health director, American Telephone & Telegraph Co., New York, speaking at the luncheon meeting of the conference on labor relations, said that shorter working hours had magnified the problem of mental hygiene because employes have more time to worry about their jobs. The solution, he said, is for management to develop recreational facilities and to assume leadership in instructing employes of leisure.

Special Wheels Discussed

To grind properly sintered carbide-tipped tools, special wheels of new and unusual characteristics have had to be developed, according to Malcolm F. Judkins, chief engineer Firth-Sterling Steel Co., McKeesport, Pa., at a machine shop practice session held under the joint auspices of the machine shop practice division and special research committee on cutting of metals. This has been because emery wheels proved ineffectual in grinding the hard carbides as they glazed and generated excessive heat without removing stock. New types of machinery also had to be developed.

Mr. Judkins described modern types of equipment suitable, in his opinion, for this work and discussed various procedures, outlining rough grinding and finishing operations.

Proper grinding procedure, he said, is of considerable importance to the user as well as to the supplier of sintered-carbide tools. "Many large users today purchase unground tools, which are called milled and brazed, or supply shanks milled ready to receive the tips that the supplier brazes in place. Others buy raw tips and fabricate the entire tools themselves."

For this latter method a simple and inexpensive hydrogen-atmosphere electrically heated brazing furnace has been developed, he said, a piece of equipment which he described.

Emphasizing the value of correct procedures in the grinding of carbide tools from the suppliers' standpoint he said: "Many users have adopted effective grinding methods, but, through lack of authoritative information many users are following grinding practices not only costly and ineffectual but also which prejudice them against carbide tools." Hence, it is to the suppliers' interest to see users are kept fully abreast with the best in present day practice.

Proper grinding methods, he continued, permit use of carbide tools with no increase in cost or maintenance over previous cutting materials. He outlined certain precautions which should be taken.

Demonstrates Instrument

E. J. Abbott, Physicists Research Co., Ann Arbor, Mich., described and demonstrated an instrument which he developed for the rapid measurement of surface roughness. Referring to the instrument as a profilometer, the speaker said it can be used on flat, cylindrical or curved surfaces of a wide variety of sizes and shapes. He said on most surfaces, the irregularities which constitute roughness are only a few thousandths of an inch across, and the instrument is designed to measure irregularities whose widths do not exceed about 1/32-inch.

The instrument consists of two parts; a tracer unit and an instrument box. In the box is a meter calibrated directly in microinches. Readings are made directly on the meter. The tracer unit is moved across the surface to be measured and the meter gives a continuous running of average (root mean square) of the height of the surface of irregularities. The reason obtained is independent of the speed of the trace, and the tracer can be moved either manually or mechanically. For most work, he said, a rate of trace of about one inch per second is convenient. The over-all dimensions of the box are approximately 7 x 10 x 22 inches; it weighs about 50 pounds.

Longer waves, curvature of the surface etc. do not record on the meter and accordingly the roughness of such surfaces can be measured with the profilometer without influence from curvature surfaces.

By means of a selector switch, he said, sensitivity of the instrument can be adjusted so that its full scale reading is 3, 10, 30, 100, 300, or 1000 microinches (0.000001-inch). He added, however, that other ranges also can be supplied for special purposes.

Power loss in tapered-land thrust bearings at varying revolutions in ratio to the taper was discussed in a paper by F. C. Linn, turbine engineering department, General Elec-

tric Co., West Lynn, Mass. In general, efficiency of this type of bearing is as high as the accuracy attained in machining. Speaking at the lubrication session and dealing with marine applications of these bearings, Mr. Linn stressed the influence and importance of lubrication and declared the temperature increase in the working bearing of the land-thrust type is approximately in ratio to the power loss. A rounded edge at the point of thrust is desirable.

Heat Given Attention

In the discussion considerable attention was given the matter of heat generated in the oil film. Friction failure, caused by metallic contact, generally results in rapid heat increases. Speed also effects increases in temperature, being substantially greater at the higher speeds. Lower loss in tapered and pivot-type bearings are about the same under practical conditions. It was also agreed the use of more oil at various points, well distributed and controlled, increases the load carrying value.

Valves which close automatically in case of failure in pipe lines or at any part of a turbine are recommended by F. Knapp, assistant hydraulic engineer, Sao Paulo Tramway Light & Power Co. Ltd., Sao Paulo, Brazil. He favors a type of butterfly or pivot valve with a tendency to close when action in one direction has been started. His paper was presented at one of the several sessions devoted to water hammer in hydroelectric plants. A by-pass valve to supplement the emergency closing valve as an aid to the latter's automatic action is desirable, a well designed unit to close slowly after the main valve has closed being recommended.

Unguarded punch presses cause most serious accidents in the metalworking industry according to E. W. Martin, safety engineer, Liberty Mutual Insurance Co., New Haven, Conn., who reviewed application of safety in mechanical production covering numerous industries. Forming operations also appear most dangerous and blanking less hazardous, according to Mr. Martin, who said danger in the former was the result of the operator using his hands under the punch. Where possible, he urged the application of a dial, push, magazine or gravity feed, although admitting some types of work do not permit the use of automatic feeds.

In die-casting, with molten metal frequently under air pressure of 400 pounds the hazard of splashing and spattering metal was stressed. The die-casting machine should be isolated, if possible, or protected by metal plates or screens if other employes are working nearby. Most accidents in die-casting occur because the die is not completely closed when air is applied, according to Mr. Martin. If the die is poorly fitted, metal frequently flies some distance. He advocates the wearing of goggles by operators of die-casting machinery and recommends that such machines be cleaned and inspected at regular intervals.

Fatigue failure from stress cycles of varying amplitude on several metals was discussed by B. F. Langer, research laboratories, Western Electric & Mfg. Co., Pittsburgh. Available data on different materials may apply to one and not to another, although supposedly of the same type. Such data also vary as to the number of times stress is applied.

Notching, either by mechanical means or corrosion, results in about the same degree of failure on steel rods, according to T. J. Doland, assistant professor, theoretical and applied mechanics, University of Illinois, Urbana, Ill. He covered in his discussion simultaneous effects of corrosion and abrupt changes in section on fatigue strength of steel. Protective coatings to resist corrosion were suggested for sucker rods; also similar coverings and special treating to prevent concentration of corrosion once started was recommended for other steels.

Question on Bearings

The inner race is the critical member of the tapered roller bearing, asserted W. O. Clinedinst, engineer, Timken Roller Bearing Co., Canton, O., who discussed the fatigue life of such bearings. Results vary as to the life of the same material operating under identical conditions. The stress application in a tapered bearing constantly changes in operation, the maximum stress being applied at about the same point, stress being zero at another point. Asked as to the effect of speed on fatigue, Mr. Clinedinst said speed did not appear to have an important influence. In the discussion, it was generally agreed the quality of bearings had been greatly improved in recent years with fewer failures.

X-ray inspection, with proper technique, providing a nondestructive test for the weld joint was stressed as an important aid to fusion welding by H. R. Isenburger, president, St. John X-ray Service Inc., Long Island City, N. Y. For fusion welding of boiler drums, petroleum stills and other such units, X-ray inspection has been of special value. Citing success of the X-ray in tests of welds in unfired pressure vessels, Mr. Isenburger declared it was equqally important to examine the seams in high-pressure piping. With extreme pressures and high temperatures, he advocated such inspection of all welded pipe joints between the boiler and turbine. He described special types of equipment for field welds. Mr. Isenburger said radiographic examination of field-welded joints in pressure piping is not only desirable, but should be mandatory. Of all nondestructive tests, X-rays offer the only means to prove beyond doubt the soundness of the material, he said.

Safe Practices Urged In Use of Wood Scaffolds

■ According to the safety pamphlet, Safe Practices, No. 12, entitled "Wood Scaffolds," recently issued by the industrial division of the National Safety council, the erection of wood scaffolds is an important task.

An overlooked item may result in serious and fatal accidents with the use of wood scaffolds in the construction and repair of buildings and in plant maintenance work, says the pamphlet. To have safety, one engaged in building scaffolds should always keep in mind that lives depend upon his thoroughness in performing this work. All materials to be used for the scaffold should be carefully inspected and rechecked during construction and after its completion. Frequent inspection thereafter should be the rule even though the scaffold is only being used a few days.

Causes of scaffold accidents are listed in the pamphlet, and some safe practices to observe when putting them up. Recommendations are also made as to the construction of various wood scaffolds, and suggestions as to the type most suitable for the particular work to be done.

Motor Winding Methods Brought Down to Date

■ *Armature Winding*, by David P. Moreton and associates; cloth, 280 pages, 5½ x 8¼ inches; published by American Technical society, Chicago; supplied by STEEL, Cleveland, for $2; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is a practical manual on the construction, winding and repairing of alternating-current and direct-current motors and generators, with practical connection diagrams. The authors have drawn heavily on their wide experience in theoretical and practical design of electrical apparatus.

Such advances have been made since present workmen were in school that it has become necessary for many to supplement school knowledge with information brought down to date. Treatment has been designed to interest the technically-trained expert as well as the shop-taught practical man who wishes to keep up with modern progress.

In 1925 The Austin Company purchased their first Industrial Brownhoist crawler crane and nicknamed it the "Blue Goose". Six more Industrial Brownhoists have been bought in the intervening years—all for "hanging high" steel in fast erection service. Among the latest of these Austin jobs is the large plant addition for the Lincoln Electric Co., shown above, where 1314 tons of steel were erected in four weeks.

Industrial Brownhoist crawler cranes are "naturals" for erection service and all kinds of construction work. Combining speed with accuracy in spotting loads, unmatched flexibility in steering, independent clutches for each motion and, above all, the unfailing dependability which is so essential to profits, these cranes have been favorites among structural erectors for many years.

Would you like to know what savings an Industrial Brownhoist would effect on your material handling work? Our nearby representative, after going over your layout with you, can give you the figures and an occasional check-up on handling costs is very much worth-while.

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INDUSTRIAL BROWNHOIST

MATERIALS HANDLING

Building Prefabricated Steel Houses On Progressive Production Plan

BY THOR HANSEN
Chief Engineer, Houses division,
Harnischfeger Corp., Milwaukee

■ ONE OF THE chief items in the high cost of ordinary building is in the labor expense of construction on the job. Practically every piece is measured, cut, fit and fastened individually. Labor costs of the building alone, not including cost of lot or of financing, average about 50 per cent, or practically equal to the material. In addition, a house, as erected piece by piece, requires about 3 months or more for completion because of the necessary "drying out" waits between steps in the interior finishing. Shortening this construction period by 2 months or more results in quicker income or utility of the premises, thus actually decreasing its cost by the increased income or utility value for this shortened period.

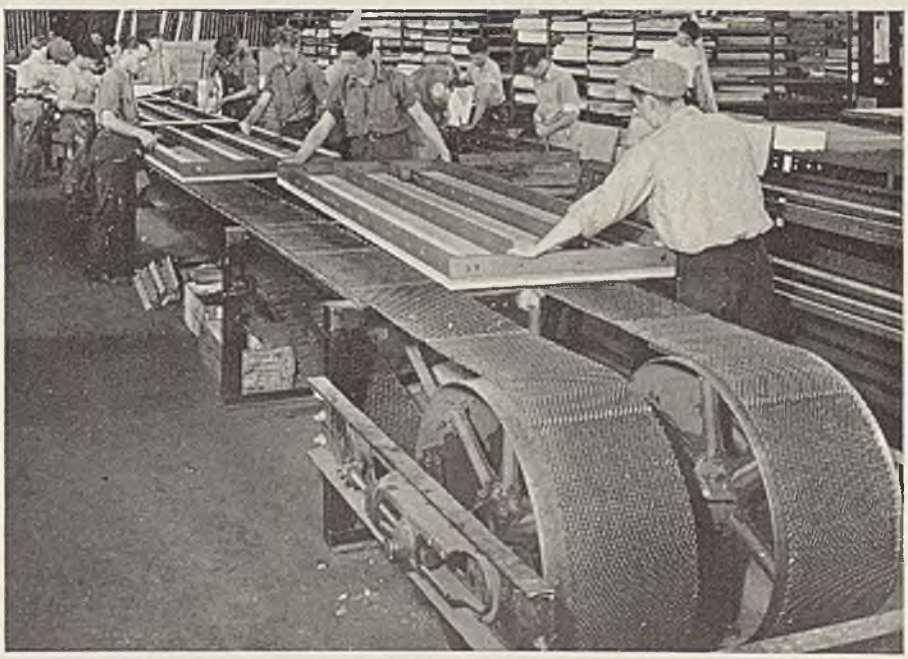
In the construction of prefabricated steel-frame houses, both of these advantages may be obtained. The house may be erected in a few days and is enclosed so that finishing may begin immediately, or as soon as the roofing is completed.

Decrease Cost of House

In planning the construction of the prefabricated panels and other part of the Harnischfeger Pre-Fab house, one of the first realizations was the possibility of decreased cost by manufacturing on a quantity straight-line-flow production and assembly basis.

The plant in which production of these houses is going forward is laid out for cutting, punching and forming steel parts for the frame, their assembly by welding and applying the protective coating in progressive manufacture. Also, wood and insulating board sections are cut to size, coated and dried progressively and meet the finished frames at a continuous assembly conveyor where the various sections are assembled and wrapped for shipment or storage. This briefly covers the general plan for production.

Production of steel parts is on one of three parallel lines. Sheets are received in carloads and stored in a building at the end of the main production bay. Steel is handled to and from storage by



Finished steel panel frames, after receiving rust-inhibiting coating, pass along on this continuous conveyor where precut and treated insulating board is applied at the rate of 50 to 60 completed panels per hour

MATERIALS HANDLING

grapples on a traveling crane. Hot-rolled 15-gage copper-bearing steel is used for the frame and cold-rolled 20-gage copper-bearing steel for trim. Sheets vary from 30 to 36 inches in width and are of various lengths to meet different requirements.

Tracks Run To Shop

A bundle of sheets is lifted from storage by the crane and deposited on a track car which carries it into the fabricating shop. The bundle is placed at the slitter by an overhead crane in the shop and the car returned for reloading. The layout of the buildings requires this sidewise transfer from storage to the shop.

Sheets are slit into strips of the proper widths for the different parts. For example, wall studs and frames use 3-inch channels; ceilings (one-story houses), 5-inch channels; floor, for one and two-story houses, 8-inch channels, all formed from these strips. The three production lines are set up for: (1) Parts under 40 inches long, such as top and bottom panel pieces, spacers, and the like; (2) Parts over 40 inches, such as studs and side pieces for wall, floor and ceiling panels; (3) Trim in varying shapes from lighter gage cold-rolled stock.

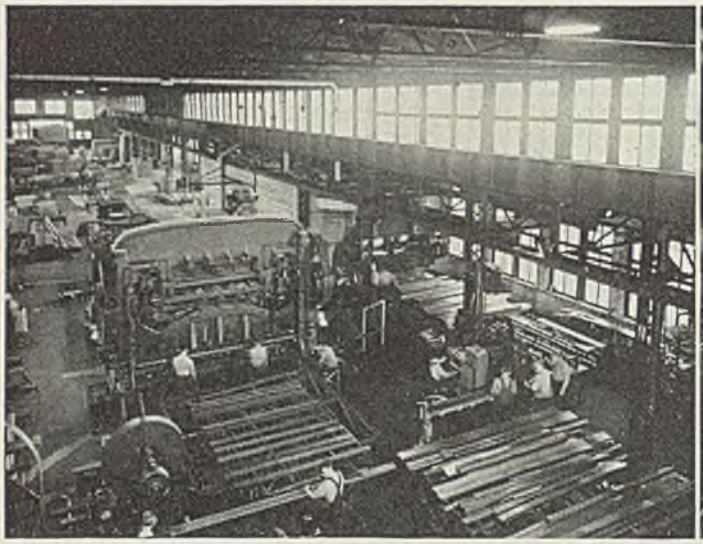
The fabrication shop is set up from one end of the main fabricating building so parts in work travel about half the length of the building. Wood and insulating material travel from the other end and both are finished at about the center. The production line for short metal parts is located along the left wall, for trim along the right wall, and for the longer parts about in the center of the main bay. Strips for short parts are carried by overhead crane to the proper line for fabrication. Pieces for trim are piled on an intermittently operated conveyor which serves for temporary storage. These lines are set along the walls of the shop. For fabricating short pieces the strips are turned to travel endwise through the various operations and machines. The first operation is to shear to length. The parts then pass along progressively on roller conveyors to the different punches and brakes and are piled on trucks at the end of the line.

On the production line for trim the pieces travel sidewise on conveyors through processing. At the end of the trim fabrication line the molding and trim pieces are placed on a slide and pass sidewise through a self-closing door in the wall into the adjoining enclosed finishing room. This room is supplied with filtered air and maintained under light pressure to prevent the entrance of dust which would spoil the finish.

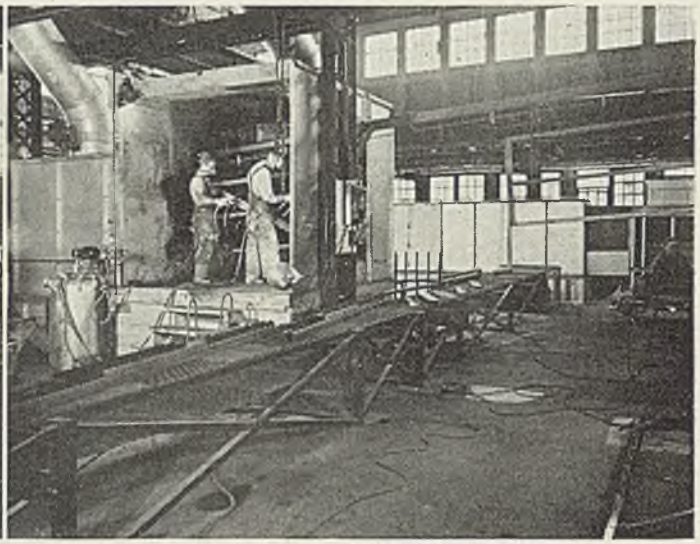
Conveyed Through Spray Booth

Molding and trim are degreased and the back or unexposed side hand coated with a light transparent enamel to prevent rusting. The exposed surface is spray coated with baking enamel of the color desired for trim. The trim pieces pass through the spray booth on a conveyor, foot-controlled by the operator. These parts are then placed on a four-wheeled steel shelf-truck, which prevents drip to parts on lower shelves, and taken to the gas-fired baking oven. Trim is baked at about 225 degrees for 1½ hours, or whatever is required for the coating. When cool the trim is wrapped in manila paper to protect during storage and shipment.

Strips for parts over 40 inches are also placed as slitted on the temporary storage conveyor. The first operation is to shear for length although some parts are cut from sheets of the proper length. Strips to be sheared are removed from the temporary conveyor, cut to length and placed on a wide conveyor consisting of slides and a pair of chains with pusher attachments which push the strips sidewise to



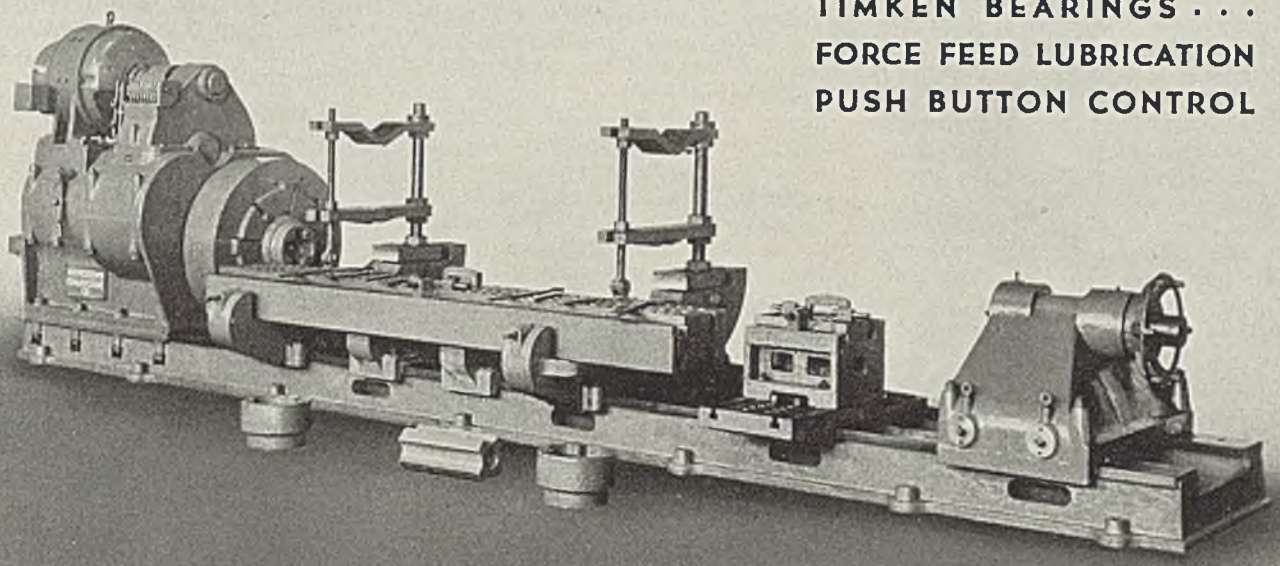
In the main fabricating building steel parts progress from this end and wood and insulating board from the far end to be finished at the center. Short steel parts are fabricated at the left, not shown, long parts in center and trim at the right



Parts for a panel frame are assembled on this woven-wire conveyor and carried to the welding jigs, right. Finished panels are hung on the overhead trolley conveyor for cleaning, then spraying and drying and are removed at the end of the final assembly conveyor

MODERN • • • ROLL TURNING LATHES

TIMKEN BEARINGS . . .
FORCE FEED LUBRICATION
PUSH BUTTON CONTROL



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MATERIALS HANDLING

the 600-ton forming press which will take a strip 14 feet long.

This press is tooled for two sets of operations. One set of dies punches out all openings in the flat strip. It is then pushed through the press to the next and parallel set of dies, with a separate setup of tools, which forms the punched strip into a channel. Thus each stroke of the press punches one strip and forms another into a channel. The operators on one side feed strips from the conveyor and those on the other side remove channels and place on another similar pusher conveyor.

Crane Moves Tools

The cutoff shear and various punches and forming tools are movable by crane and set alongside either the feeding or off-bearing conveyor so additional cutting or punching operations may be made on the strip either before or after it goes through the large press. This arrangement provides additional flexibility in the fabrication of the various parts. Only one type of parts goes through at a time, so finished parts are removed to a truck for temporary storage before assembly.

Wood and insulating boards are received by carload at the opposite end of the main fabrication building and pass through saws where they are trimmed and cut to size and shape, doors trimmed and hardware fitted, stairs built and all other woodworking operations performed. Insulation and woodwork receive priming coats. The outside surface board receives a priming coat, an aluminum seal and an oil-paint coat. This surface will receive an additional finish coat after erection.

All insulating board is spray coated while suspended on edge on a trolley conveyor. Some boards receive different coatings on the two sides. Even the edges are finished. Some batten or spacer strips are covered with paraffin to resist moisture. When dry they are loaded on trucks, which meet the loaded trucks of steel parts in the center of the fabricating bay, both having progressed from the opposite ends of the building through the processing operations.

Use Trucks, Conveyors

Steel parts for panels are trucked to an adjoining building where they are set alongside a woven-wire belt conveyor. Complete parts for a frame are taken from these trucks and placed together on this conveyor which carries them to the welders. Parts are removed, assembled in a jig and torch welded together, thus making the panels identical in size and in the positioning of the various parts so that they will fit together properly.

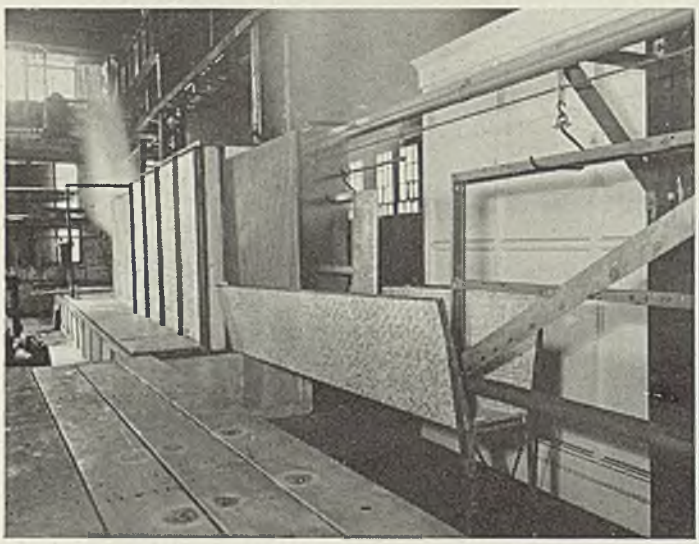
The welded panel frame is hung on two hooks on an endless cable conveyor, trolley suspended. This carries the frame through a hot chemical spray or cleaning bath which dries quickly, then through spray booths where the entire surface is coated with quick drying zinc chromate in a bakelite vehicle, and on through a dripping and drying space. The coated frames are then removed from the hangers and piled at the end of the final assembly conveyor.

Position Wooden Parts

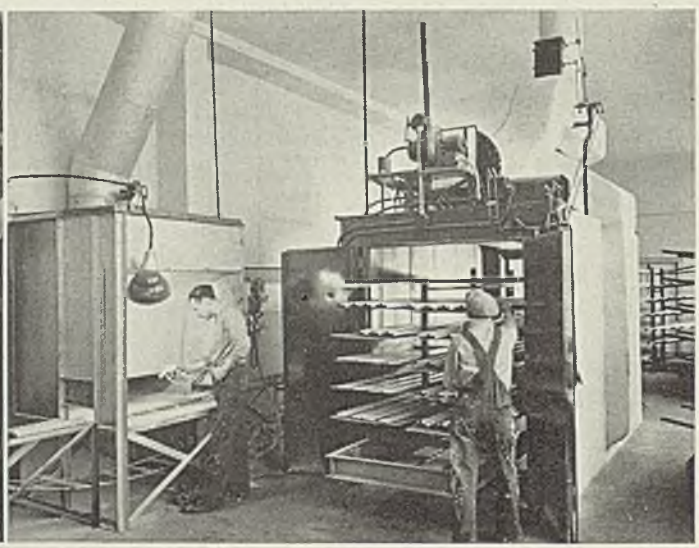
Truck loads of wood and insulating board are placed along this conveyor at the points where they are to be used. This final assembly conveyor is 4 feet wide and consists of two parallel 14-inch woven-wire belts with open space between but driven as a single belt.

The inside and double outside insulating boards with wooden spacer battens are fastened to the panel frame by heat-treated self-threading screws or by exploding rivets where wood or insulating board are joined so that no metal extends through for conducting temperature differences. Electric drills, hammers and screwdrivers speed up these operations. Practically no bolted construction is used in assembly of the

(*Please turn to Page* 85)



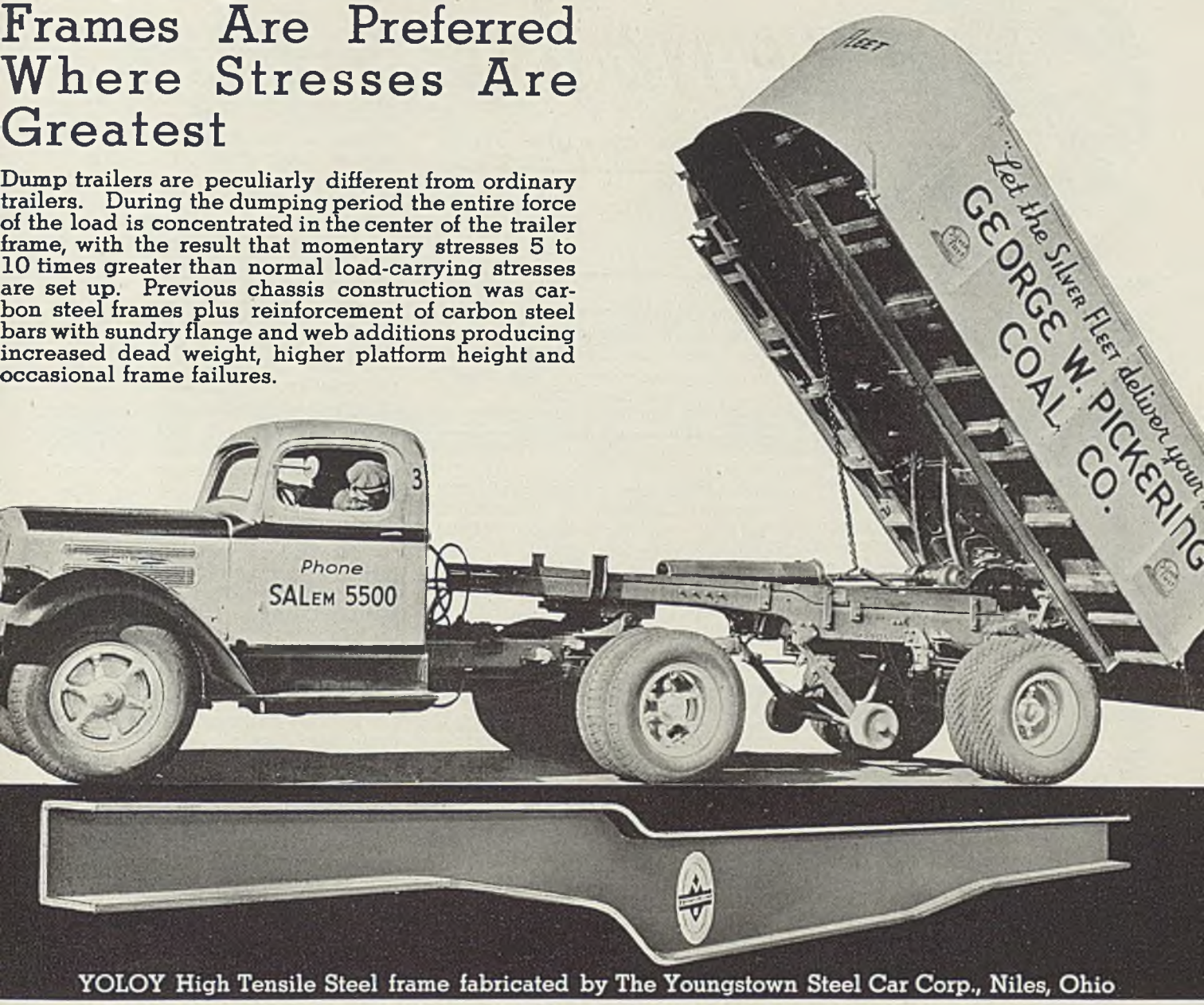
After welding, the panel frames pass on the conveyor through this hot chemical spray bath which cleans the steel and dries quickly on the way to the spray booths where the zinc chromate protective coating is applied



Steel trim and moldings are received in this enclosed finishing room, which is supplied with filtered air under pressure, for cleaning, spray coating and baking. They are then wrapped to protect finish in storage and shipment

Yoloy High Tensile Steel Frames Are Preferred Where Stresses Are Greatest

Dump trailers are peculiarly different from ordinary trailers. During the dumping period the entire force of the load is concentrated in the center of the trailer frame, with the result that momentary stresses 5 to 10 times greater than normal load-carrying stresses are set up. Previous chassis construction was carbon steel frames plus reinforcement of carbon steel bars with sundry flange and web additions producing increased dead weight, higher platform height and occasional frame failures.



YOLOY High Tensile Steel frame fabricated by The Youngstown Steel Car Corp., Niles, Ohio

Not only did Yoloy solve these problems successfully, *without a single frame failure reported to date*, but the original frame dimensions have been retained and no costly alterations in dies, jigs or fixtures were necessary to make the change-over.

Yoloy is writing a success story in fabrication--a story based on increased strength plus weight reduction. In your product the same savings probably can be made. Youngstown has experienced technicians who would be glad to investigate those savings for you.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - - YOUNGSTOWN, OHIO

YOLOY YOUNGSTOWN STEEL

High Tensile Steel Yoloy is available in sheets, strips, plates, bars, shapes, manufacturer's wire, welding wire, seamless pipe and electric weld pipe.

3-4A

YOUNGSTOWN

WELDING, ETC.

BY ROBERT E. KINKEAD

Steel Producers Should State Welding Properties

■ Increasing necessity for a simple, understandable method of describing the welding properties of metal is shown by the large expenditures that users of such steel are making in trying to find the best method of welding the new alloys.

The method being used is expensive and requires a great deal of time. Each new alloy is treated as an entirely new product and the whole routine of welding and testing is gone through to see what it does when welded and tested by conventional methods. This, in spite of the fact that, given the chemical analysis and the method of manufacture, many of the older steel makers with the producers can predict the properties with reference to welding as accurately as they can be determined by the testing methods now employed.

There is a wide gap in most steel producers' organizations between the old steel makers and the metallurgical experts in respect to problems relating to welding. This situation results in confusion on the part of the user of steel and very expensive as well as bothersome "service" from the producer. If the welding properties of a steel were stated along with its tensile strength, yield point, etc., the user would, in most cases, know what to do to weld it successfully.

The situation is one in which both steel producers and users are spending a great deal of money needlessly. It can be corrected by co-ordinating existing forces and stating the welding properties of steel before it is bought.

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.

Justice Is Administered In Weld Failure Case

■ Five foreign laborers were in a United States district court with a complaint that they had been injured and financially damaged in an accident in which welds had failed.

Counsel for plaintiffs and defense with their eyewitnesses and experts together with jury, judge and court attendants concentrated on getting the case straightened out. And in a U. S. district court that is a business-like procedure.

The judge is no figurehead; he runs the show. The case was settled out of court for a sum of money satisfactory to the plaintiffs without judgment being rendered as to whether weld failure or other causes were responsible for the accident and injury to the men. The fact that men had been injured was more important than what caused the injury.

These men came from a country where they were peasants. So recently had they come that they were abashed and obsequious in the presence of the court. Yet they obtained satisfaction for their wrongs promptly and in a most practical manner. They were treated as free men before the bar of justice, not as supplicants before their masters.

It occurs to us that the letters such people write back to their friends across the seas have more to do with making them want to come here than all the wild stories of wealth and affluence spread through Europe about life in America. When a poor foreign immigrant can come here and become President Knudsen of General Motors in less than 30 years, this country is still a land of opportunity, and social justice is not forgotten.

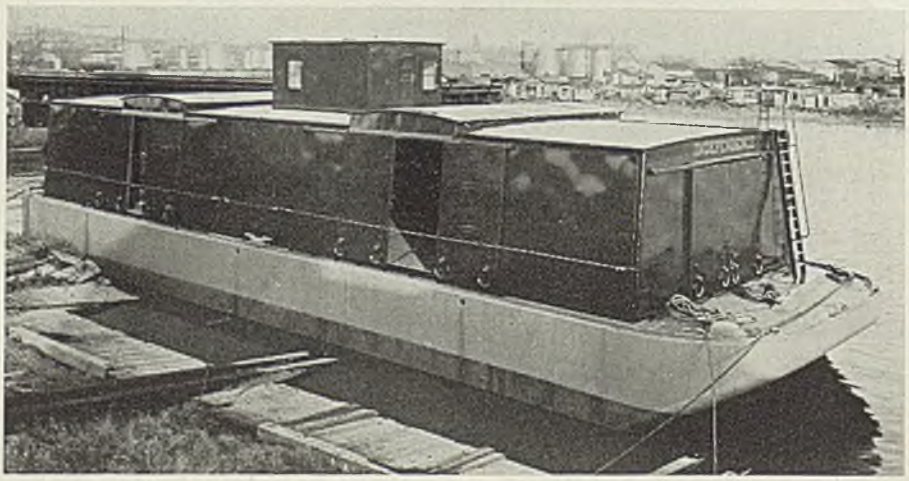
Welded Steel Machinery

■ Value of specialization in the building of welded steel machinery is becoming increasingly apparent.

To build any kind of machinery that might be built in castings at a comparable cost involves, in many cases, investment in machinery and equipment at least as great as would be required for a steel foundry. Very few plants have such complete equipment. The trend is for each plant to build such welded construction as it is equipped to build efficiently. If it is desired to have all welded construction in spite of a lack of complete equipment, it would be better in many cases for manufacturers to buy from others the equipment they cannot make themselves at a suitable cost.

As the commercial welding shop develops more completely in the matter of equipment this problem will be solved. But in the meantime, substantial economies may be obtained by manufacturers in a given locality buying welded construction from each other.

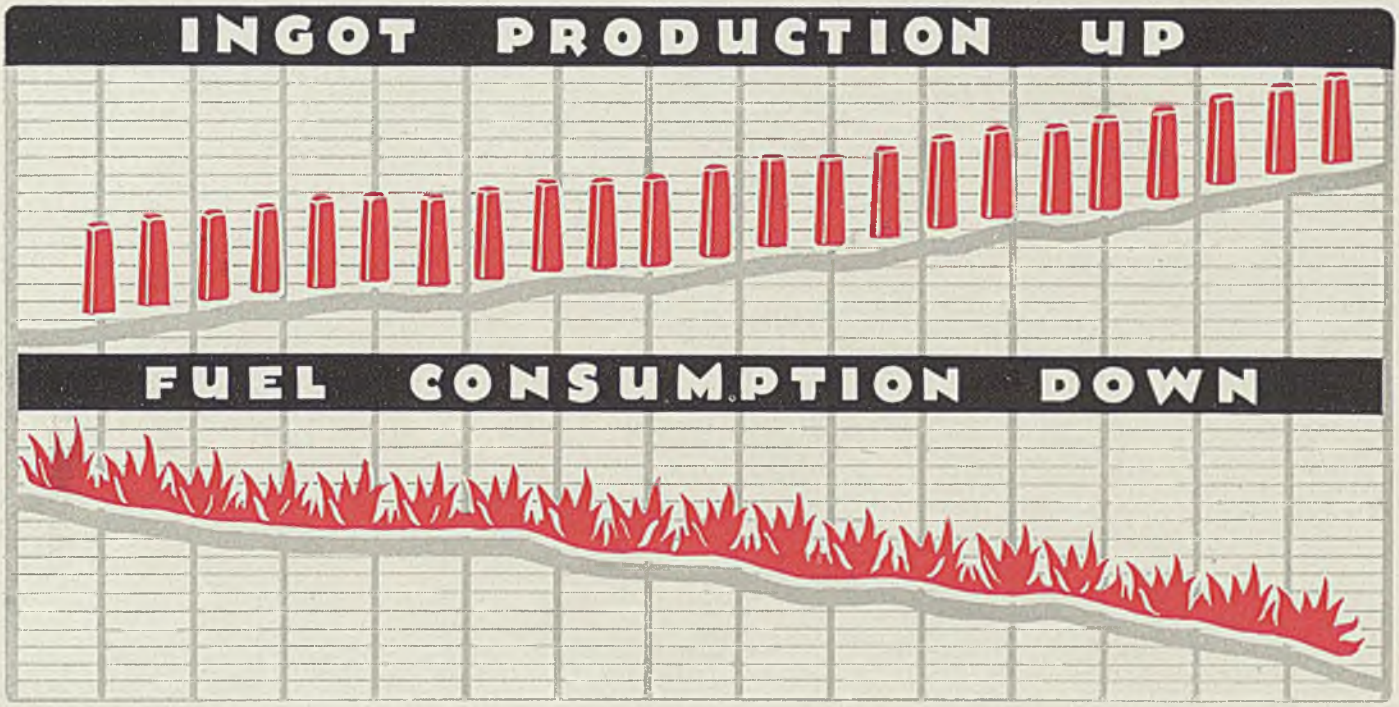
Welded Lighter Is Launched



■ Indicating the increasing acceptance of steel in freight lighter construction is this new type, welded, all-steel covered lighter built for Philadelphia & Reading Coal & Iron Co., Philadelphia, by Dravo Corp. at its Wilmington, Del., yards. One half-inch steel plate gives the hull unusual strength

A NEW PRINCIPLE—A NEW RESULT!

Increases production saves fuel!

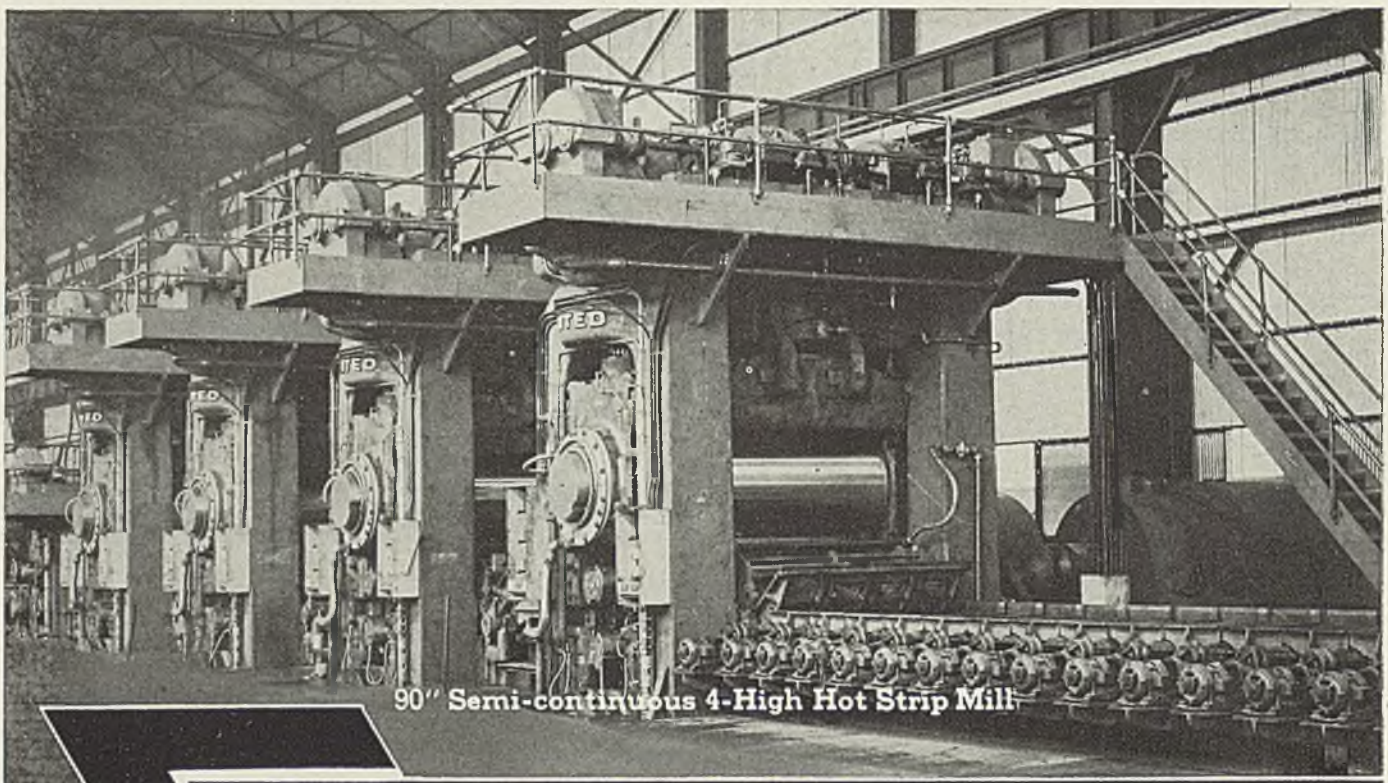


The AMCO PIT FURNACE

•Fully Automatic

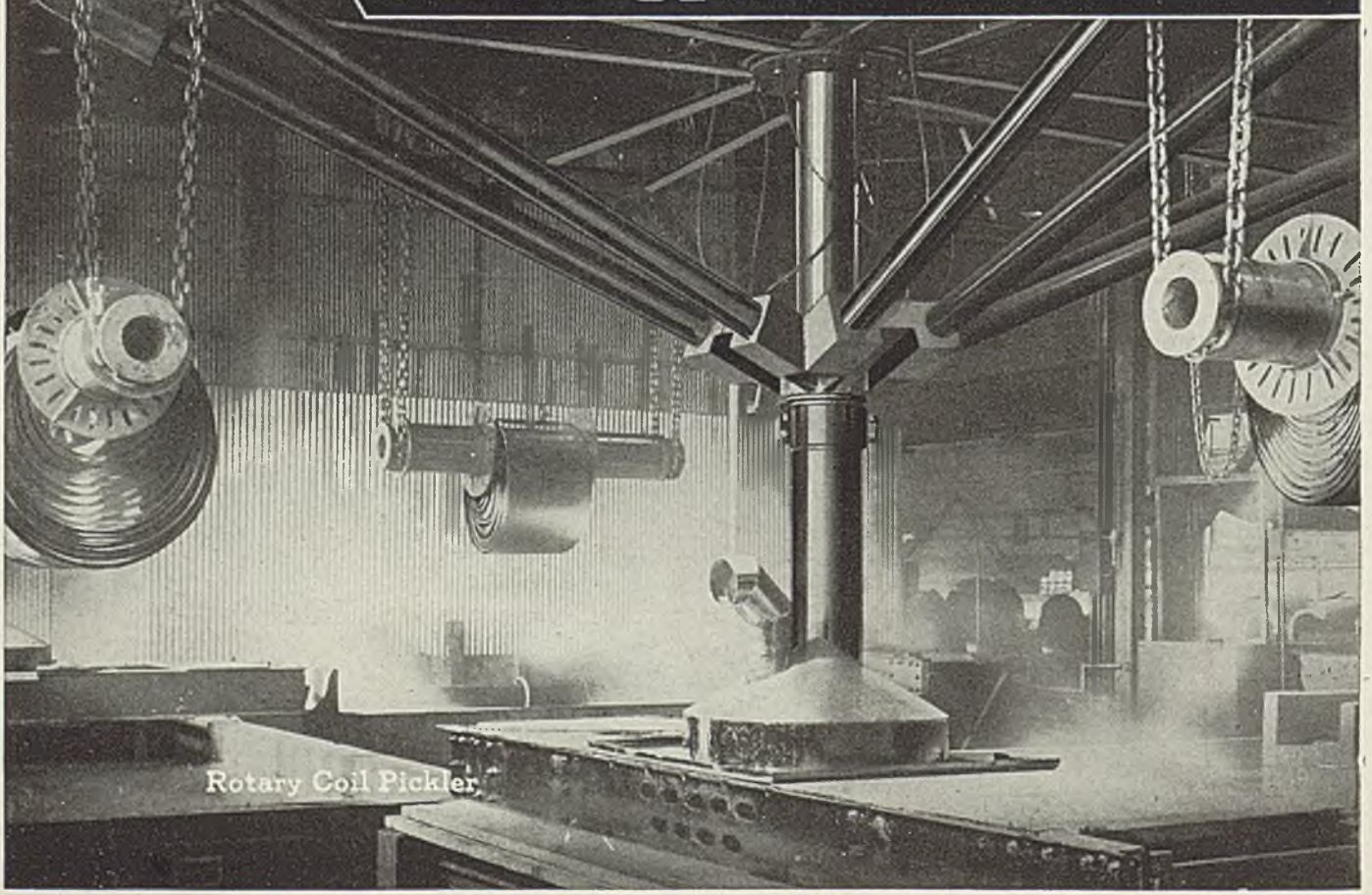
CONTINUOUS, uninterrupted fuel service avoids costly delays, decreases fuel consumption and increases tonnage. The AMCO method of firing eliminates cyclic adjustments of burners and controls. No unusual skill is required to secure efficient, uniform heating!

The AMSLER-MORTON COMPANY
FULTON BUILDING • PITTSBURGH, PA.



90" Semi-continuous 4-High Hot Strip Mill

GRANITE CITY



Rotary Coil Pickler

Continuous 96-inch Mill Now in Full Operation

(*Concluded from Page* 49)

tion from bad weather and damage from rough handling.

The layout and arrangement of the warehousing and shipping department have been carefully designed to permit rapid and efficient handling of all classes of hot rolled finished materials.

Further, every effort is made to learn what size and type of lift will be most convenient for unloading at the user's plant. This is an important factor in saving time and money for the customer.

Returning again to the finishing train of the hot mill, the steel for hot rolled strip in coils leaves the last stand as a long ribbon. The speed of the strip may be as great as 1400 feet per minute. The coiling pit is located under the main runout table, 370 feet from the last finishing stand. Most of the hot-rolled strip steel that is coiled becomes material for reduction in the cold mills, and since the cold mills roll the steel in a continuous operation, it is of great length. While coiling makes for convenience in handling, it also has much to do with the quality of the finished products of the cold mills.

These products usually require steel of a given grain size, and it is to obtain this that the strip is coiled while the temperature of the steel is high. Self-annealing through gradual cooling then takes place, establishing a uniform grain structure of the required size.

The two coilers, located in the coiling pit, are fed by the lifting of doors in the runout table just above them. The steel travels through guides into the coiling mechanism. After the strip is wound on the mandrel, the coil is ejected and tied, and placed on an endless conveyor which transports it to the coil storage building for cooling.

Cold Rolling Strip

Processing of the steel for the cold mills properly starts with the pickling of the hot-rolled strip which has cooled in coil form in the coil storage building. As the strip is uncoiled at the beginning of the continuous pickling line, ends are sheared square and adjacent ends of successive coils are either lapped or stitched together, or butted and arc-welded. Each of the two continuous picklers is 600 feet long and contains four acid tanks and two wash tanks. The strip steel passes through the continuous picklers at various speeds ranging as high as 168 feet per minute. As it emerges from the picklers, it is dried by hot air, oiled and recoiled. It is then reday for reduction in the cold mills.

Steel is fed cold from the pickled and oiled coil, through the three or four stands of the mills, depending on width of material and specifications, and is recoiled at the delivery side of the mill. Both mills are 4-high, the 93-inch mill having three stands and the 54-inch mill having four stands. The stands of each mill are set in tandem, permitting cumulative reduction of the steel with the one pass. Together, these mills have a rated capacity of 30,000 tons per month. A reduction of approximately 60 per cent in the thickness of the steel is customary for full cold rolling. Synchronization of the various stands in each mill is accomplished by means of electrical controls, and electro-limit gages provide an accurate and continuous check of the gage of the reduced strip.

All steel reduced in the cold mills is side-trimmed and roller-leveled in coil form. Further processing, and the operations involved, depend on the use of the material by the customer, which governs dimensions and specifications. Should the order being rolled call for sheets, the material is cut to the required lengths by a flying shear after side-trimming and roller-leveling.

Sheets and Coils Annealed

In order to provide the right physical properties for forming and drawing into finished products, the products of the cold mill are heat treated in the annealing furnaces. The steel may be annealed in either coil or sheet form, and when the operation is completed all of the strains resulting from cold reduction have been relieved. The annealing boxes are carefully sealed with sand, after which the air inside of them is treated with a deoxidizing gas, thereby reducing to a minimum the oxidation of the steel during annealing operation,

Exact control over temperature is a feature of the equipment for heat-treating. Sheets are piled on the bases and thermocouples are inserted in the stacks 2 inches from the top on diagonal corners and in the center 12 inches from the bottom. Lead wires are attached and passed through notches in the bottom of the furnace to a temperature recording instrument located on panel boards in the rear of each group of annealing furnaces. Coils are placed upright on the bases and handled generally in the same manner as sheets. The heat is applied rapidly until the desired temperature is reached. Then fully automatic controls maintain this temperature for the required length of time—about 24 hours for sheets and about 20 hours for coils. Gradual, even cooling of the steel takes place in the sealed boxes until the temperature has dropped to 200 degrees Fahr., when the steel is removed for air cooling to safe handling temperature.

The annealing process, to relieve all strains of cold reduction, leaves the steel soft and ductile. It is brought back to the right temper to prevent stretcher strains in forming and to provide the right stiffness in the finished product of the customer by being given a temper pass or "skin pass", as this processing is sometimes called. The temper mills are of both the 4-high roll and 2-high roll type, the unit used on each order depending on specifications of the steel. Sheets are fed singly while coiled material is run in a continuous strip.

Controlling Stiffness

In being passed through the temper mills, the steel may be reduced from 1 to 3 per cent, depending on the ratio of stiffness to ductility that the customer needs for best results in his manufacturing operations. The surface of the strip or sheets is also smoothed and polished to a high finish in this operation.

Each detail of this final rolling in the cold mill department is governed by the customer's requirements. Every effort is made to obtain complete information on how the steel in each order will be formed in the customer's plant and the service expected of the product he manufactures. Thoroughly experienced metallurgists are always available for consultation to develop recommendations to the production management.

The most advanced methods are used in all departments of the strip mill. Special attention has been given to ease of handling of the steel from one department to another. An example of this is the convenient placing of the roller levelers at the delivery sides of the temper mills. Passing of the sheets through the roller levelers flattens any slight variations and eliminates any bends in the sheets which occasionally result from handling. While the sheets are flat enough for ordinary purposes, after roller leveling, specifications sometimes call for sheets of perfect flatness. This requires stretcher leveling, a process in which the sheets are gripped at both ends by jaws attached to pistons. As the pistons force the jaws apart slowly by hydraulic pressure, the sheet is stretched taut and becomes perfectly flat.

PROGRESS IN STEELMAKING

Sintering in Rotary Kilns

■ THE PROBLEM of sintering ore fines, blast furnace flue dust and similar materials, has long been of considerable concern in the steel industry.

Several methods for sintering these materials to make a suitable feed for blast furnaces have been developed. Practically all these methods require the intermixing of some kind of fuel with the waste materials in order to obtain the proper sintering. At times it has also been necessary to screen the finished sinter to eliminate dust and poorly sintered material from the product so as to assure a suitable feed for the blast furnaces.

More than a quarter of a century ago the rotary kiln was well established for the burning of cement, and it was but natural to suggest this type of kiln be used for sintering ore fines and blast furnace flue dust. However, this problem was not nearly so simple as it appeared to be, as the fine material, when heated sufficiently to sinter, would cake up on the kiln lining, making it necessary to shut down frequently for the removal of the crust. Therefore, the idea of using the rotary kiln for sintering gained little headway at that time.

Rotary Kiln Developed

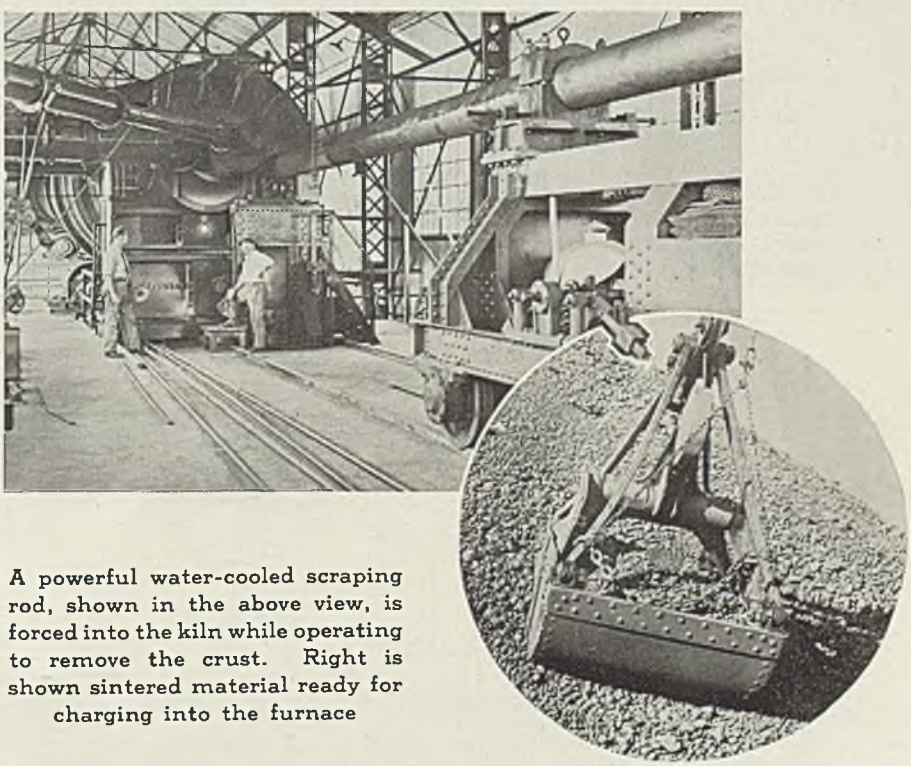
However, with the further development of the rotary kiln and realization of the disadvantages of the various other processes used, the engineers of F. L. Smidth & Co., New York, continued to work on the problem of using the rotary kiln for sintering of blast furnace flue dust, ore fines and similar materials, and by employing a special

This article has been prepared for STEEL by the engineering staff of F. L. Smidth Co., New York

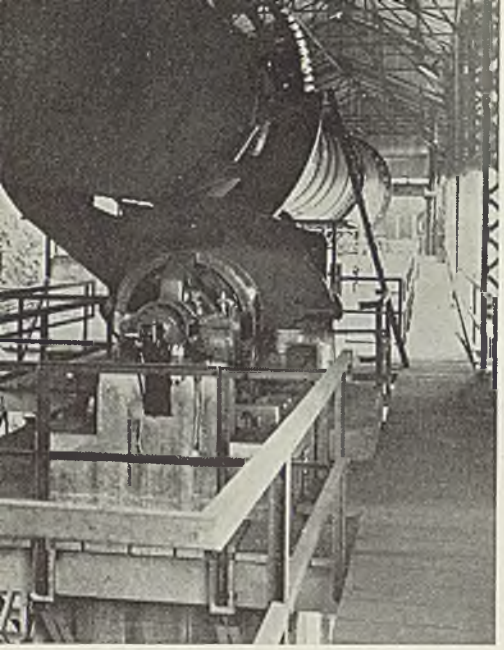
shape of the rotary kiln, and special firing methods, have succeeded in solving the problem.

The special shape of the rotary kiln causes the sinter to form in a short section of the kiln close to the discharge end and only a small amount adheres to the kiln lining. While the material adhering to the kiln lining in the sintering zone has a tendency to build up gradually, a powerful, water-cooled scraping rod has been developed which may be forced into the kiln for removal of the crust while the kiln is operating without injury to the refractory lining.

Two distinctly different firing methods are used for heating the rotary sintering kiln, depending upon the type of fuel which is available. If a rich fuel is used, such



A powerful water-cooled scraping rod, shown in the above view, is forced into the kiln while operating to remove the crust. Right is shown sintered material ready for charging into the furnace



View underneath the sintering kiln showing the driving mechanism

as pulverized coal, oil, natural gas or coke oven gas, the flame temperature will be sufficiently high to produce the necessary temperature in the sintering zone, and therefore in these cases it is only a question of concentrating the flame sufficiently to get a short sintering zone.

However, when a poor fuel is used, such as blast furnace gas or producer gas, it is essential to employ the special reduction and re-oxidation process invented and introduced by F. L. Smidth & Co. In this case the pulverized or granular material to be sintered should contain some carbon, which in blast furnace dust is already present, but which must be added if ore fines only are to be sintered, by admixing a few per cent of coke breeze or anthracite fines.

Causes Re-oxidation

The carbon contained in the material to be sintered will produce a reduction of the iron in the first part of the rotary kiln and when the reduced and pre-heated material enters the sintering zone, preheated air is blown on the material, thus causing the re-oxidation. This process develops considerable heat in the material and thus raises the temperature to that required for sintering.

By employing adjustable means for the speed of the kiln as well as the fuel supply, the operators are enabled to control both the temperature and the speed of the material through the sintering zone, whereby the complete sintering of all the material is easily obtained.

The sinter drops from the kiln to a cooler of special design consisting of a pan conveyor housed in such a manner that all the air required for combustion in the kiln and even an excess if desired, may be drawn through this cooler reducing the temperature of the sinter and at the same time preheating the combustion air for the kiln, thereby improving, to a great extent, the thermal efficiency of the entire installation.

Cools Without Grinding

This special type of cooler which has been developed permits the cooling of the sinter without any grinding action, thereby avoiding breakage of same so that it is not necessary to screen the product, which generally runs between ⅝-inch and 2 inches in size.

The accompanying sketch shows a typical arrangement of a rotary kiln sinter plant as developed by F. L. Smidth & Co. and successfully operated in many parts of the world.

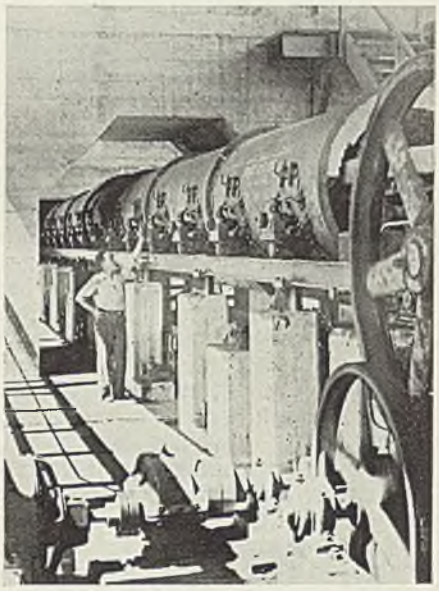
The plant shown is designed for sintering of flue dust using blast furnace gas as fuel. The flue dust is brought from the blast furnaces in hopper-dump cars which can discharge into the feed bin, or into the adjacent storage from which the flue dust may be reclaimed by a traveling crane equipped with a clam-shell bucket.

From the feed bins the flue dust is withdrawn by means of feeders and conveying machinery and to the surge hoppers above the kilns.

At this point a feeder, the speed of which is synchronized with the kiln, delivers the flue dust to the kiln. This in turn discharges to the cooler from which the finished product goes by conveyor to a hopper. From this the cars taking the nodules to the blast furnaces can be charged.

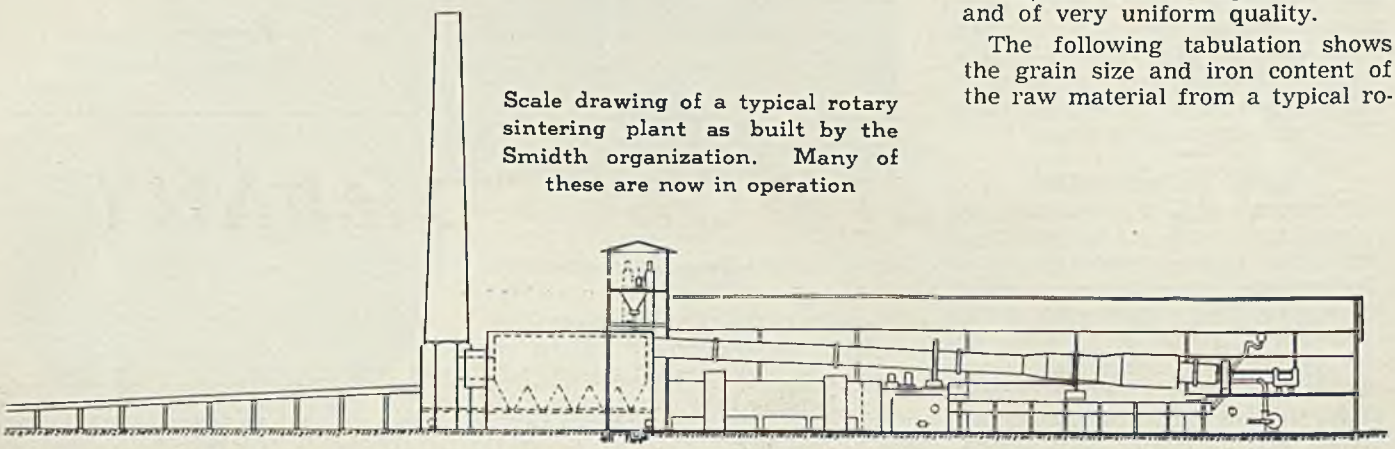
A low pressure fan is used for drawing the cooling air through the cooler and for supplying the preheated combustion air to the kiln.

The practical application of this type of installation has proved that raw materials such as fresh or stored flue dust, rolling mill scales and other fine waste containing iron, can be handled in the kiln without preliminary treatment. Furthermore, the percentage of moisture, the grain size and the percentage of carbon in the material have no influence on the process due to the fact that the combustion in the sintering zone can be constantly watched and regulated, whereby it is possible to produce a sinter of the proper degree of porosity, and yet strong and coarse and of very uniform quality.



Apparatus used for cooling sinter, located underneath the kiln

The following tabulation shows the grain size and iron content of the raw material from a typical ro-



Scale drawing of a typical rotary sintering plant as built by the Smidth organization. Many of these are now in operation

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IN power plant piping, it's an established fact that the safest pipe is the best investment.

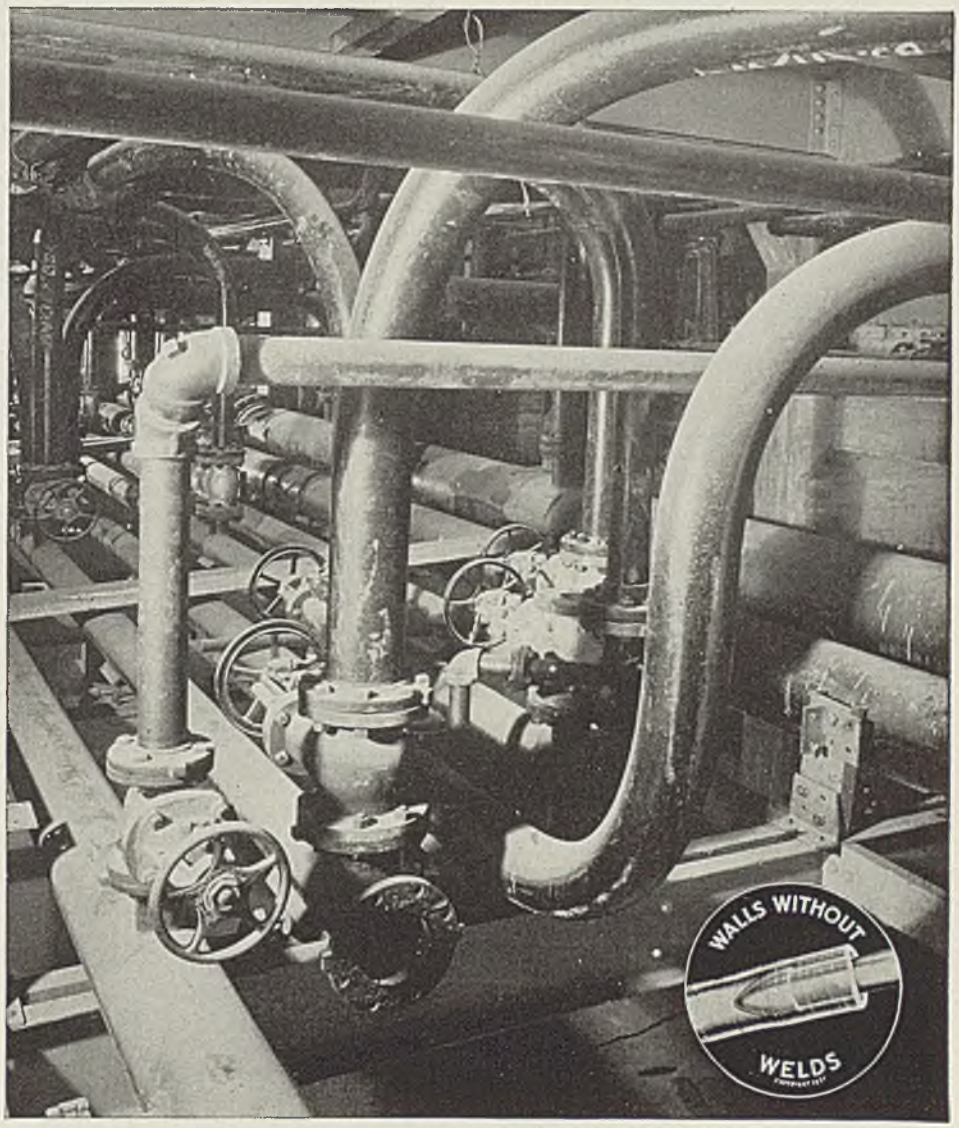
That's why leading power plant engineers prefer to work with NATIONAL Seamless—the pipe that is made without a weld, with no line of potential weakness.

These men tell us that NATIONAL Seamless cannot be excelled in high pressure steam service . . . that it stands up satisfactorily under expansion, contraction, vibration, due to pressure and all other rigorous conditions in power plant operation. They appreciate its ready workability, too . . . they can weld it with ease, bend and flange it without injury, and readily adapt it to any type of joint.

In reaching these conclusions, power plant engineers are confirming the results of our own laboratory tests, for the job of testing NATIONAL Seamless Pipe is one that never ends.

Every raw material that goes into the production of NATIONAL Seamless must first meet rigid specifications. Billets of steel, sound and flawless in every respect, are used for piercing, as any defect in the metal will be disclosed in this process. Every finished length of this pipe must pass through final tests and inspections, including the hydrostatic test, in which it is subject to pressures far in excess of actual working pressures.

No wonder power plant engineers have confidence in NATIONAL Seamless Pipe. For it is METALLURGY'S NEAREST APPROACH TO THE PERFECT PIPE! Write for complete details.



THE SMOOTH SURFACE *of* NATIONAL *Seamless Pipe, with the absence of any welding ridge, is ideal for the application of insulating materials.*

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* — United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

tary kiln installation for sintering of flue dust.

Grain Size mm	Amt.	Iron Content Per Cent	Loss on Ignition
Over 1	0.30	16.61	51.82
0.75—1	0.49	15.51	52.00
0.49—0.75	2.17	22.54	32.88
0.25—0.49	27.06	35.12	16.12
0.20—0.25	22.65	40.61	11.38
0.10—0.20	32.49	40.25	9.82
Under 0.10	14.84	36.44	12.40

The average chemical composition of the flue dust and the corresponding sinter is shown below:

Components	Flue Dust Per Cent	Sinter Per Cent
SiO_2	9.80	12.71
Al_2O_3	5.95	7.46
Fe (total)	36.51	45.64
Fe metallic	.....	0.83
FeO	15.39	41.22
Fe_2O_3	34.21	18.19
Mn	0.73	0.86
CaO	10.22	12.74
MgO	1.45	1.85
P	0.64	0.90
S	0.13	0.13
C	4.70	0.28
Co_2	6.88	.....

The operation of the equipment is very simple, requiring but 3 or 4 operators on each shift for a single unit.

This type of sintering plant has been built in several sizes having capacities exceeding 500 tons per 24 hours in a single unit. Larger units can readily be made, but for the sake of flexibility it is often found advantageous for larger capacities to install two or more units of smaller size, in which case the labor requirements are only increased by 1 or 2 men for each additional unit.

Several Fuels Available

The fuel required generally is between 13,000 and 14,000 cubic feet of blast furnace gas per ton of sinter produced, but several other types of fuel, such as coke oven gas, producer gas, pulverized coal or fuel oil, can readily be used, the type of fuel selected depending only on the cost.

Due to the simplicity of the entire installation the power consumption is very low and has been found to be between 7 and 8 kilowatt hours per ton of sinter.

The maintenance cost of this type of equipment, due to its rugged design, is very low, and consequently the lost time due to repairs to the equipment is also extremely low.

The recent improvements in the design of the rotary kiln for sintering pulverulent material containing iron have resulted in an entirely reliable and continuous method of producing an excellent quality of sinter in a much simplified plant wherein the first cost of the plant and the production cost have been materially decreased compared with older installations.

The use of sinter in blast furnaces has a pronounced beneficial effect on the operation of same in that even relatively small amounts of sinter tend to eliminate bridging and increases the production. In some cases, where the blast furnace temporarily has been charged exclusively with sinter, an increase in production of 25 to 30 per cent has been obtained and in addition the fuel consumption of the blast furnace has been reduced. Savings are thus obtained and profitable use is made of materials which may otherwise be wasted.

As already mentioned this type of equipment has successfully been used for many types of materials and the latest installation made is for the sintering of manganese ore at the plant of the Cuban Mining Co., near Santiago, Cuba, where this type of equipment has been installed to replace a sintering machine of another type for the treatment of ore concentrates from a flotation plant, as well as the slimes and flue dust.

This installation has resulted in the production of a superior product, as well as the elimination of a bad dust nuisance and a decided reduction in the production cost.

Thermostatic Metal Has Third Element Added

■ A thermostatic metal known as Tri-Ply is being marketed by Laminated Metals Corp., 775 Eddy street, Providence, R. I., and features addition of a third element, a highly active copper alloy, between the active and inactive metal.

Smoother operation is claimed and uniform thermostatic movement is accomplished throughout the operating range, which is from 0 to 1200 degrees Fahr. The active metal is 22 per cent nickel steel, while the inactive metal is 36 to 42 per cent nickel steel. When heat or cold is applied to the thermostatic metal, the third element is the first to respond and functions thermostatically with the active metal side and physically against the inactive metal, causing the entire strip to move in an arc. A new method of combining the three metals is said to assure them from ever separating even under the most severe conditions.

Describes Applications Of Fusible Alloys With Tin

■ In technical publication series B, No. 5, of the International Tin Research and Development council, entitled "Fusible Alloys Containing Tin", E. J. Daniels, describes interesting and surprising applications of fusible alloys.

It is shown that Wood's metal, Lipowitz's alloy and other well-known compositions are extremely close approximations to the eutectic mixtures of phases consisting of either pure metals, solid solutions of one metal in another or intermetallic compounds.

The microstructure is important since the strength and behavior of the alloys depend on it. It is important to cast the alloys under controlled conditions to get the desirable results in regard to plasticity and creep. Solidification of many of these alloys is accompanied by expansion instead of contraction because they contain bismuth or antimony. Problems of corrosion of fusible alloys and methods of avoiding these troubles are discussed.

Among the applications given are sprinkler plugs, boiler plugs, fusible links, seals for glass apparatus, patterns for molding and electroplating, tube bending, tempering baths and die-mounting.

Use Malleable Iron For Truck Installations

■ Malleable iron for many parts is now being used in installations to convert Ford and Chevrolet trucks into six wheelers by the Acme Six Wheeler Co., Cadillac, Mich.

Conversion installation consists of an extension of the frame together with a floating rear axle and the extra wheels necessary to carry the additional load resulting from extension of the frame body.

Several reasons are put forth for the use of this material in these installations, the main reason being that malleable iron has the necessary strength, toughness and ductility to stand shock loads. Other factors that contribute to the usefulness of the material are its properties of easier machining and light weight.

Attachment Sees Defects

■ A microscope attachment known as the Marks Polarizer and Analyzer, manufactured by Laboratory Equipment Co., 148 Lafayette street, New York, enables technicians to instantly detect defects and irregularities in transparent materials such as glass, rubber and plastics.

In the case of opaque materials, thin sections are made, and in this way ores, metals, alloys and ceramics are tested. The new attachment is said to facilitate identification and grading of crystals, dusts, food products, plant fibers, drugs, textiles, lacquers, living tissue, leather, lubricating greases and many other complex substances. The device slips into place on any microscope for instant use.

POWER DRIVES

Design, Installation and Care of Plain Bearings

■ PLAIN BEARINGS, if properly designed, installed and maintained, have been and are giving very satisfactory operation.

In a plant recently visited, the superintendent, who had been in the plant for 44 year in various capacities, stated that no babbitt bearings on the lineshafts had failed or interrupted operation during that period.

These two shafts were about 75 feet long, operating at 178 and 294 revolutions per minute, respectively. One shaft is subjected to a light, fine dust in the atmosphere; the other shaft is practically dust free. Every second year the plant and equipment, including these shafts, is overhauled. Each bearing is inspected, rebabbitted if worn, and the shaft realigned. Oiling is performed weekly from a catwalk so the oiler has free and safe access to every bearing.

Maintenance Is Excellent

Much of the reliability of this installation, as in practically all bearing service, is due to the excellent care in maintenance and servicing, especially in the careful check on alignment. Improper alignment is hard on bearings and a big waster of power, irrespective of the type of bearing.

Some engineers favor babbitt or sleeve bearings because of the low cost of supplies which must be carried for replacement. Whenever a bearing requires replacement it may be rebabbitted or, if bored from cored or solid metal, only a relatively small investment in replacements need be carried. In many instances a babbitt substitute can be used if the proper size of bearing is not in stock.

Another advantage suggested by these men is that dismantling of pulleys is unnecessary to replace a bearing. In some instances, as on crank shafts or shafts where the bearing diameter is less than that of the shaft, only split bearings may be used.

Many objections to sleeve bearings have arisen because the bearing was not designed, installed or maintained properly. This is a valid objection to any type of bearing, although some types will stand up under more abuse than will other types of bearings.

Two of the most important points in connection with the design of a babbitt or sleeve bearing are the clearance for the oil film and the grooving of the bearing to distribute the oil over the bearing surface. The bearing requires sufficient space for a film of oil heavy enough to support the shaft. Too much clearance will permit the oil to flow or spread too rapidly and be squeezed out, thus not providing the necessary protective film. Using a heavier oil may not provide fast enough flow.

Grooving is especially important, although the governing principles are not so well understood. In many cases grooving follows the pet ideas of the mechanic doing the work. Sometimes these work satisfactorily; if too large, they feed the oil too rapidly; if too small or not directed properly, the oil may not go where it is needed to maintain the protective film. Sleeve bearing manufacturers provide literature explaining and illustrating grooving for operation under various conditions of speed and pressure.

In one method of grooving that has given good satisfaction, the grooves are curved in form, extending from the oil holes in the direction of travel of the shaft to near the ends of the bearing so oil will flow into the space between the shaft and bearing. Annular grooves at the ends of the bearing with small holes drilled through permit excess oil to drain back into the oil reservoir where oil rings are used. This prevents the oil from working out on the shaft into the machine or motor.

Prevent Oil Pumping

Where a shaft operates at high speed, the grooving curve may have to be reversed to prevent oil pumping. An important point in grooving is to remember that the grooves should not extend below the load or maximum pressure point, as to do so not only decreases the pressure area but tends to wipe the film of oil from the bearing. A rounded edge on the groove is necessary under any condition, as a sharp edge will wipe or scrape the oil from the shaft, thus destroying the protective film.

In many cases the oiler adds lubricant at specified periods without any attention to the oil level, in some cases permitting the overflow plug to clog up and the bearing to overflow at the shaft ends. On a motor, the fan action of the rotor or armature then pulls the oil from the bearing. Similarly, where oil hole or inspection covers are loose or open, this same fan action will draw oil from the bearing. Where oil throwers are used, some provision is necessary for catching and directing the flow of the oil thrown.

Shaft alignment is essential for the long life of bearings. Also, the distance of the load on the shaft from the bearing has an important influence upon life and satisfactory operation. For example, if a tight and a loose pulley are placed on an extended overhanging shaft, locating the tight pulley next to the bearing produces less leverage on the bearing in operation.

Overheating Impairs Bearing

Babbitt bearings, particularly those with a lead base, may have their value impaired by overheating before pouring. Temperature and pouring conditions are important and have been widely disseminated by the manufacturers of the metals, but the actual temperatures obtained are generally a guess. In some cases, instead of moving the babbitt heating equipment close to the bearing to be poured, the metal has been superheated and carried some distance. The bearing then was condemned because of early failure.

Satisfactory bearing operation, irrespective of the type used, if of the proper size for the load, depends very largely upon the installation and treatment by the user. Before condemning the bearing, check and see if something within the user's power to correct may not be at fault.

Too Much Oil

■ Because of carbonizing in the high-pressure valves of an air compressor, the operator decided to increase the oil feed which was introduced in the air intake to the compressor, according to an item reported in the October issue of *Esso Oilways*.

Very shortly the compressor was out of service due to excessive gum and carbon on the valves. After cleaning, the compressor was started again with an increased oil feed. This time the compressor was again down within a few days. Additional cleanings and startings gave similar results.

A lubrication engineer was called in, as the oil was considered to be at fault. His recommendation was to reduce the oil feed to two drops per minute to each cylinder, instead of almost flooding the intake. With this change the compressor gave no further trouble.

Where the lubricant is out of sight when applied, as on closed bearings or into air and steam cylinders, it is often difficult to make operators realize too much lubricant may, and usually does, cause trouble. On open bearings any surplus overflows, and thus the operator knows that the bearing is supplied. Men who do not understand lubrication very often overlubricate. Overlubrication is like overeating; it may cause a nightmare of trouble.

♦

In a plant with an exceptionally high and irregular demand on the air supply, air storage tanks are placed near the machines served instead of using a single tank at the air compressor. This provides a more even air supply where and when needed than if the storage tanks were farther away and several machines were drawing at the same moment on the air in the line.

♦

To prevent corrosion or gumming of pneumatic tools when in storage, one metalworking concern uses a highly refined oil with a viscosity range between that of kerosene and light lubricating oil. Since using this oil, no pneumatic tools taken from storage have shown any traces of gummy deposits or corrosion.

♦

Performance of a gear depends largely upon the accuracy with which it is produced. Continuance of this performance depends upon the treatment and servicing after it is installed.

♦

Three factors determine the satisfactory operation of bearings: (1) A bearing of the proper type and size must be selected in accordance with the requirements of the work to be done, (2) the bearing selected must be installed correctly to insure the user receiving the service and satisfaction he rightly may expect, and (3) the bearing must be maintained and serviced properly and regularly by the user after the installation has been made.

♦

With modern bearings requiring lubrication at long periods some automatic reminder is necessary to see that lubrication is not overlooked.

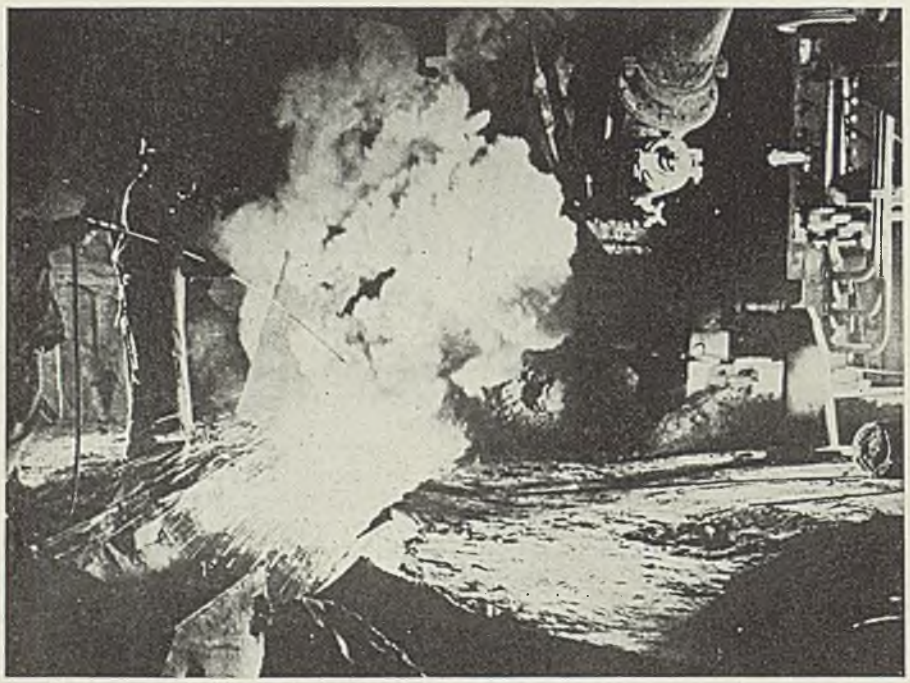
♦

Photo-electric relays are used to control the drives to automatic can-making machinery in a continuous production line having several machines in line with conveyors between. In one installation, the relay stops the machine when conveyor leading to the machine is empty. A second relay is used in the same line to indicate when the line is jammed because the first machine is operating faster than the second.

♦

Generally bending loads determine the diameter of a lineshaft; if a shaft is large enough to resist bending with normal hanger spacing it will take care of the torsion or twisting moment.

Lancing the Ladle



■ With the iron notch drilled until the compressed air driven bit is tight against the skull and with all loose clay rabbled out, an oxygen-lance is guided into the notch by a couple of attendants clothed in safety garments. Once the oxygen "takes hold" it is not long until molten iron is in the runner on its way to the ladle. Here is shown the start of the flow at the recently completed stack of American Rolling Mill Co., Hamilton, O.

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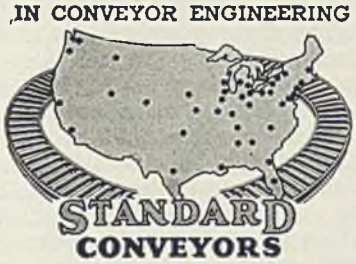

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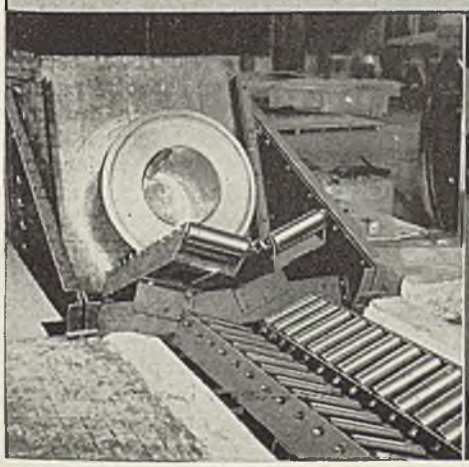
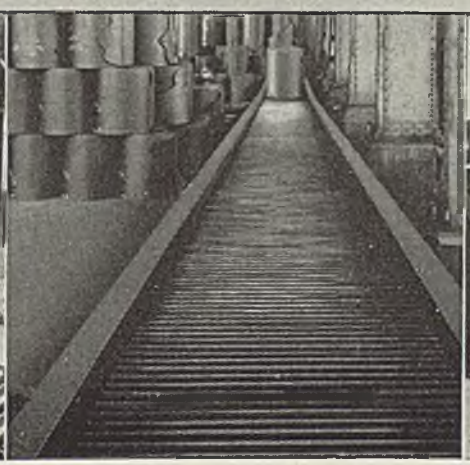
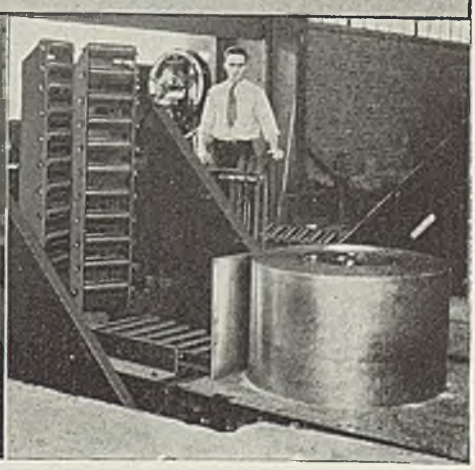






SURFACE TREATMENT AND FINISHING OF METALS

Complex Color Designs Are Applied Directly to Metal by Lithographing

INCREASED use of color and individual trademarks by various firms to identify and enhance the advertising value of their products both in shipment and merchandising has brought about an ever increasing demand for elaborately decorated metal containers.

Designs, which formerly could only be reproduced on paper, involving intricate and vari-colored trademarks and fine printing, can now be applied directly on metal through the process of lithographing. This work is done on the flat metal sheets prior to fabrication of the container and, owing to the baking treatment followed in the lithographing procedure, the applied film of color and varnish has become sufficiently tough and durable to withstand without injury the forming and manufacturing operations incident to the production of steel drums and pails.

Methods and equipment used by Ohio Corrugating Co., Warren, O., are typical of the best practice followed in lithographing on metal. This company manufactures a complete line of steel drums and pails for various products such as petroleum, alcohol, paint and food and which field is representative of the principal users of highly decorated steel containers with multicolored designs, trademarks and other features of advertising and sales value.

The steel used by this company is supplied by the mills in the form of hot-rolled, cold-rolled, or pickled and annealed sheets. These sheets are clean and dry when received and generally can be utilized without any preliminary treatment.

The first operation in the manufacture of lithographed steel containers involves coating the sheets on one side with a special inside-coating varnish. This is accomplished on a roller coating machine which automatically feeds the sheets to conveyor racks which pass through a long drying oven. There are some exceptions to the use of this varnish for inside coating, notably in the case of food products containers, which are generally coated with a specially-formulated sanitary coating, also alcohol containers which are usually made from steel left uncoated on the inside. When the inside coated sheets have passed through the drying oven, they are ready for a solid color background coat of baking enamel which is applied on the outside surface over which the lithographed designs are later imprinted.

Application of the background coat is attained on a roller coating machine with the sheets passing through a drying oven in the same manner as described for the inside coating procedure. All roller coatings are applied so that a margin of bare metal remains on the side ends of the sheet to permit weld-

In a special press applying great pressure, the transfer plate is inked with lithographic ink and the impression made on the transfer paper

ing the shell and avoidance of burning and blistering when the container is fabricated. This margin is spray coated when the welding process has been completed.

The oven, into which the roller coating machine discharges the sheets, is 90 feet long, gas fired, thermostatically controlled and of the conveyor type. Air is heated by burners located above the oven, air being fed into the oven at regular intervals. Burners are equipped with safety devices which automatically shut off the supply of gas in case of failure in any part of the system. Inside varnish coatings and most background coats are baked at a temperature of 210 degrees Fahr., while the special inside sanitary coatings are baked at a temperature of approximately 450 degrees Fahr. Thirty minutes is usually required for the baking process in either case.

At the discharge end of the oven, coated sheets are removed and placed in a vertical position in storage racks where they are held as a "bank" to supply the lithographing operations which follow.

Details of Process

Lithographing involves great care, and many intricate preparatory steps and a wide knowledge and experience to successfully cope with the various problems which arise from time to time. When a color design has been selected, the design is usually reproduced in the form of black and white working drawings. Transfer plates are then made from these drawings by a photomechanical process, making one plate for each color by photographing only those portions intended for each color. The transfer plates are zinc sheets which have been etched slightly by chemical or mechanical means to produce a smooth matte surface.

These plates are then sensitized, printed, and developed. Through the photographic process, the surface of the plate is conditioned in a manner that only the image will take ink, and it is from these plates that the actual printing plates to be used in the press are made. The next step requires inking of the transfer plate with lithographic ink and obtaining impressioins on transfer paper in a special transfer press which applies a high degree of pressure. This transfer paper has a specially-prepared surface which remains in a semimoist condition for a considerable period of time and keeps the ink soft for the steps to follow.

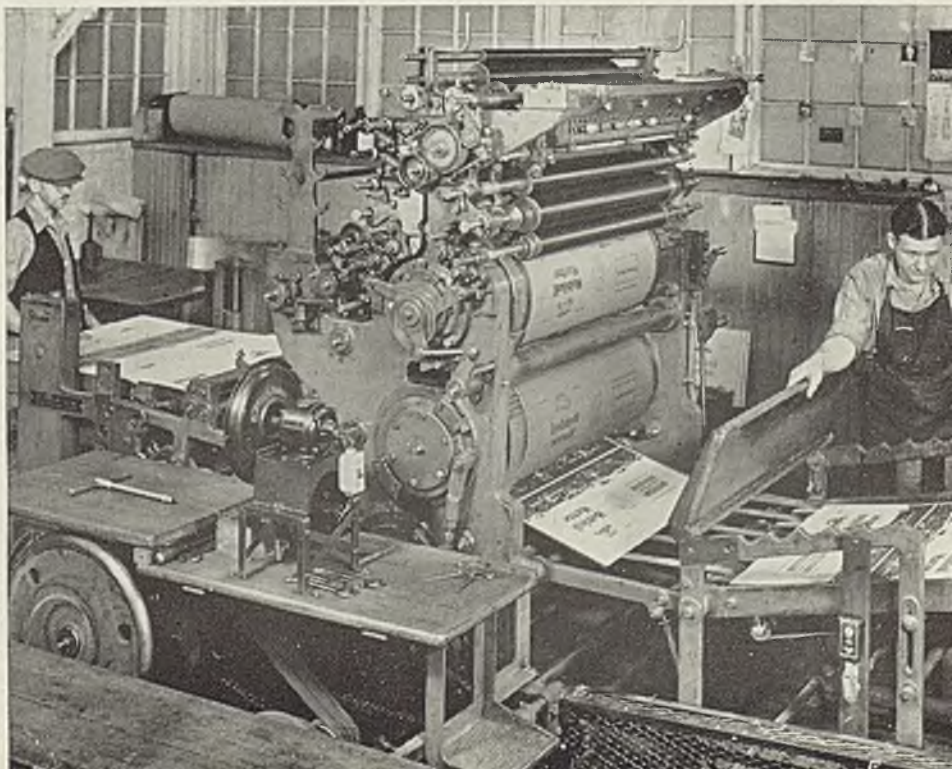
The transfer paper impressions are then mounted with exacting care in the positions which they are to appear on the final printing plate. Each image must be closely keyed with the "register" marks in order for each color to be printed in the exact proper place when the plates are mounted in the lithographing press. With each color being printed from a separate plate, the need for this precision is of vital importance. Printing plates are heavy zinc sheets which have a smooth matte surface exactly like the transfer plates, the surface being similar to a lightly grit-blasted steel surface and affording a foundation to which lithograph ink adheres firmly.

A blank printing plate is then placed in the transfer press with the mounted transfer paper arranged in proper position on the matte surface. Heavy pressure is applied and the lithographic ink on the mounted transfer paper is transferred to the zinc surface of the blank printing plate. The character of this ink is such that it has no affinity for water and, when the plate is moistened, the blank portions will not take ink from a roller, while the image will. When the printing plate is removed from the transfer press, it is washed with an etching solution which further aids the clear areas to resist ink and the image to take it.

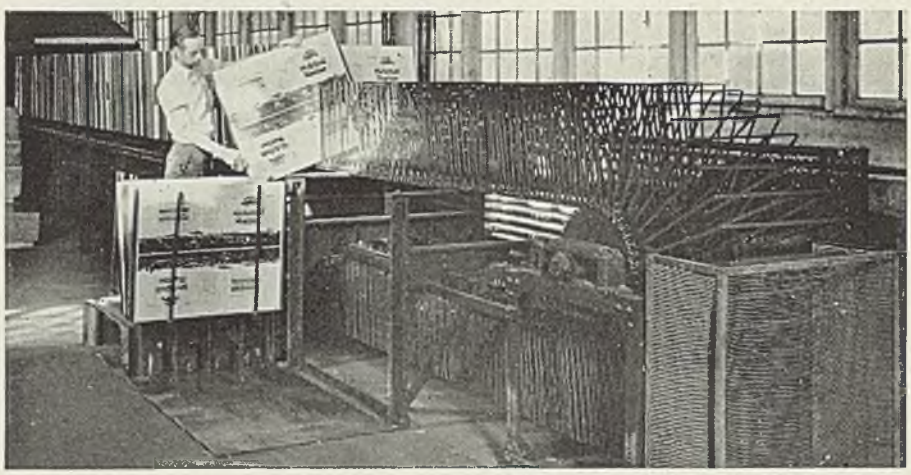
The plate is then ready to be mounted on the printing press cylinder and actual printing is carried out on the latest type off-set lithograph presses designed especially for printing on metal and which have a capacity of 2800 sheets per hour. Great precision is required in mounting the plate and when this has been accomplished, the plate is moistened by a set of damp rollers and then inked by a set of ink rollers as the cylinder with mounted plate rotates.

After lithographing, the sheets receive a final coating of clear, alcohol-resistant varnish for protection and a lustrous finish

For reasons as described, the ink only adheres to the images and, as the cylinder rotates further, the inked plate comes in contact with another cylinder covered with a rubber "blanket." The ink is transferred to this blanket, which in turn rotates and transfers the ink to the flat metal sheets being printed. The printed sheets are fed directly into a drying oven similar to the process explained for coated sheets and, when the run is completed, the printing plate is removed, the press thoroughly cleaned, and another plate mounted for the next color. This process is repeated until all colors have been applied, when the litho-



In this off-set press the sheets are lithographed and fed directly into a drying oven. The machine, built especially for printing on metal, is the latest type and has a capacity of 2800 sheets per hour



Here the finished sheets are being removed from the conveyor which has carried them through the oven. They are then formed and joined by electric welding into cylinders which comprise the bodies of the steel containers

graphed surface receives a final coating of clear, alcohol-resistant varnish for protection and a lustrous finish.

As will be noted, the lithographing and coating process is carried out on the flat sheets and it is then necessary to form and join these sheets by electric welding into cylinders which represent the bodies for pails and drums. Subsequent operations involve affixing the bottoms and tops to the body cylinder in the case of closed head containers, installation of pouring and other equipment to readily withdraw contents, and final pressure tests to insure against seepage. When this and inspection have been completed, the containers are conveyed to freight cars where they are loaded and dunnaged with great care and shipped as rapidly as they are produced.

♦

Firebricks Tested For Furnace Lining

■ Life of some industrial furnaces depends upon ability of firebrick making up the lining to resist deformation at operating temperatures. Use of heat-insulating materials on installations where they have not been formerly used, such as roofs of open-hearth furnaces and certain types of heat treating furnaces, has increased greatly the possibility of plastic deformation of the fireclay brick exposed directly to furnace heat. The reason is that insulation results in increasing the average temperature of the firebrick as compared with uninsulated firebrick.

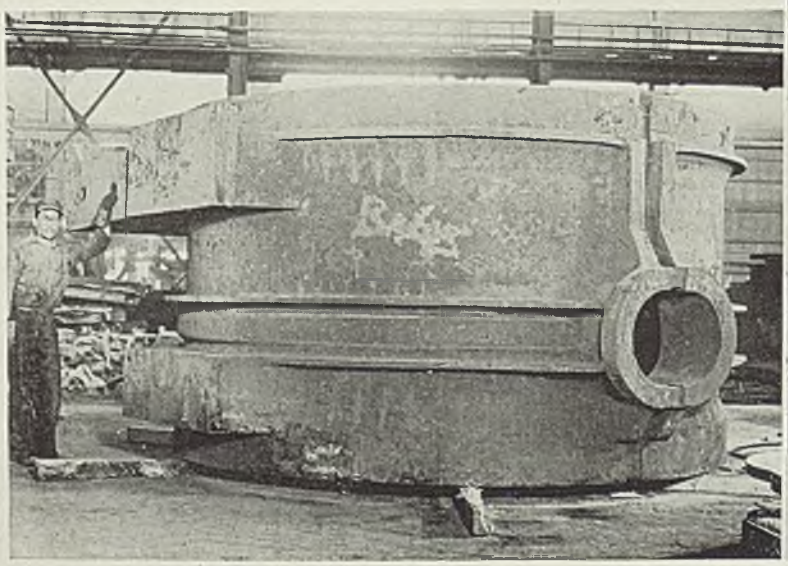
National bureau of standards, Washington, recently investigated this problem and has published its results in research paper RP 1030 entitled "Deformation and Young's Modulus of Fireclay Brick in Flexure at 1220 degrees Cent." This paper was prepared by Raymond A. Heindl and William L. Pendergast.

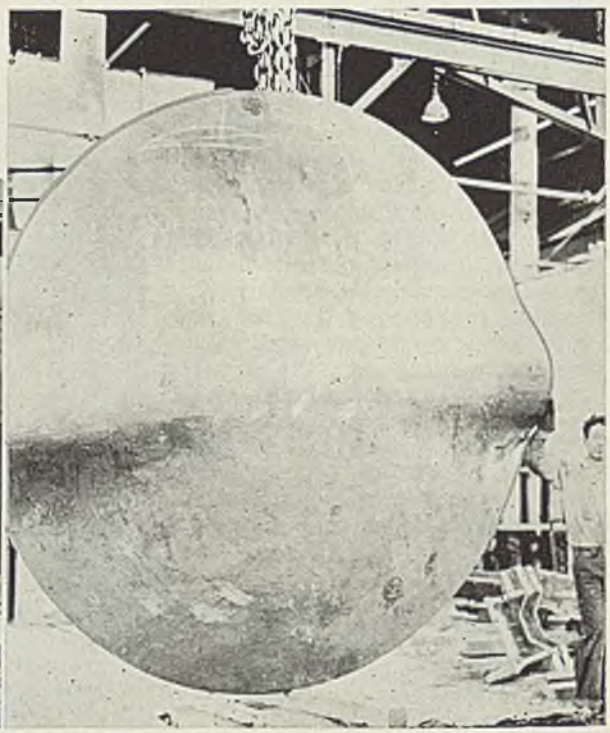
Credit to Foundrymen

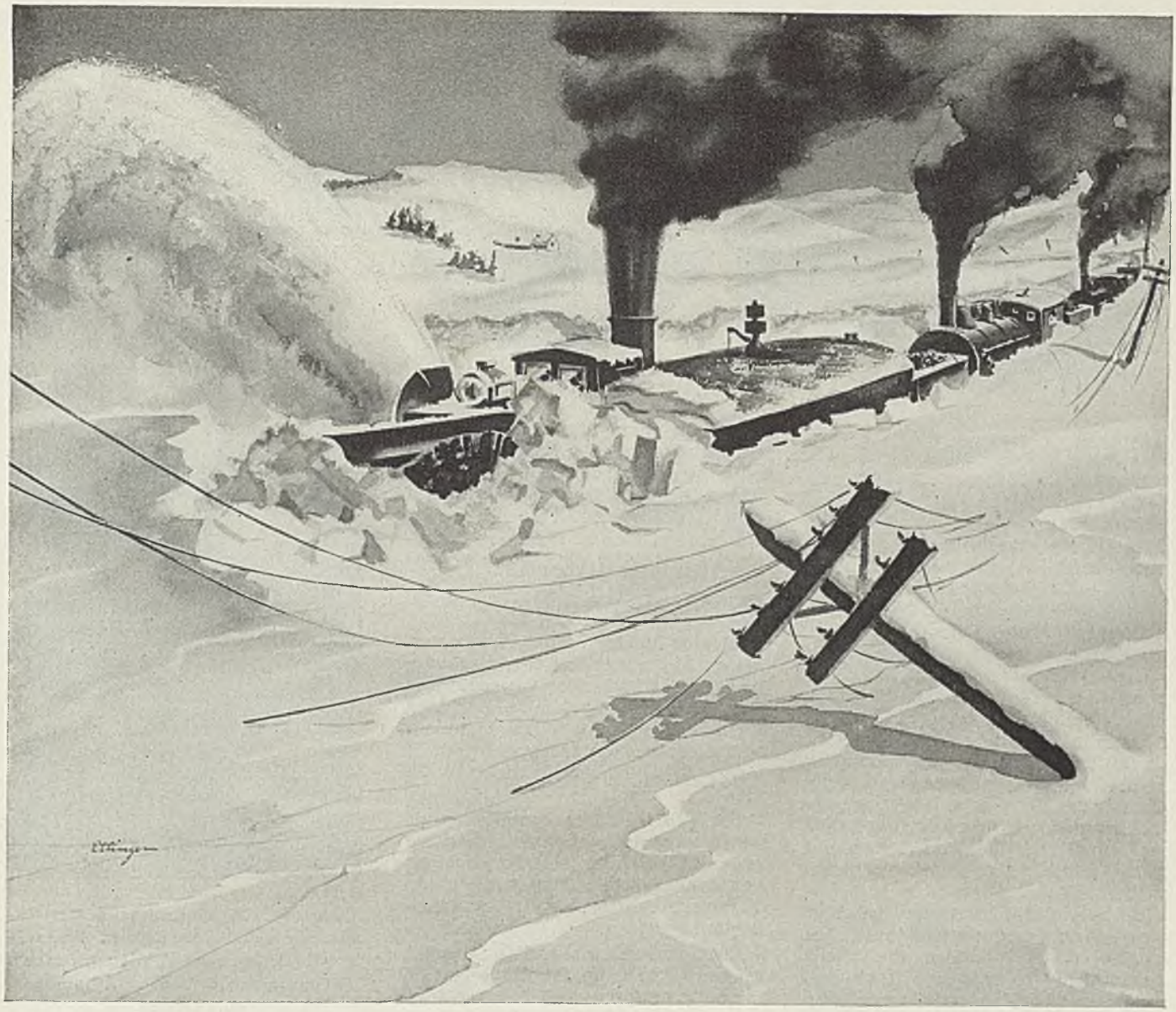
■ In publishing the article entitled "Modern Open Hearth Practice in the Steel Foundry" by John W. Porter, assistant works manager, American Steel Foundries, Granite City, Ill., in STEEL of Dec. 6, Pages 46-50, the footnote identifying the source of the article inadvertently was omitted. This article was a digest of a paper presented by Mr. Porter at a joint meeting of the St. Louis chapter of the American Foundrymen's association and the Missouri School of Mines at Rolla, Mo., and was made available to STEEL through the courtesy of the American Foundrymen's association.

Butterfly for a Dam

■ View at the right shows a large butterfly valve of combination welded and cast construction, while photo below is the valve body in which it is to be installed. These pieces were fabricated in the Torrance plant of Columbia Steel Co. and are to be used on the San Gabriel Dam No. 1 in the Los Angeles flood control project







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NEW EQUIPMENT

New Press Capable Of Deeper Draws

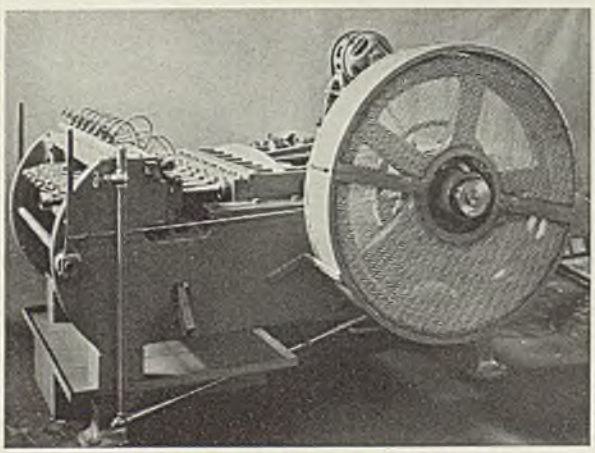
■ Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., has introduced a multiple-station press developed because it is claimed most metals will withstand more drawing without annealing when worked continuously.

Due to die arrangement and other mechanical features, this machine is capable of a much deeper drawing than that of the vertical type, it is claimed. Blanking and cupping operations are performed on a separate press. The cups are then annealed and, if necessary, redrawn and finally fed to the horizontal press where they are completed without interruption.

An oscillating, bar-type, transfer device, equipped with a series of spring fingers, carries the shells successively from station to station. Each is provided with a suitable spring knockout. After final draw, shells may be clipped and pushed through the last die. General construction is the same for presses of practically any capacity and number of stations.

Among other advantages, dies cannot fill with lubricant, defective work will clear and fall out without jamming, it is also necessary to counterbalance the gate and no time is lost in changing the metal coils.

Illustrated press can be furnished with strokes from 6 inches to 11 inches inclusive, for shells 2½ inches to 4½ inches long.



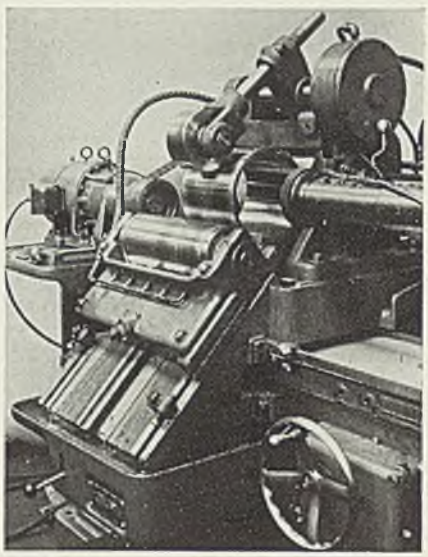
Delivery chute for scrap clippings is shown on this seven-station, horizontal drawing press built for deep shells

Centerless Internal Grinds Larger Bores

■ Heald Machine Co., Worcester, Mass., has placed on the market a new and larger No. 74 centerless internal grinding machine, designed for grinding extra large cylinders and sleeves having bores from 5 inches to 24 inches diameter by 24 inches in length.

The grinder has a centerless unit which employs a support roll, drive roll and pressure roll for holding and driving work from the outside diameter. All three rolls have anti-friction bearings.

Entire unit is mounted on a solid bridge which is bolted to the end of the base. Support roll is carried by a bracket which is moved on two flat inclined ways on the bridge, with T-slots for hold-down bolts and a keyway at the center for guiding the bracket. Drive roll is carried by a bracket which is also movable on two horizontal flat ways with a guide. These rolols are adjustable by means of hand cranks, the support roll through a rack and pinion and the drive roll through



This No. 74 centerless internal grinder is shown in action. Warning light connected with grinder notifies operator that work is near completion

a screw and nut. Both rolls also revolve in individual troughs filled with wool waste which is kept saturated with coolant, thus continually wiping the rolls clean of grit and dirt.

Pressure roll is carried at the end of an arm attached to a shaft mounted in bearings at the top of drive-roll bracket. This shaft is connected to a hydraulic rotary pressure unit which holds the pressure roll against the work, movement of roll into either this position or the retracted position being controlled by a hand lever at the front of machine.

Unit is built on the on-center principle, the wheel grinds opposite to the point of work drive roll contact. Drive roll and wheelhead are driven by means of multiple V-belts.

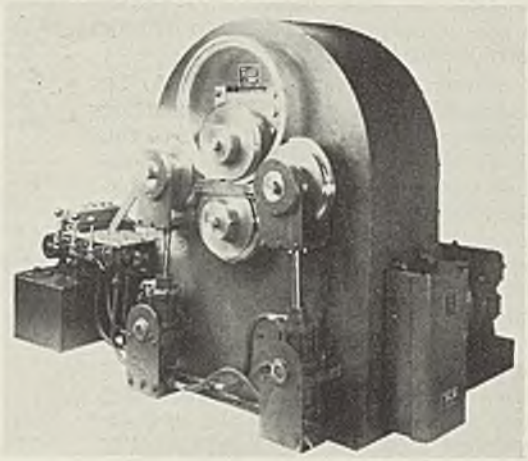
Tool Alloy Developed

■ Fansteel Metallurgical Corp., North Chicago, Ill., has developed a new general purpose hard metal

which can be used as a tip brazed to a steel shank to form a cutting tool.

The alloy, known as Tantaloy, contains tantalum carbide and possesses a degree of chip slippage which resists the development of a crater by chip action. In regrinding, little metal removal is required, it is claimed. Its tough characteristics make it efficient for such service as interrupted cuts, heavy feeds and varying hardness of metal.

Tantaloy tipped tools are available in all standard lathe, boring mill and turret sizes, and also for tips which may be brazed to boring bars, counter bores or special tools.

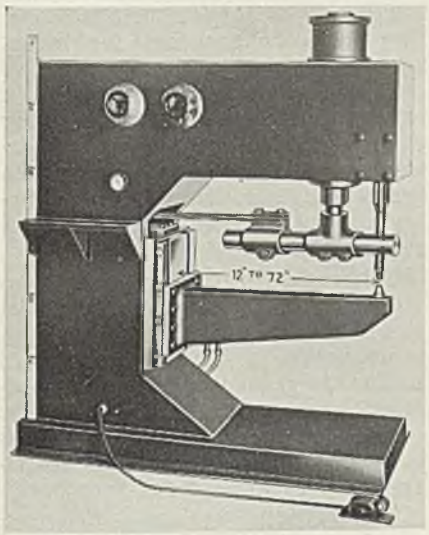


Wallace No. 480 hydraulically operated rolling machine powered by a direct motor drive

Welders Equipped with Air-Cooled Transformers

■ Eisler Engineering Co., 740 South Thirteenth street, Newark, N. J., has placed on the market a new line of welders which are suitable for work involving doors, boxes and heavier materials.

Welders are air-operated and controlled with magnetic valve, foot-operated switch and automatic timer and contactor. Transformers are either water or air-cooled. In machine No. 235 SLS, the bottom arm has a vertical adjustment; top and bottom arm can be turned in any position desired. Electrode holders are water cooled. Illustrated machine No. 235-SLA has an upper arm that can be adjusted lengthwise, also vertically, and can be turned in any position. Lower arm is narrow to permit welding in corners, edges, and narrow width doors, transformer is provided with a 24 point switch for current regulation. This machine is suitable for welding steel, iron, stainless steel, bronze, brass and aluminum. Machine No. 235-SLB has a capacity of 100 KVA and is also provided with a 24-point switch for current regulation. The lower arm is of the slide horn type and can be raised or lowered to permit welding of boxes and drawers. Special electrodes are provided to permit welding in corners, edges and other close quarters. Everything in the welder is enclosed.



This No. 235-SLA Eisler welder is capable of welding doors of many sizes. It is equipped with an air-cooled transformer

Parallels Used On Chucks

■ Taft-Peirce Co., Woonsocket, R. I., has announced a new addition to its line of set-up tools. Magnetic parallels are now made with alternate laminations of brass and steel, and can be used on any type of magnetic chuck. Two sizes, ¾ x 1½ x 3 inches and 1 x 2 x 4 inches are now in stock.

Rolling Machine Is of Arc-Welded Construction

■ Wallace Supplies Mfg. Co., 1310 Diversey parkway, Chicago, has announced the production of the No. 480 hydraulically-operated rolling machine made entirely of rolled steel plates and sections electrically arc-welded.

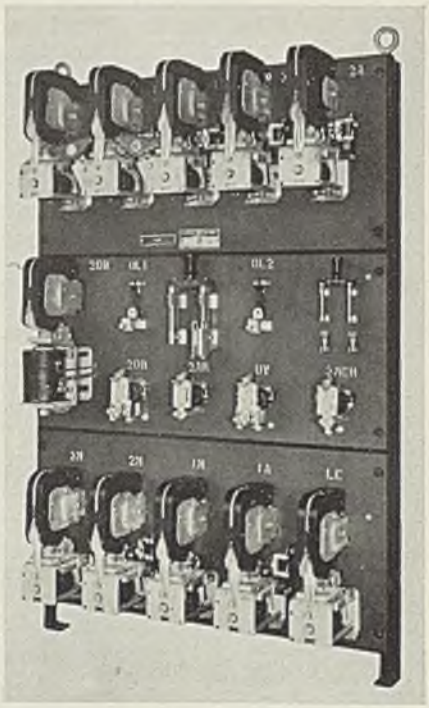
Bending rolls are powered with a direct motor drive. An additional motor, designed for a hydraulic pump, is mounted directly to the motor head. Pump is of the rotary type in hydrostatic balance.

Forward, reverse and stop buttons are provided, and may be used in conjunction with run or inching if desired. Rolls are easily removed, it is claimed. Heavy-duty shielded ball bearings are used on shafts subjected to pressure strains.

Material is bent cold. If radius of bend is large enough to make in one pass then continuous coils can be rolled, and circles cut later. Automatic control adjusts side rolls for radius of bend required, or raising the top center roll to release the material when one or both ends are to remain straight Center upper roll may also be raised for starting a straight length. Control levers will permit simultaneous raising or lowering of all three rolls, or the operating of one independently.

Crane Control Improved

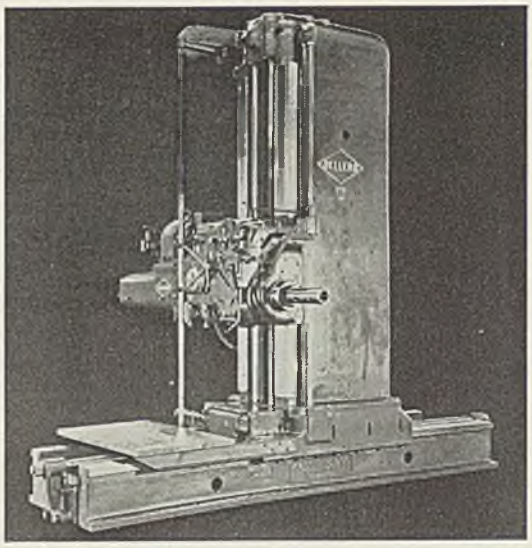
■ General Electric Co., Schenectady, N. Y., recently announced a new direct-current, crane-hoist control which makes use of rocker-bearing contactors and magnetic time relays. Among the features claimed for the new control are high lowering speeds, speed regulation, precise spotting of hook, pro-



General Electric direct-current, crane-hoist control was designed for rapid and safe lowering

tection of both motor and brake from abuse, and maximum safety for operating crew.

Power consumption is said to be economical because regenerative braking, which returns power to the line, is obtained for any load requiring 30 per cent or greater braking effort. Dynamic braking is also available for emergency stops in case of solenoid brake failure. Automatic control of deceleration by a magnetic time relay provides safe stopping of loads when lowering. Such relays are also employed to control acceleration in both hoisting and lowering. Accelerating and decelerating relays are independently adjustable.



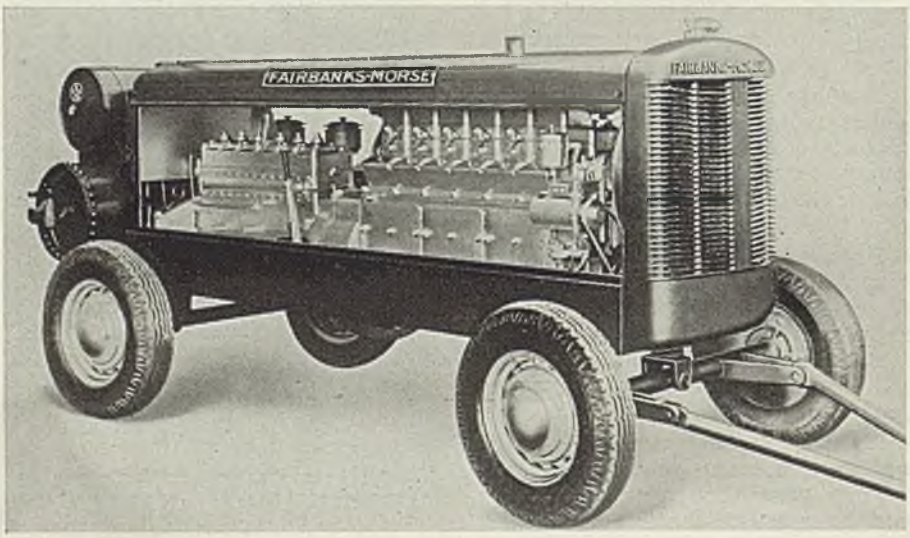
Four levers control the operation of this Sellers horizontal, floor type, boring, drilling and milling machine

Diesel-Driven Compressor Mounted Several Ways

■ Fairbanks, Morse & Co., 900 South Wabash avenue, Chicago, has announced a new self-contained, diesel-powered, 210-cubic feet per minute, air compressor available with several types of portable and semi-portable mountings for a wide range of service applications.

Unit is light-weight and compact, and claimed to offer maximum efficiency and reliability. Bearing surfaces are ample and proper lubrication is provided. Water cooling system assures uniform and thorough cooling in any climate and under all conditions. Compressor is designed to operate at full engine speed, permitting direct connection to the engine without reducing gears or belts and without sacrificing engine horsepower through reducing the rated speed. Diesel engine is F-M model 36A, four-cycle, six-cylinder, medium high-speed unit designed to permit easy inspection and servicing. Illustration shows the unit with pneumatic-tired, four-wheel, portable mounting.

Fairbanks-Morse air compressor is driven by a 6-cylinder, four-cycle, medium high-speed diesel engine



Short Shafts Drive Horizontal Machine

■ William Sellers & Co., 1600 Hamilton street, Philadelphia, has introduced a floor type, horizontal, boring, drilling and milling machine powered by a motor mounted on the head and driving machine entirely through short shafts and a number of spur gears direct to the spindle.

Head is a complete power unit from motor to spindle nose and contains forward and reverse driving clutches, all speed and feed changes, hand and power traverse to both spindles, head, saddle and table. Shafts are of heat-treated alloy steel, multiple splined, and revolve in antifriction bearings. Gears are also of heat-treated alloy steel.

Entire feed, traverse and driving mechanism are built in units, each easily removed from the head. Multiple disc clutch drives machine forward and reverse and also engages the feed and power traverse. Spindle has screw feed which gives an unvarying feed pressure. This screw-feeding action is said to insure a better finish, freedom from tool breakage and is not affected by wear. Adjustable tapered gibs are provided on the head for taking up wear from right to left as well as front to back.

Head is suspended by two counterweight cables so it cannot cock on the column when unclamped. It hangs straight and is square locked to the column with gibs giving 30 inches of vertical bearing.

Distance across the column ways is 30 inches. The front way is 8 inches wide and rear way 6 inches wide. Head is guided on front way next to cutting tools. Elevating screw is located alongside this guiding way. Entire head mechanism is automatically and continuously oiled.

Markets Flow Indicator

■ Selas Co., Eighteenth street, Philadelphia, is marketing the Flo-Scope, flow indicator designed for industrial applications of gas. Indicator consists of a metal tube with a tapered bore and a float assembly connected to an index by a rod extending from the tapered tube into the sight glass. Both float assembly and tube are made of corrosion-resisting metal.

Calibration is made prior to shipment for the specific gravity of the gas to be used. Further calibration is unnecessary. Reading scales are uniformly graduated with main divisions numbered. Scales read in cubic feet per hour. Sight glass is sealed at one end and metal-armored.

For gas-using processes in which the ratio between mixture components is desired, the Flow-Scope is available in dual-mounting. Arrangement is such that scales are adjacent.

Progressive Production Plan for Steel Houses

(*Concluded from Page* 60)

sections or in erection of the house.

At the end of the assembly line the panel is removed and wrapped to protect during storage and shipment. This line is designed to produce about 50 to 60 finished outside wall panels per hour. Special panels and door and window panels are assembled on the same conveyor, intermittently-operated instead of continuously. In the assembly of floor panels only the rough subflooring is nailed to the cross nailer struts. Partition panels have wallboard on both sides; ceiling panels have wallboard on the bottom only for one-story buildings. For two-story buildings the subflooring is nailed on in addition to the wallboard ceiling.

Finished and wrapped panels are placed on end in a cage-like container and moved by crane to storage. The complete house weighs from 30,000 to 50,000 pounds as shipped, or practically a carload. Any single panel can be handled by two men. In stock or in car the panels are set on end. As each panel is wrapped separately (floor panels which do not have a finished face are not wrapped) storing on end gives less possibility of damaging the surfaces or the hooks for attaching the battens.

Floor trucks used for handling material are of steel-frame construction with two stationary casters and two legs. A special jack-handle tongue with a single caster is hooked under the front end of the truck. Pushing the handle down lifts the front legs from the floor so that the truck may be moved and deposited anywhere. This type of truck is very convenient and requires only a small amount of space for handling.

♦

Institutions Accredited By Engineers' Council

■ For the first time in the history of engineering education in the United States, engineering curricula throughout the country have been appraised by a representative body of engineers. As a result, a single accredited list of study courses deemed worthy of approval has been published.

Accrediting process has been carried out during the past two years by the Engineers' Council for Professional Development, joint organization created by seven national engineering societies for the purpose of raising the status of the profession.

Working through four committees, the council inaugurated a program dealing with the selection, guidance, training, and recognition of members in the profession. The object of the committee was "to formulate criteria for colleges of engineering, which will insure to their graduates a sound educational background for practising engineering," also to recognize institutions prepared to teach engineering according to acceptable standards.

Accrediting was based on both qualitative and quantitative criteria. The procedure involved the use of a questionnaire and a personal visit to each institution by the committee.

Lead, Cadmium Added in Bearing Experiment

■ In technical publication series A, No. 58, entitled "The Tensile Properties of a Series of White-Metal Bearing Alloys at Elevated Temperatures", and published by the International Tin Research Development council, H. Greenwood discusses this subject.

Because the temperature of bearings when working may be much above that of the air it was decided to examine the tensile behaviour of typical tin base bearing alloys at temperature up to 175 degrees Cent. and to try the effects of additions of lead and cadmium.

According to the report, it was found that as the temperature rises the maximum stress and yield point fall fairly uniformly while elongation and deduction in area increase. Cadmium markedly improves tensile strength of the alloys when cold but is of little benefit when they are hot, and the effect of 4 per cent of lead, although slightly beneficial when cold, is reversed at the higher temperature.

Expect To Weld Cars On Production Basis

■ Pullman-Standard Car Mfg. Co., Chicago, expects to build welded box cars on a production basis in 1938.

The application of welding is steadily increasing in the construction of freight and passenger cars and parts at the various Pullman plants. Two welded box cars and one welded refrigerator car have already been built at a weight savings of 5 tons per car. The company is equipped to weld all types of alloys, including aluminum, stainless steel and the low alloy steels. Their aluminum structures are riveted, although spot-welding is used for a great deal of the interior aluminum, which is applied to the shell. The low alloys are welded throughout the structure.

It is claimed when stainless steel is used, because of its lower modulus of elasticity slightly heavier material has to be used in the framing members to produce structures of strength equal to that obtained with the low alloys.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Files—Grobet File Corp. of America, 3 Park place, New York, has issued a 1937 catalog on Grobet swiss files illustrating more than 5000 different shapes, sizes and cuts.

Degreasing — G. S. Blakeslee & Co., 381 Fourth avenue, New York, has issued a catalog covering more specific uses of solvent degreasing machines. Illustrations with explanations are included.

Dust Counters—Bausch & Lomb Optical Co., Rochester, N. Y., has released a bulletin containing answers to some of the questions that are frequently asked about the Bausch & Lomb dust counters.

Floor Plates—American Pressed Steel Co., Philadelphia, has issued a 4-page folder illustrating and describing different types of floor plates. The folder is entitled "Every Guarded Footstep."

Bronze—Chase Brass & Copper Co., 1155 Babbitt road, Cleveland, has published a 48-page revised bronze booklet which discusses the welding of Olympic Bronze. Specifications, illustrations, fabrication properties and engineering data are included.

Laboratory Appliances — Fisher Scientific Co., 711 Forbes street, Pittsburgh, has published a supplement to their catalog, bringing up to date, appliances used in laboratories. Illustrations, descriptions and engineering data are included.

Core Plates — Johns-Manville, 22 East Fortieth street, New York, has released a brochure discussing the physical properties of transite core plates with illustrations of the plates in use. Engineering data and prices are given.

Regulators — Northern Equipment Co., Erie, Pa., has issued bulletin 409-A embodying information on its Flowmatic boiler feed water regulator. Graphs, engineering data and a list of other types of regulators are listed.

Washing Equipment — Bradley Washfountain Co., North Twenty-Second and West Michigan streets, Milwaukee, has compiled catalog 937 embodying 24 pages of information regarding multi-stall showers, drinking fountains and other fixtures. Specifications and washroom planning information are included.

Zinc Die Castings—New Jersey Zinc Co., 160 Front street, New York, has prepared two booklets on zinc alloy die castings as used in electrical equipment and business machines. Illustrations are included in the booklets.

Swaging — Etna Machine Co., 3400 Maplewood avenue, Toledo, O., has issued a 4-page folder illustrating and describing swaging machine No. 312. Specifications on 2-die and 4-die machines are included.

Steam Hook-Ups — Sarco Co. Inc., 183 Madison avenue, New York, has published a 29-page booklet embodying details of correct steam trap selection, thermostatic traps, inverted bucket traps and liquid expansion, along with engineering data.

Cast Irons—Vanadium Corp. of America, 420 Lexington avenue, New York, has issued a 28-page booklet describing improved physical properties of cast irons employing varying amounts of vanadium. Illustrations, charts and tables are included.

Contour Machining — Continental Machine Specialties, 1301 Washington avenue, Minneapolis, has available a revised and enlarged edition of an earlier handbook entitled, "The Contour Machining Handbook." Tables for correct machining speeds and engineering data are given.

Fire Equipment — Rockwood Sprinkler Co., 38 Harlow street, Worcester, Mass., has released a folder announcing a 3-reel motion picture entitled "Modern Magic in Fire Protection." The movie shows a new type of fire protection system and its function.

Temperatures — Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia, has printed a 32-page illustrated catalog covering steam-plant temperature measurements from boiler furnace to turbine. Three methods of measurement described include the thermocouple pyrometer, resistance thermometer and the optical pyrometer. Engineering data are also given.

Automotive Engineers See Activity at Motor Plants

(*Concluded from Page* 52)

unit, clutch drum front unit, valve body and front carrier assembly rear unit. He pointed out that in developing the proper machining setup for these parts immeasurable assistance was received from machinery suppliers with the result that the automatic transmission plant represents the latest developments of nearly 100 machine tool builders. Incidentally, the plant was included on the inspection tour Friday morning.

Application of so-called "climb cutting" to gear hobbing operations was reviewed by R. B. Haynes, Spicer Mfg. Corp., Toledo, O. Impetus to this experiment was the marked success attending the application of climb cutting to the hobbing of splines on axle driveshafts and on propeller shaft fittings.

Climb hobbing may be defined simply as that method wherein the cutting action starts at the surface of the part being hobbed and ends at the root of the spline or tooth. This is the direct reverse of the conventional method where the cut starts at the root and finishes at the surface of the part.

Preliminary Work Is Basis

Preliminary work on adaptation of this principle to gear teeth is the basis for the following general conclusions:

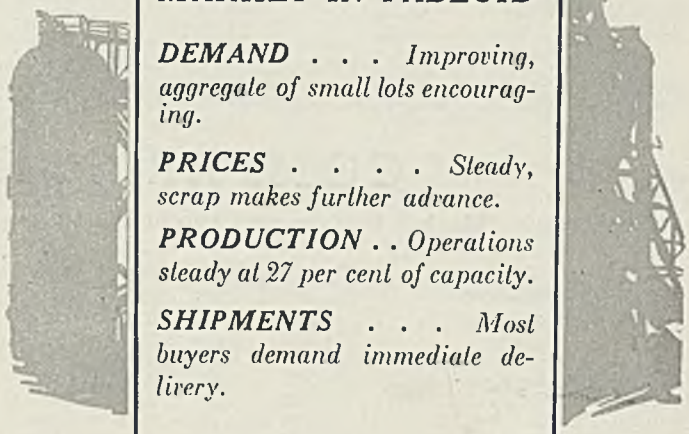
1. Finish of contour is superior with climb hobbing, but not to the degree observed in splines.
2. Climb hobbing of gear teeth is accompanied by the same increase in hob life as was apparent in work with splines.
3. Power consumption with climb hobbing amounts to about 90 per cent of that required in conventional hobbing.
4. Climb hobbing of gear teeth does not affect accuracy of tooth form.

With regard to finish grinding of gears, Mr. Haynes observed that continued experiment indicates that grinding as a means of producing satisfactory gears will be standard practice until such a time as metallurgists provide a gear steel which changes in heat treatment less than the tolerances demanded in the finished gear, or until engineers are able to design every gear with a section of uniform and predictable distortion characteristics.

How Buick has attempted to solve the problems of uniformity, accuracy, economy and quantity in production of gears was the subject of a paper presented by Charles H. Stanard, Buick Motor Co., Flint, at the concluding session Friday.

Steel Outlook Better as Decline Checks

21,000 Tons Placed For Battleships; Scrap Rises Again



MARKET IN TABLOID

DEMAND . . . *Improving, aggregate of small lots encouraging.*

PRICES . . . . *Steady, scrap makes further advance.*

PRODUCTION . . *Operations steady at 27 per cent of capacity.*

SHIPMENTS . . . *Most buyers demand immediate delivery.*

WITH downward movements in the steel industry checked and some increase in general buying, backed by development of various large projects, the situation appears better.

Some sellers find their bookings larger than in November and in a few instances indications for December point to a higher total than in October. This business is practically all in small orders for consumers who have depleted their stocks and need material immediately. Total tonnage is not large but indicates an upward trend. It is believed this buying would be heavier except for the approach of the year's end, with the usual tendency to hold inventory to a minimum.

Decision of a western steelmaker to continue production of steel at its present rate through the holidays, even if the semifinished product must be piled, indicates confidence in a renewed demand early in the year.

Approximately 21,000 tons of plates, shapes, bars, sheets and strip for battleships building in the Brooklyn and Philadelphia navy yards have been distributed widely among a number of steelmakers.

Various large projects are maturing, which promise some important tonnages. Inquiry by the Texas Co. for 24,000 tons of line pipe for export to Colombia, South America, where a 220-mile line is to be built, interests pipe fabricators. Bids Feb. 1 by the maritime commission for 12 cargo vessels involve about 96,000 tons of steel, the largest peacetime order for cargo tonnage. A structural inquiry for 6000 tons in New York is another matter of interest. Award is expected this week by the Standard Oil Co. of New York on 8 to 12 tankers, each requiring about 5000 tons of steel.

Steelmaking scrap apparently is pointing the way to better business in the steel industry, the long decline in prices being halted and a slight rise indicated. General sentiment of consumers and dealers is that the first important tonnage appearing in the market will be the signal for a rise in prices. Higher quotations for railroad lists indicate greater confidence. While some present quotations are based on prices paid by dealers for tonnage to apply on contracts at much higher prices they indicate inability to buy at less, in the face of present supplies.

For the first time since the week of Sept. 11 the national operating rate last week failed to show a decline. Various adjustments to meet delivery requirements resulted in a balance, the rate remaining at 27 per cent. Expectation is that somewhat lower schedules will result from the holidays during the next fortnight. Last week the rate was unchanged at Pittsburgh at 19 per cent, Chicago 24 per cent, Eastern Pennsylvania 29 per cent, Birmingham, Ala., 49 per cent and Detroit 52 per cent. Youngstown advanced 6 points to 30 per cent, Cleveland 5 points to 36 and Cincinnati 25 points to 54. Wheeling lost 6 points to 24 per cent, Buffalo 5 points to 16, New England 6 points to 30 and St. Louis 4 points to 16.

Automobile assemblies last week were 82,025, a decline of 3740 from the preceding week. Ford was the only major producer to increase output in face of the general curtailment and gained 2500 to 25,115. General Motors assembled 30,825, compared with 31,800 the week before; Chrysler's output was 15,850, against 19,600 the preceding week; the independents produced 10,235, off about 1500. Approach of the holiday season probably will cause further decline and no substantial increases are expected until after Jan. 1.

In sharp contrast to lagging steel demand in this country Great Britain in November established a new alltime record for production of steel ingots and castings, the third time this year it has broken into higher levels. November production was 1,178,300 tons, exceeding the previous record of 1,163,000 tons in September and 1,109,500 tons in March.

For the third consecutive week the composite of steelmaking scrap prices has advanced. Because of an advance at Chicago, with the price holding at other centers, the composite has reached $13.41, an advance of 33 cents. The iron and steel composite was advanced 2 cents, to $38.90, by stronger scrap prices. The composite of finished steel prices is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Dec. 18	Dec. 11	Dec. 4	One Month Ago Nov., 1937	Three Months Ago Sept., 1937	One Year Ago Dec., 1936	Five Years Ago Dec., 1932
Iron and Steel	$38.90	$38.88	$38.86	$38.96	$40.16	$35.15	$28.28
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.90	46.74
Steelworks Scrap	13.41	13.08	12.91	13.32	18.99	16.92	6.41

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.

COMPARISON OF PRICES

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

Finished Material

	Dec. 18, 1937	Nov. 1937	Sept. 1937	Dec. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.05c
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, Philadelphia	2.74	2.74	2.74	2.36
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.46	2.46	2.12
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.44	2.44	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.10
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.75
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.35
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.20

Semifinished Material

Sheet, bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$32.50
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	32.50
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	32.50
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	40.75

Pig Iron

	Dec. 18, 1937	Nov. 1937	Sept. 1937	Dec. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$21.8132
Basic, Valley	23.50	23.50	23.50	20.00
Basic, eastern del. East. Pa.	25.26	25.26	25.26	21.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	21.3132
No. 2 fdy., Chicago	24.00	24.00	24.00	20.50
Southern No. 2, Birmingham	20.38	20.38	20.38	16.88
Southern No. 2, del. Cincinnati	23.89	23.89	23.69	19.69
No. 2 X eastern, del. Phila.	26.135	26.14	26.14	22.68
Malleable, Valley	24.00	24.00	24.00	20.50
Malleable, Chicago	24.00	24.00	24.00	20.50
Lake Sup., charcoal, del. Chicago	30.24	30.14	30.04	26.2528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	20.6741
Ferromanganese, del. Pittsburgh	107.49	107.35	107.29	82.65

Scrap

Heavy melting steel, Pittsburgh	$13.25	$14.10	$20.40	$18.55
Heavy melt. steel, No. 2, E. Pa.	14.25	12.25	16.69	14.13
Heavy melting steel, Chicago	12.75	12.55	17.85	17.00
Rails for rolling, Chicago	14.25	15.10	20.35	17.25
Railroad steel specialties, Chicago	15.75	16.75	20.50	19.00

Coke

Connellsville, furnace, ovens	$4.37	$4.37	$4.45	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.25	4.40
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.96c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.81c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.41c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.31c
Philadelphia, del.	3.40c
New York, del.	3.44c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.71c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.76c
Philadelphia, del.	3.85c
New York, del.	3.89c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64¼c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, del.	2.52c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.01c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c
Pittsburgh, forg. qual.	2.80c

Rail Steel
To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

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

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.60c
Gulf ports	2.91c
Pacific coast ports, f.o.b. car docks	2.96c
Philadelphia, del.	2.85c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young....	2.45c
Gulf ports	2.81c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring 0.15
6100 bars 1.20
6100 spring 0.85
Cr. N., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)

(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅛-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to ⅞-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	.....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B Stnd. fltgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

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

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

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

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅝-inch incl.	47.00
Do., over ⅝ to 41/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port

Sulphate of ammonia	$29.00

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. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

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

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethlehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	24.30	.....
Cincinnait from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J, from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	⌈Neville, base plus 63c, 76c, ⌊and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer 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, Net Prices

Fire Clay Brick

Super Quality	
Pa., Mo., Ky.	$64.60
First Quality	
Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00
Second Quality	
Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00
Ohio	
First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)	
Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	38.00
Do., New Orleans	38.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.00-2.25
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

‡Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Dec. 11	10.25	11.12½	9.77½	45.25	45.25	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 13	10.25	11.12½	9.77½	44.00	44.00	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 14	10.25	11.12½	9.77½	43.50	43.50	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 15	10.25	11.12½	9.77½	43.25	43.25	5.00	4.85	5.00	20.00	14.25	35.00
Dec. 16	10.12½	11.12½	9.75	43.50	43.50	4.75	4.60	5.00	20.00	14.25	35.00
Dec. 17	10.12½	11.12½	9.75	42.50	42.50	4.75	4.60	5.00	20.00	14.00	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.00c *Conn. copper*

Sheets

Yellow brass (high)	17.37½
Copper, hot rolled	19.12½
*Lead, cut to jobbers	8.25
Zinc, 100-lb. base	10.50

Tubes

High, yellow brass	20.12½
Seamless copper	19.87½

Rods

High yellow brass	13.37½
Copper, hot rolled	15.62½

Anodes

Copper, untrimmed	16.37½

Wire

Yellow brass (high)	17.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.37½-5.62½
Cleveland	6.25-6.50
Chicago	5.75-6.00
St. Louis	5.75-6.00

Heavy Copper and Wire

*New York, No. 1	7.25-7.50
Cleveland, No. 1	7.25-7.50
*Chicago, No. 1	7.37½-7.62½
St. Louis	7.25-7.50

Composition Brass Borings

*New York	4.87½-5.62½

Light Copper

*New York	5.25-5.50
Cleveland	5.25-5.50
Chicago	5.25-5.50
St. Louis	5.00-5.25

Light Brass

Cleveland	3.25-3.50
*Chicago	3.62½-3.87½
St. Louis	3.25-3.75

Lead

*New York	3.50-3.75
Cleveland	3.25-3.50
*Chicago	3.50-3.75
St. Louis	3.25-3.50

Zinc

New York	2.12½-2.37½
Cleveland	2.00-2.25
St. Louis	2.25-2.50

Aluminum

Borings, Cleveland	6.75-7.00
Mixed cast, Cleve.	9.75-10.00
Clips, soft, Cleve.	11.75-12.00
Mixed cast, St. L.	9.25-9.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl.	11.25
Stand. No. 12 alum.	17.00-17.50

WAREHOUSE IRON AND STEEL PRICES

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Birmingham	3.85c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

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

REINFORCING BARS

Buffalo	3.10c
Birmingham	3.85c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (l)	4.25c
San Francisco	4.05c
Seattle (l)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleve., ¼-in., o'r	3.86c
Detroit	3.95c
Detroit, 5/16-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Birmingham	3.80c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Birmingham	4.55c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Birmingham	5.20c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.66c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
N. Y. ov. 10 bd.	5.00c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Birmingham	4.05c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, 1/16 & Und.	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, 14 & Und.	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Birmingham	4.91c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

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

	Base
High speed	80c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Birmingham	50-10
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill 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, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 16

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

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$30.00 6 0 0	$20.85	2 11 0
Basic bessemer	.....	20.95	2 12 0
Hematite, Phos. .03-.05	36.25 7 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$39.38 7 17 6	$43.11	5 7 6
Wire rods, No. 5 gage	54.13 10 16 6	48.13	6 0 0
FINISHED STEEL			
Standard rails	$50.63 10 2 6	$46.12	5 15 0
Merchant bars	2.73c 12 5 0	2.17c to 2.27c	6 0 0 to 6 5 0
Structural shapes	2.37c 10 12 6	1.94c	5 7 6
Plates, †¼ in. or 5 mm.	2.58c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm	3.34c 15 0 0	3.18c	8 15 0††
Sheets, gal., 24 gage, corr.	4.18c 18 15 0	3.99c	11 0 0
Bands and strips	3.07c 13 15 0	2.36c	6 10 0
Plain wire, base	4.35c 19 10 0	2.54c	7 0 0
Galvanized wire, base	5.18c 23 5 0	3.18c	8 15 0
Wire nails, base	4.13c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	$ 5.63 1 2 6	.....	.....

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

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$26.50	5 6 0(a)	$18.84	554	$25.50	750	$25.41 63
Basic bessemer pig iron	25.00	5 0 0(a)	.....	.....	.....	.....	28.03 (b) 69.50
Furnace coke	9.38	1 17 6	6.43	189	7.31	215	7.66 19
Billets	39.38	7 17 6	28.56	840	32.64	960	38.92 96.50
Standard rails	2.26c	10 2 6	1.730c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.55c	11 9 0	1.62c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.46c	11 0 6	1.58c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.61c	11 14 3	2.03c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.51c	15 15 0§	2.25c	1,500‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.35c	19 10 0	3.30c	2,200	4.50c	3,000	6.66c 370
Plain wire	4.35c	19 10 0	2.28c	1,520	2.48c	1,650	3.11c 173
Bands and strips	2.72c	12 4 0	1.82c	1,210	2.33c	1,550	2.29c 127

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

**Gold pound sterling carries a premium of 64.3 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

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

HEAVY MELTING STEEL

Birmingham, No. 1.	10.00
Birmingham, No. 2.	9.00
Bos. dock No. 1 exp.	14.00-14.25
N. Eng. del. No. 1..	13.50
Buffalo, No. 1.....	12.50-13.00
Buffalo, No. 2.....	11.50-12.00
Chicago, No. 1	12.50-13.00
Cleveland, No. 1....	12.50-13.00
Cleveland, No. 2....	11.50-12.00
Detroit, No. 1	9.50-10.00
Eastern Pa., No. 1..	14.50-15.00
Eastern Pa., No. 2..	13.00-13.50
Federal, Ill.	11.00-11.50
Granite City, R. R..	12.00-12.50
Granite City, No. 2.	11.00-11.50
New York, No. 1....	†11.00
N. Y. dock No. 1 exp.	13.50
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)..	13.00-13.50
Pittsburgh, No. 2...	12.00-12.50
St. Louis, R. R.....	12.00-12.50
St. Louis, No. 2.....	11.00-11.50
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Seattle, No. 2	7.00
Toronto, dlrs. No. 1	10.00-10.50
Toronto, No. 2	9.00- 9.50
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers ...	11.50-12.00
Chicago, factory....	11.50-12.00
Chicago, dealer	11.00-11.50
Cleveland	12.00-12.50
Detroit	10.25-10.75
E. Pa., new mat. ..	14.50-15.00
E. Pa., old mat.....	10.50-11.00
Pittsburgh	13.00-13.50
St. Louis	7.25- 7.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	9.50-10.00
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Pittsburgh	12.00-12.50
St. Louis	6.75- 7.00
Toronto, dealers	8.00

SHEET CLIPPINGS, LOOSE

Chicago	6.50- 7.00
Cincinnati	6.00- 6.50
Detroit	7.00- 7.50
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	18.00-18.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Pitts., 3 ft. and less	17.50-18.00
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.50-13.00
Cleveland	16.50-17.00
Pittsburgh	14.50-15.00
St. Louis	13.00-13.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†7.00- 7.25
Buffalo	11.50-12.00
Chicago, net	8.50- 9.00
Cincinnati, dealers..	5.50- 6.00
Detroit, net	8.50- 9.00
Eastern Pa.	12.50-13.00
New York, fdry. ...	†8.50- 9.00
St. Louis	9.00- 9.50
Toronto, deal'rs, net	9.00- 9.50

SPRINGS

Buffalo	18.00-18.50
Chicago, coil	17.00-17.50
Chicago, leaf	15.50-16.00
Eastern Pa.	18.00-18.50
Pittsburgh	17.50-18.00
St. Louis	14.75-15.25

ANGLE BARS—STEEL

Chicago	14.50-15.00
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	18.50-19.00
Cleveland, crops ...	19.50-20.50
Eastern Pa., crops..	19.00-19.50
Pittsburgh, crops...	18.00-18.50

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.00-13.50

SHOVELING STEEL

Federal, Ill.	11.00-11.50
Granite City, Ill....	11.00-11.50
Toronto, dealers....	10.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	13.00-13.50
Chicago, No. 1 net..	10.00-10.50
Cincinnati, No. 2...	9.50-10.00
Eastern Pa., No. 1..	15.50-16.00
St. Louis, No. 1....	8.00- 8.50
St. Louis, No. 2...	13.00-13.50
Toronto, No. 1 dlr..	16.00

SPECIFICATION PIPE

Eastern Pa.	13.50-14.00
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	10.00-10.50
Cincin., No. 1, deal..	8.50- 9.00
Cincinnati, No. 2...	3.00- 3.50
Cleveland, No. 2...	8.50- 9.00
Detroit, No. 1, new	9.50-10.00
Valleys, new, No. 1	12.50-13.00
Toronto, dealers....	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	9.00- 9.50
Chicago	6.50- 7.00
Cincinnati, dealers..	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	8.50- 9.00
New York	†5.00- 5.50
Pittsburgh	7.00- 7.50
St. Louis	5.00- 5.50
Toronto, dealers ...	7.00- 7.50
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.50
Buffalo	9.00- 9.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
Eastern Pa.	8.00- 8.50
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers....	8.00- 8.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem...	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	9.00- 9.50
Chicago	6.00- 6.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
E. Pa., chemical....	13.50-14.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers....	8.00- 8.50

PIPE AND FLUES

Cincinnati, dealers..	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.50-10.00
Chicago, net	8.50- 9.00
Cincinnati	5.50- 6.00
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†6.50
Buffalo	11.50-12.00
Cleveland	11.00-11.50
Detroit	9.00- 9.50
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	15.50-16.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	13.00-13.50
Chicago, elec. fur...	11.50-12.00
Eastern Pa.	13.00-13.50
St. Louis	9.50-10.00
Toronto	9.50

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	18.00-18.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	20.50-21.50
St. Louis	18.50-19.00

SHAFTING

Boston district	†15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron...	†10.00
Buffalo, steel	18.50-19.00
Chicago, iron	14.50-15.00
Chicago, rolled steel	15.50-16.00
Cincinnati, iron	15.00-15.50
Eastern Pa., iron..	16.50-17.00
Eastern Pa., steel..	18.00-18.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel ..	17.50-18.00
St. Louis, iron	14.00-14.50
St. Louis, steel	14.75-15.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2..	12.00
N. Eng. del. textile.	15.50-16.00
Buffalo, cupola	13.50-14.00
Buffalo, mach.	14.50-15.00
Chicago, agri. net..	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net.	12.00-12.50
Cincin., mach. cup...	10.50-11.00
Cleveland, mach....	17.00-17.50
Eastern Pa., cupola.	16.00-16.50
E. Pa., mixed yard.	13.50-14.00
Pittsburgh, cupola..	16.00-16.50
San Francisco, del..	13.50-14.00
Seattle	8.00
St. Louis, No. 1....	12.00-12.50
St. L., No. 1, mach.	12.50-13.00
Toronto, No. 1, mach., net	12.00-12.50

HEAVY CAST

Boston dist. break..	†8.50
N. Eng., del.	12.50-13.00
Buffalo, break	11.50-12.00
Cleveland, break....	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net...	12.50-13.00
Eastern Pa.	14.00-14.50
New York, break. ..	†10.50-11.00
Pittsburgh	13.00-13.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	16.00
Buffalo	14.00-14.50
Chicago, R. R.	14.00-14.50
Cincin., agri. del...	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R. ..	16.50-17.50
Pittsburgh, rail	13.75-14.25
St. Louis, R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	14.00-14.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.75-14.25

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	14.75-15.25

LOW PHOS. PUNCHINGS

Buffalo	17.50-18.00
Chicago	14.00-14.50
Eastern Pa.	18.00-18.50
Pittsburgh (heavy)	16.00-16.50
Pittsburgh (light)..	14.00-14.50
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer.....	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	nominal
Swedish low phos...	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton, unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%....	7.00
Chrome ore, 48% gross ton, c.i.f...	$25.50-26.50

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%.. ..... non.	45.00
So. African, 50-52% ..... non.	45.00
Indian, 50-52%.....	Nominal

—The Market Week—

Sheets

Sheet Prices, Page 90

Pittsburgh—Current market activity in sheets is composed largely of numerous small orders from miscellaneous consumers for delivery early next year. Some mills continue to ship on old orders and also are making prompt deliveries for fill-in purposes. Sheet mill operations are subsiding somewhat, those making common black sheets being active at 32 per cent of capacity, unchanged from last week. Jobbing mills have stepped up to 30 per cent this week from 28 per cent last week and galvanized plants are operating at 35 per cent of capacity, against 36 per cent the preceding week.

Cleveland — A moderate improvement is noted in specifications for hot and cold-rolled sheets. While the increase is moderate it has offered considerable encouragement to producers. Most new business is for shipment after the first of the year. However, in some instances consumers found themselves short of certain sizes and placed orders for prompt delivery for fill in purposes. Mill prices remain firm.

Chicago — Sheet orders hold to their recent restricted rate. There is no improvement in automotive buying and while orders from other consumers are being received regularly, these involve only small lots and mills are able to make early shipment despite the low rate of production. Little change in demand is looked for until January though depletion of inventories is expected to aid new business upon any upturn in consumption.

Boston — Sheet consumers are placing little new business, scattered releases being small individually for prompt shipment. Few users of sheets have placed advance orders for shipment after Jan. 1. The upturn is expected to come from jobbers, who in some instances will require moderately heavier supplies of several finishes next month, some gaps appearing in warehouse stocks.

New York—A slight improvement in buying by manufacturers of refrigerators and some miscellaneous replacement buying for delivery after the turn of the year have at least sustained sheet business here. In general, business is still dull and sellers expect only a modest improvement after inventory period. Consumer stocks of raw material have been considerably reduced; however, there is still a large accumulation of finished products at many consuming plants and until these are worked off to some important de-

gree, there is likely to be little replacement buying of plain material, it is believed.

As noted, there has been some improvement in buying by refrigerator manufacturers. These manufacturers usually begin their purchases of steel in November and December for the spring trade. However, this buying is developing much more slowly than in recent years.

Deliveries remain generally easy, although sharply reduced rolling schedules are resulting in more frequent delays.

Philadelphia — Automotive partsmakers are reported to have taken some business for first quarter delivery at concessions but this has not been reflected in lower prices on either hot or cold-rolled sheets. Both sheet sellers and buyers report no concessions in existing base prices. Current demand for sheets is still slow, with large consumers, such as automotive and radio, specifying little tonnage. Some miscellaneous buying is noted but no material revival is expected until after inventory time.

Buffalo—New buying is negligible. Spotty orders are confined to a limited volume of miscellaneous specifications. Consumers can get immediate delivery on orders. A revival of buying is hoped for after jobbers complete year end inventories.

Cincinnati—A drift of sheet orders, all for early delivery, enables district mills to operate near 25 per cent of capacity. Where facilities permit, finishing operations are staggered and on accumulation of tonnage. Some orders and inquiries for first quarter are current, but insufficient to point a trend. Adjustments on jobber discounts on galvanized and on carload shipments announced elsewhere will likely be followed by producers here.

Birmingham, Ala. — While still considerably in excess of the rate of production for most of the district's other products, sheets have not developed the anticipated demand and the output is not what it was a few weeks ago. A considerable falling off in both roofing and drum stock sheets is reported.

Strip

Strip Prices, Page 91

Pittsburgh—Strip mill operations are slowing down a trifle and new business continues in small lots. Shipments from mills are going to a varied line of consumers and auto partsmakers are taking only limited tonnages, mostly of narrower widths. Mills rolling hot strip are operating around 29 per cent of capacity, against 30 per cent last week. Those rolling cold strip are at 28 per cent of capacity, against 30 per cent in the preceding week.

Cleveland — Some improvement is noted in specifications and inquiries for hot and cold-rolled strip. However, only a small portion of current orders is for prompt delivery as most consumers are intent on keeping inventories as low as possible. Consumption is well maintained and according to some if it remains at the current level a marked improvement in buying is looked for within the next 30 days. Prices remain firm.

Chicago—Orders generally show no improvement and continue in small lots for prompt needs. Consumers are not interested in buying ahead, consequently orders for January rolling are light. Inventories of most users are well below those of a year ago but there is little expectation of heavier buying before an upturn in requirements of major customers.

Boston—That consumer stocks of narrow cold strip are showing wider gaps is indicated by a spotty, but moderate improvement in buying for prompt delivery by diversified

users. While the gain in new volume is not large in the aggregate, some producers are booking more scattered car-lot orders for early shipment. Evidence that inventories are substantially lower gives a better outlook rather than any real sustained buying movement. While finishing operations average close to 30 per cent of capacity, several rerollers are doing slightly better. Hot strip buying continues light and prices are firm.

New York — While narrow cold strip buying continues light, the steady recession of recent weeks appears to have been halted, with indications of an upturn of mild proportions after the turn of the year. This assumption is based on evidence that consumer stocks are materially smaller. In spots replacement orders are more substantial and for immediate delivery. Operations of strip fabricating industries are low, but consumption is still ahead of new tonnage reaching mills, a situation which has prevailed for weeks. Prices are firmly maintained. Users of hot strip show little interest in future needs, most rerollers being well supplied for immediate requirements.

Philadelphia—Inventories in both hot and cold-rolled strip in narrow widths have been reduced materially. In view of present curtailed activity, however, consumers are placing only a few fill-in orders when necessary. Prices are steady.

Birmingham, Ala. — Strip continues on a more or less unsatisfactory basis. Orders are not regular, and most are for small quantities.

Plates

Plate Prices, Page 90

New York—Approximately 21,000 tons of plates, shapes, bars, sheets and strip for two battleships being built in the Brooklyn and Philadelphia navy yard has been distributed widely among steel mills. Important lots include 1000 tons of medium black flat bars to Republic Steel Corp. at 2.90c, Brooklyn, and 2.83c and 2.90c, Philadelphia; 500 tons strip to Inland Steel Co at 3.32c, Brooklyn, and 3.28c, Philadelphia; 6615 tons of medium black plates to Central Iron & Steel Co. at 3.04c Brooklyn, and 2.94c, Philadelphia; 4100 tons wider plates to Carnegie-Illinois Steel Corp. at 3.10c, Brooklyn and 3.02c, Philadelphia; 2000 tons wide plates to Lukens Steel Co. at the same prices. Others sharing in the awards are Worth Steel Co., Bethlehem Steel Co., Phoenix Iron Co.

Pittsburgh — Plate tonnage continues disappointing. Further recession in orders is reported, but the decline appears less sharp than recently. While orders aggregate less than they had been some time back, the volume is not down as much as had been expected. The immediate outlook is clouded, but sellers are hopeful of a gain in tonnage after the first of the year.

Cleveland — Little change is noted in the plate market as miscellaneous orders continue at the low level reported the first of the month. Until the ICC decides on the requests of a general freight increase few expect substantial buying from that source. Stocks in most consumers' yards are said to be below normal, while consumption is well above shipments.

Chicago—Quiet in railroad equipment building and in fabricated structural steel is restricting plate orders to small lots. Mills have no backlogs and shipment can be made in a week to ten days. Prospects for heavier plate consumption depend to a large extent upon the future revival in freight car building.

Tank fabricators are less active but are experiencing better operations than most plate users.

Boston — Most of the larger shipyards in this district are well supplied and an increase in plate specifications from ship-builders is expected during the next few weeks. Current buying is light for miscellaneous needs and prompt delivery asked.

Philadelphia — The trade awaits placing of Standard Oil tankers now on inquiry. Part of these may go to a yard in this district. This order may involve up to 60,000 tons of plates. Interest is also aroused by an inquiry for 24,000 tons of steel line pipe for shipment to Colombia. Miscellaneous plate demand is negligible. Orders are sufficient for only two to three days rolling a week. Consumers demand almost overnight delivery and placing of an order often depends on what day a mill happens to be rolling. Foreign buyers are reported offering as low as 2.00c but the minimum quotation is said to be 2.28½c, f.a.s. Port Richmond.

Bids will be received Feb. 1 by the maritime commission at Washington for 12 fast single screw steel cargo vessels. It is understood that each will require some 8000 tons of steel.

The new vessels will have a speed of 15½ knots, 50 per cent faster than most American merchant vessels.

Birmingham, Ala.—Scattered orders continue to make most plate business. Improvement, it is believed, will be evident shortly after the first of the year, but no perceptible upturn is anticipated before then.

Seattle—New pipeline projects are developing and prospects for early activity in local shops are promising. Seattle has approved specifications for the $500,000 Harrison street improvement involving unstated tonnages of 20, 24 and 36-inch steel pipe, alternate cast iron. Bellingham, Wash., has approved a $750,000 bond issue for a major supply pipe extension. Tacoma has awarded at $120,862 to the Hydraulic Supply Mfg. Co. Seattle, a contract to furnish 9500 feet of 36 and 48-inch water supply mains, involving 700 tons, which probably will be supplied by the Columbia Steel Co. The gage is $\frac{5}{16}$-inch. Puget Sound Sheet Metal Works will furnish several storage tanks for the Columbia Breweries, Tacoma, involving 150 tons.

Plate Contracts Placed

1110 tons, steel water pipe, St. Paul, Minn., to Taylor Forge & Pipe Works, Chicago.

700 tons, 36 and 48-inch welded steel pipe, Tacoma, Wash., to Hydraulic Supply Mfg. Co., Seattle.

500 tons, liner plates, dam project, Fort Peck, Mont., to Treadwell Construction Co., Midland, Pa.

445 tons, five barges, Point Pleasant, W. Va., to Nashville Bridge Co., Nashville, Tenn.

210 tons, water main in connection with grade crossing elimination, Cypress avenue, Bronx, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Bronx Water Works Inc. subcontractor under J. Leopold & Co., New York.

150 tons, tanks for Columbia Breweries, Tacoma, Wash., to Puget Sound Sheet Metal Works, Seattle.

Plate Contracts Pending

1800 tons, seagoing hopper dredge, chief of engineers, war department, Washington; Pusey & Jones Corp., Wilmington, Del., low, $1,764,550; bids Dec. 14.

190 tons, standpipe, Scituate, Mass.; taking bids.

Unstated, 20, 24 and 36-inch water supply line, for Seattle; bids soon.

Bars

Bar Prices, Page 90

Pittsburgh — Little change has developed in the steel bar market. While some small business is coming in, the aggregate is not large and sellers are resigned to a dull period for several weeks. With consumers cleaning up their inventories, there is little expectation that heavy buying will develop until after the first of the year. At the same time, however, some business for delivery after Jan. 1 is coming in and, while comparatively small, is encouraging. Prices are firm and despite the dullness, pressure is absent.

Cleveland — Most local forging concerns continue to specify for fill in purposes, although an increasing number are inquiring for material for shipment after the first of the year. While demand for alloy and plain carbon steel bars has held up comparatively well from farm equipment manufacturers, requirements of auto partsmakers continue light. Inventories of most consumers are said to be considerably below normal and will soon reach the point where additional buying will become necessary, if present rate of consumption continues.

Chicago — Except for occasional gains in orders from farm equipment manufacturers, steel bar demand continues quiet and practically unchanged from the rate of the previous several weeks. Orders are small individually and prompt shipment generally is requested. Occasional purchases are being made by consumers who have been out of the market for several months, indicating stock depletion.

Boston—Demand for bar stock has slackened further with new buying at the lowest point of the year. Alloy and forging material moves in fewer small lots with little change in carbon bars. Most of the larger consumers are working on inventories, which in spots, however, are at a low point with some moderate replacement orders expected next month.

New York—Sharply reduced rolling schedules are slowing up bar deliveries. While in general deliveries are still easy, the necessity of the mills to await an accumulation of specification sufficient to warrant a rolling is having its effect on shipments. Meanwhile, orders are still light, with specifications from the machinery builders holding up relatively the best, it appears.

Philadelphia—Hand to mouth buying prevails in steel bars, in both cold and hot-rolled material. Some improvement is noted in forging bars. Forging shops have booked some foreign business in addition to domestic tonnage. Prices are firm.

Birmingham, Ala.—Bar demand is scattered and miscellaneous, although it is indicated some fairly heavy requisitions are being held in abeyance, particularly for railroad maintenance work.

Pipe

Pipe Prices, Page 91

Pittsburgh — Largest line pipe inquiry in many months has just been put before American pipe mills for export to Colombia, S. A. Inquiry involves 23,000 to 24,000 tons of 12¾-inch O. D. line pipe, aggregating 220 miles. It may be either electric-welded or seamless tubing. While the inquiry was put out by the Texas Co., it is understood the pipe will be laid by a Colombia Oil & Gas Co., in which both the Texas Co. and the Standard Oil Co. of New York are interested financially.

Cleveland — The decline in both residential construction and indus-

trial expansion programs has definitely left its impression on aggregate tonnage of standard steel pipe shipped out of jobbers' stocks. Most jobbers expect a continued recession in new business until after the first of the year, at which time it is hoped that general uncertainties which now prevail, will have altered to the extent that confidence will be restored.

Chicago—Pipe sellers see little possibility of better demand within the next month or two, though several fairly large tonnages still are pending. Federal money is not available for new work but a number of old projects for which funds were appropriated have yet to be closed. Chicago had taken bids on 375 tons of 16-inch pipe.

New York — All indications point to a reaffirmation by mills of merchant pipe for next quarter. Meanwhile, the resale market, which has been highly unsettled for months past, is assuming stronger tone, as mills are allowing less leeway in concessions on stocks held here on consignment.

In addition to 415 tons recently bid, New York city is expected to ask bids shortly on 705 tons, 12 and 20-inch cement-lined cast pipe. A few attractive tonnages for water line extensions are expected out soon after the new year.

Birmingham, Ala.—Bolstered by an order for 10,000 tons of cast iron pipe last week, the district's pipe outlook continues somewhat brighter with inquiries available to indicate some additional lettings shortly after the first of the year. Generally, however, production is low.

San Francisco—Pacific Northwest markets have shown considerable improvement and a number of new water system improvement projects are expected to come up for figures soon. Awards for the week totaled 1552 tons, bringing the aggregate to date to 28,613 tons, compared with 45,828 tons for the same period a year ago.

Cast Pipe Placed

1150 tons, 8-inch, improvement Ninth avenue SW, Seattle, to United States Pipe & Foundry Co., Burlington, N. J.
455 tons, 8 and 6-inch, extension to water distribution, Sandusky, O., to James B. Clow & Sons Co., Cleveland.
450 tons, 6, 8 and 10-inch, Three Forks, Mont., to unstated interests; D. M. Manning, Hyshan, Mont., general contractor.
266 tons, 6 to 10-inch, class 150, Sanger, Calif., to Pacific States Cast Iron Pipe Co., Provo, Utah.
136 tons, 6 to 12-inch, class 150, Spokane, to Pacific States Cast Iron Pipe Co., Provo, Utah.
125 tons, PWA project, Akron, O., to U. S. Pipe & Foundry Co., East Burlington, N. J.

Steel Pipe Placed

Unstated, 7000 feet, 10-inch, for Toledo, Oreg., to unnamed supplier.
Unstated tonnage, 2840 feet, 20 and 24-inch steel pipe and fittings, United States engineer, Washington, to Thomas Somerville Co., Washington $15,340.13, delivered, bids Nov. 23, schedule 48.

Steel Pipe Pending

23,000 tons, 12¾-inch O. D. line pipe for Colombia, S. A.; inquiry by Texas Co., New York, for Colombian company.

Cast Pipe Pending

913 tons, 4 to 12-inch, Las Mesa, Lemon Grove & Spring Valley Irrigation District, Las Mesa, Calif.; bids opened.
705 tons, 20-inch, cement-lined, New York city; out for bids soon.
600 tons, Waverly, Ill.
375 tons, 16-inch, Chicago; United States Pipe & Foundry Co., Burlington, N. J., low.
328 tons, 12-inch, Bremerton, Wash.; bids soon.
294 tons, disposal plant, Pueblo, Colo.; bids opened.
200 tons, 8 and 12-inch class 150, for Spokane; bids Dec. 23.

Semifinished

Semifinished Prices, Page 91

Lagging demand for semifinished steel continues. Seasonal influences

are being reflected in a steady slackening in specifications. Indications are that no pick-up in ordering will be experienced until after the turn of the year.

Wire

Wire Prices, Page 91

Pittsburgh — Wire specifications are lower and further slackening is expected over the holidays. Improved buying is expected after the first of the year as some buyers' stocks are reported virtually depleted.

Cleveland — Little new business is reported for prompt delivery, although a moderate improvement is noted in orders for shipment during January. Most consumers continue their policy of reducing inventories as much as possible as the year end inventory period nears. Consumption is fairly well maintained and seems to have leveled off at the low levels reported a few weeks ago. Demand from automobile partsmakers remains disappointing.

Chicago—Steel wire demand continues slow, little change being shown in business over the past several weeks. Stocks of users generally are light but with consumption restricted, there is little occasion to order ahead. Interest in holding down inventories is restricting demand from jobbers.

Boston—Wire orders are sufficient to hold finishing mill operations at 30-35 per cent of capacity, incoming volume being at the level of the last two weeks. Specifications are for small lots, but well diversified and for prompt shipment. Consumers show surprisingly little interest in prices and no tonnages are appearing to test quotations, which are firm.

New York—For the second week wire demand failed to decline further and this leveling off in buying, still at a low rate, tends to warrant the hope that bottom has been reached. In spots there has actually been a slight improvement, with some surprise car lot orders for prompt delivery appearing. Such events are exceptions and in general small fill-in specifications rule. Tonnage now on the books for first quarter shipment is light, but an increase in demand early in that period is indicated. In machine screw products there has been a slight gain from small rivetmakers, requirements for other such items being light.

Birmingham, Ala.—Some improvement, although slight, is evident in demand for wire products. Dealer stocks are practically exhausted, and there is practically a certainty buying must be resumed on a comparatively satisfactory basis soon after the first of the year.

Rails, Cars

Track Material Prices, Page 91

Preparation of railroad budgets for 1938 indicate purchase of practically as much rail and fastenings tonnage as for this year, although some roads will carry over some tonnage. The Missouri Pacific is inquiring for 900 tons of 131-pound rails.

Philadelphia Rapid Transit Co. has placed 20 trolley cars and is considering bids on 141 new buses and 44 trolley coaches. American Car & Foundry Motors Co. has booked 45 parlor coaches for the Santa Fe Trail Transportation Co.

It appears likely that domestic freight car orders for the year will fall under 52,000 cars, as compared

Behind the Scenes with STEEL

Cadaver Caverns

■ OUR Morbid Thoughts department this week calls our attention to the mortuary refrigerators being manufactured by Jewett Refrigerator Co., Buffalo. New 2-body and 3-body models are available, although mob scene models to accommodate as many as 200 have been built. Inhabitants loll about in temperatures varying from 20 to 35 degrees Fahr. and it is to be assumed the units are foolproof, fireproof and escapeproof. Stewing in our editorial cubicle next summer, this will be an item for our Pleasant Thoughts department. And modern darkies need no longer weep because Massa's in the cold, cold ground. He'll probably be thumbing his nose at us from the depths of an air-conditioned corpse-cooler.

Imprinter

■ ONE OF those things that make men and companies stick in the mind we found on the end of a letter from Mr. H. Boersma, advertising manager of Holland Furnace Co., Holland, Mich. Slogan of this company is "Holland Furnaces Make Warm Friends," and substituting for the trite and untrue "yrs. truly" at the bottom Mr. Boersma jots down "Warmfriendly yours." A very merry Christmas to him for that. We've tried without much avail to find an appropriate line for the base of our epistles, but so far we have only succeeded in coining a few derogatory ones like "Steelthily yours." All suggestions will be appreciated.

Add Ads

■ SINCE time immemorial we have had a certain complacent feeling steal over us at the mention of that controversial phrase, "the goose hangs high." Seems like all problems become negligible and difficulties suddenly iron themselves out at the picture created by these words. Now in substantiation of this feeling comes Austin Co., on page 56 of this week's book, to say that the high-hanging goose has been a good thing for them, too. Debtfully and deferentially we bow to Harrisburg Steel on page 53 for adding to our addled pate knowledges heretofore unbeknownst to us. Perhaps in reincarnation we shall some day regain the lost secrets of the Russian steelmakers, if you believe in that sort of thing. We'd like to meet that able ancient of Russia when he comes back to these parts.

Saluemus

■ SINCE this is our last official appearance prior to the holidays, which are really no holidays at all for us who are barrelling out the Yearbook of Industry issue of STEEL, getting it ready for mailing New Year's Eve, may we take this opportunity, may we seize the occasion, may we avail ourselves of this opportune moment, well, before we get tongue-tied, here's a Christmas card from Shrdlu, Cmfwyp, STEEL's editors, circulators and space-chasers—all of us—to all of you, the men of industry.

On behalf of Future Prosperity, who cannot express herself at the moment, STEEL *and its men want to send you their hopes and beliefs that she will return soon in this most sincere Season's Greeting.*

We'll be back again to see you, as usual, between the holidays. Till then, we're going out to dunk our Christmas list in a hot Tom & Jerry.

—SHRDLU

with 64,643 last year, 19,308 in 1935, and 23,829 in 1934. The only outstanding inquiry on which there is any likelihood of action before the end of this month is that of the Western Pacific involving 400 units and even should this be placed the total would still be slightly under 52,000.

New York Central will close Dec. 30 on its first quarter steel requirements of plates, shapes, bars, sheets, pipe, wheels, axles, billets and tubes.

Car Orders Placed

Philadelphia Rapid Transit Co., Philadelphia, 20 trolley cars, to the St. Louis Car Co., St. Louis.

Rail Orders Pending

Missouri Pacific, 900 tons, 131-pound rails; purchase authorized by federal court.

Buses Booked

A. C. F. Motors Co., New York: Seven 35-passenger for Connecticut Railway & Lighting Co., Bridgeport, Conn.; four 31-passenger for Triple Cities Traction Corp., Binghamton, N. Y.; two 36-passenger for Florida Motor Lines Corp., Jacksonville, Fla.; two 36-passenger for Old Colony Coach Lines Inc., Boston.

Shapes

Structural Shape Prices, Page 90

New York—Structural steel inquiry is heavier than expected, led by 5830 tons for a Long Island railroad grade crossing, Lynbrook, N. Y., closing Dec. 29. More projects ranging around 500 tons each are out for bids. November bookings by fabricators will show a sharp increase over those of October, probably close to 150,000 tons. Public work in New York city will be heavy next year, the proposed budget asking for close to $303,000,000 for new projects and additional funds for work already under way. Indications are subway work will be more active with bridges, tunnels, public

Shape Awards Compared

	Tons
Week ended Dec. 18	19.109
Week ended Dec. 11	10,987
Week ended Dec. 4	13,526
This week, 1936	13,667
Weekly average, 1936	16,332
Weekly average, 1937	23,497
Weekly average, November	24,633
Total to date, 1936	1,110,001
Total to date, 1937	1,198,332

Includes awards of 100 tons or more.

schools, hospitals and other city department needs heavy.

Pittsburgh—While structural demand continues light a number of new inquiries have provided an encouraging note. The largest new pending tonnage calls for 10,000 tons estimated requirements for Kensico dam, New York, project now being planned.

Cleveland — Structural steel requirements continue limited to small tonnages. It is claimed that a number of expansion programs involving considerable tonnage are being held up, awaiting a more promising outlook. Among awards last week a few state bridge jobs were noted, but nothing of consequence was reported from private sources.

Chicago — Activity in fabricated structural steel is near the poorest rate in years and inquiries and prospective work indicate little early pickup. Orders have been placed for the first of several buildings constituting the foundry group for the International Harvester Co.'s new Indianapolis plant, with several thousand tons expected to be required eventually. New inquiries total about 6000 tons.

Boston — With large individual tonnages lacking, structural steel contracts approximate 800 tons, most being for construction in Connecticut. Pending inquiries involving 100 tons and under are more numerous, indicating a wider distribution of work in the near future.

Philadelphia — Other than the Pennsylvania state program, few projects are appearing. Several fair-sized jobs still are before the trade. Business is insufficient to support even a moderate rate of operations. At least one mill will shut down entirely for a week or more over the holidays.

San Francisco—The largest structural award since last May involving 2900 tons of sheet piling and structurals for the construction of the Mare Island, Calif., drydock was placed last week. Bethlehem Steel Co. was awarded 1500 tons of piling and Moore Drydock Co., San Francisco, took 1400 tons of shapes.

Seattle — Structural shapes continue in better demand than other items. While fabricators have nearly exhausted backlogs, considerable work is in prospect for early award.

Shape Contracts Placed

3000 tons, Flushing river bridge superstructure and Northern boulevard grade separation, Queens, N. Y., Triborough Bridge authority, project, to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart & Co., New York, general contractor.

1550 tons, power plant, Commonwealth & Southern Power Corp., Bay City, Mich., to Ingalls Iron Works, Birmingham, Ala.

1500 tons, power house, Commonwealth & Southern Corp., New Castle, Pa., to Ingalls Iron Works, Verona, Pa.

1500 tons, sheet piling, Mare Island drydock, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

1400 tons, structurals, Mare Island drydock, Calif., to Moore Drydock Co., Oakland, Calif.

800 tons, apartment house, Eightieth and Madison avenue, New York, to Harris Structural Steel Co., New York.

600 tons, central school, Vestal, N. Y., to Bethlehem Contracting Co., Bethlehem, Pa.

580 tons, Owens-Illinois Pacific Glass Co., plant, Oakland, Calif., to Moore Drydock Co., Oakland, Calif.

550 tons, school, Livingston Manor, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

510 tons, 7-story store addition, William Hengerer Co., Buffalo, N. Y., to R. S. McMannus Steel Construction Co., Inc., Buffalo.

448 tons, highway work, project FAP 805-14, Waller county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

430 tons, bridge, St. Regis, Mont., to Virginia Bridge Co., Roanoke, Va.

400 tons, girls' infirmary and tunnel, Polk, Pa., for state of Pennsylvania,

to Bethlehem Steel Co., Bethlehem, Pa.

295 tons, bridge FAP 687-A, Dickens county, Texas, to North Texas Iron & Steel, Fort Worth.

235 tons, fire and police stations, Greenwich, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; bids Nov. 23.

225 tons, Crawford hall, Grove City, Pa., to Pittsburgh Bridge & Iron Works, Pittsburgh.

225 tons, overpass over Pennsylvania railroad, route 4, section 36, Monmouth county, and bridge, Bergen county, New Jersey, to American Bridge Co., Pittsburgh; J. P. Burns, Dumont, N. J. and J. W. Rogers, Newark, general contractors, two projects.

225 tons, state highway bridge, C-37-5, RC-3927, Buffalo road, Rochester, Monroe county, New York, to Genessee Bridge Co., Rochester; John Petrossi Sons Inc., Rochester, general contractor.

215 tons, library building, Connecticut state college, Storrs, Conn., to Berlin Construction Co., Berlin, Conn.

210 tons, warehouse, New York Central railroad, West Thirtieth street, New York, to Harris Structural Steel Co., New York.

205 tons, garage, Southern New England Telephone Co., Bridgeport, Conn., to American Bridge Co., Pittsburgh; E. & F. Construction Co. Inc., Bridgeport, Conn., general contractors.

200 tons, structural steel angles, bureau of supplies and accounts, navy department, delivery to Brooklyn and Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa., schedule 2059, bids Nov. 16.

200 tons, undercrossing, Thirteenth street, Fargo, N. Dak., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, mix house, Libbey-Owens-Ford Glass Co., Ottawa, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

190 tons, bridge FAP 37, Fayette county, Texas, to Mosher Steel Co. Dallas, Tex.

185 tons, approach spans, Bangor & Aroostook railroad, Presque Isle, Me., to Bethlehem Steel Co., Bethlehem, Pa., direct bids.

183 tons, crossing near Redding, Shasta county, California, to Ingalls Iron Works, Birmingham, Ala.

170 tons, addition to armory, 108th F. A., General State authority, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, bottling plant, Coca Cola Bottling Co., Atlantic City, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, bridge No. 5380, Chippewa county, Minnesota, to Minneapolis-Moline Power Implement Co., Minneapolis.

160 tons, bridge 158-6B, Clay county, Indiana, to Vincennes Steel Corp., Vincennes, Ind.

150 tons, four 122-foot oil derricks, General Petroleum Corp., Long Beach, Calif., to Macco Construction Co., Los Angeles.

150 tons, state overpass bridge, route 4, section 36, Freehold, N. J., to American Bridge Co., Pittsburgh.

146 tons, mercantile building, S. H. Kress & Co., Texarkana, Tex., to Mosher Steel Co., Dallas, Tex.; Bowen Construction Co., Hot Springs, Ark., general contractor. Reinforcing to Southern States Steel Co., Dallas.

141 tons, radial gates, for Pilot Knob check ways, Boulder project, Calif., to Pacific Iron & Steel Co., Los Angeles.

133 tons, Geneva street bridge for United States Engineer office, Los Angeles, to Consolidated Steel Corp., Los Angeles.

120 tons, building, International Agriculture Corp., Lockland, O., to Ingalls Iron Works, Birmingham, Ala.

119 tons, highway work, project C-238-1-2, to North Texas Iron & Steel Co., Fort Worth, Tex.

115 tons, West Brand boulevard bridge, United States Engineer office, Los Angeles, to Consolidated Steel Corp., Los Angeles.

115 tons, grade and high school, Chaumont, N. Y., to Syracuse Engineering Co. Inc., Syracuse N. Y.; Gardner Construction Co., Syracuse, general contractor.

108 tons, crossing, Livingston, Merced county, California, to Moore Drydock Co., Oakland, Calif.

105 tons, steel sheet piling, repairs to Wilmington harbor south jetty, for Philadelphia army engineers, to Carnegie-Illinois Steel Corp., Pittsburgh.

105 tons, Woolworth store, Niagara Falls, N. Y., to Bethlehem Contracting Co., Bethlehem, Pa.

105 tons, armory, Evansville, Ind., to George L. Mesker & Co., Evansville, Ind.

100 tons, office, for Don Baxter Inc., Glendale, Calif., to Consolidated Steel Corp., Los Angeles.

100 tons, locomotive crane, for San Diego, Calif., to unnamed interest.

100 tons, Montgomery Ward & Co. building, Sacramento, Calif., to Golden Gate Iron Works, San Francisco.

Unstated tonnage, foundry buildings, International Harvester Co., Indianapolis, to Gage Structural Steel Co., Chicago.

Unstated, four main tunnel control gates, Fort Peck project; Fegles Construction Co., Minneapolis, general contractor.

Shape Contracts Pending

10,000 tons, steel sheet piling, estimated requirements, Kensico dam, New York; project now being planned.

5830 tons, grade crossing, Long Island railroad, Lynbrook, N. Y.; bids Dec. 29.

1500 tons, building, Hawaiian Pineapple Co., Honolulu; project abandoned.

1500 tons, building, Central library Brooklyn, N. Y.; bids Dec. 23.

1000 tons, bridge, Bay City, Mich.; Owen-Ames-Kimball, Grand Rapids, Mich., low.

800 tons, power plant, Louisiana Steam & Generating Corp., Baton Rouge, La.

680 tons, state highway projects, Flushing, Riverhead and Orange counties, New York.

550 tons, buildings, Tallmans Island sewage treatment plant, New York; bids Dec. 21.

545 tons, convent and school, St. Pascal church, Queens, N. Y.

500 tons, plant, Aluminum Co. of America, Mobile, Ala.

500 tons, bridge, Bayville, N. Y., for Nassau county.

500 tons, bottling plant, Coca Cola Bottling Co., Pittsburgh.

465 tons, public school 119, Bronx, N. Y.; Lehigh Structural Steel Co., Allentown, Pa., low, $39,879, bids direct on steel, fabricating and erecting.

450 tons, shapes and bars, memorial auditorium, Burlington, Iowa; J. P. Cullen & Son, Janesville, Wis., low.

400 tons, state bridge, Shetuckit river, Norwich, Conn.; N. Benvenuti & Sons, New London, low.

330 tons, store building, S. S. Kresge Co., Baltimore.

275 tons, bridge, Port Royal, S. C.

260 tons, bridge over Compton creek, Compton, Calif., for U. S. government.

255 tons, Wilson Canyon Bridge, Coconino county, Arizona; bids Dec. 28.

235 tons, Long Beach Main Line-Pacific Electric railway bridge, United States engineer office, Los Angeles; bids opened.

225 tons, apartment, Hartford, Conn., taking bids.

215 tons, public school 134 tons, Queens, N. Y.; Bethlehem Fabricators, Inc., Bethlehem, Pa., low, $17,875, bids on steel direct, fabricating and erecting.

190 tons, crossing, Union Pacific tracks near Pico, Los Angeles county, California; bids Dec. 30.

150 tons, library, Drew university, Madison, N. J.; bids Dec. 22.

125 tons, school, Providence, R. I.

125 tons, substation structure, Seattle light department; bids Dec. 23.

Unstated, bulkhead frames and gates for Coulee dam; bids to bureau of reclamation, Denver, Jan. 4.

Reinforcing

Reinforcing Bar Prices, Page 91

New York — Billet steel reinforcing bars, cut lengths in car lots, are now quoted at 2.84c, delivered building site, including trucking, in an effort to stabilize the price structure, long erratic. Except for close to 1500 tons for a grade crossing, Long Island railroad, closing Dec. 29 and 1700 tons for tunnel approaches, New Jersey, one contract being rebid, active inquiry is smaller. Awards are also down, but include 375 tons for a bridge and grade crossing, Flushing, Queens, N. Y.

Pittsburgh — Seasonal influences are reflected in lagging demand for concrete reinforcing bars. Awards continue restricted and only a few new projects are appearing. Specifications still are shrinking and are expected to continue downward. The tone of the market appears somewhat firmer.

Cleveland — Tonnage requirements of reinforcing bars and joists from private sources in Northern Ohio during November is estimated at 300 and 363 tons respectively.

Chicago—While concrete bar shipments are declining and new inquiries are few, a fair number of jobs remain pending. School work predominates. United Air Lines has placed 100 tons for an office building here.

Philadelphia — Bethlehem Steel Co., Bethlehem, Pa., has taken 800 tons for Sears Roebuck store, Baltimore, which is by far the largest award of the week. Considerable work has been placed with contractors for which bars still must be bought. A new bar mill is expected to go into operation next month.

Seattle — Public work projects are developing in the Pacific Northwest and are expected to stimulate the demand early next year. Meanwhile suppliers are booking small tonnages, less than 50 tons each, for numerous school projects. Pending tonnages, outside of Coulee dam requirements, total less than 500 tons.

San Francisco — Although inquiries continue to come forth slowly, awards aggregating 3953 tons reported placed were the largest since mid-August. This brought the aggregate this year to 95,760 tons, compared with 226,512 tons in 1936.

Concrete Bars Compared

	Tons
Week ended Dec. 18	5,418
Week ended Dec. 11.....	2,032
Week ended Dec. 4.....	4,056
This week, 1936	2,810
Weekly average, 1936.....	6,065
Weekly average, 1937	6,081
Weekly average, November	6,282
Total to date, 1936	320,868
Total to date, 1937	310,225

Includes awards of 100 tons or more.

Reinforcing Steel Awards

1180 tons, Roza irrigation project, Washington state, to Knoxville Iron Co., Knoxville, Tenn.

800 tons, store, Sears Roebuck & Co., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

365 tons, Flushing river bridge superstructure and Northern boulevard grade crossing, Queens, New York, to Joseph T. Ryerson & Son, Inc., Jersey City, N. J.; James Stewart & Co., New York, general contractor; Triborough Bridge authority project.

300 tons, highway work, project FAP 805-14, Waller county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

300 tons, ward buildings No. 13 and 14, state hospital, Norristown, Pa., to Sweets Steel Co., Williamsport, N. Y.

281 tons, bureau of reclamation, Cantu, Calif., to unnamed interests.

255 tons, bureau of reclamation, Phoenix, Ariz., to unnamed interests.

225 tons, Washington state highway jobs, to Northwest Steel Rolling Mills, Seattle.

200 tons, telephone building, Glendale, Calif., to unnamed interest.

174 tons, bureau of reclamation, invitation A-22,102-A, Parco, Wyo., to unnamed interest.

155 tons, highway work, project FAP 687-A, to North Texas Iron & Steel Co., Fort Worth, Tex.

140 tons, municipal improvement, stores and apartments, Princeton, N. J., to Carroll-McCreary Inc., New York.

140 tons, Balch and Chippenhook bridges, Clarendon, Vt.; Edward L. Knight, South Royalton, Vt., low, bids Dec. 7.

130 tons, high school, San Bernardino, Calif., to unnamed interest.

125 tons, high school, Barstow, Calif., to unnamed interest.

125 tons, Kenmore bridge, King county, Washington, to Northwest Steel Rolling Mills, Seattle.

113 tons, crossing, Livingston, Merced county, California, to Ceco Steel Products Corp., San Francisco.

107 tons, bureau of reclamation, invitation 24,582-A, Potholes, Calif., to unnamed interest.

103 tons, bureau of reclamation, invitation 24,592-A, Araby, Ariz., to unnamed interest.

100 tons, building, United Air Lines, Chicago, to Calumet Steel Co., Chicago.

100 tons, hospital, Elizabethtown, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

Unstated tonnage, highway project 8511, Duchess county, New York, to Concrete Steel Co., New York; De Christopher Bros., Peekskill, N. Y., general contractors, $144,020.25.

Reinforcing Steel Pending

1500 tons, grade crossing, Long Island railroad, Lynbrook, N. Y.; bids Dec. 29.

850 tons, New Jersey approach section,

Lincoln tunnel, New York; George M. Brewster & Son, Bogota, N. J., contractor.

600 tons, buildings, sewage treatment plant, Tallmans Island, New York; Dec. 21.

500 tons, Kapalama drainage district, Honolulu, T. H.; bids Dec. 20.

260 tons, sewage treatment work, Freeport, Ind.

228 tons, high school, Dinuba, Calif.; bids opened.

200 tons, high school Niles Center, Ill.

146 tons, foundations, Pacific Gas & Electric Co. substation, Oakland, Calif.; general contract to Dinwiddie Construction Co., San Francisco.

100 tons, hospital addition, state at Fort Steilacoom, Wash.; bids opened.

100 tons, bridge, Rock Creek, near Shoreham hotel, project 3B4, National Capitol parks, Washington, D. C.; Bahen & Wright Inc., Washington, low, $93,189.40, bids Dec. 9.

Pig Iron

Pig Iron Prices, Page 92

Pittsburgh—Market continues to drag and new buying has been reduced to an occasional carload or two, largely malleable and No. 2 foundry grades. Activity of foundries probably will be further restricted during the holiday period.

Cleveland — Pig iron producers note little change in miscellaneous orders, which are limited to individual carloads, reflecting only actual needs of consumers. Stocks in producers' yards are said to be normal, while most consumers are operating only two or three days a week on a hand to mouth basis. Producers do not expect any important buying movement until after the middle of next month and in the interim are expecting to carry over considerable fourth quarter tonnage.

Chicago—Pig iron shipments are declining more rapidly and December deliveries are expected to be less than one-half those of November. Foundry operations, however, are off only about 15 per cent since a month ago. New business so far is quiet since a number of customers have taken only a portion of the iron contracted for this quarter. The market is steady on new business at $24, furnace, for No. 2 foundry and malleable.

New York—While pig iron consumers have fair stocks considering present dull state of business, it would not take much of a lift to force them again into the market. Some large consumers have sizable stocks, but they are the exception. Discouraging aspect is that consumers cannot see more business soon for their own products. As long as they have no important business in sight they will not buy much iron. Trade opinion is that there will not be much improvement before the middle of next month.

Boston—While a few consumers are showing more interest in limited requirements for first quarter, such buying has been light and shipments for current spot needs are less active. Buying for shipment after Jan. 1 is mostly by medium-sized consumers, the larger melters depending on stock being carried over into the new year while the smaller users continue to take spot lots as needed. Foundry melt is meager with some improvement expected next month. About 900 tons of Indian iron arrived last week against old orders.

Prices quoted on 626 tons of foundry iron, delivered to Boston and other eastern navy yards, Dec. 14, were generally firm and in line with listed quotations, although not identical for all points of delivery. Largest individual tonnage was for Norfolk, Va., 223 tons, and lowest bid was $26.20 by a merchant furnace, or about $4 under price quoted by several other sellers. Good part of bids received were from nonmerchant producers.

Philadelphia—Shipments now are being made on a 75,000-ton basic iron order booked for England recently, and which, it is understood, was split by two companies. Foreign buying otherwise is light with merchant interests maintaining prices offered are not particularly attractive. Domestic consumers continue to show some interest in spot requirements. However, sellers have little iron on books specified for first quarter delivery. No price deviations are reported.

Buffalo—Shipments showed a further decline and producers are forced to accumulate iron to maintain present operating rates. Foundries are reducing inventories as the majority are working a three or four-day week. Some revival in activity is looked for in the first quarter.

Cincinnati—A few inquiries for first quarter pig iron are appearing, otherwise the market is inactive. Shipments are at the low point for the year after a modest spurt on specifications against contract on Northern iron. Melt has declined further.

St. Louis—With steel mills' ingot operations down to a new low for some time, and other melters, such as stove plants and job foundries, greatly lessening their operations, the melt of pig iron has been reduced considerably during the last week.

Birmingham, Ala. — Perceptible slowing down has been noted in demand in the South, especially with the advent of the holiday season. A major contributing factor is decline of foundry operations. Production, however, continues unchanged from last week with 13 furnaces pouring.

Toronto, Ont.—Business continues slow in the pig iron market, with sales now running under 1000 tons a week. The curtailment in demand is due to the holiday season, rather to decline in plant operation. Current demand is entirely from hand-to-mouth buyers and all sales are for spot delivery. A number of melters are covered to the end of the year and deliveries are steady. Pig iron prices are firm and unchanged.

Scrap

Scrap Prices, Page 94

Pittsburgh — More strength appears developing in the iron and steel scrap market, although at present this seems largely sentimental. Dealers are furnishing the only market activity at this time and are suggesting a price level of $13.50 to $14 for No. 1 heavy melting steel. However, the last sale to a mill consumer brought $13.50. Tentative negotiations have been initiated by several consumers in this district, involving heavy melting steel, pressed sheets and short rails. Up to this time nothing definite has developed from these negotiations.

A large local consumer is reported to have bought 4000 to 5000 tons of heavy melting steel at $13.50. Dealers are understood to be covering at $14.

Cleveland — Routine business appears the present rule in scrap. Occasional cars are picked at the market levels but shipments continue restricted here and in the valleys. Quotations are unchanged but nominal.

Chicago—Scrap prices are higher but the upturn is entirely the result of more active bidding by dealers and brokers covering higher priced orders. Mills remain out of the market but sellers indicate they would not accept new business in heavy melting steel at less than $14, compared with the recent nominal range of $11.50 to $12. The mill price nominally may be quoted $12.50 to $13. Specialty grades are stronger.

Boston—Improved sentiment in the scrap outlook is enhanced by scattered firmer bids for material, involving several grades, and yard dealers are more disposed to hold for better prices. While no pronounced upturn in buying has developed, bids are more numerous for Pennsylvania shipments.

New York — Buying of scrap for domestic shipment and export has slackened further, with shipments to eastern Pennsylvania light. Prices are steady and unchanged in most grades with $13.50 prevailing for No. 1 heavy melting steel for export.

Buffalo—The results of the compromise reached between the leading consumer of the area and dealers in iron and steel scrap indicate a reluctance of sellers to part with stocks at prevailing nominal prices.

The proposition of the consumer gave dealers the right to ship against oil contracts on a percentage basis to the extent they would take orders at present prices of $13 a ton for No. 1 heavy melting steel and $11 for No. 2.

Philadelphia — Some steelmakers in this district are picking up small lots of No. 1 heavy melting steel at $14.50 and $15, which substantiates the current range of quotations, which is unchanged for the second week. The market is regarded as potentially strong and the scrap trade and consuming interests expect the first important tonnage covering will bring higher prices.

Detroit—Scrap prices are sentimentally stronger, with steel mill grades up 25 to 50 cents per ton, in spite of the fact buying is practically nonexistent. The explanation probably is the speculative laying down of tonnages by certain interests rather than any definite buying for consumption.

St. Louis—The market for iron and steel scrap is stronger, and some prices are higher by 25 cents to $2 a ton. The advances are due principally to eagerness of dealers in covering their short interest, and the scarcity of scrap.

Toronto, Ont.—Sharp reduction in dealers' buying prices became effective in the Canadian scrap market during the past week and leading dealers now are quoting $1 to $2.50 per ton under previous levels. No explanation is given for the change, other than that little scrap is being thrown on the market and demand is tapering.

Seattle — The situation is unchanged, the trade marking time hoping for a resumption of the export movement, which is not likely to take place before early spring.

Warehouse

Warehouse Prices, Page 93

Pittsburgh—Activity in the iron and steel warehouse market continues limited. Seasonal influences are serving further to depress demand and distributors look for little change in the volume of business until after the turn of the year. While consumer inventories are attributed in some quarters as largely responsible for the recent slump in buying informed distributors state such inventories are not excessive, and, in fact, in some instances are on bottom.

Cleveland — Announcement of a reduction of $2 a ton on reinforcing material out of jobbers stocks is expected to have a stabilizing effect on an otherwise weak market. Most distributors expect a continued decline in orders and shipments through the remainder of the month as the year end inventory period nears. According to some December will be the worst month this year, in some instances less than 40 per cent of the March peak. Estimates for January and first quarter, while highly speculative, are expected to remain below the comparable period this year.

Chicago—Sales continue to follow the trend common to December and are expected to reach a bottom during the last week. Reduced consumption as well as the desire to restrict inventories is contributing to lower demand.

New York—While volume booked by warehouses this month approxi-

mates the November tonnage, the usual holiday recession is expected to bring the total under the previous month. Warehouse prices are mixed, with more steel products involved as some smaller distributors seek to lower inventories.

Philadelphia—Jobber interests report volume still restricted but in some of lighter products are a shade better than during the past three weeks. December volume to date compares favorably with November.

Cincinnati—Warehouse sales are yielding further to seasonal influences, although industrial users are taking steadily in reduced volume, to fill immediate requirements. Prices are unchanged.

Seattle—Business has improved slightly this month and is ahead of November. Most items are moving in small lots with sheets leading. Mill orders are infrequent. Prices are steady.

Tin Plate

Tin Plate Prices, Page 90

New York—Most consumers of tin plate will go into the new year with some stocks taken in at the old $4.85, Pittsburgh, price, and this, incidentally, will probably lead to some merchandising problems for those who will endeavor to base their products on the $5.35, Pittsburgh, price for tin plate. Contracting for next year is getting under way slowly and this situation combined with continued hesitancy on the part of export buyers in making purchases is resulting in a generally quiet tin plate market. Foreign buyers, apparently, now that the domestic prices in this country have been reaffirmed, are endeavoring to obtain a better gage of prospects in other producing countries before entering the market here at the firm prices indicated as likely to prevail here.

Pittsburgh — Current demand for tin plate is slow seasonally. Operations are estimated around 50 per cent of capacity, but are expected to go lower over the Christmas holidays. Specifications are down and consumers are slow to make known their 1938 requirements. One reason is the general business uncertainty, and another the fact that consumers' stocks are reported heavy. Producers are hopeful that a pick-up in business will develop shortly after the turn of the year, and the belief is widely held that 1938 business will compare fairly well with that experienced during the current year. Recent extension of current prices into 1938 is seen as a factor for delaying orders at this time. Consumers assured of a stable market for months to come and with plentiful stocks to care for their production requirements are in no haste to cover ahead.

Steel in Europe

Foreign Steel Prices, Page 93

London—(*By Cable*)—Great Britain in November established a new alltime record for production of steel ingots and castings, with a total of 1,178,300 tons. This is the third time a new high mark has been reached this year. In March 1,109,500 tons was produced and in September 1,163,000 tons, each the highest to that time. Pig iron output in November totaled 762,300 tons, compared with 769,600 in October, from 135 blast furnace stacks, compared with 133 at the end of October.

Steel imports in November totaled 272,501 tons compared with 220,500 tons in October; exports 198,008 tons compared with 211,100 tons.

Blast furnaces are sold well ahead and supplies of basic iron are eased by substantial imports from Canada and the United States. Steel demand continues intense in the domestic market and mills are booked for many weeks ahead. All steel-using concerns are active. Exports are light.

Iron Ore

Iron Ore Prices, Page 94

New York—Tungsten ore prices have taken a turn upward, following a decline of several weeks, with the market today holding around $24.50 to $25 duty paid, per net ton unit. This upswing is the result of renewed European demand which has undoubtedly been stimulated by the further turn of events in the Sino-Japanese conflict.

Domestic buying, however, has not been stimulated in an important degree. American converters of ore are still fairly well covered for the present and little improvement is expected in buying until after the turn of the year.

Ferroalloys

Ferroalloy Prices, Page 92

New York—With steelmaking operations still sagging, and with the possibility that they may reach an all-time low during the week following Christmas holiday when a number of large units may be shut down until after New Year's, shipments of ferromanganese this month will undoubtedly be the lightest this year.

This will be particularly true with no advances in prices having been scheduled for the first quarter of next year. The market is $102.50, duty paid, Atlantic and Gulf ports, a price which has held on all new business since early last spring, despite the fact that manganese ore is still higher today than at the time the present price was announced.

Due to the stronger trend in ore, ferrotungsten prices are somewhat higher holding at $2 to $2.25 per pound, tungsten contained, freight allowed, in carlots.

Discuss Merchandising

(*Concluded from Page 28*)

Price Level," four manufacturers agreed that insofar as they could determine there will be no downward revision in prices soon. W. A. Purtell, president Holo-Krome Screw Corp., Hartford, Conn., opened this part of the program. He explained that in general costs determine prices, and that the major factors in cost are materials and labor. There is no evidence that these costs are going to come down.

When costs are at present levels, said D. W. Northup, president, Henry G. Thompson & Son Co., New Haven, Conn., nobody wants to see selling prices reduced. This same attitude is essential in buying.

J. Harvey Williams, president, J. H. Williams & Co., Buffalo, said he does not believe that there will be any lowering of prices.

Subscribing to these same opinions, L. M. Knouse, president, Stanley Electric Tool Co., New Britain, Conn., stated that he based his own ideas specifically upon his own, the electric tool industry.

There is a growing tendency, asserted Mr. Curtis, for certain manufacturers to increase the number of their distributors and thus reduce the value of their old distributors' franchises. The latter do not like this policy. Manufacturers, therefore, may well give thought to this important topic of "Selective Distribution," as there is a distinct menace in its nonobservance.

Harold F. Seymour, chairman, committee on distributor relations, American Supply and Machinery Manufacturers' association, reported progress in the direction of better relations between his group and the distributors. After calling attention to the fact a definite policy on distributor relations had been adopted and publicized, Mr. Seymour said the question of margins presents a great problem. Too great margins are dangerous and uneconomic. It is essential to arrive at adequate margins, and then maintain them.

In an address on "Effective Sales Assistance by the Manufacturer," Mr. Ridings made some suggestions based on his experience as a distributor. Catalogs showing list prices should be furnished wherever possible in numbers sufficient to cover the distributor's entire prospect list. The showing of list prices is all-important.

A sales manual should not be an engineer's handbook, he said. It should be built around key products and should be edited by a competent advertising man. There is much waste in the flood of letters, testimonials and similar material. What is needed is a 90 per cent reduction in bulk.

Final address on the program was that of Julio F. Sorzano, manager, industrial division, Wailes Dove-Hermiston Corp., New York, whose subject was "The Manufacturer Looks at Distributor Co-operation." Mr. Sorzano described his organization's experiences in the past year.

Nonferrous Metals

Nonferrous Metal Prices, Page 92

New York — Price declines in copper and lead were the chief developments in nonferrous metal markets last week. Consumer buying interest continued light since buying incentives were still lacking. Quotations on the London Metal Exchange, with the exception of zinc, were below the average for the previous week.

Copper — The leading custom smelter reduced prices ⅛-cent per pound on Thursday to the basis of 10.12½c, Connecticut, for electrolytic. Primary mine producers continued to quote 11.00c, the price on which rolled and drawn products are predicated. The November statistical report showed an increase of 30,682 tons in world refined stocks. Indications are that production is being reduced in line with the lower rate of consumption.

Lead — Prices declined $5 per ton to the basis of 4.75c, New York, and 4.60c, East St. Louis. The unexpected cut was attributed to slack inquiry and an accumulation of ore and scrap at smelters' plants.

Zinc — Sales improved but the volume was still below normal. Unfilled orders on sellers' books have been reduced about 50 per cent from the August peak. Prime western held steady at 5.00c, New York.

Tin — Prices fluctuated from 42.50c to 44.00c compared with the previous week's close of 45.25c. Consumer buying interest continued quiet.

Equipment

Chicago—While machine tool and plant equipment sales have declined, business for some sellers this month is well ahead of the November volume as a result of the closing on several large orders. Demand is spotty but sales in some cases are better than anticipated. A feature of recent buying is the increased demand for machinery parts, indicating users are taking advantage of the present business lull to make necessary repairs.

Boston—Shops still operating near capacity are fairly numerous. Domestic orders have declined, although sales of grinders with some producers this month are better than last. At least half dozen shops have large backlogs for export to Russia, Japan and other countries. Deliveries gradually are improving, prices are firm and there are no cancellations of metalworking machinery orders reported. Builders of textile mill equipment are less active and the shoe industry is at low ebb. Few shoe machines, however, are

sold outright, being leased on a royalty basis.

New York—Machinery orders are fewer, most dealers' volume this month trailing that of November and far below December last year. Purchasers are buying only what is absolutely required and considerable volume on which estimates had been asked is being held up. Deliveries are improving, one mid-west lathe builder promising shipment in six weeks. Numerous shops still have good backlogs, several with heavy equipment on the books for shipment through March. Export buying continues brisk and prices are well maintained on domestic business.

Seattle — Seasonal requirements are providing a fair volume of business, pumping equipment and electrical supplies leading. Plant replacements are less than normal due to depressed conditions in logging and lumbering.

Construction and Enterprise

Ohio

WELLSVILLE, O.—Board of control, city hall, takes bids within 30 days for constructing filtration plant in little Yellow creek. Total cost $160,000.

WILLARD, O.—Village is making plans for constructing sewage disposal plant and sewerage system. Plans special election to vote $65,000 bonds as city's share of cost. Total cost $100,000. Jennings Lawrence Co., 12 North Third street, Columbus, O., engineer.

WRIGHT FIELD, DAYTON, O.—War department, air corps, receives bids until 10 a.m., Dec. 23, for various quantities of aluminum alloy bushings, ball and socket joints, and universal aircraft joints; until 10 a.m., Jan. 7, 1938, for 4000 feet of ⅛-inch flexible conduit, specification 32119; 2100 feet of ¼-inch flexible conduit, 7300 feet of ⅜-inch flexible conduit, specification 32007-F.

New Jersey

ATLANTIC CITY, N. J.—Atlantic City Electric Co. will install main power substation in former converter station of Pennsylvania-Reading Seashore lines, in meadow district, including transformers, switchgear and other equipment for power supply for traction system of Atlantic City & Shore Railroad Co.

PASSAIC, N. J.—Home Fuel Oil Co. Inc., 223 River drive, plans construction of steel tanks and installation of pumping equipment of proposed new bulk oil and distributing plant at Port Newark. Cost $100,000.

TRENTON, N. J.—Crescent Insulated Wire & Cable Co. Inc., 319 North Alden avenue, Trenton, has let general contract for one-story addition. Cost with equipment over $50,000.

VERONA, N. J.—Essex Co. plans pipe line to carry Newark water for powerhouse and laundry, and will install gasoline engine pumping station to provide independent source of power for fire use. Runyon & Carey, 31 Fulton street, Newark, engineers.

Connecticut

BERLIN, CONN.—Kensington district plans pumping station, force mains and collecting mains for disposal system. Cost $25,000.

BRIDGEPORT, CONN.—Jenkins Bros. is planning an addition to its foundry.

COLCHESTER, CONN.—Town making plans for waterworks, including storage, pumping and distribution facilities. PWA allotted $40,023. Total cost $100,000. H. Wolcott Buck, 650 Main street, Hartford, engineer.

NEW HAVEN, CONN.—A. C. Gilbert Co., Blatchley avenue, will receive bids for three-story brick and steel factory. Cost $40,000. Westcott & Mapes Inc., 139 Orange street, architect. (Noted Sept. 20.)

TORRINGTON, CONN.—Fire damaged the plant of the Colonial Bronze Co. Nov. 9.

Massachusetts

FRAMINGHAM, MASS.—Town, board of public works, J. Williams, chairman, plans constructing new water supply system including concrete reservoir, trunk mains, pumping station and equipment. Cost to exceed $300,000. Whitman & Howard, 89 Broad street, Boston, engineers, are now investigating ground water supply.

New York

CATON, N. Y.—Department of commerce, aeronautical division, Washington, plans constructing five 125-foot steel towers to transmit radio signals to pilots flying Newark-Buffalo route, four miles from here. Cost $40,000. Maturity soon.

NEW YORK—E. J. Barnes Associates, 101 West Thirty-first street, New York, would like to purchase 20-ton 30-inch gage gas or diesel locomotive. Steam type acceptable.

Pennsylvania

BENTLEYVILLE, PA.—Village will receive bids to 7:30 p.m., Dec. 23, for water supply and distribution system. Project is partly financed by PWA. Cost $138,000. Chester Engineers, Century building, Pittsburgh. (Noted Dec. 6 issue.)

PHILADELPHIA—Frankford arsenal, Philadelphia, takes bids to Dec. 28, invitation 314-38-546, for form turning lathe, delivery Frankford arsenal.

PHILADELPHIA — Standard Plating Works Inc., 1617-27 North street, has acquired property on Olney avenue, Olney, Pa., for a one-story plant for which contract will be let. Present plant, including tinning, polishing, buffing and electroplating departments will be moved to new location. Estimated cost over $50,000.

Indiana

INDIANA—Acme Engineering Co., L. H. Bowman, president, plans power project on Salamonie river, including three dams and power houses to develop 2000 horsepower in Wabash and Huntington counties.

Michigan

DETROIT—Divco Twin Truck Co. will erect factory and office building on Hoover road in southern Macomb county. Smith, Hinchman and Grylls, Detroit, architects.

EWEN, MICH.—Sawmill of Bergland Lumber Co. was damaged by fire.

GRAND RAPIDS, MICH.—Private plans completed for construction of oil refinery building and storage tanks for State Refining Co., Grand Rapids, to be erected in northeast section of city.

LANSING, MICH.—Chubb Engineering

Corp., 1108 Olds Tower, Lansing, has been incorporated with 5000 shares non-preferred voting stock to manufacture steel and other metals. Loyde H. Chubb, 915 North Capitol avenue, incorporator.

PAW PAW, MICH.—Flood waters of Paw Paw river washed away hydro-electric plant of village. Estimated cost for new plant $100,000.

Alabama

BIRMINGHAM, ALA.—Mohawk Silica Corp. plans boiler house at new silica processing plant in Calhoun county near Ohatchee. Cost $70,000.

Maryland

CHILLUM, MD.—William B. Dolph, general manager station WOL, Washington, having test surveys made near Chillum, Md., to determine one of three locations as site for new 1000-watt transmitter including two 230-foot towers with building to house transmitter equipment and emergency studio. Main studio remains in Heurich building, Washington.

EASTON, MD.—Phillips Canning Co., Cambridge, Md., let contract to Charles Brohawn & Bros., Cambridge, Md., for erecting 2-story plant to replace burned factory. Cost including equipment $50,-000.

HAGERSTOWN, MD.—City rejected bids for constructing central equipment building on site of old municipal electric light plant and will call for new bids. Building foundation to be completed within three weeks. Wood & Kirkpatrick, Stock Exchange building, Philadelphia, engineers.

ST. MARY'S, MD.—Southern Maryland Tri-County Co-operative association, Welcome, soon lets contract for new one-story generating plant. Cost $60,-000. P. M. Anderson, Investment building, Washington, engineer.

District of Columbia

WASHINGTON—Office of general purchasing agent, Panama Canal, will receive bids until 10:30 a.m., Jan. 3, 1938, schedule 3310, for pipe-cutting and threading machines; until 10:30 a.m., Dec. 30, schedule 3309, for draw-cut hack-saw, screw-cutting lathes, column-shaper, radial drill press, internal grinder and surface grinder, and electric rivet heater, delivery Cristobal or Balboa, Panama, Canal Zone.

WASHINGTON—Navy department, bureau of supplies and accounts, takes bids to Jan. 4, 1938, schedule 2320, for motor-driven drill press, delivery, Mare Island, Calif.; schedule 2333, triple-drum electric winches, delivery Mare Island, Calif.; schedule 2340, hand-operated fuel oil pumps, delivery various east and west coast points.

Florida

MIAMI, FLA.—B. L. Smith Corp., Major B. L. Smith, president, commander of marine contingent at Opa-Locka naval reserve air base, leased site on Le Jeune road, west of municipal airport for construction of factory to manufacture airplanes and airplane accessories.

MIAMI BEACH, FLA.—People's Water & Gas Co., 637 Washington avenue, plans steel pipe line for high pressure gas service connecting Miami and Miami Beach, with lines running across Biscayne bay.

Mississippi

MISSISSIPPI—REA approved loan grant of $300,000 to Four County Electric Power Co. for constructing power lines in Clay, Lowndes, Oktibbeha and Noxubee counties to supply power for 1000 families.

PRENTISS, MISS.—City receives bids in about 30 days for water works, including installation of 8000 feet of pipe, 19 fire hydrants. Bonds voted. Cost $10,-000. Plans from J. C. Sanford, Marshall, Miss.

VICKSBURG, MISS.—U. S. engineer, Box 60, Vicksburg, takes bids to Dec. 23, invitation 1106-38-146, for 2500 feet steel wire rope, delivery Lake Providence.

VICKSBURG, MISS. — Three transformers of Mississippi Power & Light Co. damaged by fire. Herbert M. Jolly, local manager.

North Carolina

BURLINGTON, N. C.—Century Hosiery Mills Inc., Clyde W. Gordon, secretary-treasurer, installing machinery for dyeing and finishing in Aurora cotton mill building, Webb avenue, production to begin early in 1938.

NEW BERN, N. C.—Dixie Chemical Co. Inc., Kinston, N. C., plans fertilizer plant. Cost $75,000.

WILMINGTON, N. C.—Manufacturing unit of Corbett Package Co. outside city limits damaged by fire.

WILMINGTON, N. C.—Southland Mfg. Co., operating two shirt factories, will consolidate plants and construct addition to Second and Greenfield streets plant, including installation of additional machinery. Estimated cost $25,000.

South Carolina

COLUMBIA, S. C.—Wallace Concrete Pipe Co., Box 893, Columbia, would like to purchase 30 to 35-horsepower low-pressure boiler with return tube, 18 to 20-pound pressure. Used boiler preferred.

Louisiana

JENNINGS, LA.—Plant of Fred I. Getty Mfg. Co. damaged by fire.

LAKE CHARLES, LA.—Date of opening bids for construction of sewage treatment plant No. 2 has been postponed from Nov. 30 to Dec. 28 by board of commissioners. Bonds totaling $262,000 available. J. M. Fourmey, Hammond, La., engineer. (Noted in Dec. 13 issue.)

SHREVEPORT, LA.—Southwestern Gas & Electric Co., 428 Travers street, contemplates improvements to service in Louisiana for 1938 including addition to Arsenal Hill plant. Cost $3,250,000.

Tennessee

DECATUR, TENN.—Meigs County Electric Corp. has additional REA allotment of $35,300 to complete 200 miles of power lines in Meigs, Hamilton, Rhea, McMinn and Cumberland counties. Estimated total cost $247,000.

MURFREESBORO, TENN. — Middle Tennessee Electric Membership Corp. has additional REA allotment of $24,000 for completion of 261 miles of rural line in Rutherfordton county. Total cost $260,000.

NASHVILLE, TENN.—Bandsaw mill of Farris Hardwood Lumber Co. damaged by fire.

TRIMBLE, TENN.—Gibson County Electric Membership Corp., Lyle B. Cherry, president, Trenton, has allotment of $123,050 for constructing 141 miles of transmission lines in Dyer, Obion and Gibson counties.

West Virginia

HUNTINGTON, W. VA.—KaBee Inc. H. W. Kayes, president, Huntington, plans installing equipment in distilling and rectifying plant. Cost $100,000.

WHEELING, W. VA.—Wheeling Electric Co. has taken out permit for new power substation at Fifteenth and McCollock streets and will begin work at once.

Virginia

ABINGDON, VA.—City voted $70,000 bonds for installing soft water system.

HOPEWELL, VA.—Norwood Wilson, Hopewell, would like to purchase 100-ton locomotive steam crane.

WYTHEVILLE, VA.—R. P. Johnson receives bids on used boiler 150 to 200-horsepower, complete with stack, standard fittings and dutch oven equipment. 125 pounds pressure, ASME code, Tennessee. Delivery.

Missouri

KING CITY, MO.—City, care of C. Pettijohn, mayor, plans sewage disposal plant with equipment, imhoff tank, trickling filters and auxiliary piping. Also water filter plant. Will seek WPA funds. Cost $65,000. C. A. Haskens & Co., Finance building, Kansas City, Mo., engineer.

SIKESTON, MO. — Mississippi-Scott-New Madrid County Co-operative association is negotiating with REA for construction of 400-mile line, extending south from Sikeston to New Madrid county, Scott and Mississippi counties. Cost $300,000. H. M. Zaricor, Commerce, Mo., temporary chairman.

ST. LOUIS—Mississippi Valley Equipment Co., Chamber of Commerce building, St. Louis, would like to purchase Symons cone crusher, 3 or 4 foot, coarse bowl type; and double-drum 3-phase 60-cycle electric hoist with 2220-volt minimum capacity; also 25-ton guy derrick with 25 to 50-foot boom.

ST. LOUIS—Ford Motor Co., Dearborn, Mich., has acquired 374 acre site in St. Louis county with Mississippi river frontage for erection of assembly plant to replace present plant. M. N. Johnson, 4100 Forest Park boulevard, local manager. (Noted in Aug. 30 issue.)

Arkansas

LESLIE, ARK.—H. W. Wright, manager, Marshall Ice & Electric Co., plans constructing 8 miles of 3-phase line from Marshall to Leslie.

LITTLE ROCK, ARK. — Board of trustees, state school for blind, plans central heating plant in two-story institutional building. Cost $300,000.

Oklahoma

BLACKWELL, OKLA.—City has completed arrangements and secured authority to issue bonds for $300,000 for extensions and improvements in municipal electric power plant, including installation of 4000-kilowatt turbogenerator unit, high pressure boiler and auxiliary equipment. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

HOLDENVILLE, OKLA.—City votes Dec. 21 on $70,000 bonds for additions and improvements to waterworks. Frank Crane, mayor.

LAWTON, OKLA.—John C. Head has applied to communications commission, Oklahoma City, Okla., for permission to construct radio station.

TIPTON, OKLA.—Southwestern Electric Co-operative, Tipton, plans erecting 150 miles of rural electric lines in Tillman county near here. Allotment of $150,000 has been made. E. T. Archer & Co., New England building, Kansas City, Mo., engineer.

Wisconsin

FOND DU LAC, WIS.—Marco Mfg. Co. Inc., has been organized in Wisconsin to continue business of Marco Mfg. Co., Chicago, which has transferred factory and headquarters for manufacture of automobile ignition units and parts. K. M. McLeod, K. A. Schmitt and L. C. Gerhard, incorporators.

OSHKOSH, WIS.—Winnebago county board has appropriated $40,000 for an additional unit of highway garage and service station and adopted plans by J. F. Dreger, 20 Algoma boulevard. E. M. Bird, county highway commissioner.

TOMALIZ, WIS. — Wisconsin Public Service Co., 1029 North Marshall street, Milwaukee, plans construction of hydro-electric project on Wisconsin river near here, including power and transmission line from Tomaliz to Wausau. Cost $1,657,000.

Minnesota

BLUE EARTH, MINN.—A report on the construction of a sewage disposal plant has been submitted to the city council by the engineer. W. Enger, city clerk. Burlingame, Hitchcock & Estabrook, Minneapolis, consulting engineers.

DETROIT LAKES, MINN.—City, E. J. Bestick, clerk, takes bids to 8 p.m., Jan. 3, 1938, for piping and auxiliary equipment, smoke breeching and coal handling equipment, foundations for turbine, condenser, pumps, and electrical construction at municipal power plant. Foster & Wahlberg, Duluth, consulting engineers.

GRAND MARAIS, MINN. — Pigeon River Lumber Co., Grand Rapids, Minn., has applied to federal power commission for permission to construct 5500-horsepower power house on Pigeon river and 110,000-volt transmission line.

MORA, MINN.—Engineer's preliminary report on the construction of a sewage disposal plant has been submitted to city council and application will be made soon to WPA for aid. W. R. Handschu, city clerk. Charles Handschu, Moose Lake, Minn., engineer.

WORTHINGTON, MINN. — Boote's Hatcheries & Packing Co. Inc., plans one-story cold storage and refrigerating plant at meat-packing plant. Cost $45,000. J. C. Boote, president. (Noted Oct. 25 issue)

Texas

BIG SPRINGS, TEX.—Cosden Petroleum Corp., Electric building, Ft. Worth, plans installing motors and controls, conveyors, electric-operated pumping machinery and other equipment for expansion and improvements in oil refining plant at Big Spring. Estimated cost $500,000.

BRYAN, TEX.—Bryan Coca Cola Bottling Co. has been incorporated here. George Stephan, Carroll Machos, incorporators.

DUVAL, TEXAS.—Duval Gasoline Co., care of Republic Oil Co., Benedumtrees building, Pittsburgh, Pa., recently organized as subsidiary interest, plans installing motors and controls, conveyors, electric-operated pumping machinery and other equipment in new gasoline refining plant at Benevides, Tex., vicinity of Duval. Power house and compressor station will be built. Cost of entire project $250,000.

ELDORADO, TEX.—City, care of secretary, announces due to changes in plans bids were not received Nov. 22 for waterworks and sewers and will advertise again for bids. Cost is $110,000. Koch & Fowler, Great National Life building, Dallas, engineers.

KAUFMAN, TEX.—Rural Electric Co., W. W. Biard, secretary, has allotment of $100,000 to construct 95 miles of line in Kaufman county. Hawley, Freese & Nichols, Capps building, Fort Worth, Tex., engineers.

SAN ANGELO, TEX.—City, J. P. Burden, engineer, plans extension to sewage treatment plant, including imhoff tank etc. Cost $10,000.

WINK, TEX.—City, F. F. Breazeale, mayor, receives bids Dec. 29 for sanitary sewer system and disposal plant, including 3000 feet 10-inch pipe, 7000 feet 8-inch pipe, 23,500 feet 6-inch pipe, 15,000 feet 4-inch pipe, 1200 feet 6-inch pipe; two-story sedimentation and sludge digestion tank; install hand operated 4-inch diaphragm pump. Koch & Fowler, 701 Great National Life building, Dallas, Tex., engineers.

Kansas

KANSAS CITY, MO.—Kansas City Coca-Cola Bottling Co., 2540 West Pennway, plans making improvements to plant and installing machinery for additional bottling unit to increase production 50 per cent. Cost $50,000.

LEAVENWORTH, KAN.—City reports have been submitted for waterworks improvements, including new pumps and new 4,000,000-gallon-per-day filter plant. Cost $290,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., engineers.

WATHENA, KAN.—Doniphan County Rural Electric Co-operative is making plans for constructing 125 miles rural transmission lines. Cost $115,000. E. T. Archer & Co., New England building, Kansas City, Mo., engineer.

North Dakota

BISMARCK, N. DAK.—State water conservation commission, E. J. Thomas, chief engineer, has recommended a pumping project for irrigation purposes on Fort Stevenson flats, McLean county. Cost $600,000.

GRAND FORKS, N. DAK.—City council has appointed Lium & Burdick, Grand Forks, Nebr., as engineers to make a preliminary survey and plan improvements to the municipal waterworks system. C. J. Evanson, city auditor.

South Dakota

MURDO, S. DAK.—WPA has approved plans for construction of pipe line and water filtration and sterilization plant to be built after Jan. 1, 1938. H. R. Judd, city auditor.

Iowa

BOONE, IOWA—City making plans for reservoir and water softening plant. G. A. Nelson, Boone, engineer.

LAKE PARK, IOWA—City, L. N. Rowe, mayor, voted in favor of $15,000 bond issue to finance construction of water purifying plant including storage facilities.

MAQUOKETA, IOWA—City, J. G. Thorne, clerk, is taking bids to 2 p.m., Jan. 6, 1938, for construction of addition and alterations to present light plant building, including furnishing one 875-horsepower heavy duty diesel engine with all necessary equipment, including switch gear and cooling system.

MORNING SUN, IOWA—City is taking bids to Jan. 3, 1938, for three 360-horsepower diesel engines with all necessary equipment and electric distribution system. Estimated cost $65,000. Ralph W. Gerhart, 349 Twenty-first street, Cedar Rapids, Iowa, consulting engineer.

Nebraska

MADISON, NEBR.—City, Frank Cerney, clerk, has filed application with state railway commission for permission to construct a two-mile transmission line.

NORTH PLATTE, NEBR.—Platte Valley Public Power and Irrigation District, North Platte, plans transmission line from generating station at Sutherland to site of Kingsley dam. Estimated cost $65,000. Parsons, Klapp, Brinckerhoff & Douglas, 142 Maiden lane, New York, consulting engineers.

OMAHA, NEBR.—Nebraska Power Co., Omaha, plans 15 miles extensions in rural transmission lines in parts of Washington, Dodge and Sarpy counties. Permission has been granted.

OMAHA, NEBR.—U. S. Engineer, City National Bank building, will soon receive bids for 100-kilowatt direct current generating set with 160-brake horsepower diesel engine; 320-brake horsepower diesel for operation at 450 revolutions per minute; centrifugal dredge pump; 5-drum electric-driven hoist; construction of a dredge. Total cost $39,000.

PIERCE, NEBR.—Iowa-Nebraska Light & Power Co., Norfolk, Nebr., plans construction of power line between Pierce and Foster, Nebr. H. L. Carson, company district manager.

Colorado

DENVER, COLO.—Bureau of reclamation will receive bids to Dec. 27, specification 999-D, for furnishing motor-driven pumping unit for Klamath project in Oregon and California.

PUEBLO, COLO.—Universal Oil Refining Co., Amarillo, Tex., has sketches for new refinery. Cost $50,000.

Arizona

WINSLOW, ARIZ.—Arizona Electric Power Co., Winslow, has authorized installing 1050-horsepower diesel generator unit and auxiliary equipment in local power plant. Cost $100,000.

Pacific Coast

BAKERSFIELD, CALIF.—Palomar Refining Co. plans boiler house, pumping station, steel tank, storage and other equipment at new gasoline topping plant in Fruitvale oil field area, two miles from here. Cost $80,000.

LONG BEACH, CALIF.—National Aircraft Co. will erect a new aircraft manufacturing plant on an 11-acre site adjoining Long Beach municipal airport to manufacture military training planes for export purposes. Plan to have plant in operation by July 1, 1938.

LOS ANGELES — Standard Battery Separator Co., 2446 East Fifty-third street, plans rebuilding factory damaged by fire, including equipment. Cost is $200,000.

SANGER, CALIF.—City council will receive bids for furnishing and erecting 60,000-gallon steel water tank and tower, and furnishing and installing turbine pump, pipe, and fittings.

BONNEVILLE, OREG. — Pennsylvania Salt Mfg. Co., Philadelphia, and Chipman Chemical Co. Inc., Bound Brook, N. J., are planning constructing sodium chlorate plant near Bonneville dam. Cost $500,000.

BELLINGHAM, WASH.—Voters have approved proposed $750,000 bond issue to finance steel main water supply line to serve enlarged plant of Puget Sound Pulp & Timber Co.

EPHRATA, WASH.—City is making plans for constructing water system, sewage disposal plant and sewerage system. Cost $15,000. Parker & Hill, Smith Tower, Seattle, engineers.

SEATTLE—State WPA has allocated $148,458 for improvement of water distribution system in Kenmore suburban district.

SEATTLE — City officials approved specifications for proposed Harrison street water system improvement and will call bids soon. Includes steel and cast-iron pipe, pumping house and equipment. Cost $500,000.

SEATTLE—City will receive bids to Dec. 23 for construction of Henderson street sewer project. Cost $265,000. Bids will be called at later date for construction of treatment plant and equipment.

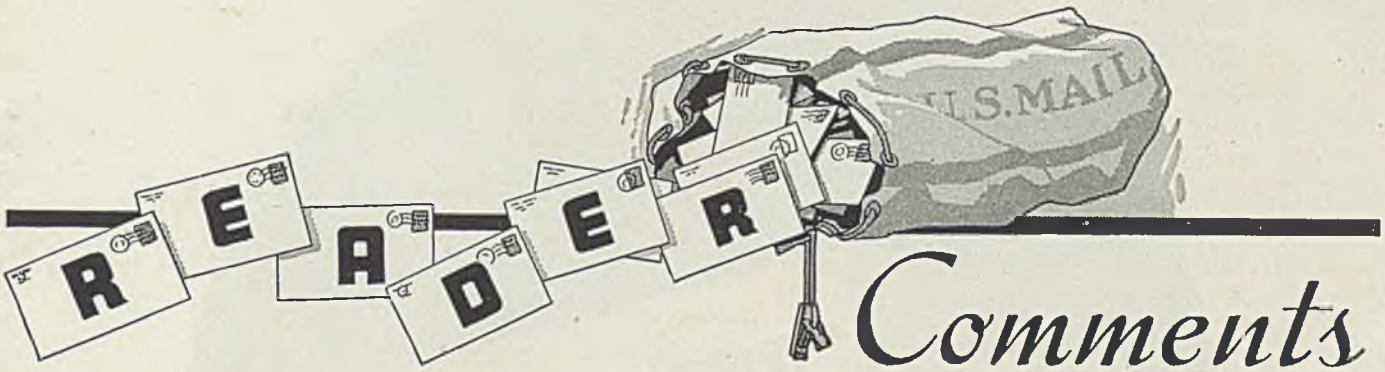
Canada

HAMILTON, ONT.—Dominion Foundries & Steel Ltd., Depew street, F. A. Sherman, general manager, plans watermain and oil line. Estimated cost $30,000.

OWEN SOUND, ONT.—Mead Ore Refineries Ltd., 4 South Richmond street, West Toronto, is making plans for constructing oil refinery. Cost $500,000.

WESTON, ONT.—Public utilities commission soon takes bids for water softening plant. Cost $16,000.

HULL, QUE.—Gatineau Power Corp. is making plans for erection of transmission lines. Cost $75,000.



Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Need Steady Employment

To the Editor:

The greatest need in the steel industry today is the development of a system of control to level off the hills and valleys in employment. Until the industry devotes a proportional amount of energy to the solution of this problem it is not fulfilling its obligation to humanity.

Can't you use your influence in STEEL to help solve this problem?

ELECTRICAL SUPERINTENDENT
Cleveland.

"If This Be Treason—"

To the Editor:

It amused me, and it may amuse you: SWOC lodge at Johnstown, Pa., recently drew up and circulated resolutions based on its interpretation of a news report from Washington that "seventy-two corporations offered to provide immediate employment for one million men in return for the repeal of undistributed profits and capital gains taxes."

Based on this interpretation the lodge in its resolutions stated, "Such a plot is plainly an attack upon the public welfare, a wilfull, premeditated, anti-social and unjustifiable violation of the public trust . . an act as truly damnable as any act of treason in time of war."

The resolutions are addressed to President Roosevelt, and request that he "discover the persons responsible for the aforesaid conspiracy . . . exhaust every resource to provide suitable penal discipline of the individual persons in control of said corporations . . . including incarceration in federal penitentiaries . . . "

News reports must be read intelligently. When intentionally or unintentionally misinterpreted they may lead to such foolish resolutions as the Johnstown lodge's. Is it sensible to assume that any corporation or corporations conspired to make such a "deal" with Roosevelt?

Furthermore, thoughtful reading reveals that industry has been trying to make it plain that under the taxing laws it is difficult to proceed with expansion. This is keeping millions of men out of work. It is too bad the Johnstown lodge got the wrong idea, possibly from a garbled newspaper report.

E. M. F.

Pittsburgh

Threads vs. Welds

To the Editor:

We have read with interest the article on pages 85 and 86 of the Dec. 6 issue of STEEL, entitled "Special Problems Met in Welding Oil Well Casing."

To us, as manufacturers of pipe threading equipment used extensively both in tube mills and in the various oil fields for the threading of oil well casing, this article presents a challenge which we cannot permit to pass unanswered.

We have no particular quarrel with welding as a practice. We do feel, however, that when proponents of welding speak of the reduced efficiency of the pipe wall where threads are cut it is time to call attention to a few self-evident facts.

In the article to which we referred the following statement is made: "It should be obvious that a considerable portion of the advantage gained by using the higher carbon steels is lost by the reduced efficiency of the pipe wall where threads are cut, and this would be more than offset by using material which would permit developing 100 per cent efficiency at the joint."

The obvious implication in the above statement is that the cutting of the thread reduces the efficiency of the joint by a reduction in the wall thickness of the pipe. This is not exactly in keeping with the facts. You can readily appreciate that when a coupling is screwed onto a length of casing, the threads in the coupling are contacting the external threads on the casing for the entire thread length.

Obviously, it would be impossible for the threaded section to part at the root of any one thread without first stripping out all of the threads in the coupling, or on the casing, from the point of fracture back to the end of the threaded section. In this event, the shearing would have to take place through a section of metal considerably thicker than the wall of the casing itself. It is not enough merely to visualize the thread on a length of casing, and upon noting that there is a reduction in the wall thickness of the pipe to assume that there is a corresponding reduction in the efficiency of the joint, but it is absolutely essential to visualize the joint as an assembly.

The statement quoted above also

(*Please turn to Page* 51)

A Question You Can't Afford To Have a Customer Ask You

"Why not make it of *STEEL?*," we asked the construction industry . . . And scores of firms were led to find new sales appeal in the permanence, beauty and safety of this superior building material.

"Why not make it of *STEEL?*," we challenged container producers . . . And scores of firms found that this versatile material enabled them to revolutionize accepted distribution methods.

"Why not make it of *STEEL?*," we repeat for the profit of all industry . . . And in renewing that query we continue to offer you steel with a latitude in size and analysis that has helped many manufacturers solve difficult production problems.

With today's accelerated consumer preference for steel, you cannot afford to lag while your customers keep pace with the constantly expanding list of new steel uses. Why not investigate what Great Lakes Steel can do for *you*? Why not make it of STEEL?

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