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# STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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**PRODUCTION • PROCESSING • DISTRIBUTION • USE**



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## PROCESS VESSEL

*This 11 ft. 4 in. diameter, 21 ft. 4 in. high Nickel-Clad Steel process vessel, of all-welded construction, was built by BLAW-KNOX COMPANY, Pittsburgh, Pa. This job is typical of heavy plate construction using Lukens Nickel-Clad Steel produced by the Lukens Steel Company, Coatesville, Pa.*

\* Reg. U. S. Pat. Off.

## WRITE US TO-DAY FOR THESE . . . .

These bulletins were prepared to present the essential facts about the performance of Nickel-Clad Steel. Illustrated with actual installations in successful plants. The titles: *Lukens Nickel-Clad Steel; Storage Water Heaters and Tanks; Methods for the Fabrication of Nickel-Clad Steel Plate.* Price schedules and Mill Limits on Nickel-Clad and Inconel-Clad Steel.



# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

## As the Editor Views the News

**M**UCH can happen in 30 seconds. Last Wednesday at Lorain Mrs. William A. Irvin crashed a bottle of champagne against the prow of a lake vessel. W. A. Gerhauser touched a control switch. Descending blades severed restraining ropes. The new ore carrier WILLIAM A. IRVIN (p. 33) glided into the water. Whistles blew. Workmen waved hats. Visiting guests beamed their enthusiasm. The launching crew breathed a sigh of relief. The first lake freighter launched since 1930 had gone off the ways smoothly. Three sister ships near completion. Their operating costs will be low. Their performance in 1938 will be an incentive for further modernization of lake fleets.

At the time U. S. Steel was staging this successful launching party, Westinghouse Electric & Mfg. Co. was exhibiting for the first time (p. 30) a new alternating current motor manufacturing aisle in its East Pittsburgh works. Visitors witnessed the latest in layout, materials handling, production control, machine

### Company Insurance

tools and industrial lighting—all synchronized for efficient manufacturing. A few days previously at Middletown, American Rolling Mill Co. entertained several hundred guests at the formal opening (p. 34) of its superbly appointed new research laboratory. Inspection of the new facilities gave point to Charles F. Kettering's remark that a research laboratory—properly operated—is a company's "insurance department."

These demonstrations at Lorain, East Pittsburgh and Middletown—like numerous others which occur frequently throughout industry—mark the completion of additions to the nation's facilities for creating wealth. It is a pity that all American citizens cannot witness a ship launching, or the opening of new manu-

### Creating Wealth

facturing or research departments. Could they participate in these events and grasp their significance, they would sense the enormity of the mistake our

government administration made when it over-emphasized the importance of changing the *distribution* of wealth and income to the danger point of not only neglecting but actually discouraging the *creation* of wealth and income. Now the government is professing to be frantically concerned about correcting this mistake. Encouraging private initiative to undertake the construction of more ships, more manufacturing aisles and more laboratories is the government's best bet for assuring the "more abundant life" it has promised.

Advent of the federal social security program discouraged many private companies from continuing pension and other plans which had been in effect, in some cases, for many years. However, one employer is extending a profit-sharing and social security plan (p. 23) which has been in operation 19 years.

Its results are attracting widespread attention. An employe pays 5 per cent of his earnings into a trust fund and the company pays into it 10 per cent of its net operating earnings (but not more than four times the amount put in by employes). The plan has the effect of accomplishing much more than any government programs, and, of course, is more flexible. Also it hinges upon the willingness of the owners to share profits liberally with employes.

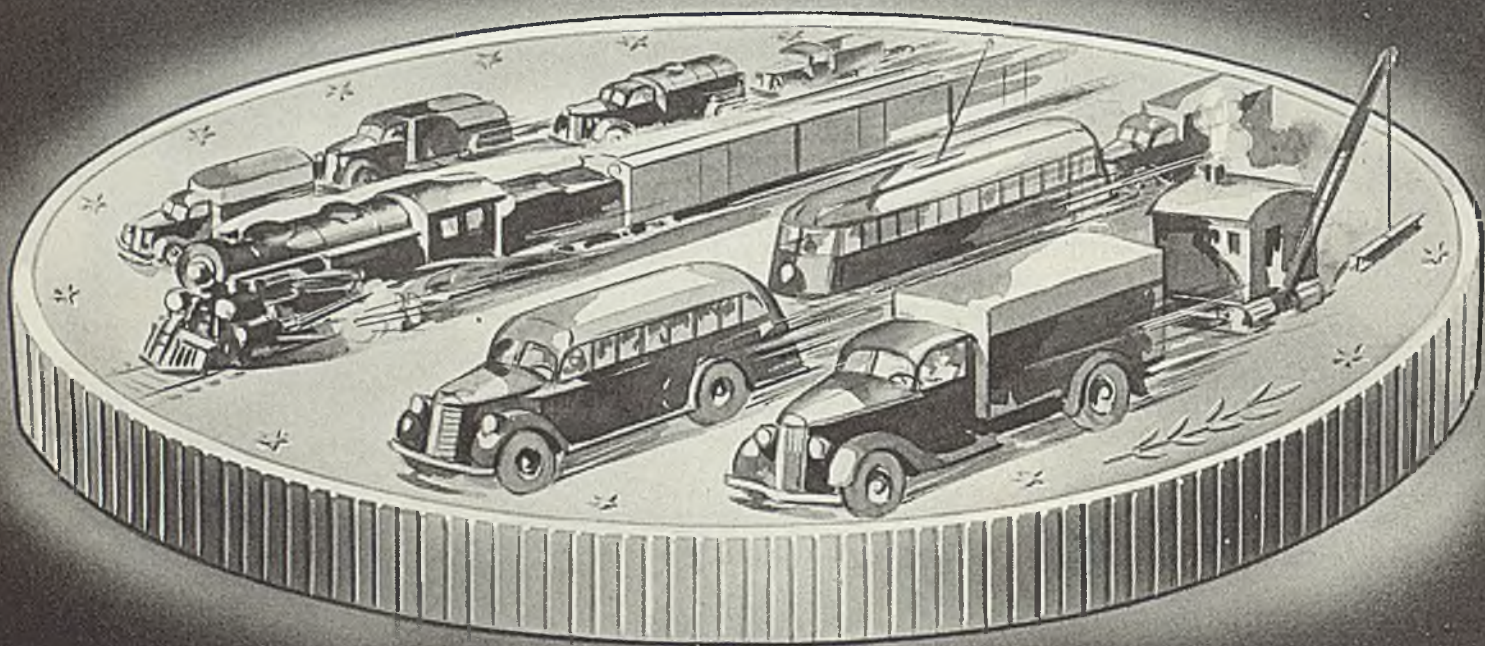
An important operation in the manufacture of high-quality, deep drawing wide strip steel is annealing. Accurate control of the heating cycle and uniformity of heat distribution are necessary and oxidization and sealing must be avoided. In the Lackawanna plant of Bethlehem Steel Co. (p. 64) these requirements are met in

### Progress in Annealing

a large box annealing department containing 44 radiant tube furnaces, each equipped with three bases and three inner covers or shrouds. The design and construction of these units and the provision for close control in their operation are a revelation to persons familiar with the type of annealing equipment common in the majority of sheet mills ten years ago. This is another evidence of improvement and refinement necessitated by the more exacting current demand for high quality steel products.

*E. L. Shaner*

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With Inland Hi-Steel he can greatly reduce structural weight without loss of strength . . . and this open hearth alloy also has much greater resistance to atmospheric corrosion even than copper bearing steel.

These advantages can now be added to his product at very small cost, for his tonnage consumption of

steel is reduced and his fabrication costs are not materially increased.

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Send for Bulletin No. 10 which fully describes Inland's low alloy, high strength Product

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# Making Laborers Capitalists;

## How Joslyn Plan Works

BY J. EDWARD TUFFT

■ FOR 19 YEARS the Joslyn Mfg. & Supply Co., manufacturer of pole line equipment, has had in operation in its Chicago works a profit-sharing and social security plan devised by M. L. Joslyn, president. Recently it has been extended to the company's subsidiaries, and is attracting widespread interest for the results that it has accomplished.

According to company officials, it builds the maximum of loyalty and efficiency among employes, and averts labor trouble.

At present the profit-sharing plan has 309 members. On Jan. 1 next these will be increased to about 420. The company was down to a low employment level during the depression, but with rapidly increasing business, employment likewise has increased, so that it contemplates a thousand employes in the plan in the near future, as directly and indirectly it employs about 2500 in its various enterprises.

Basic is the thought that the laborer himself becomes a capitalist, the resultant identification removing the cause of conflict. Basic also is the thought that earnings must be equitably distributed by the administrative department of any business if mental comfort is to be magnified and friction minimized. In Mr. Joslyn's own words "the old idea that capital is entitled to all it can squeeze out and still keep labor functioning is rapidly fading out of the industrial picture."

The new idea, Mr. Joslyn feels, is that instead of capital seeking to get all that it can get and still keep labor functioning, we have the better idea of seeing to it that

labor gets all it can get without impairing the functioning urge of capital.

The old thought was that the highest forms of labor leading up to what is known as brain work should take all it could get and still keep common labor functioning. The new, and in the opinion of Mr. Joslyn and his associates, the better idea, is that common labor

should get all it can get without discouraging skilled laborers and brain workers.

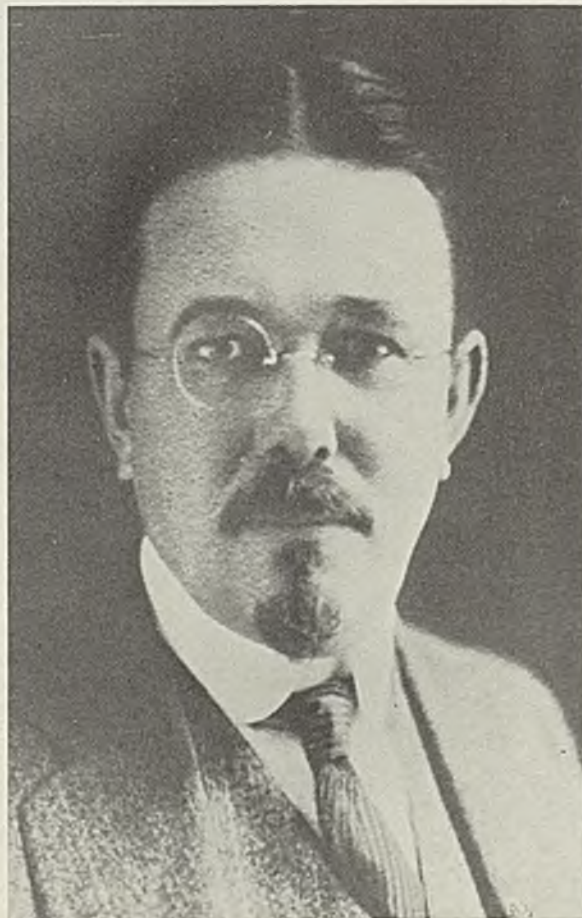
This new emphasis "means a broader and sounder base for the social structure." This is said despite the fact that the Joslyn management recognizes the danger of over emphasis in this new attitude, with consequent unfairness to capital.

The Joslyn company has proposed in its plan relative to the distribution of earnings to allot to capital as dividends only such amounts as will keep capital willing to serve to the extent required—the rest going to labor. Furthermore the plan proposes to allot to salaries only such amounts as will reasonably retain the best men available for corporate purposes, the rest going to common labor.

The plan, initiated in 1919, offers a reward for continuous satisfactory service, and penalty for failure to give it. It enforces saving and makes it acceptable by returning an average of 9 per cent interest. It protects old age, and operates to relieve unemployment through borrowing possibilities either within or outside of the fund. It functions for steady progress in the building of an estate.

"Capital," says Mr. Joslyn, "in emergency can live on itself for a while and can take great losses. Labor, having no reserve, cannot do so. Any real partnership between capital and labor, therefore, is possible only when the laborer himself becomes a capitalist."

This ideal state, however, cannot be brought about if the laborer has just enough to pay his bills each Saturday night, or if whatever small



M. L. Joslyn

"Partnership between labor and capital is possible only when the laborer himself becomes a capitalist."

savings he does hoard are the prey of get-rich-quick schemers against whose wiles the limited experience of the worker gives little if any protection.

Mr. Joslyn also believes that the darkening shadow of a probably dependent old age dulls the mind of the employe, and through much of his life cuts down his efficiency. The best investment in dollars and cents, it is asserted, lies in the removal of that fear. These are but a few of the thoughts which prompted the profit-sharing and social security plan.

It may be outlined briefly. An employe who has been with the company in any capacity three full calendar years must sign the profit-sharing contract, or leave the company's employ. That is the first provision.

It necessitates rational selection of employes, but when the criticism is made that such plan means forcing a man to sign a contract the answer Mr. Joslyn makes is that a man incapable of seeing its benefits after three years' association with hundreds of other men working under it, unquestionably lacks the attributes necessary for good service.

Under this contract the employe agrees to pay 5 per cent of his earnings into the trust fund. The company agrees to pay into the same fund 10 per cent of its net operating

earnings, but never more than four times as much as the employe pays in.

In practice, up until the depression, the company paid the maximum amount into the fund each year, and it is resuming this maximum payment in 1937.

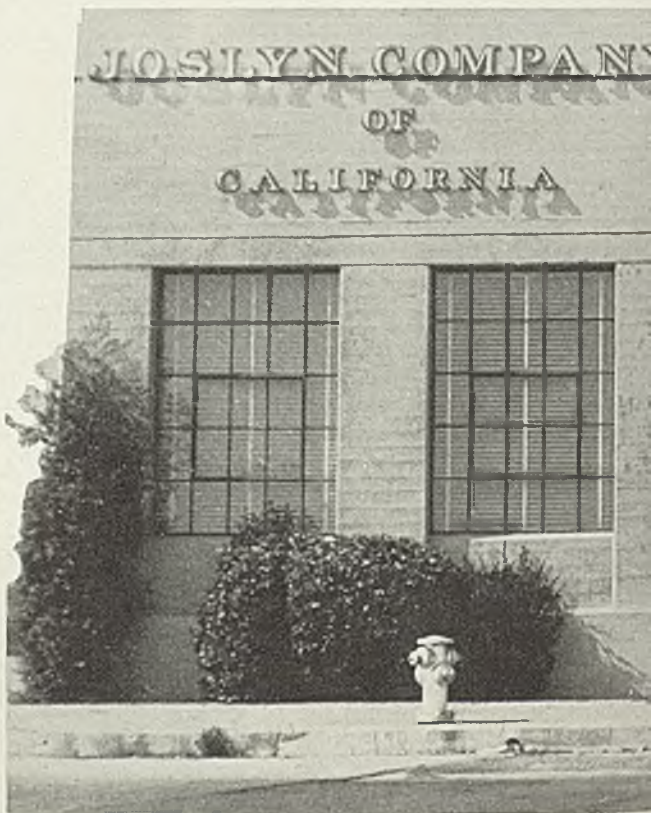
This means that an employe has seen this fund grow at the rate of 25 per cent of his earnings annually, plus the compounded interest earnings which builds it rapidly.

In other words if an employe earns \$200 a month, or \$2400 a year, he pays 5 per cent of that,

or \$120 a year into the fund. The company in turn in normal years pays four times that amount, or \$480, into the same fund. This means a total of \$600 per year, plus the unearned increment which plain arithmetic shows to grow rapidly with the passing of time.

During the first seven years of profit sharing an extra credit is provided for the member in case of death or disability, and on a diminishing scale each year so as to bring such credit to at least \$2000 from the date he becomes a member. After seven years the fund accumu-

"Despite the depression, on Jan. 1, 1937, at the end of 18 years, every employe who had paid in \$100 per year had a credit in the profit-sharing fund of \$16,500." Photo at right shows one of the Joslyn company's manufacturing plants



lations are ample without this extra credit.

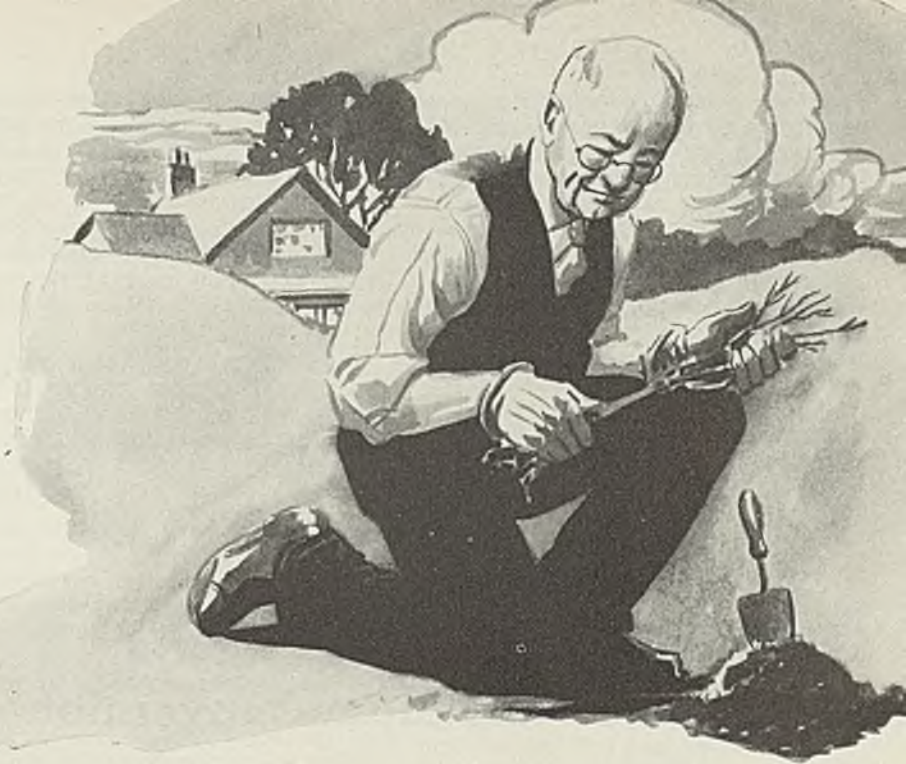
The retirement age under the Joslyn plan is not 65 but 60. The thought is that 65 is such an advanced age that but little time is left for enjoying leisure, while a 60-year age retirement leaves a reasonable amount of time.

If a man elects to quit the employ of the company before reaching the retirement age, he receives all the money he has paid into the fund, plus its earnings; and in addition one-half of all the company has paid in, plus its earnings. The one-half of the company's contribution which

is not paid to him does not revert to the company but is pro-rated to fund credits of the other employes.

In order that it may be impossible for men with large salaries to get too great a credit in the fund, a salary maximum of \$4000 per year has been set with reference to the fund. That is to say, not more than \$200 per year can be paid into the fund by any individual.

The fund is in the control of a trustee who acts with the approval of an advisory committee of five, three of whom are officers of the company and two of whom are



manner: The advisory committee has ruled that any person who is discharged may appeal his case to the advisory committee and he may call any witnesses he desires from the personnel. If the discharge is not sustained by a four-fifths vote, the discharge is voided.

As three members of the committee are officers of the company even a hint of unfairness in a discharge would not be overlooked, as no good and much harm would accrue to the company in case of an unfair discharge. One of the two employe representatives must join with all three officers in upholding the discharge, or it is not effective.

In practice in 18 years there never has been a case of discharge that has been questionable.

It should be noted that the employe must retire from the fund at 60 years of age unless requested to remain for specific reasons. The credit due him from the fund may be paid in cash or may be paid in 11 equal payments over a period of ten years. In any case the payment of the whole amount immediately, or in installments, is done with the continued welfare of the retiring employe in mind. The reason for this is obvious.

The expression of confidence in the plan as it applies to efficiency and earning on the part of the company is indeed unanimous. The president, the officers, the managers, and the foremen all assert that the plan pays its way at all times through the increase in loyalty, efficiency and lengthened tenure.

It is obvious that no man of settled intelligence and character is going to quit a job prematurely when his ultimate estate, his stake in the company so, to speak, increases with his term of service, and

ected by the employes. It is required that the portion of the fund contributed by the employe be invested only in such securities as have the approval of the state for investment of trust funds.

The part that the company contributes may be invested at the discretion of trustee and advisory committee. This has resulted in the fund as a whole being invested in high grade bonds, mortgages and preferred stock.

In practice the employe's contribution goes into the former and the company's into the latter, the preferred stock of the company itself, which has always paid a good rate of interest, being purchased for the most part. Naturally this means that the trust fund now has large ownership in the company.

Despite the depression, which cut down 20-year estimates, on Jan. 1, 1937, at the end of 18 years, every

employe who had paid in \$100 per year had a credit in the fund of over \$16,500. If conditions remain as expected, at the end of 20 years he will have a credit of \$26,500.

At the end of 30 years it seems obvious that a worker paying \$100 per year to the fund would have a credit of \$46,000 and more. A man paying on the basis of a \$4000 per year salary, the maximum allowed, would at the end of 20 years have a credit of \$41,200, and at the end of 30 years a credit of \$92,000.

#### Protection Against Discharge

To protect families in the early years of the tenure a death and disability reserve is now being built up, but in the later years of the tenure the trust fund credit grows so large that this type of protection is considered unnecessary.

The worker is protected against unjust discharge in the following

especially when it increases so rapidly in the latter years prior to his retirement. The experience is that the men stay. Men who started with Mr. Joslyn are still with him.

The company is primarily a manufacturer of outdoor electrical pole line equipment—practically everything that goes on a power line. During the war, being unable to obtain an adequate supply of steel, it installed a rolling mill in Chicago to take care of its own requirements. This developed to the rolling of round bars and angles for the trade in Chicago.

In 1928 it purchased the Fort

Wayne Rolling Mill, Fort Wayne, Ind., which it has operated since then. Two years ago it installed an electric furnace at Fort Wayne to make its own billets, so that today, with the electric furnace and two rolling mills, the steel business is an important part of the company's rather diversified manufacturing activities.

In electrical equipment one of the most important factors is the hardware line, and the company has a hardware factory in Chicago, and one in Los Angeles, while it takes the output of a third plant at Cortland, N. Y.

## Progress of Acetylene Industry Shown at Birmingham Convention

■ LARGE attendance featured the thirty-eighth annual convention of the International Acetylene association, in Birmingham, Ala., Nov. 10-12, the first it has held in the South. The opening luncheon was attended by 538, and more than 100 were turned away on this occasion due to lack of accommodations.

In welcoming the delegates, J. L. Perry, president, Tennessee Coal, Iron & Railroad Co., Birmingham, and president-elect of Carnegie-Illinois Steel Corp., paid tribute to the rapidly increasing usefulness of the

oxyacetylene process in industries throughout the South.

"Nature has been kind to the district having Birmingham as its center," said Mr. Perry. "Its industry has been of an expanding character and the district has a great future."

Business in this country is remiss in not telling the public more about itself, said the keynote speaker, Dr. James Shelby Thomas, president, Chrysler Institute of Engineering, Detroit, and president, Clarkson College of Technology, Potsdam, N. Y. He protested against attempts to

regiment the people, and warned of the necessity for taking positive action to safeguard democratic principles of government. "History has proven time and again that culture exists only where there is leisure, and leisure exists only in countries in which industry and trade prosper." For the protection of our institutions, he warned, it is high time for business men in this country to let the public know where they belong in the scheme of things.

C. D'W. Gibson, Air Reduction Sales Co., New York, and retiring president of the association, predicted expansion in the use of acetylene. In 1935 production of acetylene was reported as 1,133,824,000 cubic feet. Approximately 900,000,000 cubic feet is being used annually in the manufacture of various chemicals. Today some 100 base chemicals can be produced as derivatives of acetylene gas. Use of the gas also is increasing rapidly in cutting and welding.

The association's Morehead medal was awarded to H. Sidney Smith, director and past president of the International Acetylene association and past president, British Acetylene association. The address of award was made by C. O. Epperson, director and past president of the association and vice president, National Cylinder Gas Co., Chicago. In his speech of acceptance, Mr. Smith said the oxyacetylene industry now ranks twelfth among the country's leading industries and that its opportunities for future expansion are boundless.

### New Officers Elected

Stepping up from the vice presidency, Elmer H. Smith, president, Commercial Gas Co., Minneapolis, was elected president of the association. H. P. Dolisie, managing director Canadian Liquid Air Co., Montreal, was elected to succeed Mr. Smith as vice president, while H. F. Reinhard was re-elected secretary, and Henry Booth, sales manager, Shawinigan Products Corp., New York, was re-elected treasurer.

Re-elected as a director was L. F. Loutrel, Shawinigan corporation, in addition to the new directors E. A. Doyle, The Linde Air Products Co.; E. F. Faulhaber, Compressed Industrial Gases Inc., Chicago; and Mr. Gibson. On the executive committee, Mr. Dolisie replaces Mr. Gibson.

Membership in the association now includes approximately 95 per cent of the industry, according to officials. New members include American Manganese Steel Co., Chicago Heights, Ill.; Denver Oxygen Co., Denver; Houston Oxygen Co., Houston, Tex.; Southwestern Oxygen Co., El Paso, Tex.

Abstracts of technical papers presented at the convention will appear in subsequent issues of STEEL.



■ At speakers' table for the Acetylene convention's opening luncheon, left to right: H. Sidney Smith, Prest-O-Lite Co., New York, director and past president of the association, who was awarded the Morehead medal; J. L. Perry, president, Tennessee Coal, Iron & Railroad Co., who after Jan. 1 will be president, Carnegie-Illinois Steel Corp., and who welcomed the guests; C. D'W. Gibson, president of the association, and Dr. James S. Thomas, president, Chrysler Institute of Engineering, Detroit, who delivered the keynote address



# Sums Up "Model Year": 5,100,000 Cars, Trucks

■ CLOSING of the Detroit automobile show formally rings down the curtain on the 1937 model year for the automobile industry, and launches the new year some six weeks ahead of the calendar. It marks a time when the industry's statisticians sharpen their pencils to add up what has happened in the past 12 months.

Forgetting the dark outlook of the present, figures show the automobile industry to have completed one of the greatest years in its history, only 1929 offering any comparable totals.

Production of 1937 models, according to government figures for both United States and Canada and including passenger cars and trucks totaled 5,109,819, and this despite the shackling influence of widespread strikes, slowdowns, skips and other forms of interferences. Considering the model year to have started with October, 1936, and ended with September, 1937, there were five months in which production exceeded the half-million mark, and four months in which output approximated 400,000. Production increase over 1936 ranges from 12 to 15 per cent.

## Employment Is Greater

America's No. 1 industry—which consumes 20 per cent of the nation's steel, 75 per cent of the rubber, 6 per cent of the lumber, 17 per cent of the copper, 36 per cent of the lead, 11 per cent of the zinc, 14 per cent of the tin and 12 per cent of the nickel—had an average weekly employment of 515,000 and a payroll of \$16,000,000, compared with employment of 489,000 and payroll of \$15,785,000 in 1929. These figures are from the Automobile Manufacturers' association.

Wholesale value of cars and trucks produced for the year reached a total of \$2,876,500,000. Add to this the wholesale value of accessories, service equipment, tires and replacement parts and this rises to \$4,304,500,000.

An interesting sidelight relates to the matter of taxes. Total motor vehicle user taxes for the year are estimated to be nearly one-third the value of all production, including accessories, etc., the tax bill amounting to about \$1,565,000,000.

The showing which the automobile industry has made during the past year is all the more striking

when it is considered that in comparison with 1929 a much shorter work week was in effect, average period being five days compared with the former six. Credit for this accomplishment must go in large measure to the designers and builders of equipment used in the industry, which has permitted turning out more cars in shorter time, with no sacrifice in total employment or wage levels.

Figures compiled by the Michigan state department of labor and industry show average weekly wages of persons employed in the transportation and equipment industries in April, 1925, were \$29.68. For the first nine months of 1937 the average weekly wage of the same group was \$33.06.

Plants in Michigan, by the way, are estimated to account for upward of 75 per cent of all production of cars and trucks. Analysis of employment figures shows these plants to encompass 67 per cent of total employment of the industries, including cars, trucks, tires, parts.

Progress in the Michigan employ-

ment-payroll figures over the past two years is indicated from a survey appearing in the *Michigan Manufacturer and Financial Record*. In April, 1935, 107 plants in the transportation equipment field reported employment of 251,074 with weekly payroll of \$7,468,631. A little over two years later, in July, 1937, 151 plants in the same field reported employment of 356,850 with weekly payroll of \$11,913,891.

The automobile industry is a heavy spender as far as new equipment and plant rehabilitation are concerned. Ford Motor Co. alone in the past eight years has spent \$217,000,000 for new equipment, and in that time has scrapped and replaced almost half of its production facilities. This does not take into account the recently announced \$40,000,000 program which is now under way.

Run down the list of car builders and you will find scarcely one which has not launched ambitious plans for expanding production still further for the coming year. On an average these plans call for facilities providing about 20 per cent greater output. This would suggest the industry is heading for a 6,400,000-car year. Present prospects do not indicate much likelihood of achieving this goal in 1938, but the industry is not concerned solely with 1938, looking still further ahead to a promising future.

Turning again to the matter of

## Breaking the Camel's Back



■ TO TEST the strength of steel top and steel body structure of a four-door sedan, Studebaker engineers began piling 50-pound bags of sand upon a wooden platform erected on top of the test car. In the illustration, 24,000 pounds of sand had been loaded on, and the first signs of failure were beginning to appear, although the doors could still be opened. The body collapsed under a load of 24,750 pounds, nearly seven times its own weight

expenditures for expansion, a few figures will indicate the trend. Fisher Body Corp. is spending \$15,000,000; Buick \$10,000,000; Cadillac \$6,500,000; diesel division of General Motors \$2,500,000; Pontiac, Olds and AC Spark Plug smaller amounts; Packard \$13,000,000; Chrysler divisions \$15,000,000; Briggs well over \$3,000,000; Nash \$2,500,000; and so on down the line.

This continuous policy of spending money to make money is what makes the automobile industry such a great field for suppliers of material and equipment. Its soundness cannot be questioned, for the automobile industry as now constituted shows handsome profits as long as it can move production in the volume to which it is geared.

A quick glance at some of the nine-month profits reported by automobile companies will attest the above point. For example, General Motors \$155,000,000; Chrysler \$13,000,000; Packard \$1,500,000; Briggs \$8,000,000. Composite balance sheet of 38 companies, including manufacturers, partsmakers, material and equipment suppliers, shows aggregate net profit for nine months of about \$300,000,000.

## LABOR

### UNEMPLOYMENT PROBLEM DEVELOPING IN STEEL

■ Despite the sharp decline in steel-making operations, the actual number of workers laid off still is relatively small. Producers, as in the past, are attempting to stagger employment.

Increasing attention is being paid to the status of individual employes in arranging schedules—seniority, dependents and ability being first considerations. Wage rates are maintained.

Some departments have been reduced to not more than three days a week while others are operating not more than two days. Steel men generally are hopeful for an upturn after the first of the year, but recognize an unemployment problem for some weeks ahead.

### "LESS TIME, SAME PAY" FOLLOWS CIO VICTORY

After winning a collective bargaining election last week at the plant of the Westinghouse Airbrake Co., Wilmerding, Pa., officials of a CIO affiliate announced plans to seek a 36-hour week, no pay reduction and double time for overtime. The CIO affiliate won the national labor board election by a vote of 2369 for the CIO affiliate, to 1908 opposed.

The board has ordered an election at Interlake Iron Corp.'s Chicago

plant for workers to choose either the Amalgamated Association of Iron, Steel, and Tin Workers or the Employees' association to represent them.

## Private Building, President's Aim

■ President Roosevelt last week called into conference business and financial representatives in an effort to start private building.

It was reported at the White House that the Chief Executive talked more than two hours, outlining the situation as he sees it, and asking for co-operation of the business interests represented.

Those who attended the meeting, and who apparently are to continue as a special advisory committee on building to the President, included: Marriner S. Eccles, chairman of the federal reserve board; S. Sloan Colt, president, Bankers Trust Co., New York; Gerard Swope, president, General Electric Co.; Robert E. Wood, president, Sears, Roebuck & Co.; Edward F. McGrady, now labor relations director for RCA and former assistant secretary of labor; Henry C. Turner, president, Turner Construction Co., New York; J. M. Daiger, financial adviser for the federal housing administration; and Isador Lubin, head of the bureau of labor statistics, department of labor.

The main objectives of the President's housing program, he stated at a press conference Friday, are to get capital into building, to obtain lower interest rates and building costs. He said it was primarily for the lower income groups.

A conference on residential construction is to be held in Washington, Nov. 17-18, under auspices of the construction and civic development department, Chamber of Commerce of the United States. The meeting is to be held in the Chamber's building.

## Foundrymen Oppose Black-Connery Bill

■ Opposition to the Black-Connery wage bill, now pending in congress, was expressed by foundrymen of southern Ohio, southeastern Indiana and northern Kentucky meeting in Hamilton, O., last week.

A resolution listing the foundrymen's objections was adopted and will be sent to senators and representatives in the districts represented. Objections cited include:

Right of search and seizure accorded to the board is dangerous to

the extreme; use of the labor department to make investigations and inspections is looked on with distrust; small firms cannot afford to employ counsel nor attend hearings to protect their interests; possible voiding of existing contracts may work disaster; penalties are too severe and might be used for extortion in the hands of the unprincipled; powers of the board as to employment of staff are entirely too broad.

## Modernizing Columbia Steel

■ Confirming its faith in the West as a growing industrial center, the Columbia Steel Co. has announced that an extensive modernization program is well under way.

In Los Angeles final plans are being completed for a new office building to house the company's southern California sales force. Warehousing facilities are also being enlarged and improved.

At the company steel mills in nearby Torrance steel mill machinery is being installed. Already a new 3-high roughing mill is in operation and new furnaces for the jobbing mill are complete. A mechanized finishing mill with double compartment pack furnace was placed in operation Oct. 13. A similar mill is scheduled to start rolling within a few days, and at the present is 80 per cent complete.

A Landis roll grinder started Oct. 8. Cold mills have been relocated, as have been bar shears and Mesta pickler. Building extensions, crane runways and new roofing are 90 per cent complete.

In Pittsburg, a new wire galvanizer has been placed in operation. Numerous other improvements are under consideration.

The blast furnace at Provo, Utah, is being rebuilt. The coal mine at nearby Columbia has undergone modernizing which, the company states, will make it one of the finest mines in the country.

## Predicts Gain in 1938 Gasoline Consumption

■ The outlook for the petroleum industry in 1938 is bright regardless of the slight decline in business experienced by all industries during the past few months, Axtell J. Byies, president, American Petroleum institute, declared at the eighteenth annual meeting of the institute in Chicago last week. He predicted a gain in gasoline consumption next year.

# October Ingots Drop 21 Per Cent

Production of open-hearth and bessemer steel ingots in October was 21 per cent below the total for September, totaling 3,392,691 gross tons, compared with 4,301,869 tons in September, according to the American Iron and Steel institute. October production was 25 per cent lower than the output of 4,534,246 tons in October, 1936, the record month of that year. The largest output in 1937 was in March, when 5,216,666 tons were produced.

Cumulative production for ten months of 1937 was 45,891,460 tons, 20 per cent greater than the total of 38,060,388 tons produced in the corresponding period of 1936, and only 4 per cent below the total of 47,888,156 tons made in the first ten months of 1929, the record year.

The industry operated at 58.31 per cent of capacity, compared with 76.52 per cent in September and 78.15 per cent in October, 1936, according to the institute's figures. STEEL's estimate of the production rate in October was 59.46 per cent.

Average tonnage per week in October was 765,844 tons, against 1,005,110 tons in September and 1,023,532 tons in October, 1936.

## District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Nov. 13	Change	Same week 1936	1935
Pittsburgh	32	-9	68	44
Chicago	35	-7	76	57
Eastern Pa.	38	None	47.5	39
Youngstown	43	-8	70	53
Wheeling	54	None	92	84
Cleveland	35	-19	80.5	77
Buffalo	30	+8	84	37
Blrmingham	54	None	74	58
New England	30	None	73	93
Cincinnati	15	-29	96	†
St. Louis	33.3	-9.1	68	†
Detroit	82	-8	100	88
Average	39	-8	74	52

†Not reported.

## PRODUCTION

Further curtailment of production in practically all centers has brought the national operating rate to 39 per cent, 8 points below the preceding week and the lowest since July, 1935.

Cleveland — Dropped 19 points to 35 per cent of capacity. Otis Steel Co. and Republic Steel Corp. have taken off all open hearths,

while National Tube Co., Lorain, continues with 11 out of 12 operating.

Cincinnati — Production dropped 29 points last week, to 15 per cent of capacity, when one interest put out all open hearths and another dropped from five to three.

St. Louis — Dropped 9.1 points to 33.3 per cent of capacity, three open hearths being taken off last week.

Birmingham, Ala. — Unchanged at 54 per cent of capacity with probability of this rate continuing for some time.

Youngstown, O. — Down 8 points to 43 per cent of capacity, with 39 of 83 open hearths and two bessemer units on single turn. Outlook for this week is for the same rate. Republic Steel Corp. has blown out No. 3 stack for relining and enlargement.

Chicago — Down 7 points to 35 per cent as a result of sharp curtailments by two leading interests. Some plants anticipate a further curtailment this week. Three more blast furnaces have been shut down giving the district 19 active stacks out of 39.

Central eastern seaboard — Unchanged at 38 per cent. One interest, previously down completely, relighted three furnaces. One of the larger independents has taken off one furnace.

Pittsburgh — Down 9 points to 32 per cent.

Wheeling — Unchanged at 54 per cent.

New England — Unchanged at 30 per cent of capacity with little change expected this week.

Detroit — First marked recession of the year in steelmaking occurred last week when the rate dipped 8 points to 82 per cent. Two furnaces are down for rebuilding, a third was down the full week, and two more were taken off Friday.

Buffalo — Up 8 points from last week, to 30 per cent. Five open hearths were relighted.

## Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent

	—Open Hearth—		—Bessemer—		— Total —		Weekly production, all of companies, gross tons	Number of weeks in month
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1937								
Jan.	4,433,145	84.20	291,794	54.30	4,724,939	81.43	1,066,578	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March	4,812,879	91.42	403,787	75.14	5,216,666	89.91	1,177,577	4.43
April	4,681,677	91.83	390,198	74.98	5,071,875	90.27	1,182,255	4.29
May	4,767,269	90.55	386,290	71.88	5,153,559	88.82	1,163,332	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	336,035	62.67	4,556,596	78.49	1,030,904	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	271,948	52.38	4,301,869	76.52	1,005,110	4.28
Oct.	3,203,447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
10 mos.	42,632,495	.....	3,258,965	.....	45,891,460	.....	1,056,676	43.43
1936								
Jan.	2,843,415	54.76	196,389	32.21	3,039,804	52.39	686,186	4.43
Feb.	2,754,446	56.76	202,445	35.55	2,956,891	54.53	714,225	4.14
March	3,148,813	60.64	185,040	30.33	3,333,853	57.46	752,563	4.43
April	3,627,830	72.14	304,775	51.62	3,932,605	69.99	914,593	4.29
May	3,735,283	71.93	302,092	49.55	4,037,375	69.58	911,371	4.43
June	3,640,672	72.40	334,897	56.72	3,975,569	70.75	926,706	4.29
July	3,587,764	69.25	326,606	53.69	3,914,370	67.61	885,604	4.42
Aug.	3,833,727	73.83	350,560	57.50	4,184,287	72.11	944,534	4.43
Sept.	3,848,340	76.71	303,048	51.45	4,151,388	74.05	969,950	4.28
Oct.	4,216,536	81.20	317,710	52.11	4,534,246	78.15	1,023,532	4.43
10 mos.	35,236,826	.....	2,823,562	.....	38,060,388	.....	873,543	43.57
Nov.	3,993,472	79.42	329,553	55.82	4,323,025	76.94	1,007,698	4.29
Dec.	4,119,025	79.50	303,342	50.20	4,424,367	76.42	1,000,988	4.42
Total	43,349,323	70.74	3,458,457	48.07	46,807,780	68.36	895,329	52.28

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons bessemer, 6,325,000 gross tons; for 1936, on weekly capacities of 1,172,160 gross tons open-hearth ingots, 137,624 tons bessemer, 1,309,784 tons total, based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth ingots 61,280,509 gross tons, bessemer 7,195,000 gross tons.

## October Machine Tool Orders Lowest of Year

October machine tool orders were the lowest of the current year, the index of the National Machine Tool Builders' association dropping to 152, compared with 210.7 in September, a 28 per cent decline. October orders, however, were as high as any month in 1936 except December.

Domestic orders were 89.1, compared with 119 in September. Foreign orders index stood at 62.9 against 91.7 in September. Export shipments accounted for 43 per cent of the October total.

# Building Motors In Modern Aisle

■ To enable it to meet increasing demand for industrial alternating-current motors, Westinghouse Electric & Mfg. Co., recently completed and placed in operation at its East Pittsburgh, Pa., works a new motor manufacturing aisle incorporating the latest in layout, machine tools, production control, materials handling and industrial lighting. These facilities were shown for the first time to a group of 45 editors Nov. 10.

The company has consolidated in proper relationship in one location, on one floor level and under one responsibility, all operations for building, warehousing and shipping standard and special industrial induction motors in a range of from 1 to 50 horsepower. The required floor space of 197,000 square feet was provided by roofing over an open court between two buildings with a welded steel structure and removing separating walls. The area is 1500 feet long and three aisles wide.

To obtain the benefits of quantity production without interference from special items, two manufacturing lines have been set up. One consists largely of special-purpose equipment for standard parts and motors; the other of general-purpose equipment for special items and custom-built motors.

Each of these lines has unit manufacturing centers that supply parts by conveyor to subassembly and final assembly positions. In each

line the objective was to so arrange departments that the flow of work will be away from raw material storage at one end of the building to finished motor storage and shipping department at the other end.

To accomplish these objectives required installation of about 2 miles of conveyors of many types; involved crane facilities ranging from a simple chain hoist on a jib to a 10-ton overhead crane; four broad-gage railroad spurs for handling raw materials; supplementing available equipment with \$220,000 worth of modern machine tools; and purchase of thousands of dollars worth of special tools and precision gages.

A comprehensive description of the new motor manufacturing aisle and its materials handling features will be presented in an early issue of STEEL.

R. W. Owens is manager of the motor division, and G. S. Ryan superintendent.

## Cartel Buys Huge Scrap Tonnage

■ Several hundred thousand tons of scrap have been placed by the International Scrap cartel (European) with American interests, it was reliably reported in New York last week.

Prices paid were stated to be \$16.50 for No. 1 heavy melting steel, and \$15.50 for No. 2, f.a.s.

Four representatives of American interests are known to have attend-

ed a meeting of the scrap cartel in London last week.

According to opinion in the domestic market the purchase will have a widespread strengthening effect.

The cartel closed on about 250,000 tons in September, said to have been at \$21.50 per ton for No. 1 steel, which was \$2.50 above a previous purchase in August.

## Republic Takes In Subsidiaries

■ In order to simplify the company's capital structure, several subsidiaries of Republic Steel Corp. are being taken into the parent company, it was announced last week.

These subsidiaries include the Union Drawn Steel Co., Berger Mfg. Co., Trumbull Cliffs Furnace Co., River Dock Co., and the Niles Steel Products Co.

Their physical properties are being taken over directly by Republic and are being placed under Republic's general mortgage dated Sept. 1, 1935, under which Republic's outstanding bonds have been issued. The subsidiaries' stock had been pledged originally under the mortgage, and upon their dissolution the physical properties are being substituted for the stock.

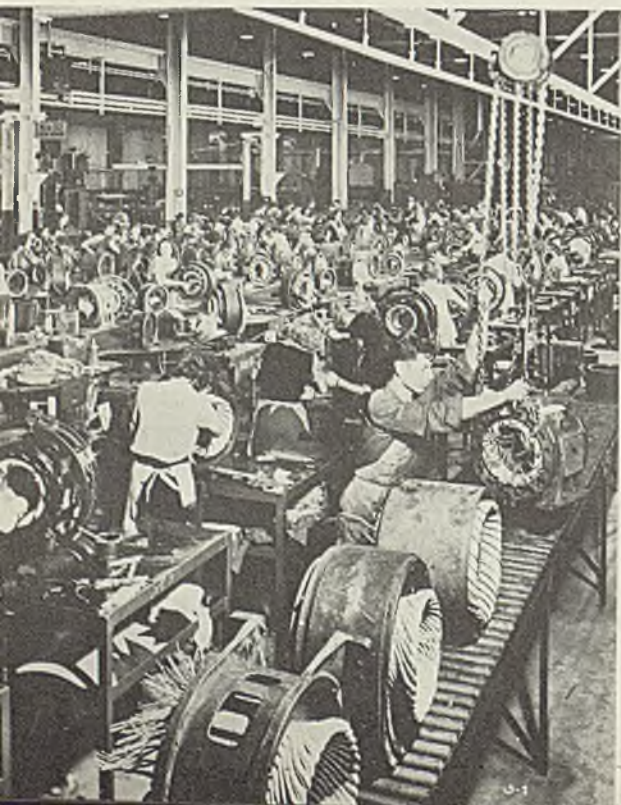
No new financing or expansion program is involved in the transaction.

## Film Shows Making and Use of Wire Fence

■ A sound motion picture on production and proper erection of woven wire fencing has been released by Republic Steel Corp., Cleveland, through its agricultural extension bureau. It is entitled "Steel, Servant of the Soil," and requires 45 minutes running time.

The film presents a version of the discovery of iron and primitive methods of production. This is followed by the modern method from mining of the ore to manufacture of the wire and fabrication into fencing, with a demonstration of approved methods of farm fence erection, including installation of wood and steel corner posts and final stretching of the fence on its supports.

■ A modernistic exhibit will tell the story of stainless steel and its use in construction of light-weight, streamlined trains as built by the Edward G. Budd Mfg. Co., Philadelphia, in the waiting room of the Reading terminal station. Reading soon will place a Budd-built train in operation between Philadelphia and New York.



Most modern mass production methods and equipment are used in the new industrial alternating-current motor manufacturing aisle of Westinghouse Electric & Mfg. Co. This illustration shows a large group of workers inserting coils into stator core slots. Frames are delivered to and moved from the winding stations by roller conveyors

# FINANCIAL

## JONES & LAUGHLIN'S THIRD QUARTER EARNINGS DOWN

■ Jones & Laughlin Steel Corp., Pittsburgh, and subsidiaries for quarter ended Sept. 30 report net profit of \$1,750,696 before surtax, equivalent after preferred dividend requirements to \$1.25 per share on 576,320 shares of common stock outstanding. This compares with \$2,451,976, or \$2.47 per common share in the preceding quarter and \$1,870,866, or \$1.45 per common share, in the September quarter of 1936.

For nine months net profit was \$6,185,066, or \$5.38 per common share, against \$2,053,320, or \$3.50 per preferred share, in the first nine months of 1936. Preferred dividends were \$26.25 per share in arrears on Sept. 30.

## KOPPERS CO. TO ISSUE QUARTERLY STATEMENTS

Koppers Co., Pittsburgh, in the future will issue 12-month earnings statements quarterly. Heretofore, only annual reports have been issued. The company's bonds are listed on the New York stock exchange. For the 12 months ended Sept. 30 net profits were \$3,083,552 before surtax, equal to \$15.41 a share on 200,000 shares of preferred stock outstanding. None of the common is in the hands of the public. The report for the calendar year 1936, showed net income of \$3,065,630, or \$15.33 per share on the preferred. Operating income varied only slightly between the two reports. However, dividend and interest income showed a decline, but this was offset by a decline in fixed charges.

## DIVIDENDS DECLARED

A dividend of \$1 per share, payable Nov. 30 to common and preferred stockholders of record Nov. 9, was declared by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This is the fourth dividend this year, bringing the total to \$4 per share. Orders booked for the nine months ended Sept. 30 were \$191,200,758, compared with \$134,148,358 for the same period in 1936, an increase of 43 per cent. Net income for the nine months was \$16,726,520 against \$11,123,706 for the like 1936 period, a gain of 50 per cent. Unfilled orders Sept. 30, were \$78,155,632, compared with \$40,605,205 Sept. 30, 1936.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., declared a common dividend of \$1.50, payable Dec. 21 of record Dec. 10. The last previous dividend was a quarterly of \$1.50, paid March 30, 1929.

Rustless Iron & Steel Corp., Baltimore, has declared a regular quar-

terly dividend of 62½ cents on preferred, payable Dec. 1 to record Nov. 15.

Acme Steel Co., Chicago, has declared a \$1 quarterly dividend, payable Dec. 13 to record Nov. 15.

## Intrastate Rail Rate Increases Refused

■ Intrastate freight rates in New Jersey will not be advanced Nov. 15 in line with interstate rates as fixed by the interstate commerce commission. Action in New Jersey pending meeting of the state commission Nov. 23. Delivered Newark prices on by-product coke will remain unchanged for the present.

Pennsylvania public utility commission has refused to grant a request of railroads in Pennsylvania for authority to increase rates on intrastate shipments in keeping with the higher interstate rates.

Although the Pennsylvania commission maintains reasons for the requested increase are insufficient, it has ordered a hearing to determine the reasonableness of the demands. Date of hearing has not yet been set.

## Convention Calendar

Nov. 16-18—Galvanizers Committee of American Zinc Institute. Third meeting at Netherland-Plaza hotel, Cincinnati. E. V. Gent, 60 East Forty-second street, New York, is secretary-treasurer.

Nov. 17-18—National Founders association. Forty-first annual meeting at Waldorf-Astoria hotel, New York. J.

M. Taylor, 29, South LaSalle street, Chicago, is secretary.

Nov. 18-19—New England council. Thirteenth annual conference at Hotel Statler, Boston. Howard C. Rice, 1032 Statler building, Boston, is secretary.

Nov. 26-27 — American Foundrymen's association. Joint conference with Buffalo chapter at Willard Straight hall, Cornell university, Ithaca, N. Y. Prof. A. C. Davis, engineering department, Cornell university, Ithaca, N. Y., is in charge of arrangements.

Nov. 29-Dec. 1—American Society of Agricultural Engineers. Winter meeting at Stevens hotel, Chicago. Raymond Olney, Saint Joseph, Mich., is secretary.

Dec. 6-9 — American Society of Mechanical Engineers. Fifty-eighth annual meeting at Engineering Societies building, New York. C. E. Davies, 29 West Thirty-ninth street, New York, is secretary.

Dec. 6-11 — Exposition of Chemical Industries. Biennial exposition at Grand Central Palace, New York. Charles F. Roth, Grand Central Palace, New York, is manager.

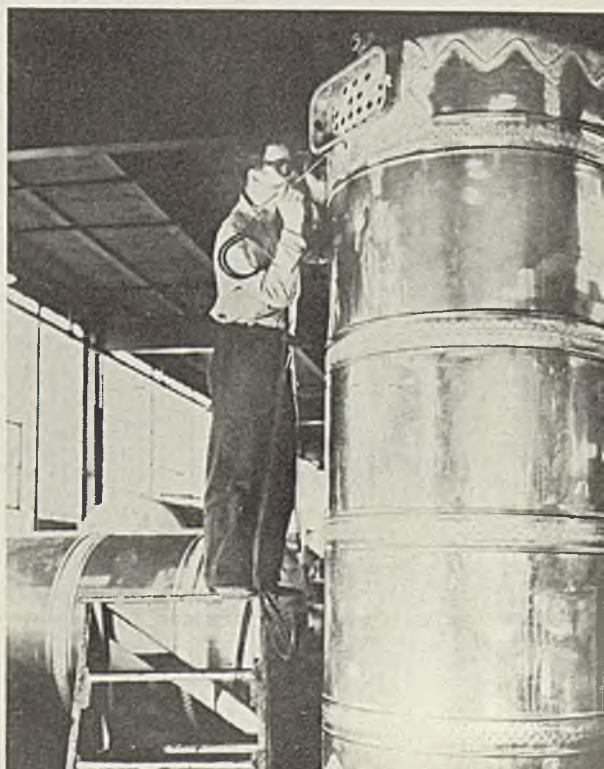
## Refrigerator Sales in 1938 To Approximate 1937

■ Electric refrigerator sales in 1938 will be between 2,250,000 and 2,500,000 units, estimates A. E. Allen, vice president, Westinghouse Electric & Mfg. Co. This year's sales will approximate 2,500,000 units, with estimated retail value of \$400,000,000.

Demand for replacement models, due to improvements in new designs, adoption of a new calendar year from November to November, anticipated construction of many new homes were cited as indications for continued prosperity of the industry, an important steel consumer.

## Giant Gas Tank for Transoceanic Clipper

■ One of six immense fuel reservoirs that will be installed in each of the 72-passenger transoceanic Clippers being built by Boeing Aircraft Co., Seattle, for Pan American Airways. A workman is shown finishing a precise job of acetylene welding on the tank, of aluminum alloy. This tank is 9 feet long, holds 600 gallons. Two of these will be housed in the 152-foot wings. Four other gasoline tanks holding 750 gallons each, will be built as an integral part of the hydro-stabilizers



# MEN OF INDUSTRY

■ C. PARKER HOLT, executive vice president, Caterpillar Tractor Co., Peoria, Ill., has been transferred to the San Leandro, Calif., office, where, as vice president, he will direct Caterpillar activities and coordinate them with headquarters in Peoria. A. T. Brown, formerly vice president in charge of the accounting, treasury, traffic and parts departments, succeeds Mr. Holt as executive vice president.

L. B. Neumiller, formerly director of industrial relations, is now vice president administering the parts, service and traffic departments, as well as continuing active management of industrial relations. D. G. Sherwin has been advanced from treasurer to vice president in charge of advertising, sales and treasury departments. D. A. Robison, assistant treasurer, has been elected treasurer, succeeding Mr. Sherwin.

Victor M. Drury, Montreal, has been elected president, Canadian Car & Foundry Co. Ltd., succeeding the late W. W. Butler.

Glenn Merrefield, general foundry superintendent, Alhambra plant of Kay-Brunner Steel Products Inc., Los Angeles, has been promoted to plant manager.

Frank Fields has been appointed general manager, Sidney Machine Tool Co., Sidney, O. He succeeds A. C. Getz, who has assumed the duties of vice president.

J. M. McNeal, European sales manager for Landis Machine Co., with headquarters at Birmingham, England, has returned to the home office of the company in Waynesboro, Pa., for a visit.

F. E. Rhine, former sales manager, Duncan Foundry & Machine Co., has been appointed service manager of Joy Mfg. Co., Franklin, Pa.

W. S. Carson has been appointed vice president in charge of sales, Detroit Seamless Steel Tubes Co., Detroit. He formerly was in charge of the company's Cleveland office.

Kenneth McKenzie has been appointed district manager in James-town, N. Y., for Brace-Mueller-Huntley Inc., Buffalo. Fred D. Hamilton has been named manager of sales, sheet and strip division, Buffalo district.

H. B. Kahle, head of the Arnold, Pa., extrusion department of Aluminum Co. of America for the past three years, has been promoted to superintendent of the new extrusion

works now being built at Lafayette, Ind. A graduate of Allegheny college, Mr. Kahle was first employed by the Aluminum company in 1917, when he was assigned to laboratory research at New Kensington, Pa.

Harry W. Schuetz has been named by Pittsburgh Screw & Bolt Corp., Pittsburgh, as general manager of the Colona division, manufacturer of pipe-thread protectors for oil country goods, succeeding the late Walter A. Clarke. Mr. Schuetz, associated with the company for a



Harry W. Schuetz

number of years, is widely known throughout the industry. He will continue his field work in the petroleum industry and contact pipe mills along with his new duties.

F. Gladden Searle of Bronxville, N. Y., has been elected a director, Worthington Pump & Machinery Corp., Harrison, N. J. Mr. Searle is also vice president in charge of sales and advertising, Continental Can Co., and a director, Vincennes Packing Corp., Vincennes, Ind.

C. Alfred Campbell, nationally known automotive sales, advertising and sales promotion engineer, has become associated with Marmon-Herrington Co., Indianapolis, maker of all-wheel-drive trucks, and trailer and track-laying tractors, as general sales director.

John M. Crawford, chairman, Parkersburg Rig & Reel Co., Parkersburg, W. Va., was elected president of the Petroleum Equipment Suppliers association at its recent annual meeting in Chicago. He succeeds W. J. Morris, Continental Supply Co., Dallas, Tex. John L. Shakeley, vice president, Frick-Reid Supply Corp., Tulsa, Okla., was made vice

president, and Wharton Weems, attorney, was renamed secretary-treasurer and counsel.

Judge John D. Petree, formerly head of the NRA in Alabama and Alabama director of the National Emergency council, until it was abolished recently, has been appointed manager for District 13, National Bituminous Coal commission. The district includes Alabama and a few counties in Georgia and Tennessee.

C. P. Randolph, chief engineer of Edison General Electric Appliance Co., Chicago, has been elected vice president in charge of engineering. He became chief engineer of the company in 1918 when it was formed in a consolidation of the heating device department of General Electric Co., the Hughes Electric Heating Co. and the Hotpoint Co.

W. H. Greaves has been named assistant representative in Scotland for Edgar Ailen & Co. Ltd., Sheffield, England. He will work with A. MacPhail, chief representative. Mr. Greaves has made a special study of stainless and acid-resisting steels, and before joining Mr. MacPhail spent some time at the Imperial Steel Works, studying the heat treatment of steels.

J. M. Fernald, vice president and general manager, Baker Ice Machine Co., Omaha, Nebr., has been re-elected president, Refrigerating Machinery association. A. H. Baer, general sales manager, Carbondale division, Worthington Pump & Machinery Corp., Harrison, N. J., was re-elected first vice president, and William B. Henderson, Washington, executive vice president.

Arthur McCaughna, formerly with Norge Refrigerator Co., Detroit, and prior to that associated with Kelvinator Corp. and Edward G. Budd Mfg. Co., has been appointed president of General Foundry & Mfg. Co., Flint, Mich., succeeding Carl W. Bonbright. The latter is resigning to devote a larger part of his time to other activities, but will continue as an executive and director.

## DIED:

■ A. E. KAYES, 54, since 1923 superintendent of the refinery plant, International Nickel Co., Huntington, W. Va., in Huntington, Nov. 5. Associates of Mr. Kayes credit him with the development of more non-ferrous alloys than any other man in the United States and much of the progress in the practice of metal refining by the use of the electric

furnace. He was the second president of the Electric Metal Makers Guild.

Arthur T. Hugg, 54, advertising manager, Detroit Steel Products Co., Detroit, in Detroit, Nov. 6.

W. L. Clark, manager, Weber-Knapp Co., Jamestown, N. Y., in Jamestown, Oct. 29.

Howard C. Myers, engineer of tests for The Midvale Co., Nicetown, Philadelphia, in that city, Nov. 2.

B. A. Fuller, president and treasurer, Hercules Mfg. Co., Centerville, Iowa, in that city, Oct. 24.

C. M. Burnett, 54, vice president and a founder, Lewis Bolt & Nut Co., Minneapolis, at his home in St. Paul, recently.

Elihu R. Lyman, 53, president, Massachusetts Gear & Tool Co., Woburn, Mass., in that city, Oct. 28.

Laurence R. Wilder, 49, electrical engineer, and formerly president, New York Shipbuilding Corp., Camden, N. J., Nov. 7 at Pascagoula, Miss.

Lawrence Bowden, for many years chief clerk in the Pittsburgh sales department, Crucible Steel Co. of America, in Pittsburgh, Nov. 2.

George Beasom, manager of the Boston district warehouse, Scully Steel Products Co., in Boston, Nov. 2. He was president, Boston chapter of American Steel Warehouse association.

## Captain Gets Bonus If Scrap Ship Makes Port

■ A twenty-year-old freighter, loaded with scrap and itself destined for scrap, will bring Capt. F. Takata a \$5000 bonus if he safely completes the voyage from the Panama Canal to Yawate, Japan.

The ship, the EASTERN KING MARU, formerly owned by the United States shipping board, has gross tonnage of 2995 tons and 1814 net. Her total load of 3100 tons of scrap and 1092 tons of coal places her low in the water and reduces speed to less than eight knots.

The scrap from the canal was sold last May to the Boston Metal & Iron Co., Baltimore. The freighter now is owned by T. Miyaji & Co.

Five Japanese and one British ship passed through the Panama Canal last week bound for Japan with 40,000 tons of scrap, pig iron, steel, other metals, machinery and cotton.

# Irvin Launched; Three More Ore Vessels To Go in Before Spring

■ AMID holiday atmosphere the first ore freighter launched on the Great Lakes in seven years slid sideways down the ways at the Lorain, O., yards of the American Shipbuilding Co. last Wednesday. It was the WILLIAM A. IRVIN, first of four new vessels built this year for the Pittsburgh Steamship Co., United States Steel Corp. subsidiary.

Mrs. William A. Irvin, wife of the president of the Corporation for whom the freighter is named, christened the ship while several thousands including many officials of the Corporation and its subsidiaries, looked on.

The IRVIN with its three sister ships, all to be launched before spring, will increase the Pittsburgh Steamship Co. fleet to 73 freighters and six barges, the largest fleet on the Great Lakes. All will be ready for service with the opening of the 1938 shipping season.

Near completion in the Lorain yards is a sister ship soon to be christened the GOVERNOR MILLER in honor of Nathan L. Miller, former governor of New York and now chief counsel for the Corporation. On the ways of the Great Lakes Engineering Works, Ecorse, Mich., are two more, one to be named the JOHN HULST and the other, RALPH H. WATSON, in honor of vice presidents of the Corporation.

Overall length of the IRVIN is 610 feet 9 inches; molded beam, 60 feet,

molded depth, 32 feet 6 inches. Draft is designed for a maximum of 22 feet and displacement is 18,780 long tons on maximum draft.

In place of the usual reciprocating engines, the IRVIN will receive its motive power from cross compound steam turbines. Although turbines are used almost exclusively on ocean vessels, this is the first application on the Lakes.

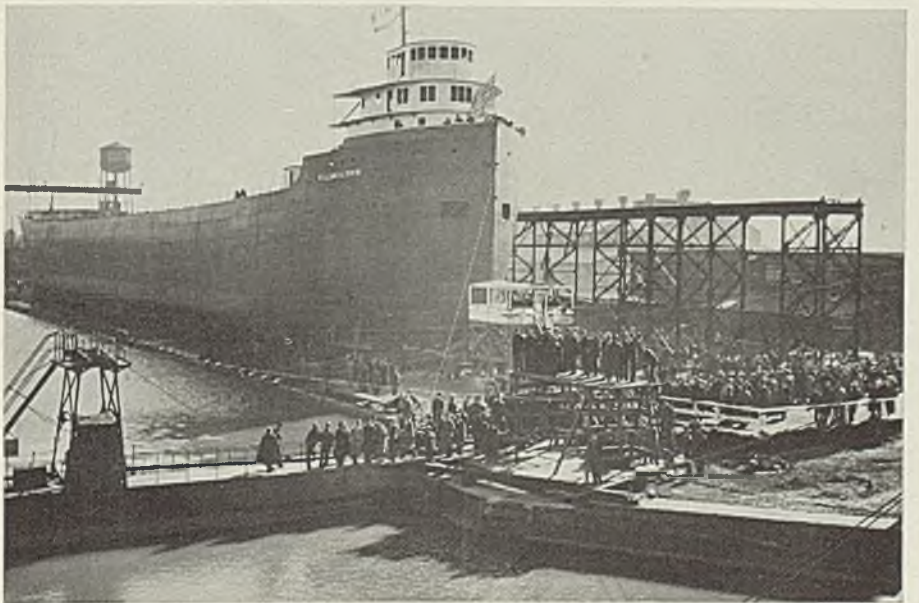
Coal bunker is elevated between the boiler room and the engine room, self-feeding to the stokers by means of gravity chutes. A system of conveyor feeders draws coal from the bottom of the bunker and discharges direct to the stoker hoppers.

Hatch covers also are of improved design. Covers are solid type and will be lifted from place with a gantry crane, moving on tracks the full length of the cargo deck, and deposited in the open spaces between the hatches.

Electric welding was used extensively in the vessel's construction. Approximately 4700 tons of steel was required.

All partitions within the after deck are of steel construction and walls and ceilings sheathed in fire-proof material. Crew quarters will be ventilated mechanically. Owners' quarters are on the spar deck, fore-castle deck, and upper deck.

Capt. J. N. Rolfson, Wyandotte, Mich., master of the MYRON C. TAYLOR, will command the IRVIN.



■ Launching of the WILLIAM A. IRVIN, first of four new bulk carriers built this year for the Pittsburgh Steamship Co., was occasion for a community celebration in Lorain, O. Several thousands, including many officials of the United States Steel Corp., and subsidiaries, attended. Some Lorain county schools were dismissed to allow pupils to witness the ceremony

# Research Defined as "Insurance" at Dedication of Armco Laboratory

■ FORMAL opening of American Rolling Mill Co.'s fine new research building in Middletown, O., was celebrated Nov. 5 by some 300 members of that organization and their guests. The day was devoted to inspecting the company's properties, including the new building, while the evening was given over to a banquet and address. Dr. Anson Hayes, the company's director of research, was toastmaster.

"The research laboratory of a company, if properly operated, is that company's insurance department," said Charles F. Kettering, vice president in charge of research, General Motors Corp., Detroit. "If the objectives are carefully selected and the investigations conducted thoroughly, some of them are bound to be reached, thus paving the way to new or improved products and to increased services to mankind. A research department is a guarantee that the company will keep up with progress.

"I cannot listen very sympathetically to pessimistic reports about

future business conditions," he declared. "It reminds me of the time one of my assistants reported he could not analyze some steel because it was too hard to drill. The trouble was that his drill was too soft. A soft approach to the problems in hand never produces results. All problems are difficult until they have been solved. After solution they prove simple.

## Obsolescence Makes Prosperity

"One of the best methods of promoting prosperity at this time is to create obsolescence. Obsolescence and prosperity are tied together and obsolescence makes prosperity. Manufacturers at all times should make their customers reasonably satisfied, but should not allow their customers to wear them out. Improvements should be made, and that is a research job. As long as the new thing is worth more than the unused portion of the old thing, customers will be willing to buy the new thing. So keep moving, and you are bound to stumble into

something; nobody ever stumbled into anything sitting down."

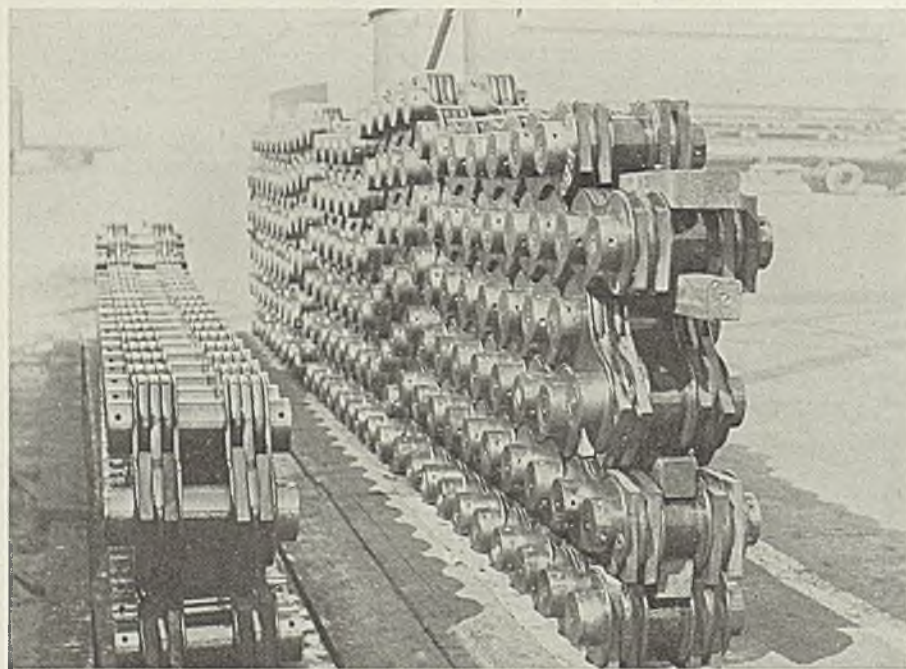
Research work has been a dominant factor in the company's progress, but in the early days this work was done by the steelworkers, working in a spirit of full confidence and loyalty between them and the management, said George M. Verity, chairman. This early work resulted in developments in electrical sheets, iron of unusual purity, high-grade galvanized iron sheets, and other products. Later came the crude beginning of a research department which constantly has grown in magnitude and in the scope of its work.

Results of research work, he stated, have been of inestimable value in making the world a better place in which to live. The savings that have accrued to the users of electrical current, through the efforts of the manufacturers of electrical equipment and their suppliers of special grades of steel, today are so monumental it is difficult even to estimate them, he said.

"The real goal of industry," said Charles R. Hook, president, "is to find new products for old and new uses, so that as industry itself grows more people will have the jobs and the money to buy these conveniences. Research is the key, industry the force that can turn the lock."

Designed and erected by the Austin Co., Cleveland, in co-operation with Harold Goetz, architect, Middletown, the new building has 43,500 square feet of floor space. It has a steel frame, steel roof and sides and was assembled entirely by welding. As stated in STEEL, Oct. 4, p. 68, it will be devoted in the immediate future to research work under 12 specific classifications, all intended to broaden the applications of steel products.

## Heavy Chain Forged for Flood Gates



■ To hoist flood gates at three dams in the Metropolitan water district system, southern California, distributing water from Boulder dam, unusually large chain is being manufactured by the Consolidated Steel Corp. Ltd., Los Angeles. There are ten gates in the three dams. Each gate leaf, weighing about 200 tons, will be supported by two lengths of chain. In all, 717 feet of chain is being made, the links being drop forged, and pins hand forged of SAE 3140 steel. Links are 11 inches long, center to center; 14½ inches wide; 10¾ inches deep, while the pins are 19 inches long

## Labor Relations at Chicago Conference

■ The fourth annual midwest conference on industrial relations was conducted by the Industrial Relations Association of Chicago and the School of Business, University of Chicago, at the university Nov. 12. Program consisted of various discussions on labor relations subjects. Speakers included Charles Fahy, general counsel, national labor relations board; C. S. Ching, director of industrial and public relations, United States Rubber Co.; and G. W. Adrianson, director of industrial relations, Commonwealth Edison Co.

John A. Stevens, manager, industrial relations, Chicago district, Carnegie-Illinois Steel Corp., is president of the Industrial Relations Association of Chicago.



## Higher Prices No Check to Scrap

■ Consumption of steel and iron scrap by the steel industry in the United States amounted to 36,358,133 gross tons in 1936, 37.6 per cent more than the 26,415,330 tons in 1935, according to the bureau of mines, department of the interior. In the same period steel ingot production increased 39 per cent.

The bureau figures include 99 per cent of consumers.

The amount of scrap used by the industry last year was 37 per cent larger than the total iron content of all domestic and imported iron and manganiferous ores consumed. In 1935 the amount of scrap melted was 46 per cent larger than the iron content of all the ore used.

Higher price of scrap and relatively heavy exports caused only slight changes in the proportions of scrap and pig iron melted.

The survey considered pig iron as well as scrap. Consumption of scrap and pig iron combined in 1936 was 66,456,767 gross tons, compared with 47,035,793 tons in 1935, a gain of 41 per cent.

### Practice Changed Little

In 1936 home scrap, that produced in the plant of the consumer, represented 28.4 per cent of the material used; purchased scrap 26.3 per cent, and pig iron 45.3 per cent. In 1935 the percentages were, home scrap 28.4 per cent, purchased scrap 27.8 per cent, and pig iron 43.8 per cent. The displacement of scrap by pig iron was comparatively small.

Consumption of ferrous raw materials in the Southwest, Pacific Coast and New England, which districts depend largely on scrap, averaged a gain of 37 per cent, compared with 41 per cent for the entire country. The relative use of purchased scrap in these areas increased from 57 per cent of the total consumption of scrap and pig iron in 1935, to 60 per cent in 1936.

In the six largest steel-producing states, Pennsylvania, Ohio, Indiana, Illinois, Michigan and New York, which in 1936 consumed 78 per cent of the total scrap and 83 per cent of the pig iron, the proportion of purchased scrap to total scrap and pig iron decreased from 26 per cent in 1935 to 24 per cent in 1936.

A contributing factor in this shrinkage was increased production of duplex steel, the so-called "synthetic scrap." This is a low-carbon iron processed first in the bessemer converter and then refined in the open-hearth, removal of the carbon in the converter shortening the period of refining in the open hearth.

Consumption of home scrap in 1935 was 13,346,752 tons; in 1936 it

was 18,901,389 tons. Purchased scrap consumed in 1935 amounted to 13,068,578 tons; in 1936, 17,456,744.

More than 90 per cent of domestic steel output, as measured in steel ingots and castings, is made in open-hearth furnaces. In 1936 open-hearth charges consisted of 54 per cent ferrous scrap and 46 per cent pig iron, compared with 57 per cent scrap and 43 per cent pig iron in 1935. Purchased scrap represented 50 per cent of total scrap in 1935 and 48 per cent in 1936.

The six largest consuming states rank as follows: Pennsylvania, using 27 per cent of the total scrap and pig iron; Ohio 22 per cent; Indiana 11 per cent, Illinois 9 per cent; Michigan 6 per cent, and New York 5 per cent.

## Mill Equipment Orders Booked

■ A group of mill equipment orders from foreign and domestic sources has been announced by United Engineering & Foundry Co., Pittsburgh.

The company has received from "Machinoimport" of U. S. S. R. a contract to supply complete 112-inch hot and cold, four-high reversing mills; a 66-inch complete four-high cold reversing mill, and a 112-inch and a 66-inch planishing mill with auxiliary equipment. There is also

a complete finishing department, including cleaning, shearing, leveling and processing equipment.

The company also has closed with Youngstown Sheet & Tube Co. for a new high-speed, two-stand, four-high 42-inch wide tandem skin pass mill for cold-reduced tin plate in coil form, and an electrolytic cleaning line for processing material. This will be installed in Sheet & Tube's Indiana Harbor, Ind., plant.

Through the H. A. Brassert Co., consulting engineers, Chicago and London, United Engineering has received orders for two four-high reversing cold mills and three two-high skin pass mills from Stewart's & Lloyds division of the Lancashire Steel Corp., Corby, England. These mills are similar to those United Engineering is now completing for McLouth Steel Corp., Detroit; Acme Steel Co., Chicago; and Thomas Steel Co., Warren, O.

Through its Canadian associates, Dominion Engineering Co. Ltd., United Engineering has sold one of its new rotary coil picklers to Dominion Foundries & Steel Ltd., Hamilton, Ont.

United Engineering's associated English company, Davy & United Engineering Co. Ltd., has sold two of the largest heavy forging presses ever manufactured. During the past three years United Engineering & Foundry Co. has been awarded contracts by foreign countries aggregating more than \$15,000,000.

## Russia Buys Steel Mill Equipment in Pittsburgh



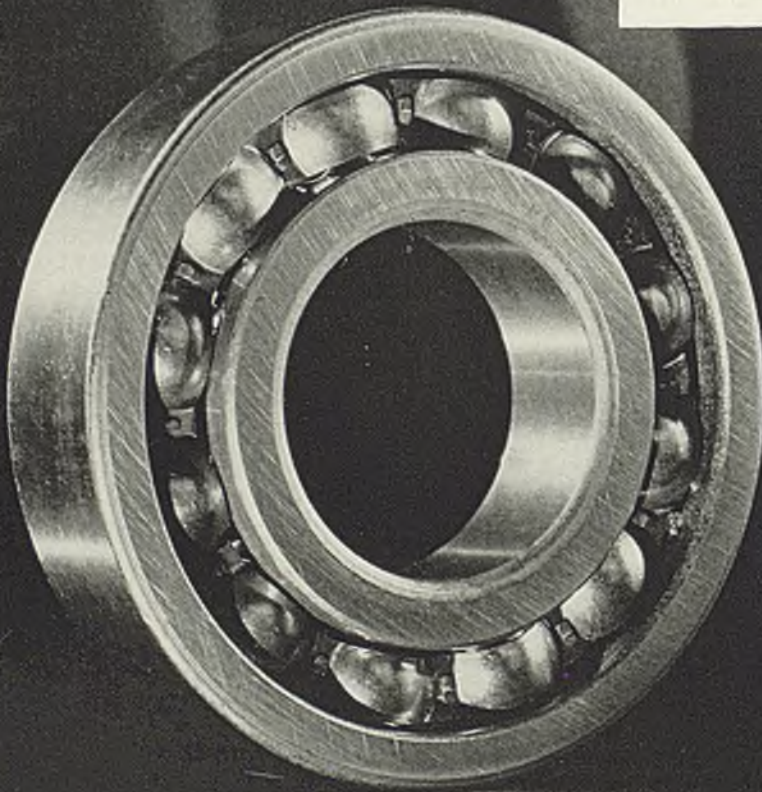
■ United Engineering & Foundry Co. officials and representatives of "Machinoimport", U. S. S. R., signing contracts covering substantial orders for new machinery to be shipped to Soviet Russia by the Pittsburgh company. (See accompanying article.) The four at the desk are, left to right: K. C. Gardner, George T. Ladd, president, United Engineering, V. K. Bogdan and N. K. Pereverzin. Standing, left to right, John L. Young, Charles F. Buente, A. Domov, L. Lestchenko, James S. Crawford, L. Zhukovitsky, B. Bubovniko, I. Sipin and Joseph Kinney

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# MIRRORS OF MOTORDOM

DETROIT

■ BRASS hats of motordom were kept on the run last week trying to keep tab on some dozen simultaneous metropolitan automobile shows, but in between shows they found time to do a little serious head scratching over the outlook for coming months. A consensus of opinion on prospects for automobile business probably would best be expressed by a five-letter word starting with "I" and ending with "y."

The Detroit show was well attended, according to official pronouncements, with turnstiles clocking crowds slightly larger than last year; for example, on Tuesday 19,783, compared with 18,177 last year. It must be remembered, however, that Detroit's population has jumped an estimated 300,000 during the past 12 months. As far as buying was concerned, a number of representatives queried expressed satisfaction, but their smiles were not convincing. Chief deterrent to closing sales appeared to be the low figures quoted on trade-ins. Add to this the higher prices on 1938 lines and the minimum of changes made this year, and you have a picture of some hard sledding this winter for salesmen.

## Price Revisions Likely

Price revisions downward are considered by many as entirely likely around the first of the year. Already there has been some jockeying in prices, Plymouth for example having shaved \$15 from its deluxe models to bring prices more into line with those announced by Chevrolet. Plymouth had announced prices originally before Chevrolet, but quickly made adjustments to keep on a competitive basis. Substantial profits shown by most motor companies in the third quarter are all the more reason for assuming there is still some margin to play with in setting retail prices, in spite of higher wage and material costs.

Looking over field reports, one company notes salesmen currently

BY A. H. ALLEN

*Detroit Editor, STEEL*

are averaging ten interviews per sale, compared with the average of five interviews per sale last year.

The Detroit distributor of a car in the higher-price brackets last week had 55 orders on its books held up by lack of down payment or signatures by the prospective buyers. The Chicago distributor of this same company is experiencing a similar condition and is holding up deliveries on 180 orders pending a final O.K. by buyers.

## Ford Exhibit Draws Crowds

Because little information on the new Ford lines has appeared, the Ford exhibit at the Detroit show outdrew some of the others. Models on display were obviously equipped with hand-made fenders, reflecting the difficulties Ford is having in getting production started. A Ford representative offered the guess it would not be possible to get delivery on some models until the first of the year.

Rumors were floating around the show early in the week that the UAW was planning to call a strike of show salesmen through its automobile salesmen's union local. A police detail was on hand at Convention hall to forestall disturbances, and Tuesday evening pickets appeared at the entrances carrying signs demanding recognition by dealers of the salesmen's and garage employes' unions, both UAW locals. No disorder resulted and an injunction was obtained restraining the picketing.

■ AUTOMOBILE company executives are not kidding themselves over the public's slow reaction to automobile shows. Production schedules in nearly all cases are being eased off. Take Cadillac-La Salle for example. Last week schedules were cut to 198 cars per day from

the previous week's 280. This week it is planned to hold at around 1000 cars for the five days of production, but next week production will be further curtailed to about 790 and the week after that to 700. The plant has gone to a 30-hour week in production departments.

Electric Auto-Lite in Toledo, O., large Chrysler supplier, has likewise placed its 3000 employes on a 30-hour week. Briggs in Detroit has reduced schedules and will be operating only 19 full days this month.

Apparently all producers except Ford have built up fairly large stocks in dealers' hands and in warehouses. Some observers here, taking cognizance of this, say the industry has been deliberately fortifying itself against the possibility of forthcoming troubles in the ranks of labor, and that if the UAW should begin further disturbances in assembly plants, a 60-day shutdown by the entire industry would not be unlikely. They feel events are unquestionably leading to a showdown with the UAW, that it must come sooner or later, that the industry is battering down the hatches for a blow.

## Layoffs Inevitable

As a straw in the wind, consider what happened at Hudson last week. Feeling too many men were working in the paint department for the production being handled, the company laid off eight; immediately UAW members called a meeting in the plant to discuss the situation. No sooner had this been done than the management closed the entire plant and 10,000 men went home. The difficulty was ironed out quickly and men returned the next day, but this indicates how managements are going to deal with any further attempts at sitdown strikes or the like.

Many observers believe the UAW in recent months has engineered deliberate slowdowns, and that managements are slowly but surely getting fed up with these tactics. One of the larger plants in Detroit,



# MIRRORS OF MOTORDOM

having a contract with the UAW, now has more men on the payroll than ever before, yet production is far from a peak. Layoffs are inevitable.

Speaking of layoffs, there is considerable wondering and amazement over the wholesale layoffs and personnel readjustment among salaried employes of at least two of the larger steel companies. Granted, of course, the steel operating rate has skidded below the profit level, Detroit feels it is still a little early to start swinging the axe on white collar employes who were probably the last to feel the benefit of improved business.

Perhaps the automobile industry itself can be blamed for the new depression in steel. Certainly there has been little volume buying for 1938 models. Whereas last year purchasing departments were buying steel for as far ahead as March, at present purchases are on almost a day-to-day basis, with no buying beyond the first of the year to speak of. In addition there appears to have been an appreciable inventory of steel carried over from the 1937 models, and while such inventories seemed puny a few months ago when business was on the upgrade, they loom large now production is slipping.

■ **LAST** week Ford officials gave the go-ahead on 44,000 models which would mean about two weeks of normal production. Counting 7000 dealers to be stocked with 11 body styles each, there will still be a deficiency of 35,000 to 40,000 cars among Ford dealers. Difficulties still beset the production lines at the Lincoln plant, and Ford is going to have to step fast to show the rest of the industry much competition the balance of this year.

At the same time there may be a motive behind all this delay at Ford. The management, from Henry Ford on down, is too smart to be caught napping and events of the next few months may throw an entirely different light on the master minding at the Rouge plant. Incidentally, it is reported impossible for any new man to get a job with Ford these days, so carefully is the company proceeding to avoid internal uprisings which might be plotted by the UAW. The union has levied

## 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
9 mos....	3,012,628	3,461,468	3,955,013
Oct.....	280,316	230,049	*352,565
Nov.....	408,550	405,799	.....
Dec.....	418,317	518,958	.....
Year.....	4,119,811	4,616,274	.....

Estimated by Ward's Automotive Reports

Week ended:		
Oct. 16 .....		89,680
Oct. 23 .....		91,905
Oct. 30 .....		90,155
Nov. 6 .....		89,770
Nov. 13 .....		85,325
	Week ending	
	Nov. 13	Nov. 6
General Motors .....	45,110	46,215
Chrysler .....	22,100	26,000
Ford .....	2,650	1,250
All Others .....	15,465	16,305

\*Estimated.

assessments of \$1.50 on Chrysler members and \$1 on General Motors members to finance the Ford unionization campaign, the difference in rate probably reflecting the relative strength of the UAW in these organizations.

It is understood that within the last ten days a union leader at one of the Chrysler plants made a visit to the Youngstown district and addressed workers in a parts plant there, asking them to be prepared to leave their jobs in sympathy should a strike develop at Chrysler. The men attending this meeting, by the way, in defiance of instructions to return to work, so crippled production the plant was unable to make shipment of a rush order.

Delegates from all Chrysler UAW locals in the country will meet in Detroit Nov. 27 to "determine policies" which the union will pursue in contract negotiations with Chrysler. Meanwhile negotiations between the UAW and General Motors appear to have been stalemated and no steps toward renewing or revising the contract which the cor-

poration has with the UAW have been taken—at least not publicly.

A picket line was installed at one of the General Motors plants in Flint recently to check the union cards of all workmen entering the plant and to ascertain that dues had been paid. The atmosphere at Flint is growing tense again, according to recent visitors, and the new mayor is said to be inclined to favor the UAW to the point where he has effectively shackled the city police.

■ **OUTLOOK** for the refrigerator industry, an important section of Detroit business, is said to be unfavorable. A survey made by a large mail order house shows farm buying has dropped 27 per cent in the last three months, and the farm market was hoped to provide an important outlet for refrigerators in the coming year. One of the reasons ascribed to this collapse in buying by farmers is a tightening up on government loans which has forced many buyers in rural areas to abandon plans for new equipment, both household and otherwise.

A supplier of stampings reports requests from buyers in the refrigerator industry to recheck quotations in the effort to shave 10 per cent from his prices. There are only three places this 10 per cent can come from—profits, wages or materials. Realizing the pressure from unions and government on holding up wage rates, and taking into consideration the current inflexibility of steel prices, the outlook is rather poor for profits, especially since in times like the present it is a sore temptation for competing companies to trim quotations a little to get the business.

■ **GENERAL MOTORS** has prepared an interesting little brochure showing how its affiliated companies blanket the field as far as automobiles are concerned. All in all, General Motors can supply you any one of 90 passenger cars, ranging in delivered price from \$648 to \$7170. Take your pick from seven business coupes, two station wagons, 11 sport coupes, 11 convertible coupes, seven two-door sedans, nine two-door touring sedans, nine four-door sedans, 12 four-door touring sedans, ten convertible sedans and 12 limousines with special bodies.

Proposal to build a new plant in the Detroit area for the production of a small car powered by a 5-cylinder radial engine mounted in the rear, and priced under the Ford level, is the subject of behind-the-scenes comment. Reputedly \$12,000,000 of capital has been raised for the project, but at the moment activity appears dormant, probably due to the unsettlement in financial circles.

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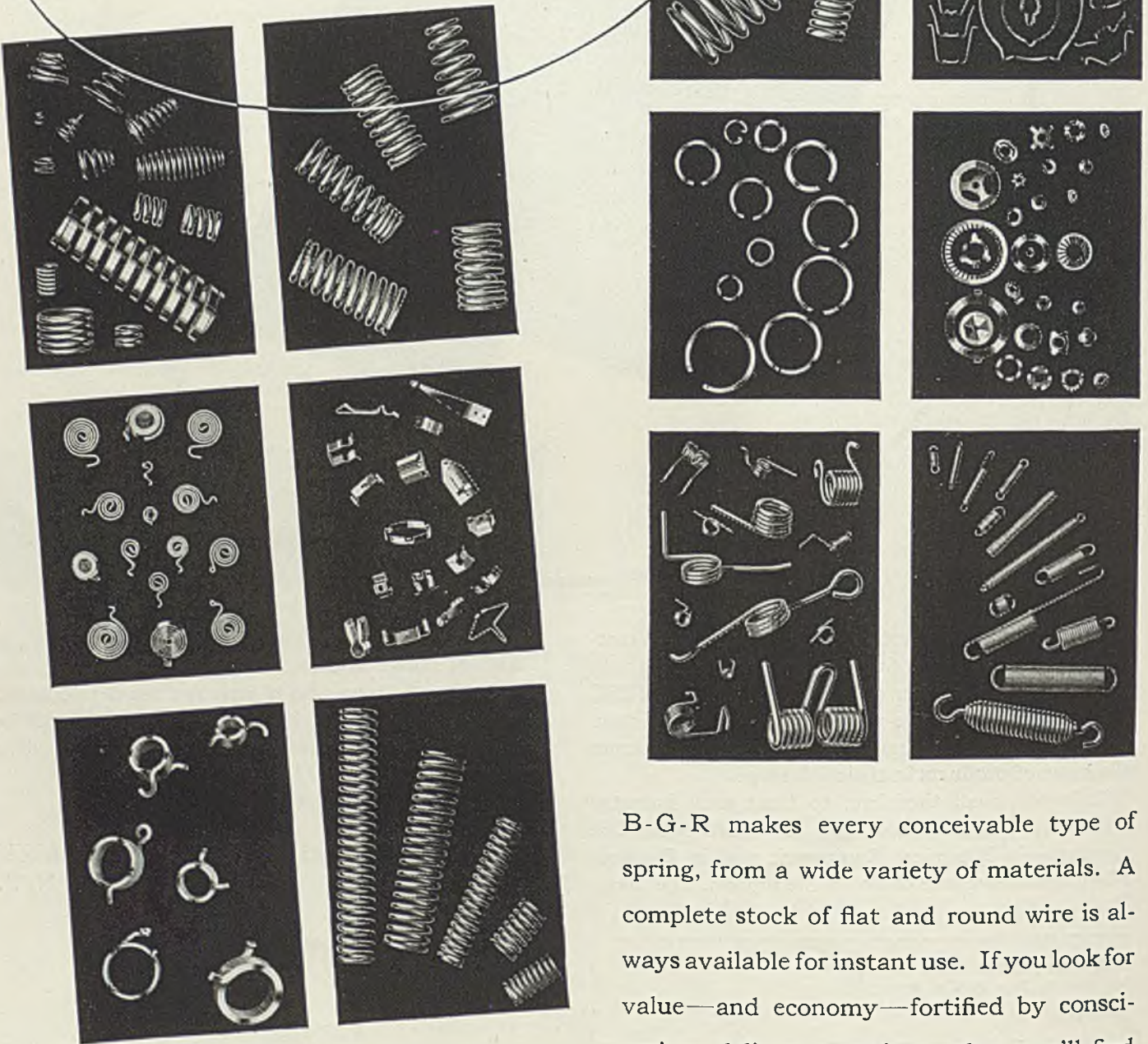
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# WINDOWS OF WASHINGTON

WASHINGTON

BY L. M. LAMM

Washington Editor, STEEL

■ IN ADDITION to many collateral matters there are several of extraordinary interest to the steel industry which will be pending at the extra session of the seventy-fifth congress which convenes Nov. 15. To cite only a few of them, the hearings in connection with the bills which would embargo, except under license, iron and steel scrap exports; the anti-basing point bill of Senator Wheeler, Montana; the hours and wages bill now pending in the house, having passed the senate; and the redrafting of the revenue act.

It must be remembered that when congress meets in this extra session it can consider any legislation that meets its fancy; it is not limited to the purpose for which the President called the special session. In fact, congress would not even have to take up the matter for which it was called unless it feels so inclined.

## Surplus Tax Change Likely

There is a definite feeling in some unusually well informed circles that the bills prohibiting scrap exports except by license may not come to a hearing before the senate committee on military affairs. Reasons given for this attitude, among other things, are that the price of scrap has decreased since this movement started and more scrap is available. It is believed entirely possible, therefore, that this matter may be adjusted without legislation.

Just what will be done about the Wheeler antibasing point bill, no one seems to know. Senator Wheeler introduced this bill, amended from a previous congress, a long time before the end of the last session and no hearings were held at that time. Extensive hearings were held on a similar bill two sessions back.

There was nothing particularly new in connection with the corporate surplus tax last week, other than what has already been said in these columns, except for the fact that many government officials are

getting on the band wagon, either asking for entire repeal of this tax or its amendment. There is every reason to believe that something will be done.

The most important matter is that the President simply refuses to be "smoked out" on this subject. During the past couple of weeks or so newsmen at the White House press conferences have tried every way to put Mr. Roosevelt on record in this regard but he eludes all such attempts. At any rate there is no secret that most of his leading advisers are doing everything they can to get him in the right frame of mind to ask for some changes.

A subcommittee of the ways and means committee of the house, which is charged with writing the new tax bill, has been in session for a couple of weeks, hearing treasury department experts on the subject behind closed doors. It is expected that public hearings before the full membership of the ways and means committee will begin early in January, although no definite date has been set.

## South Opposes Wage-Hour Bill

During the past week the President has had a number of conferences with personal advisers and also with leaders of congress in connection with the hours and wages bill. It will be remembered that this bill passed the senate at the last session on what has been termed the 40-40 plan, that is, a maximum of forty hours per week and a minimum wage of 40 cents per hour. This, of course, is what the President desired. As a matter of fact, it is reported on excellent authority that when the hours and wages bill was first sent to congress the Chief Executive himself put these figures in the bill after there had been con-

siderable dispute among those who prepared the draft.

However, southern members of the house opposed this figure and, with the Republicans, were able to keep the house from making any move during the closing hours of the last congress. And this even in spite of the fact that both CIO and A. F. of L. did everything possible to get some kind of action before adjournment.

Sentiment here is that many members of the house have come back to Washington with the idea that this bill should be amended before it becomes law. There is no unanimity of opinion, however, on just what can or should be done to ease the situation.

## Substitute Bill Proposed

A number of suggestions have been made to displace the present bill and one of these has been made by Representative Lamneck, Ohio, who it is recorded, had discussed the matter with a number of industrialists.

The proposed Lamneck bill amends the federal trade commission by declaring the employment of workers under substandard labor conditions in the production of goods for commerce to be an unfair method of competition within the meaning of section 5. Substandard labor conditions are defined by the use of "oppressive wage," "oppressive work week," and "oppressive child labor." The trade commission, in this bill, is apparently charged with the discretionary determination of what constitutes an oppressive work week or wage in any given case. No statutory standard is provided other than general statements concerning the factors which are to be taken into consideration, such as, cost of living, value of services, standards of collective agreements in similar occupations, health, efficiency, availability of workers, etc. Oppressive child labor is the employment of minors under 16 years of age or, in hazardous occupations,

minors less than 18 years of age.

While the bill adopts some of the legislative guides of the Black-Conerly bill to develop oppressive standards, there is complete absence of limitations as to the rate of wage or length of work week which can be imposed. Further there seems to be no direct provision for exceptions or tolerances of any kind. No standard is set up for determination of hazardous occupations. Penalties are severe and the usual court review of orders seems absent though recovery of civil penalties is through civil action.

The protection of states having high labor standard laws against invasion by states having no laws or less stringent laws would cause the greatest confusion and industrial dislocation, it is believed. It would practically bar goods from Hawaii and Puerto Rico while opening the gates to Japan, the Philippines, Germany, Switzerland, Czechoslovakia, and other countries.

#### **BASING POINT ACTION HINGES ON CEMENT CASE**

There is every reason to believe the cement basing point case before the federal trade commission will be used as a precedent for the steel industry and that no complaint will be issued against any of the steel companies on this score.

An official of the trade commission told the writer recently that it has been definitely decided that no complaint will be issued in the steel industry on the basing point question "unless it is forced upon us." In other words, unless some pressure is brought to bear on the commission not even a complaint will be issued. In the event that this should be done, it is known that the commission would not go forward with a steel basing point case until after the cement case has been completed.

The commission has for a third time extended the time for beginning its hearings in the cement case. It has announced that hearings will begin Dec. 1 and that no further postponement will be granted. One of the leading attorneys for the cement industry is now engaged in a prolonged hearing before the department of justice in the oil case, and that is given as the reason cement interests are not ready to go ahead.

#### **NAVAL TOOL EQUIPMENT PROGRAM STANDING STILL**

During the past fiscal year \$1,566,100 was expended by the navy department for additions and replacements of plant equipment in navy yards, according to Rear Admiral Harold G. Bowen, chief of the bureau of engineering, in his annual report to the secretary of the navy.

This sum, the admiral states, includes \$66,100 specially allotted to

Norfolk navy yard to enable the latter to speed up the production of turbine blades necessary to the navy's new construction program. He says also that approximately \$1,000,000 of the remainder was expended for metal-working machine tool replacements and additions and \$500,000 for other equipment.

"Since the beginning in 1930," says Admiral Bowen, "of a replacement program of machine tools designed to gradually reduce the then average age of 19 years to 15 years, annual expenditures for all navy yard equipment have averaged \$1,195,000. These expenditures have not been sufficient to bring about a down turn in the age curve, with the result that the need for tools continues to grow rather than diminish. The need is evidenced by the fact that the peace time work load is being met only by resort to two or three shifts in many of the important shops. This is of consequence in that if facilities are so limited that shifts are necessary for the peace time work load, there exists no ready means of expansion in an emergency."

#### **ANTITRUST LEGISLATION NEEDS CAREFUL STUDY**

The attorney general stated at a press conference last week that he has not yet formulated recommendations for antitrust legislation, although he did say that he had a mass of material that he could pass on to congress in connection with the present law if the members wanted it. In answer to definite questions on the subject Mr. Cummings said that he does not yet know the answer to the antitrust question.

There must be an adequate study, before any legislation can be passed to amend the present antitrust laws, he said. He stated that he would be most apprehensive of quick legislative action by congress on the antitrust law, and he expressed the belief that the matter should be given mature consideration before legislation is even drafted.

While not making any definite statement, it is known that the attorney general is having experts in the justice department go into the question fully.

#### **MERCHANT MARINE IN DIFFICULT SITUATION**

Joseph P. Kennedy, chairman, and other members of the United States maritime commission, last week issued an economic survey of the American merchant marine. Probably the country will not like what the commission said about the merchant marine but the body had the statistics to back up what it said.

The commission referred to the merchant marine of the United States as "a very sick industry." It

stated further that "any remedy, to be effective in this case, must be a compound of many ingredients. The ills of shipping are felt throughout the industry. They have left their mark with equal severity on owner, manager and worker."

It is pointed out in the survey that "some of the lines are heavily burdened with debt; most of them have been operating, until recently, at a loss. Now they are faced with the problem of replacing their fleets, just when, after eight years of depression, they are beginning to make a little money."

In the final analysis, says the commission, the merchant marine problem boils down to three questions: What do we need? How can we get it? And what will it cost?

#### **CALUMET EMPLOYEES TO VOTE**

The national labor relations board has announced an election among the hourly paid production and maintenance employes of the Calumet Steel division of Borg-Warner Corp., Chicago Heights, Ill.

The workers will determine whether they desire to be represented by the Amalgamated Association of Iron, Steel and Tin Workers of North America, Lodge 1027, or by the Chicago Heights Steel Workers' Protective association or by neither organization. There are 575 employes at the plant.

#### **CUBAN STEEL IMPORTS GROW**

Cuban imports of iron and steel products through the port of Habana, which receives some 70 per cent of the Cuban imports, amounted to 46,462 metric tons during the first nine months of 1937 compared with 30,870 tons during the corresponding period of last year, according to local estimates reported to the department of commerce by the American commercial attache, Habana.

Aggregate imports of iron and steel products from all sources registered an increase of some 50 per cent, those from the United States advancing 54 per cent and those from Europe increasing 44 per cent.

#### **STEEL PLANT FOR BRAZIL**

Skoda Works, Prague, Czechoslovakia, a machinery and armament concern has established an affiliated company in Rio de Janeiro, Brazil, according to reports made public in Prague and forwarded to the department of commerce.

The purpose of the new company, which is capitalized at approximately \$70,000, will be to import Czechoslovakian products into Brazil, particularly those manufactured by the Skoda Works, and to export Brazilian products to Czechoslovakia and to engage in the manufacture of certain products in Brazil.



## *To Prove Sincerity Administration Should Reverse Legislative "Musts"*

**I**F WE are to believe the propaganda now emanating from Washington, the administration wants business to know that it is not going to be as harsh in its treatment of industry in the future as in the past five years.

This sounds good, of course. But the way to convince the doubting Thomases is to do something tangible to show that the old policy of persecution actually has been discarded. The day of effective lip service in regard to promised "breathing spells" has passed.

A very convincing way of proving that the old destructive policies have been discarded would be to change the program for the special session of congress. As things now stand, the "must" agenda for this session calls for early enactment of hours and wages legislation and an act to revive AAA in a modified form.

### *Present Preferred Legislation Destructive to Morale; Insistence Will Only Prolong Business Recession*

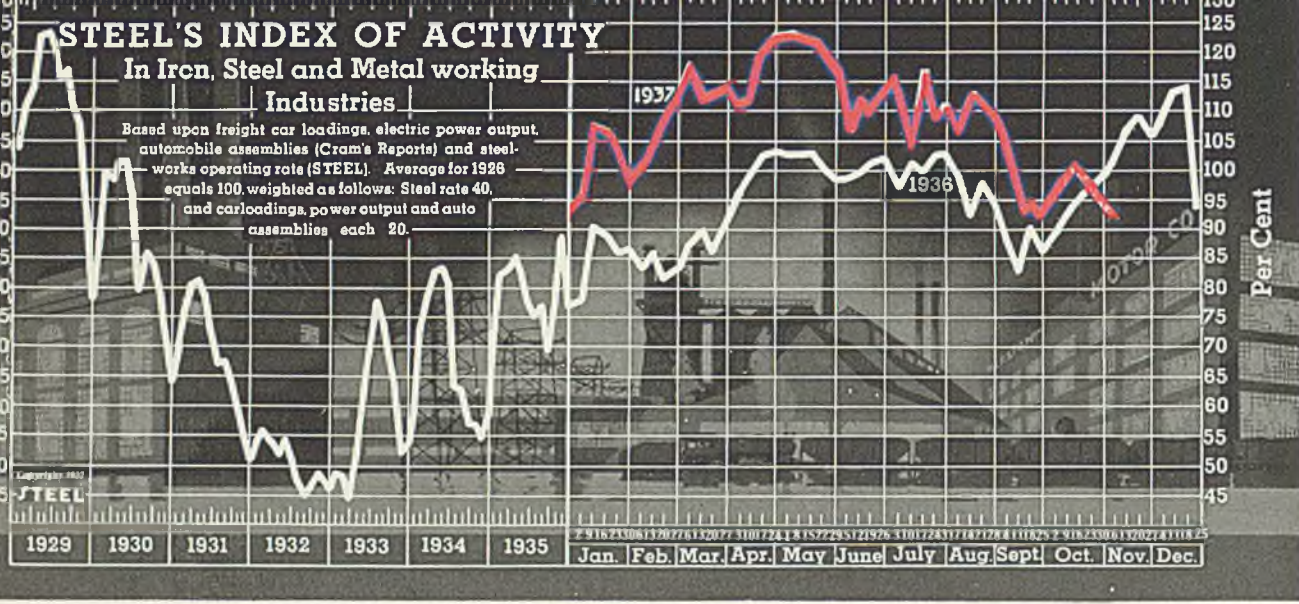
These two objectives are destructive. To persist in demanding immediate action upon them is to deepen and prolong the curse of the present recession. To give these highly objectionable measures precedence over sorely needed corrective legislation is obstinacy carried to the extreme of absurdity.

Why not reverse the order of action? Today the administration says act on wages and hours and AAA first, and then tackle the modification of the tax laws in the regular session. If the administration is sincere in its appeals to business that it does not want to continue to stifle private initiative it can easily demonstrate its sincerity by doing four things:

### *Wage-Hour and AAA Best Put Aside for Present; Tax and Wagner Act Revision Will Revive Confidence*

1. Ditch all thought of a wage and hour bill at this time.
2. Forget the revival of AAA.
3. Make revision of the tax law the first order of business in the special session.
4. Almost simultaneously with action on taxes in the special session, act to modify the Wagner act so that it bears with equal emphasis upon the destructive practices of labor unions as well as employers.

Unless the present order of business is reversed in this fashion, Washington's frantic appeals to industry to believe in its sincerity will avail nothing. The "breathing spell" racket has been worked too often to be effective now.



*STEEL'S index of activity declined 3.4 points to 92.3 in the week ending Nov. 6*

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Aug. 28	108.5	94.0	77.3	55.1	70.3	45.2	66.5	87.4
Sept. 4	104.8	87.5	70.9	53.5	65.5	45.4	65.3	79.0
Sept. 11	94.3	83.1	70.1	58.7	69.1	44.9	60.9	85.0
Sept. 18	95.0	90.1	69.4	58.1	68.2	47.8	65.6	86.2
Sept. 25	93.0	86.2	68.5	89.3	66.9	48.0	65.2	83.8
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	95.5	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	78.8
Oct. 30	95.7†	99.1	86.4	55.0	52.3	48.4	59.2	72.5
Nov. 6	92.3*	102.1	88.4	54.9	50.7	48.5	56.0	71.5

\*Preliminary. †Revised.

## Rate of Industrial Activity Drifts to Lower Levels

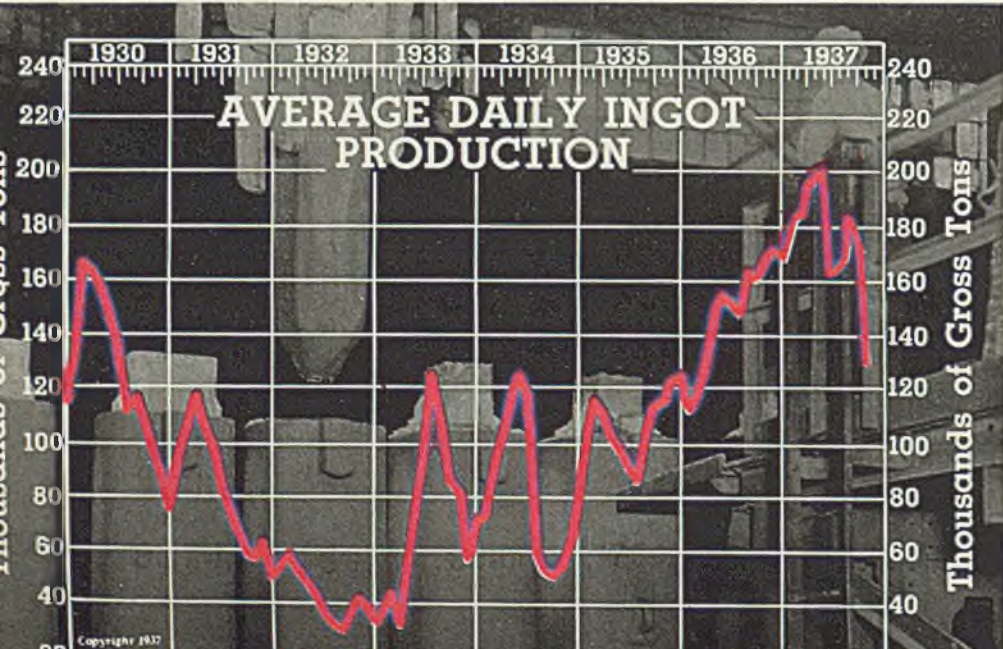
**B**USINESS has reached the midway point of November without exhibiting signs of new demand in sufficient volume to halt the declining trend of industrial activity. The weekly barometers of a few fields, as for instance engineering construction, have shown moderate gains but the overwhelming majority of business statistics indicates a further drift to lower levels.

In the week ending Nov. 6, STEEL'S index of activity in the iron, steel and metalworking industries stood at 92.3, a decline of 3.4 from the 95.7 of the previ-

ous week. Contributing to the drop were moderate recessions in all four elements of the index.

Steelworks operations slipped off to 47 per cent of capacity and will drop again in the current week. Car loadings receded to about 732,000 cars and electric power output barely escaped dropping to below the 2,200,000,000 kilowatt-hour level. Automobile production, reflecting the absence of positive encouragement emanating from the New York show, dropped slightly to 89,770 units.

Business sentiment has improved somewhat on the basis of increasing evidence that Washington knows it has overplayed its hand in discouraging private business initiative. Professions of a change of heart are promising but not convincing. Deeds, not words, now are required to stimulate a new surge of activity.



	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. ....	.....	173,496	121,170
Dec. ....	.....	170,448	122,936

# BUSINESS TREND

## Carloadings Continue Downward Trend From Oct. 2 Peak

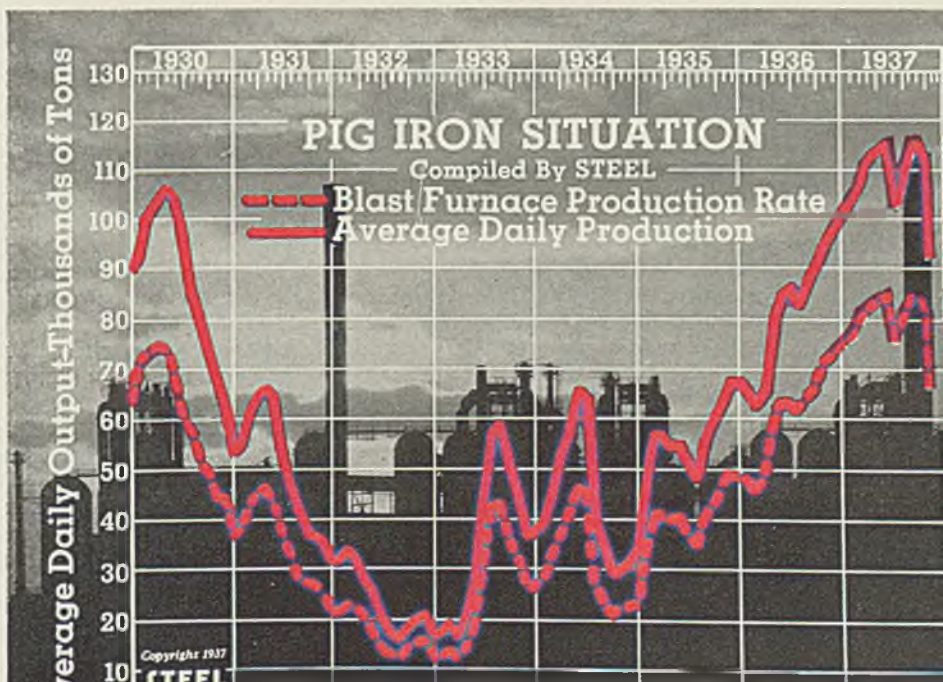
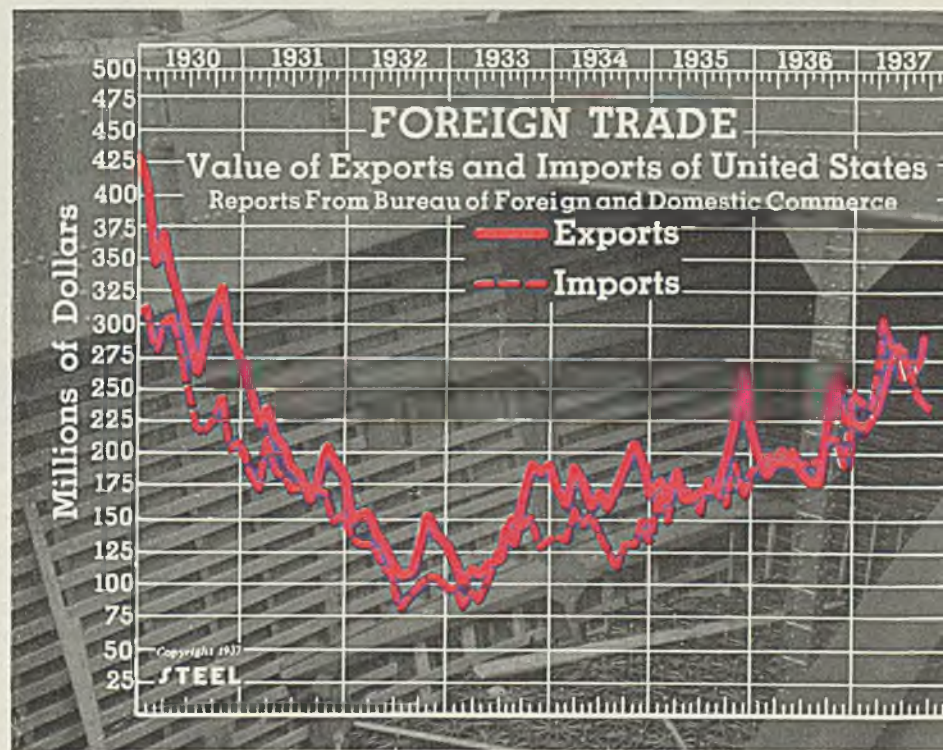
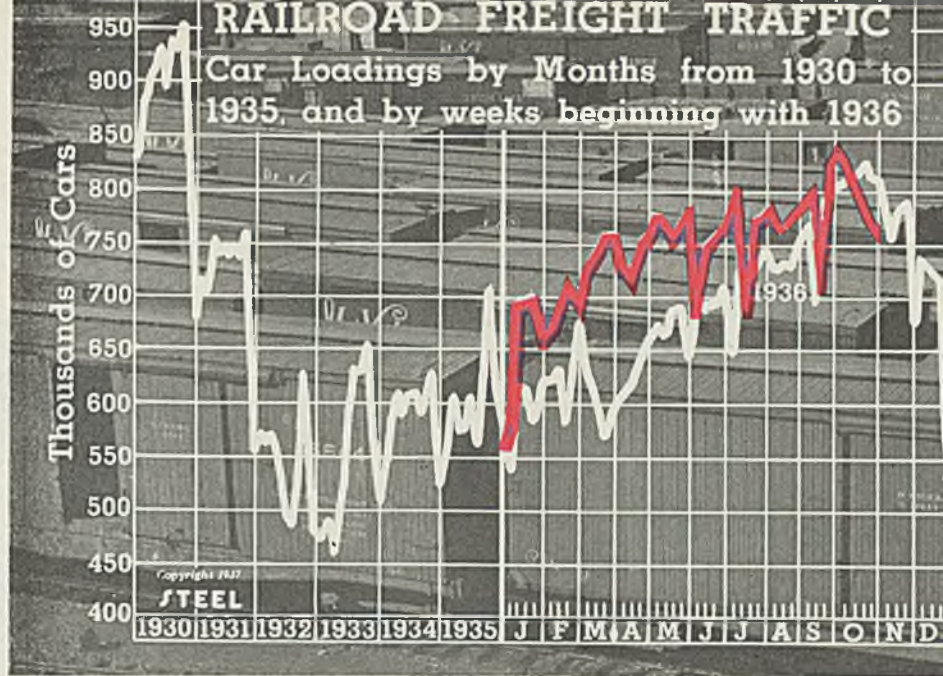
	1937	1936	1935
Oct. 30.....	771,655	814,175	680,622
Oct. 23.....	773,353	815,972	707,826
Oct. 16.....	809,944	826,155	732,947
Oct. 9.....	815,122	820,195	734,274
Oct. 2.....	847,245	819,126	706,877
Sept. 25.....	840,446	807,070	630,771
Sept. 18.....	826,565	789,510	707,644
Sept. 11.....	711,299	699,859	700,357
Sept. 4.....	804,633	764,680	592,786
Aug. 28.....	787,378	753,742	679,861
Aug. 21.....	781,247	734,973	626,373

## Favorable Trade Balance Widens Through September

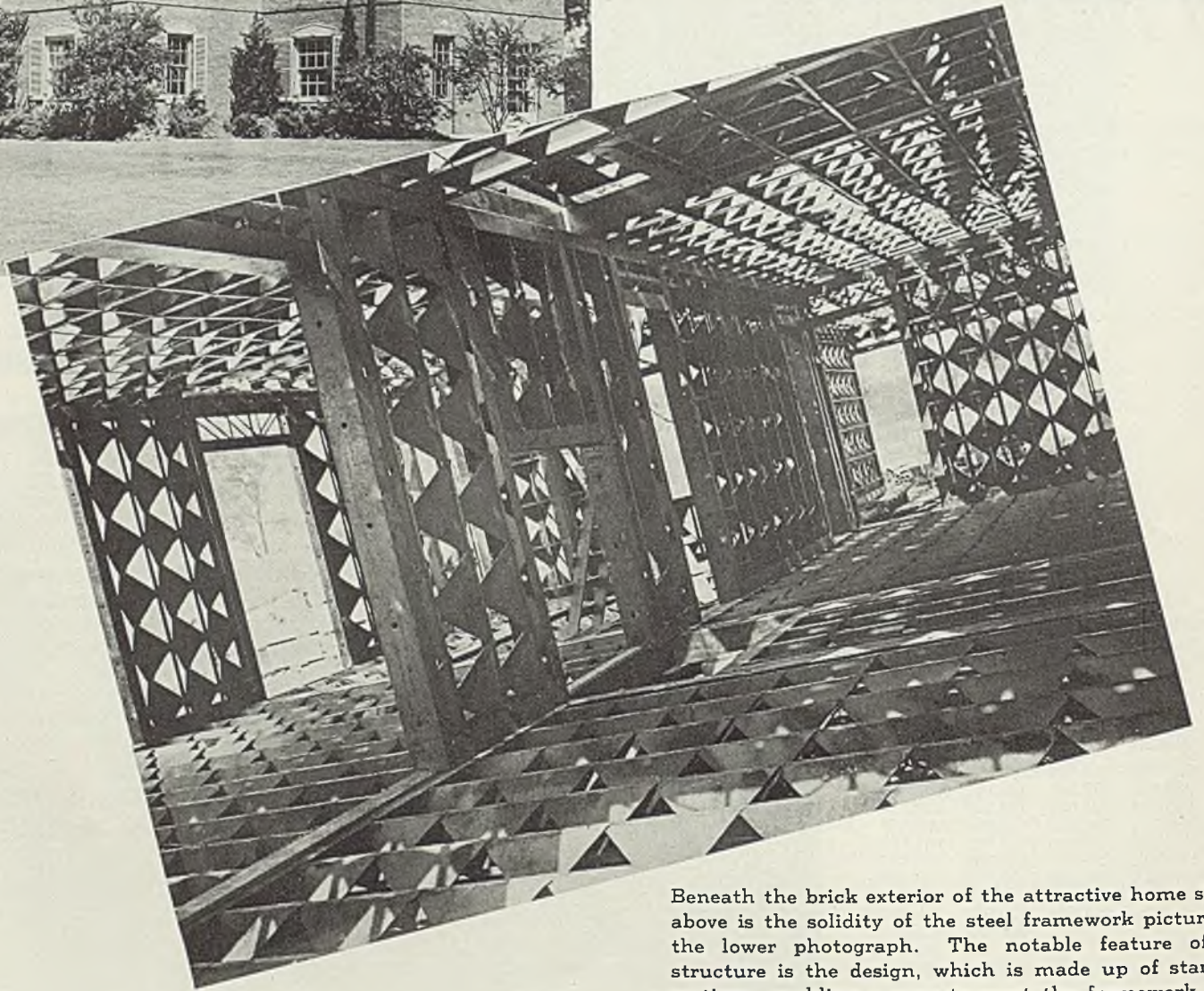
	Dollars (000 omitted)			
	1937		1936	
	Exports	Imports	Exports	Imports
Jan.	221,550	240,396	198,654	187,482
Feb.	232,504	277,805	182,024	192,774
March	256,390	306,699	194,790	198,686
April	269,171	287,252	192,795	202,779
May	288,924	285,038	201,042	191,110
June	265,341	285,925	185,188	192,233
July	267,185	265,349	178,324	193,409
Aug.	277,668	245,707	178,249	195,016
Sept.	296,729	233,361	220,539	215,701
Oct.	.....	.....	264,708	212,001
Nov.	.....	.....	225,766	196,423
Dec.	.....	.....	229,739	244,321

## October Iron Output Down 15.3 Per Cent

	Daily Average, Tons		Blast Furnace Rate, Per Cent	
	1937	1936	1937	1936
Jan.....	103,863	65,461	76.6	48.2
Feb.....	107,857	63,411	79.5	46.6
March...	111,951	66,004	82.5	48.5
April...	113,354	80,316	83.7	59.1
May...	114,360	85,795	84.3	63.1
June...	103,843	86,551	76.6	63.6
July...	112,947	83,735	82.9	61.5
Aug.....	116,676	87,475	85.7	64.3
Sept....	113,937	90,942	83.7	66.9
Oct....	93,259	96,509	68.4	71.0
Nov.....	.....	98,331	.....	72.3
Dec.....	.....	100,813	.....	74.2



# New Metho



Beneath the brick exterior of the attractive home shown above is the solidity of the steel framework pictured in the lower photograph. The notable feature of the structure is the design, which is made up of standard sections, enabling a crew to erect the framework in 36 working hours

■ MANY major obstacles which have confronted the development of steel houses are said to have been overcome in an effective manner in a system developed by the Arcy Corp., 630 Fifth avenue, New York, and applied in a group of five buildings just completed on the Rockefeller Estate, Cleveland, and in a large private residence for Laurence Rockefeller at Pocantico Hills, N. Y. In this system a series of panels comprising standard sections made of steel sheets and small angles are shipped to the building

site and welded together to form a complete house frame. The operation is speedy and the frame for a 10-room house can be erected complete by a crew in 36 working hours. Because of co-ordination of the work in the various trades such a house can be completed in the remarkably short time of 10 weeks.

"Production of the house itself has been the chief problem of the house building industry," said B. J. McGarry, president, Arcy Corp. "Heretofore we have made only raw materials. All the money saved in mak-

ing these materials by mass production has been burned up in the assembly. The building of the house itself has been a series of separate operations with one craft having to wait on the other. The Arcy system places as much of this work as possible under the mass production principle, resulting in speedy assembly in the field as well as in the shop and eliminating as many of the old time field operations as possible.

"In other words, the Arcy methods seem to have solved three outstand-

# For Erecting Steel Houses

ing problems that have confronted the steel industry in the housing field. Most serious has been the problem of putting the individual house on a production basis. Second has been the problem of competing against ordinary building construction costs. Third has been the problem of giving to the public the same flexibility of design in steel as has been possible with other materials.

"To solve these problems, the company set out to combine architectural design, engineering, production and construction into a single merchandising organization, thus giving to the home owner the economies that result from a unified building procedure. The company's activities key right into the mass production methods by which materials are produced and by which manufacturers produce the parts and equipment that go into Arcy houses."

The steel framework used in these houses is built up of so-called diamond sections. Three 1-inch steel angles are placed parallel to each other at the three corners of an equilateral triangle having sides 18 inches wide. Square 16-gage steel sheets are bent over one of these bars in the diagonal position so that the opposite corners of the sheets touch the other two bars. This assembly is joined by electric welding. These sections come to the building

site welded together in fours where they are assembled into the building framework by field welding. On completion of the erection of the frame, steel stairs and window sash are put in place, also assembled by welding.

## Erection Procedure

While the exterior finish, brick, stone, stucco or wood, is being applied, the plumbing, wiring and air conditioning ducts are installed. Planks of reinforced gypsum bound with tongue and groove steel edges are laid over the floor panels. Partitions of steel channel studs are set in place. The partitions in these houses are non-bearing and have no structural value. A wire mesh fabric lath is wired to these studs and steel wall panels and baseboards placed in position. The house then is about 90 per cent complete. After plastering, steel kitchen cabinets, wardrobes, plumbing fixtures and the like are installed.

The company, in conformity with its idea of prefabrication, buys as much material as it can from a single source, the steel industry.

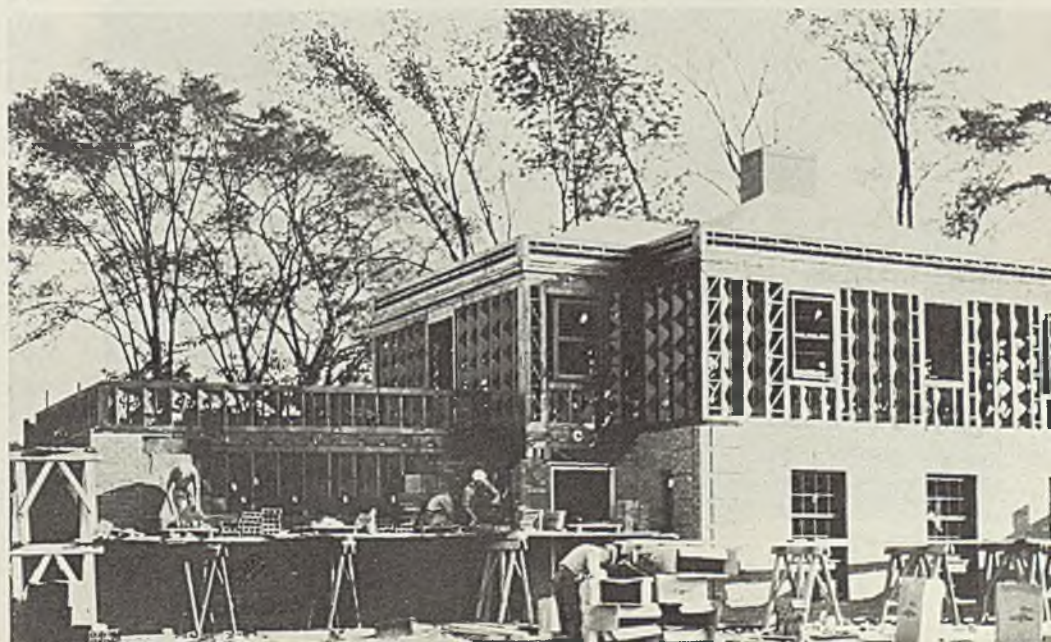
Every Arcy home comes complete, with all details executed in accordance with a single contract. The kitchen has a stainless steel sink and is completely equipped with formed steel cabinets appropriately deco-

rated. All working surfaces are finished in linoleum bound with stainless steel. Bathrooms have towel and medicine cabinets of the same formed steel type as the kitchen cabinets. Of the same type are the linen cabinets. Wardrobes in the bedrooms are likewise formed of steel sheets, and are finished in enamel and recessed with door surfaces flush with the wall. They contain a space for hanging, one for storage and there are hat racks and ample drawer space.

The steel stairs may be finished in wood, rubber or linoleum. The stair rail may be wrought iron, stainless steel or wood. Interior trim, including base and window and door casings, is of formed steel sheet. Walls of bath and kitchen are covered with linoleum and all bathtub enclosures are of vitrified glass. Windows are casement or double-hung, nonwarping. They are of electro-galvanized steel and are weather-stripped. The roof is of slate, shingle or composition roofing, depending on exterior design. Heating and air conditioning equipment of most modern type are furnished. All exterior metalwork is copper.

Arcy Corp.'s plan for the coming year is to build a limited number of houses in the east and middle west. Production will be stepped up gradually.

Brickwork follows rapidly after the steel framework has been assembled. Here is a view of the partially completed home



# CARBURIZING—

Its History—Selection of Steels and Type of Case—A New Hardenability Test—Materials and Equipment—Production Practice

## PART I

■ CARBURIZING, or "carbonizing" as it was called until about 15 years ago, is one of the oldest of the ferrous arts, in view of which considerable interest was attached to the comprehensive symposium on this subject held at the recent annual convention of the American Society for Metals in Atlantic City, N. J. The 13 technical papers presented and their attendant discussion contributed a wealth of information valuable to practical man and research expert alike. Herewith STEEL presents an extended review of the material included in the symposium.

### Historical Background

Antiquity of the carburizing process was analyzed by E. F. Davis, chief metallurgist, Warner Gear Co., Muncie, Ind., who pointed out that although the present box carburizing still is termed "cementation" in Europe it is not an outgrowth of the well-known "cementation process,"

but it was one of the means of imparting carbon to the hammered spongy iron made long before the Christian era.

Early workers in iron and steel did not know exactly the part played by carbon in hardening iron as it is known today, believing it to be some magical ingredient, celestial agency or phlogistic potency. Carburizing agents were referred to by such mystic terms as black ox blood, "toade oyle," fen moss, viper flesh, mummy powder and the like. Not until the sixteenth century did the iron and steel industry become sufficiently centralized and commercialized to lead to the debunking of these early myths.

Although there was much use made of carburizing during the middle ages, it was really the bicycle industry which gave the first important stimulus to commercial case hardening. As early as 1895 bearings and cones were being car-

burized, and copper plating was being used as a carburizing resist. Cost of carburizing during this period ran from 10 to 20 cents per pound and the quality of work usually was poor.

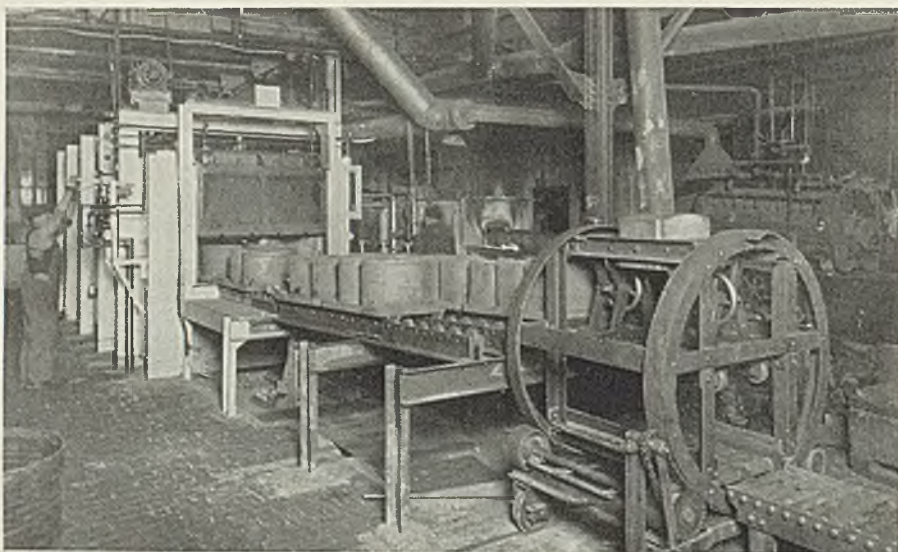
Early furnaces were coal fired, and it was not until the introduction of fuel oil for furnaces that the now familiar square or rectangular box carburizing unit came into being, and in Europe it is even now used practically universally.

The period from 1910 to 1920 was one during which considerable carburizing was done, mild steels of the carburizing grade predominating on automobile construction, covering nearly all gears, most stressed or wearing parts, and even crankshafts. During this period the metallurgist gradually replaced the blacksmith in superintending heat treating operations, and the thermocouple replaced the human eye.

### Carburizing Compounds

A milestone was the work on grain size of McQuaid and Ehn in 1922, an outgrowth of their investigation of the variables in case-hardened work, which immediately was seized upon to make the steelmaker the goat for all the defects of case hardened work.

For many years, the chief carburizing compound used as raw ground bone, later superseded by compounds of charred leather with bone, and bone with charcoal. After 1910 the trend was toward the energized or chemical type of compound—mixtures of charcoal, Solvay coke, retort carbon with energizers and catalysts such as iron oxide, sodium



Two-row straight-through type of carburizing furnace

phosphate and acetates, and the carbonates of calcium, barium, lithium, sodium and strontium. Introduction of the latter type of carburizers was an important step in the reduction of carburizing costs.

One of the first steps toward improving uniformity was automatic fuel control. This was preceded by automatic signaling pyrometers utilizing colored lights. Usually three lights were employed, a green light which would burn when the temperature was below the required limit, a red light when the temperature was too high, and a white light when the temperature was within the limit, usually 25 degrees.

About 1922 the economy of heat-resisting alloy carburizing boxes was first demonstrated. Another important contribution of this type of alloy was the possibility of placing mechanical equipment, roller rails and metallic hearths within the furnace itself and still maintain the underfiring principle. However, the first major step toward improving quality and eliminating uncertainty of box furnace practice was the rotary-hearth furnace.

Next came the long tunnel straight-through type of furnace utilizing roller rails cradled on trunnions in alloy shoes which were imbedded into the furnace hearth. Carburizing boxes were laid on trays, set lengthwise or sidewise and pushed by means of exterior mechanical or hydraulic pushers the entire length of the furnace.

#### Waste Heat Utilized

Although many metallurgists preferred electric heating for carburizing, because radiant heating is effective when large masses are to be heated, it was not economical in operation when applied to the tunnel or straight-through furnace and seldom could compete with the gas and oil-fired furnace of this design. Manufacturers of electric furnaces then designed the counterflow furnace whereby the heat ordinarily wasted could be conserved by utilizing it to preheat the boxes entering the furnace. This necessitated feeding the boxes in at opposite doors, and adding a heat exchange chamber to each end of the furnace. The counterflow furnaces were therefore quite long, some 75 feet or more.

In 1928 the first "boomerang" or return counterflow furnaces were installed for carburizing although there had been previous adaptations of this principle for annealing. These are two-row chambers utilizing the counterflow idea just described, with the exception that the boxes come out the same door they enter, hence the designation "boomerang." The furnace is divided into two zones. The zone nearest the door which occupies two-thirds of the total interior area is utilized for the heat transfer chamber. The rear zone

is the heating chamber, with cast electric units suspended from the arch and below the roller rails.

Parallel with the mechanized furnace has come other improvements which have been labor savers and are equally as important as the furnace itself in economizing this operation. One of these is the roller conveyor for moving boxes to the furnace door. Another is the turnover machine which enables the box to be reversed, and the third is the mechanical mixing and handling of carburizing compound.

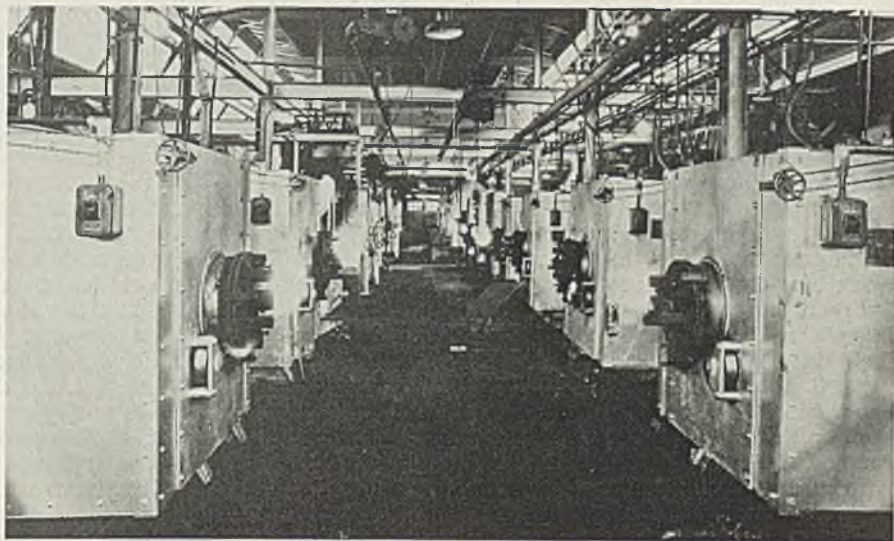
#### Trend Toward Finer Grain

With introduction of the fine-grained shallow hardening steels, it was discovered that such steels would endure prolonged carburizing treatment without coarsening the austenitic grain size and such parts

Co., Elizabeth, N. J. These furnaces consisted of a slowly rotating horizontal retort revolving on rollers and the retort externally heated by gas.

This method of carburizing did not gain much headway, although there were several installations in operation between 1914 and 1918 which utilized gas under pressure. Although the employment of gas alone was not highly successful in the early days and the application of these furnaces limited to certain classes of work, yet the furnaces were effective when the retort was packed with solid carburizer and a large number of them were incorporated in plants manufacturing

Battery of horizontal rotary retort carburizing furnaces



could be quenched directly from the box without further treatment except a tempering operation. Also that such steels did not have a tendency to pile up excessive cementite on the outer layers and furthermore that such steels did not distort any more than the coarser deeper hardening types which had been cooled in the boxes and given a lower temperature reheat. During the last few years the trend of nearly all the carburizing steels has been toward the finer grained steels and a marked increase toward direct quenching procedure.

It has long been recognized that the reactions occurring between the steel during carburizing have been due to an enriched carbonaceous gas which serves as a carrier of the carbon monoxide with carbon dioxide serving as the means of changing carbon to monoxide by the well-known reversible reactions. The employment of gas is by no means new. In this country it was introduced in the Machlet furnace about 1910, first built by the American Gas Furnace

small parts, such as bolts, screws, nuts, chain links, pins, bearing races, rollers, etc., and many of these furnaces are being used at the present time.

#### Rotary Units Increase

In recent years there has been a fair number of rotary carburizers with horizontal alloy retorts adaptable for small parts and designed to carburize with either gas or solid carburizer. Many of these have a capacity of 500 to 1000 pounds of work per charge, being of larger capacity than the earlier ones mentioned.

The next modification of the gas carburizing principle which attained success was the pit-type furnace. These consisted of a round shell, usually sunk below the floor level and equipped on the interior walls with electric heating units composed of round rods recessed in grooves of refractory material. With this equipment was supplied two or more retorts of chromium-nickel heat-resisting alloy. The work to be car-

burized was placed in racks, on fixtures, or in perforated baskets, some holding 800 to 1000 pounds of work and these placed in the retort. After loading the latter it was lowered into the furnace shell. A sealing cover was bolted on the retort by means of I-bolts and fastened to the retort with a collar. On the cover was an electric fan and vertically mounted fan motor and a large drip lubricator. In this cover was also located the thermocouple.

Into the lubricator was placed oil for the carburizing. About one pint of oil per hour of carburizing time was required, or about 1 gallon per ton of steel carburized. For a charge requiring a case depth of 0.050-inch and containing 800 pounds of work, about 2 quarts of oil was necessary. Several mineral and vegetable oils alone and mixed have been employed successfully. Some of these are turpentine, linseed oil, bone oil and nitrobenzine with kerosine. In some installations propane, city gas and natural gas have been substituted with varying results.

#### Oil Vaporizes to Gas

When oil is employed, which is the most common procedure, it is allowed to drip slowly into the retort where it vaporizes. The fan then distributes the vapor throughout the work and the decomposition of the hydrocarbon produces the carburizing gases. For a case depth of 0.040-inch, 5 hours are required, for 0.050-inch, 6 hours and for 0.060-inch, 8 hours. These vary some with the size and charge of the equipment but are typical.

In all of the previous gas carburizers described, the hydrocarbon in the form of gas or vapor was introduced into the furnace without previous treatment except partial dehydration or prior mixing with a certain amount of air. About 1930, E. J. Cowan and associates developed the continuous gas carburizer whereby a hydrocarbon gas is mixed with CO<sub>2</sub> by the medium of flue gas and this introduced into the retort, through which work is progressively moving, with the gases also moving in the same direction. In this muffle are three distinct zones; one for sooting or depositing finely divided carbon on the surface; second, that of active reaction whereby the carbon is converted to carbon monoxide, in a form it is absorbed or combined with the steel; and third, a leaner gas zone whereby no surface activity occurs and which has been termed the zone of diffusion.

A typical furnace for doing this work, including gas conditioning apparatus, costs approximately \$15,000. This size equipment consists essentially of a muffle 15 feet long, 26 x 14 inches inside, set into a combustion chamber heated by burners properly spaced for even heating. The muffle rests on cross piers with

one end free, and on rollers to allow for expansion of the muffle when heated. The muffle is made of sections of heat-resisting alloy. The composition most favored at present is one of 35 per cent nickel and 15 per cent chromium. This specific alloy has shown the most satisfactory life in service.

In the front portion of the furnace is a charging vestibule and in the rear a holding chamber. The center portion constituting the area of the muffle is the carburizing chamber. There are four doors—two sealing doors on each end of the muffle, and the furnace doors on the extreme ends of the furnace.

The work is moved through the furnace by means of automatically controlled pushers against alloy trays which are pushed on alloy skid rails in the muffle.

However, nearly 40 per cent of the total expense of gas carburizing is in the muffle cost. These cost from \$5000 to \$6000 to replace and their life average is placed at about 14,000 heat-hours. When these fail the entire furnace is out of commission and must be practically rebuilt. This usually occurs at a time when the furnace is most badly needed, hence it is often advisable to have stand-by equipment available or the equipment in duplicate so that production will not be held up at a critical time.

Another consideration is the fact that these furnaces always do not carburize as they should and sometimes develop troubles which are baffling to solve. Occasionally there is a tendency to decarburize, sometimes the work comes out covered with soot. At intervals the work will not harden. An austenitic soft skin will occur at times. One user had trouble with a slight flaking on the surface which was unexplainable. The effect of nascent nitrogen, sulphur and various parasitic gases have not been definitely determined.

#### Carburizing Costs Reduced

Within a span of 35 years carburizing costs have been reduced from approximately 15 cents per pound, as practiced in the old coal-fired furnaces, to less than 1 cent per pound, with somewhat doubtful claims of less than ½ cent in some of the newest gas carburizing installations.

In the newest gas carburizing processes not only is the case depth held with exactitude but the hypereutectoid zone can be made as deep as desired, or an eutectoid or hypoeutectoid case produced by controlling the activity of the carburizing gases. This control is impossible by pack hardening methods.

Weighing the merits of various types of carburizing furnaces, H. W. McQuaid, Republic Steel Corp., Massillon, O., urged against too much haste in selection of a gas carburizing furnace to replace the

more common oil-fired furnace. He gave as his opinion that the properly designed oil-fired furnace, using carburizing boxes which are designed to reduce the insulating effect of the compound to a minimum, will produce carburized work about as economically as the gas furnace.

Gas carburizing furnaces are well adapted for the production of light cases and for applications where control of the carbon in the case is important. The batch-type gas furnace, particularly the rotary type, said Mr. McQuaid, lends itself to production of carburized cases with a maximum carbon content controlled to meet most any specified amount.

Before making an investment in expensive gas carburizing equipment, Mr. McQuaid recommended careful consideration of what the most modern compound type of equipment has to offer, pointing out that all furnace and other equipment should be purchased to handle the particular product involved, with care exercised to prevent a carburizing department from being built around a furnace rather than around a given product.

#### Case Depths Increased

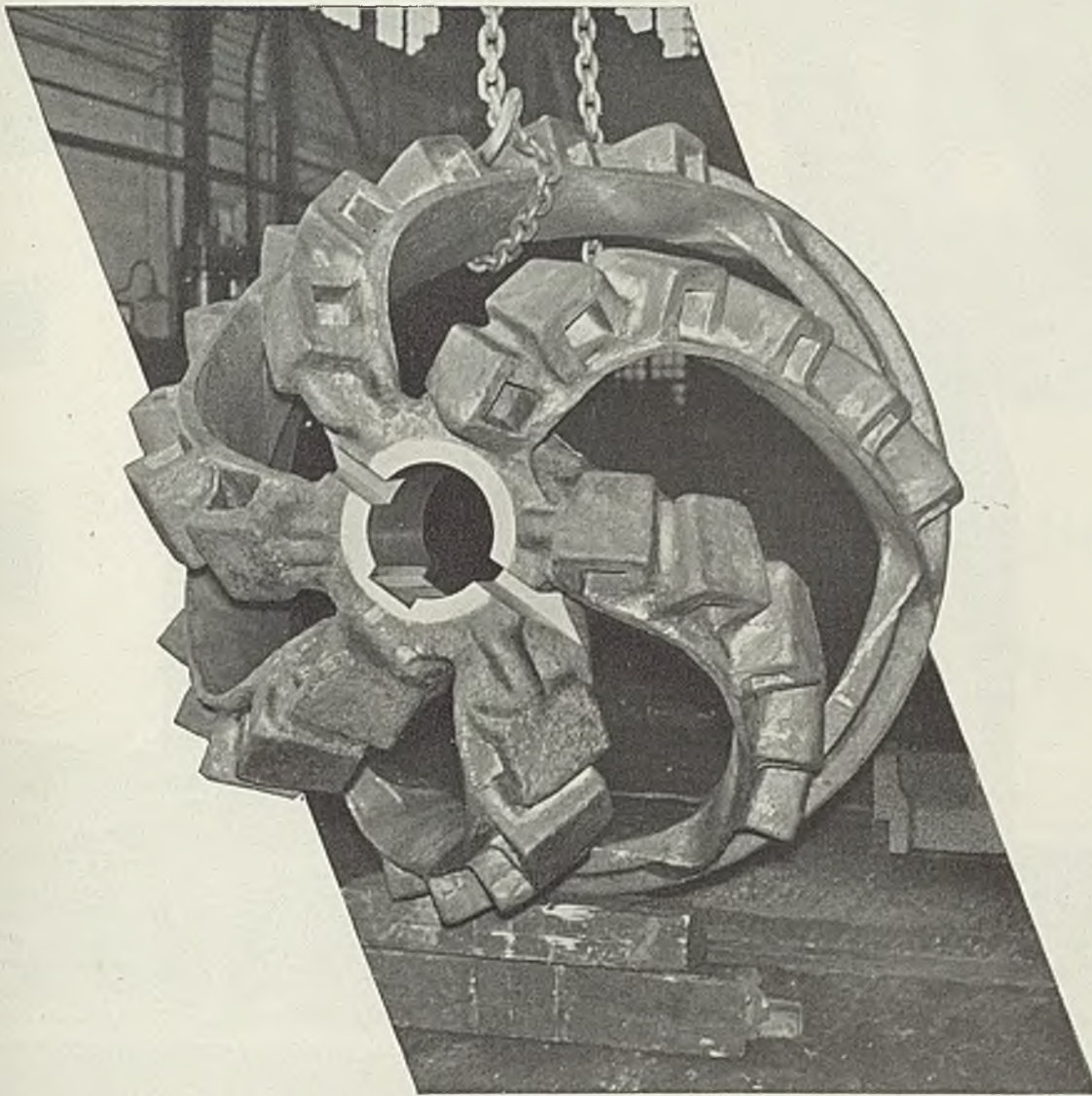
To developments in gas carburizing, John F. Wyzalek, metallurgist, Hyatt Bearings division, General Motors Corp., Trenton, N. J., suggested adding the recent "nicarb" process developed by the American Gas Furnace Co., by which, through the use of an atmosphere of carburizing gas such as propane combined in proper proportions with ammonia and air, it is possible to produce depths of case up to at least 0.015-inch, in character similar to a cyanided case, using S. A. E. 1010 steel without quenching and with minimum distortion.

■ DIGGING into the fundamentals or mechanics of the carburizing process, M. A. Grossmann, Republic Steel Corp., Chicago, restated the generally accepted belief that it is CO gas, derived either from carbon of solid compound or directly from carburizing gas, which is the agent actually carrying carbon into the steel. He then dealt in considerable detail with the mechanism by which this agent transfers the carbon into the metal, both in pack carburizing and in gas carburizing, as well as the effect of temperature, energizers and the like.

The carburizing process should be considered not as a single process but as a combination of two steps. The two steps are (a) carbon enrichment at the surface, and (b) diffusion from the surface into the interior. That is, (a) the steel at its surface reacts with the surrounding carburizing medium to form a

(Please turn to Page 76)





## Let US Shoulder the Responsibility for your Intricate Castings

UNUSUAL STEEL CASTINGS, such as this rock cutter for a dredge, are all in the day's work at Birdsboro.

All sorts of intricate shapes are being made possible by the new Randupson Process. Introduced to America by Birdsboro only a few years ago, this process, combined with nearly half a century of foundry experience, is producing castings that set a new standard for the industry.

Birdsboro R-P castings are more faithful to pattern—give you sound, dependable metal without pin holes or

fins—and a smooth surface free from nail heads. They are cheaper to use because their accuracy and clean surface reduces machining time to a minimum.

Specify Birdsboro R-P on that next casting job. Let us shoulder the responsibility for your large and intricate castings.



# BIRDSBORO

STEEL FOUNDRY AND MACHINE COMPANY  
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STEEL CASTINGS • HYDRAULIC MACHINERY • SPECIAL MACHINERY • CRUSHING MACHINERY • STEEL MILL EQUIPMENT • STEEL AND CHILL ROLLS

# YALE

**ALWAYS - IN ALL WAYS . . .**

*Outstanding*

Y-A-L-E . . . Just four letters of the alphabet. But place them together on a Hand Lift Truck and they spell YALE—a trademark recognized throughout industry as a guarantee that *that* truck will give top performance!

And no wonder! For years Yale Hand Lift Trucks have stood up under the test of time—have given *efficient, economical* service wherever they've been in use. Outstanding service that has put Yale Trucks where they are today—**IN FRONT!**

Yale Trucks are preferred by the operator as well as the executive because they're not only speedy—but **SAFE!** They ease his work—safeguard his health. Help him produce more—in less time. With a Yale Hand Truck on the job, men work better—raising per capita production . . . lowering per capita cost!

Find out how much Yale Efficiency—Speed—and Safety can save YOU. Call in our representative—He'll tell you in dollars and cents.



TRADE **YALE** MARK

**THE YALE & TOWNE MANUFACTURING COMPANY  
PHILADELPHIA DIVISION, PHILADELPHIA, PA.**

# MATERIALS HANDLING



## Crushing of Turnings Simplifies a Difficult Scrap Handling Problem

■ DISPOSAL of metal turnings from machine tools in mass production plants presents a cumbersome and often a costly materials handling problem. In addition, certain fire and accident hazards always are inherent when the oil-laden material is permitted to accumulate in open scrap piles.

Various methods have been devised for sorting, storing and transporting turnings to shipping points, one highly efficient solution being to reduce the tangled masses into short lengths by crushing and to accumulate them in storage bins preparatory to shipment as scrap. This

method results in reduction of handling and loading costs; furthermore, by reason of size uniformity and easier handling, the chips bring better scrap prices and are more neatly prepared for shipment.

Accompanying illustrations show the appearance of steel turnings before and after crushing. Crushed turnings are less bulky and much easier to handle.

Several installations of equipment

for collecting, cleaning, crushing and otherwise handling turnings have been made recently in large automotive plants. In one such installation, shown in several of the accompanying illustrations, the turnings are produced from steels of two types, one a high carbon composition and the other containing nickel. It has been found desirable to keep the turnings from these two steels separate because the nickel



Metal turnings as they are removed from machine tools bulk up into tangled masses, as shown at the left, and are extremely awkward to handle. When broken up in a crusher, as shown above, they are in small pieces and can be handled with ease, furthermore, they require less space

# MATERIALS HANDLING



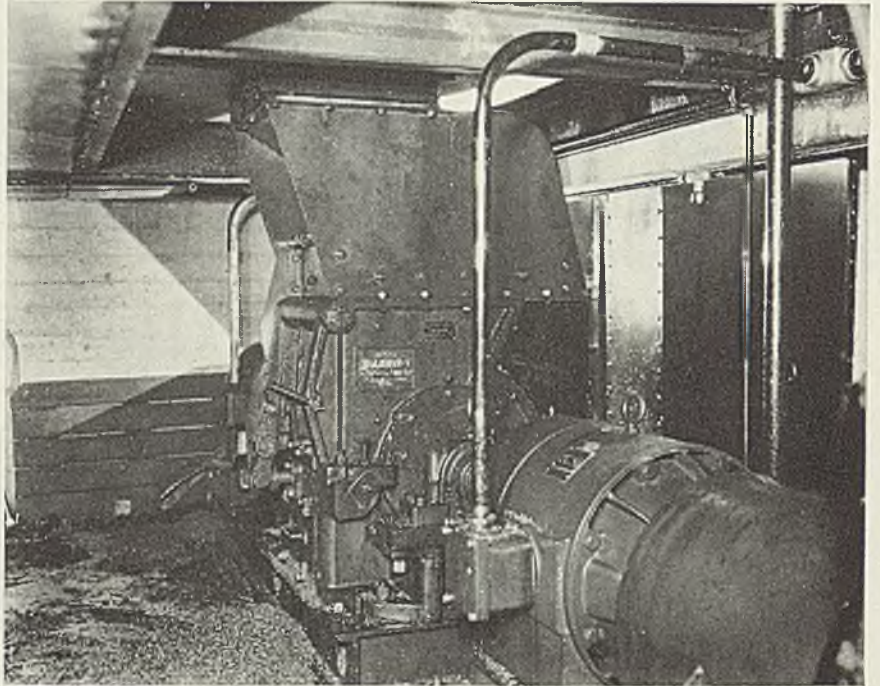
inch flextooth metal turnings crushers, each rated at 1½ horsepower. These machines, one of which is illustrated, are mounted on steel sub-bases, which carry the motors direct-connected to the crushers through flexible couplings. They are fitted with metal traps which catch any solid pieces of steel that might be carried by the turn-

*(Please turn to Page 81)*

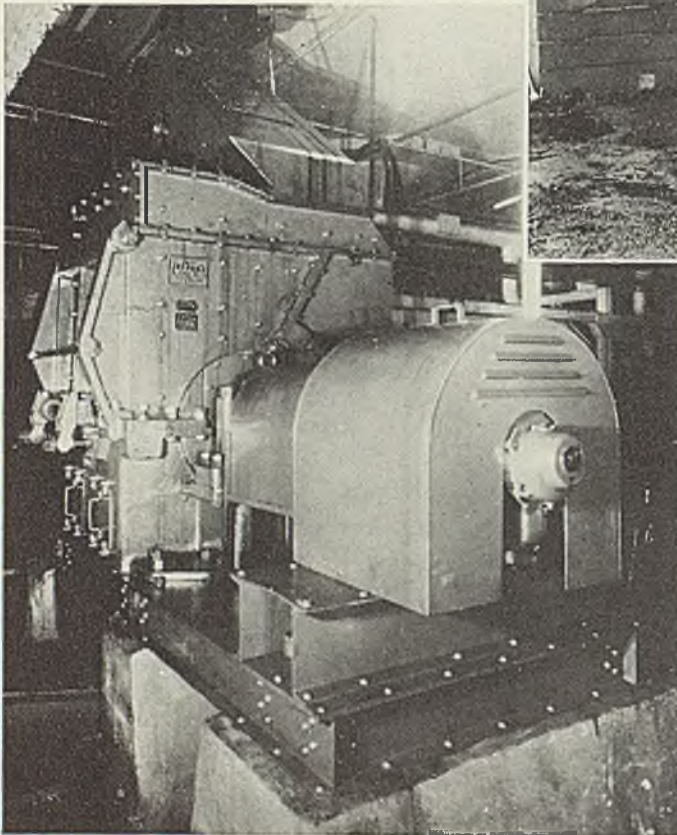
steel commands a somewhat higher scrap price than the high-carbon grade.

While turnings generally can be moved to the reduction station by a variety of methods and in many cases are transported by conveyors, in this case they are delivered to the handling station by wheelbarrow.

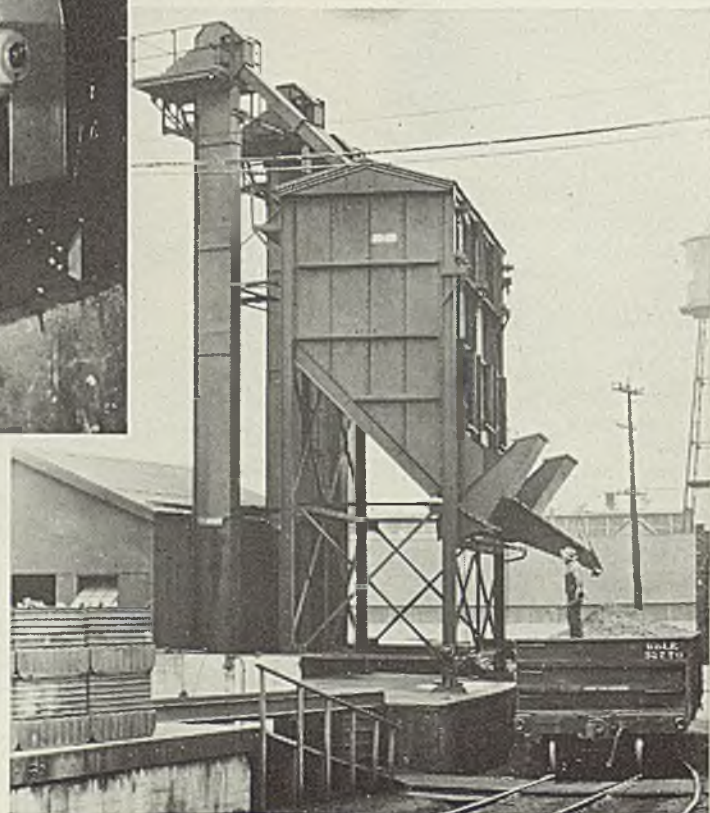
Prior to the crushing operation, cutting oil adhering to the turnings is recovered in a centrifugal wringer. After the wringing operation, turnings are fed through the wringer house floor to two 24 x 20-



Above is shown one of two flextooth type turnings crushers in a large automotive plant. Wheelbarrows carry the turnings to the crushers



Turnings are delivered to the crusher shown above by a conveyor. This eliminates manual handling. The metal turnings handling station (right) adds orderliness to plant housekeeping and facilitates loading the scrap for shipment. Photos courtesy Jeffrey Mfg. Co.



# Exide

announces a **SUPER BATTERY**

## Largest size industrial truck battery ever made

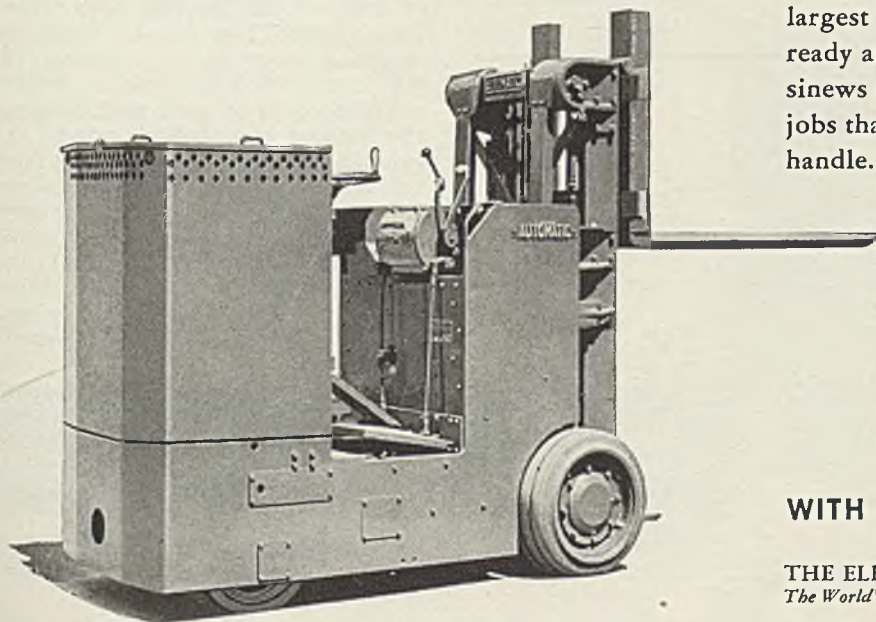


**L**ARGER, more powerful material handling trucks . . . industry has wanted them, needed them. Now they are possible, for here is a battery to drive them that has nearly twice the capacity of former electric industrial truck batteries.

The new *super* Exide-Ironclad, Type FLM-13, has a capacity of 1080 ampere-hours at the normal six hour discharge rate. Yet it requires but 26" x 51" floor space, for it is assembled in a space-saving steel tray. In double-shift service, the steel

tray assembly facilitates quick changing of batteries, providing continuous service through the use of duplicate batteries.

With the big trucks of today, and the larger ones planned for tomorrow, this super Exide-Ironclad Battery enormously broadens the useful range of low-cost handling methods. It is the world's largest size battery for electric industrial trucks, ready and able to pour giant power into the steel sinews of these units—the battery for those heavy jobs that some men thought no battery could ever handle. Why not write for full details today?



# Exide IRONCLAD BATTERIES

WITH EXIDE MIPOR SEPARATORS

"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia  
The World's Largest Manufacturers of Storage Batteries for Every Purpose  
Exide Batteries of Canada, Limited, Toronto



# SURFACE TREATMENT AND FINISHING OF METALS

## Reduction of Acid, Labor Costs Are Prime Factors in Pickling Research

■ Several papers presented at various society meetings this fall reveal that interest in the improvement of present pickling methods is unabated. Reduction of cost both for acid and labor have been prime factors in recent research but attainment of specific surface conditions to meet subsequent processing requirements has aroused special interest. This is true in both the steel industry itself and in metal fabricating circles.

At the second annual forum held by the Porcelain Enamel Institute at Ohio State university, Columbus, O., Oct. 13-15, B. T. Sweely, Chicago Vitreous Enamel Products Co.,

Cicero, Ill., described his work with the iron sulfide pickling bath. In the enameling industry adherence is a vital factor and the influence of pickling methods on this property can not be overemphasized. As a consequence enamellers have played safe in many cases and allowed pickling costs to climb rather than take a chance on an even greater cost induced by a high scrap loss.

In opening his paper, Mr. Sweely pointed out that mere roughening or etching of the surface alone did not promote adherence with enamels free from the usual adhering oxides. In his experiments it was found that samples pickled in mixtures of sul-

furic and nitric acid followed by a nickel flash, while showing evidence of decided etching, failed to develop adherence when enameled with an adhering oxide free ground coat. Good adherence was obtained, however, with this type of ground coat enamel when the samples were etched in an iron sulfide pickle bath and nickel flashed. It was also found that good adherence could be secured by passing hydrogen sulfide gas into the sulfuric acid bath.

### Analytical Method Developed

The first step in developing this type of bath was to find a method of determining the hydrogen sulfide content of the pickling bath when iron sulfide was used. Using a starch solution as an indicator, it was found that a standard iodine solution could be used to determine the amount of hydrogen sulfide, expressing the results as per cent free sulfur. By control of the hydrogen sulfide content, together with proper control of such factors as time, temperatures, rinsing and the usual control for the other portion of the pickling operations, no difficulty was encountered in securing reproducible results.

Work was carried on in a small pickle room using tanks 20 x 36 x 36 inches with suitable provision for heating, handling and drying, etc. Iron sulfide solution was sampled just before ware was placed in the bath and again immediately after pickling was completed. Complete

(Please turn to Page 74)

### Pickling Schedule

Operation	Tank	Tank Strength	Time	Temp. (Deg. F.)
1	Cleaner	4-5% Na <sub>2</sub> O	20 Min.	Boiling
2	Running cold water		Rinse	
3	Sulfuric acid and iron sulfide	Acid 7-8% Sufficient iron sulfide to maintain the desired H <sub>2</sub> S concentration.	10-15 Min.	130-140
4	Running cold water		Rinse	
5	Sulfuric acid	2.75-3.25%	3 Min.	125-135
6	Hot water rinse		20 Min.	135-145
7	Nickel	3 oz. single nickel sulfate, ¼ oz. boric acid per gal. pH 6.0-6.2 adjusted with ammonium hydroxide to maintain specified pH.	5 Min.	150-160
8	Running cold water		Rinse	
9	Hot water rinse		3 Min.	165-175
10	Sulfuric acid	0.4-0.6%	3 Min.	130-140
11	Hot water rinse		3 Min.	165-175
12	Neutralizer	0.8-0.1% Na <sub>2</sub> O 0.28 oz. borax per gal. 0.16 oz. Soda ash per gal.	5 Min.	180-190
13	Drying oven	Rapid drying.		

**NOW —**  
**GET BOTH Wide Welding Range Plus Quality**

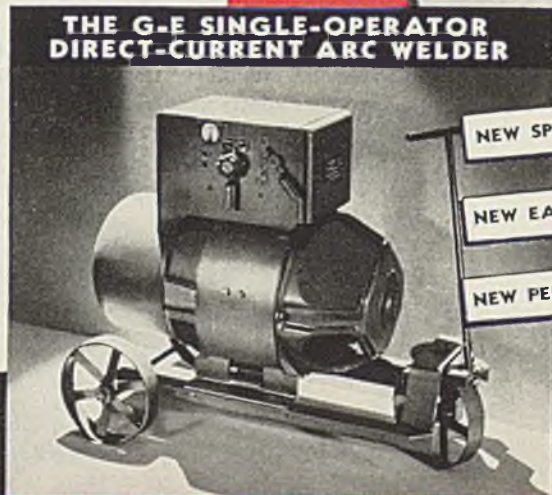
**FROM LIGHT-GAUGE WELDING UP TO HEAVIEST PLATE**  
**FULL-RANGE QUALITY PERFORMANCE**

**A**N arc welder meets modern needs for profitable fabrication and repair work only when it provides a faultless output of current for light-gauge welding as well as for heavier work.

Both a wide welding range and faultless output at all points in that range are provided exclusively by the modern G-E single-operator arc welder, with its new, improved features of design and performance. You can turn the current on full tilt, cut it down to a trickle, or set it anywhere in between—you get a “peppy,” stable arc at all points in the entire range. It meets Navy specifications on every adjustment.

But why not ask the nearest G-E arc-welding distributor or G-E sales office for a demonstration of this modern arc welder? Or write General Electric, Schenectady, N. Y., for descriptive bulletin GEA-1440F.

To give you the right equipment, General Electric builds the largest and most complete line of arc welders in the world.



**GENERAL**  **ELECTRIC**

# What They Said About the 1937

"Compared with its predecessors and with other annual or special editions, this issue deserves special commendation.

While our principal requirements are steel, coal and oil, the wide variety of our equipment necessitates the use of hundreds of other parts, materials and supplies. Because of this we find many ideas and suggestions for plant, product and method betterment in the editorial and advertising pages of this unusual issue."

—Assistant to the President

"I feel that your organization is to be very highly complimented on this issue, as it is unusually attractively presented, both from a make-up and printing standpoint, with exceptionally well selected and written articles, and should be a very valuable reference book for the entire steel industry. There is no doubt that 'Steel' has kept pace with the Steel Industry, and possibly a little bit ahead.

I expect to keep this issue of 'Steel' on my desk until it is replaced by the 1938 issue."

—President

"There is no doubt in our minds but that our ad will bring satisfactory results, for we have to date received sufficient response that assures our conviction in this direction.

May we also take this opportunity to compliment you on the beauty and general make-up of the January edition. This is one of the finest copies we have been privileged to scan. The work shows that intelligent, constructive thought was foremost in the minds of those responsible for gathering the data and combining it in the issue which has resulted. We can appreciate a compilation such as this would be a welcome addition to any office library to serve as a guide many times when specific information is required. We are glad that we selected your medium to represent our offering to the industry."

—Manager

"I note as I travel around that these annual issues are generally kept on hand for reference."

—President

"A great many trade and technical magazines come to our plant, and I presume they are all worth while. There are so many of them,

however, that I only have time to look over a few. I never miss a chance, however, to read 'Steel' from cover to cover. I think you are to be congratulated in getting out a publication that so completely meets the need of the industry."

—Vice President and Gen. Mgr.

"Looking at it from the Advertisers' angle, I am quite sure it will be of great value during 1937."

—Advertising Manager

"I think this is the best number you have ever gotten out, and congratulate you most heartily. In particular, the method of presenting the subjects under definite headings seems to me an excellent one, which makes it very easy to select the articles to be read carefully, while at the same time getting a good general look at the whole picture."

—Assistant to President

"While the editorials, articles and information the issue contains are fine, important and educational, it is the advertisements that are so impressive. Most of them seem to stand right out and become alive."

—Vice President

"As usual 'Steel' has done a magnificent job in the Statistical Issue. I am particularly impressed with its layout and ease of sectional part location. Last week was first chance I had of giving it a good once over and some of the articles will require a second reading to do them justice."

—Advertising Manager

"Anyone in our industry can afford to take the time required to go through this issue carefully from cover to cover. Not only is it a beautiful job to start with, but it is packed full of most useful data and information."

—Advertising Manager

"The 'Yearbook of Industry' of STEEL, published January 4, is one of the finest annual review numbers I have ever inspected. I feel confident that it will prove invaluable to the iron, steel, coal and power industries for reference purposes.

Also, I am quite pleased with the appearance and position of our advertisement."

—Assistant Secretary



# YEARBOOK ISSUE of STEEL!

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"With reference to your 1937 Yearbook, we are pleased to say, in our opinion, it is the best issue you have published. While previous issues were good and each succeeding one better than the previous, this issue of 1937, in our opinion, surpasses all of them and we want to congratulate you for this good record."

—President and General Manager

"I am very much impressed with the 1937 annual issue of STEEL. Viewed from every angle it is certainly a commendable job and I want to compliment you on it. We take pride in being represented so conspicuously in such a conspicuous issue."

—Advertising Manager

"We have been thinking a lot of nice things about the January 4 issue of 'Steel' ever since it reached us, and have also heard a lot of favorable mention. It is our opinion that this particular issue of your paper has set a mark that will be hard to excel. It contains a wealth of valuable and interesting information presented in an attractive manner."

—Advertising Manager

"Getting so much information between two covers without having it somewhat jumbled and difficult to locate is rare. Last year's setup arranged the material admirably and you were wise to continue it."

—Manager

## HOW WILL THE 1938 YEARBOOK SERVE INDUSTRY?

. . . By presenting in the most condensed form possible, business statistics for the preceding year, consumption and production figures, prices, directory of trade names of ferrous and non-ferrous alloys, equipment developed in 1937.

. . . By studying labor and public relations in terms of present needs and future possibilities.

. . . By reviewing expansion in the metalworking and metal producing industries in 1937, and the financial aspects for the same period.

. . . By discussing construction, railroads, agriculture, containers, automobiles, appliances, pipe lines, air conditioning, machinery, export, etc.

. . . By covering developments in heat treating, machinery, forging and stamping, materials handling, industrial drives, metal finishing, welding, casting, die casting, steelmaking, etc.

. . . By giving market summaries, construction, current news.

. . . By combining all of the above, plus many other business phases, into one homogeneous issue. It will carry all of the features which have made the annual "Yearbook of Industry" issues distinctive in former years. It will contain all of the established articles and departments of current issues such as "The Business Trend", "Mirrors of Motordom", "Windows of Washington" "Materials Handling", "Power Drives", "Progress in Steelmaking", etc.

It will have a complete business history between its covers and will replace the 1937 issue as the reference book for the metal producing and metalworking industries.



# WELDING, ETC.

BY ROBERT E. KINKEAD

## Serious Attention Given Purchase of Equipment

■ In welding departments, as elsewhere in many manufacturing plants, conditions have reached the stage at which serious attention is being given to the purchase of new equipment.

The reasons why new equipment is in order at the present time lie deep in the cyclic character of American business. It is easy to oversimplify the case by giving one reason, when, as a matter of fact, there are many contributing causes with a different dominant one showing itself between competing members of the same industry.

But whatever the cause for the urge to buy new equipment, certain principles seem universally applicable. What might be called the relativity factor is important.

In a competitive group, one member is behind, equal to or leading his principal rival in the matter of quality and low cost of production. In buying new equipment he proposes to catch up or lead. This leads to the dilemma.

If he buys equipment which has been proved and is well known, it is a reasonable expectation that it will soon be on its way to obsolescence. On the other hand, if he buys equipment which is just emerging from the experimental stage, he

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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.

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most certainly will have greater need of adapting it to his requirements and may have to stand considerable expense in the process. In either case, the purchase price is only part of the cost; the remainder appears as a high obsolescence rate or a high cost of getting the equipment to "work" satisfactorily.

Another phase of the relativity factor involves the pressure set up on a manufacturer's competition by the very act of contributing to the art of welding by adoption of a new process and "making it work". The vendors of the equipment, if they know that an important advance has been made, will promptly use that fact to force the competition to do likewise.

Assuming that such pressure is successful, as it usually is, the original manufacturer has lost the advantage he hoped to gain with reference to his competition. To preserve the advantage, it seems necessary to take active steps to prevent the salesmen from getting the important facts about economic re-

sults of the new practice. The problem is to be sure new information gets into the shop continually, but to prevent confidential information of use to competitors from getting out of the shop.

These angles of the problem of purchasing welding equipment arise because of the rapidity with which development is being carried forward in the welding field. If a man buys welding equipment in the same way that he buys screw drivers, which are pretty well stabilized, he may look forward to the necessity of replacing it frequently and never getting any competitive advantage from its use.

Such analysis from the engineering viewpoint should supplement the purchasing officer's tabulation of weights and selling prices.

## Welding Craftsmanship

■ Urge to skilled craftsmanship is strong among the welding operators in spite of the fact that little effort is put forth on the part of the industry to foster it.

Prizes for engineering achievement are liberally offered as they should be, but more recognition should be given the man who perfects his craftsmanship.

Good craftsmanship is more than a factor in economics by which quality and low cost are obtained; it is a way of life which tends toward self-respect, industrial stability and social justice. Good craftsmen are notably good citizens and have a stake in successful industry.

To say that good craftsmanship condemns a man to a lower social order is to neglect the facts as illustrated by Walter Chrysler, Charles Schwab, Henry Ford and many others not so well known. No good craftsman is ever just a cog in a wheel; he is in fact a partner in the business of maintaining an honorable business. The power of good craftsmanship is well known and is recognized in most cases without resort to pressure of strikes and industrial warfare. The head of a business is usually prouder of his group of skilled craftsmen than he is of fine machinery or the bricks and mortar in the plant.

Good craftsmanship has nothing to fear from automatic welding machinery. The plain fact is that a great deal more automatic welding machinery would be used if there were enough highly-skilled craftsmen to operate it. We have never seen an automatic welding machine that did not require more skilled craftsmanship to keep in operation than is required to do manual operation.

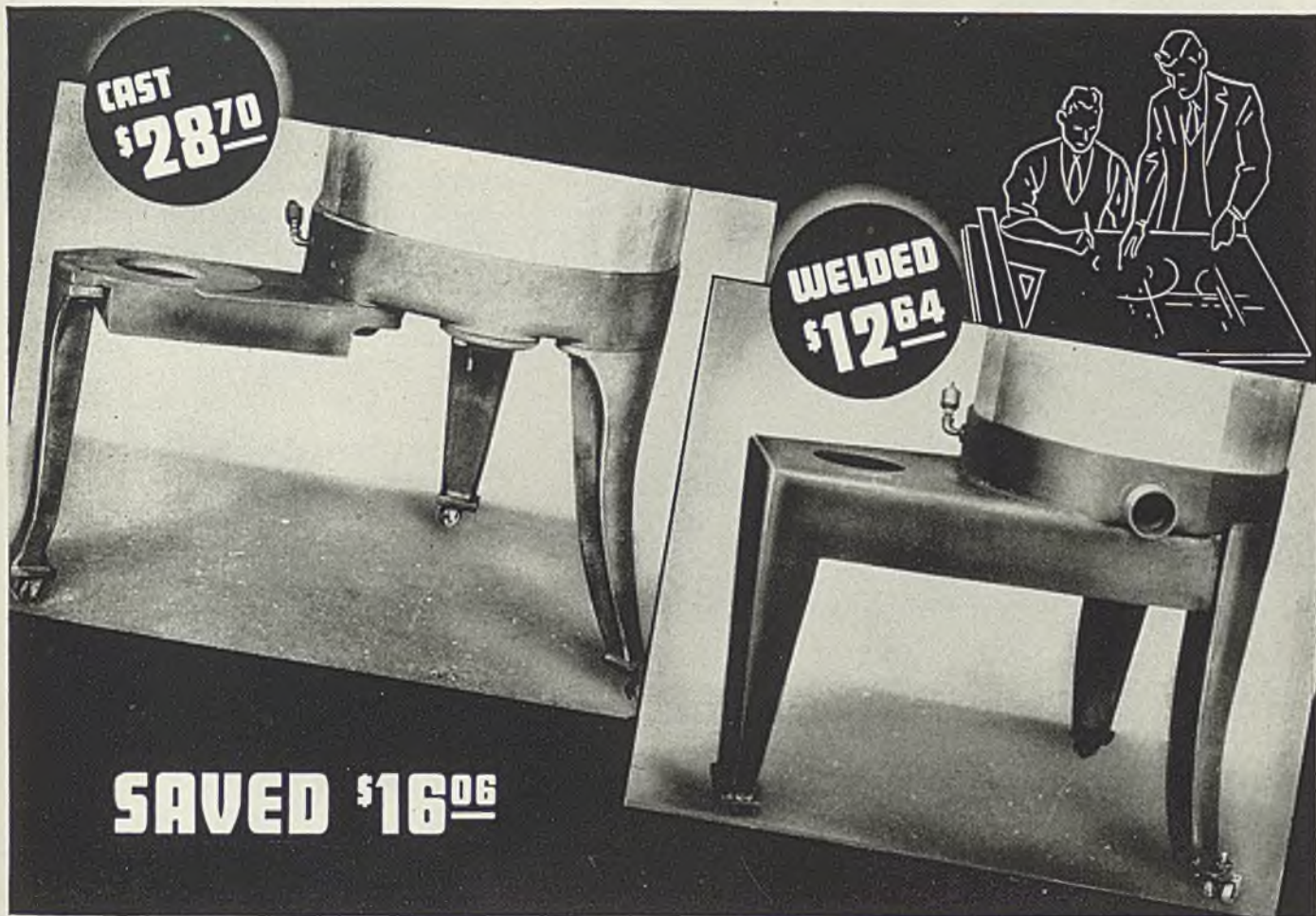
The highly skilled craftsman is an important member of the welding industry.

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## Hot Metal Mixer Has Unusual Capacity



■ This new hot metal mixer, part of the equipment at the new No. 3 open hearth division at Bethlehem Steel Co.'s plant at Lackawanna, N. Y., has capacity for 1200 pounds. It was placed in operation early this year



## You are **BOUND** to profit by changing over to welded design

Changeover of this potato peeler stand from cast iron to welded steel reduced its cost from \$28.70 to \$12.64. In other words, the manufacturer saves \$16.06, or 56%, every time the part is produced. Moreover, the welded steel stand is more saleable because it is better looking, unbreakable, weighs 20% less and can be supplied in any height the customer wants at no additional cost for patterns.

Increased profits, credited to welded design, are usually the result of some one man in the company who firmly believes in welding. He *knows* that his company will profit.

Your company too, will profit by appointing some man of authority to push welded design. You can start welding easily, with little investment for equipment, because you can change one part at a time. May we be of service to you?

*Write for Machine Design Application Sheets. Issued Periodically.*

**THE LINCOLN ELECTRIC COMPANY • DEPT. Y-441, CLEVELAND, OHIO**  
*Largest Manufacturers of Arc Welding Equipment in the World*

**LINCOLN SHIELD-ARC WELDING**  
 BUILDS LIGHTER AND STRONGER PRODUCTS • FASTER • AT LESS COST



# PROGRESS IN STEELMAKING

## Box Annealing in the Modern Continuous Strip Mill

■ WITH its forty-four radiant tube furnaces the box annealing department in Bethlehem Steel Company's continuous strip mill at Lackawanna, N. Y., has the capacity and the flexibility required in handling the large output of a modern mill. The most rigid control of temperature and annealing cycle insures a product of unprecedented uniformity. From its start this plant has, day in and day out, successfully met the exacting specifications of today's steel consumer.

Development of the continuous strip-sheet mill ranks among the most important contributions in modern steel manufacture. Chal-

BY A. H. SHONKWILER

Strip Mill Superintendent  
Bethlehem Steel Co.  
Lackawanna, New York

lenged by the automobile makers' demand for wider sheets, in lighter and more uniform gages, and with higher ductility and improved surface properties, the steel producers have raised the output of strip and sheet until it now accounts for practically one third of all finished steel

commodities which are now produced.

In the modern strip mill the slab leaves the heating furnaces at the proper rolling temperature and passes in continuous motion through tandem rolling mills, emerging from the last stand still red hot and at a speed approaching fifteen miles per hour. The entire operation, from slab to strip, is accomplished in two minutes or less.

### Setup of Mill

The Lackawanna continuous strip mill, of Bethlehem Steel Company, employs a "roughing" train of four rolling mills, preceded by a scale breaker and followed by another scale breaker and a "finishing" train of six mills. Continuous picklers remove the rolling scale, and the strip-sheet is then passed through three cold stands of rolls in tandem where it is reduced to the desired gage and surface finish. The strip is annealed in coils, or leveled, sheared and annealed as sheets. Annealing is then followed by skin rolling and leveling, and the sheets are finally inspected and oiled and prepared for shipment.

As cold work causes the steel to harden and stiffen it is necessary to heat treat all cold rolled strip



Fig. 1—The box annealing building is about 1000 feet long and 100 feet wide. There are forty-four furnaces arranged along a central aisle

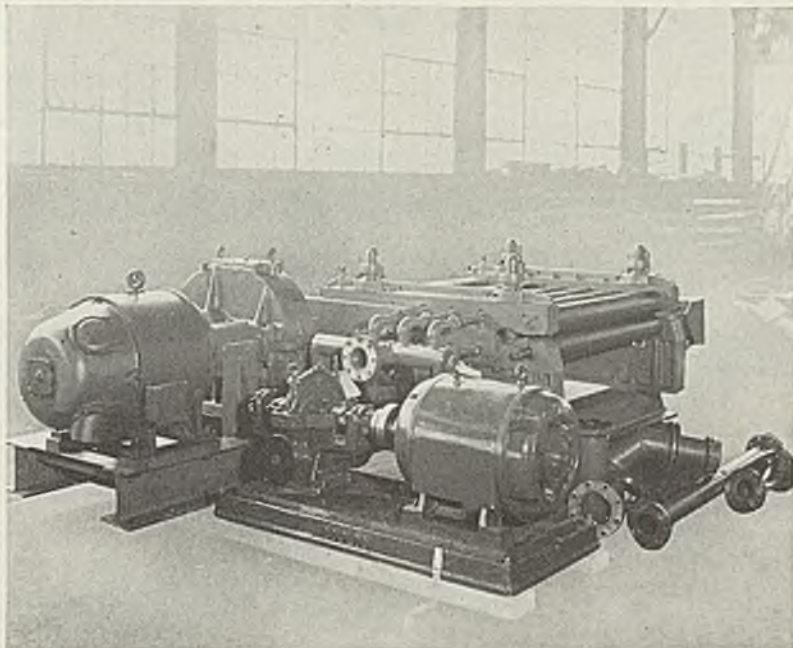
# HYDRO SCRUBBER . . .

PATENTED

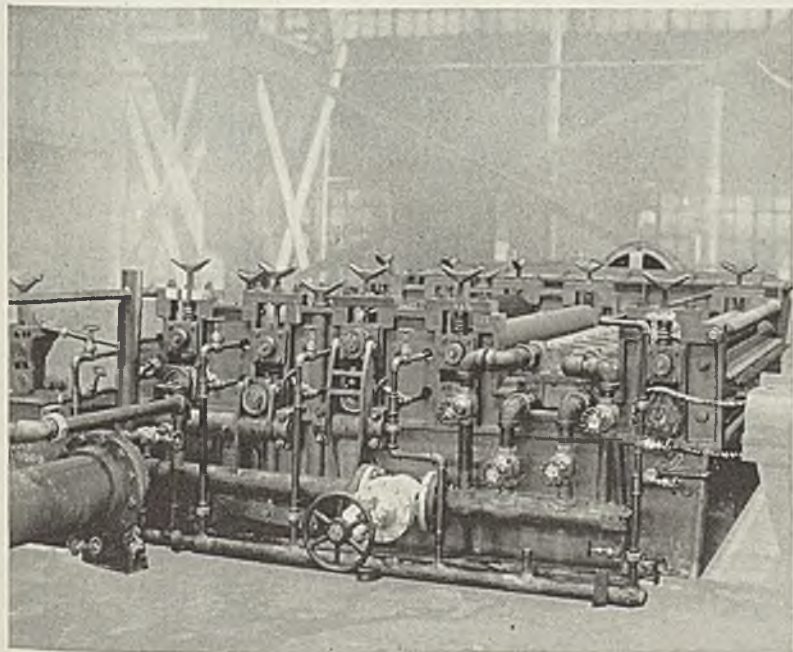
This Scrubber uses no brushes or drier. It uses high temperature water for the scrubbing action. The water heats the sheet to such a temperature that after passing through the wringing rolls, the sheet will dry on the runout conveyor and can be piled without sweating.

The water is reused, requiring considerably less water than other types of machines. The water in the tank need be changed only twice a day. The water is heated by steam and since it is reused, the consumption of steam is very low.

This unit is furnished complete with pump, tank and conveyors.



## Revolving Brush Scrubber



This is our high production type of scrubber. It is equipped with anti-friction bearings throughout, and operates at speeds of 100 to 300 ft. per minute. All rolls are driven from separate drive box through universal couplings. Brush rolls are high speed and have a longitudinal oscillating motion, which eliminates brush streaks.

This Scrubber is furnished with complete auxiliary equipment such as Acid Dip Tanks, Water Spray Tanks, Caustic Spray Tanks, Oilers, etc.

When arranged with the proper auxiliary equipment this machine will—

- 1.—Bright pickle, scrub and dry previously wet pickled sheets and strips.
- 2.—Clean, scrub and dry Hot Rolled sheet and strip steel in the "as rolled" state or in a pickled, normalized, or annealed condition.

OUR ENGINEERS ARE AT YOUR SERVICE  
AT ANY TIME

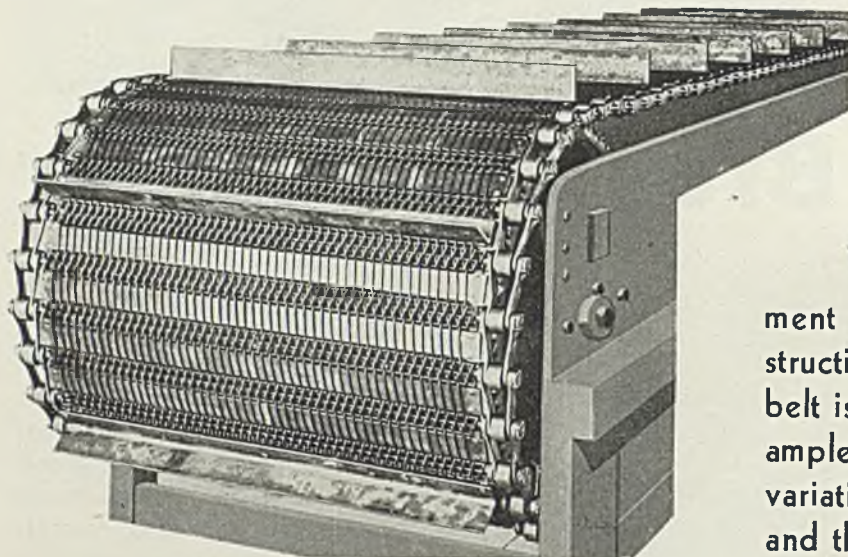
*Chilled and Alloy Iron Rolls*

*Iron and Iron Alloy Castings up to 50 Tons*

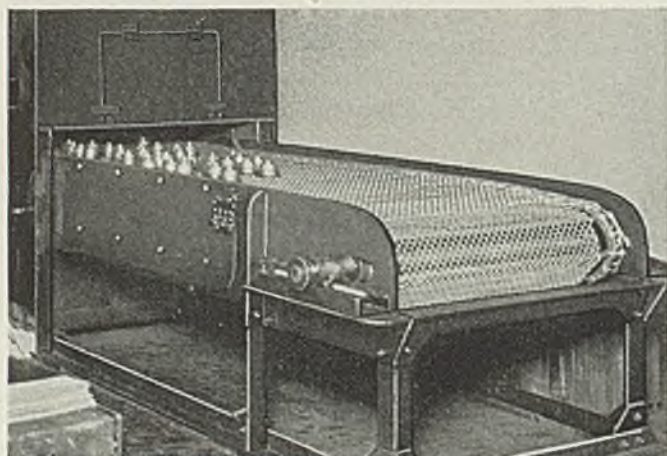
**The Youngstown Foundry & Machine Co.**  
Youngstown, Ohio

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"CAMBRIDGE" QUENCH TANK BELT



"CAMBRIDGE" WOVEN WIRE CONVEYOR BELT



★ In nearly every case in the continuous handling or treatment of metal parts, the type and construction of the most practical conveyor belt is an individual problem. For example, there are over 1,000 construction variations of Cambridge Conveyor Belts and the selection of the proper type for the job can mean important savings in operating costs through increased efficiency.

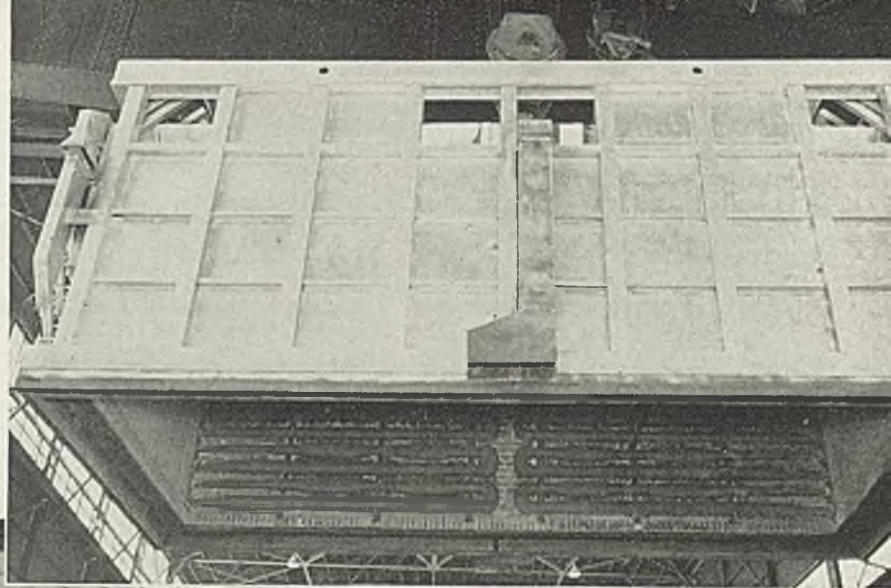
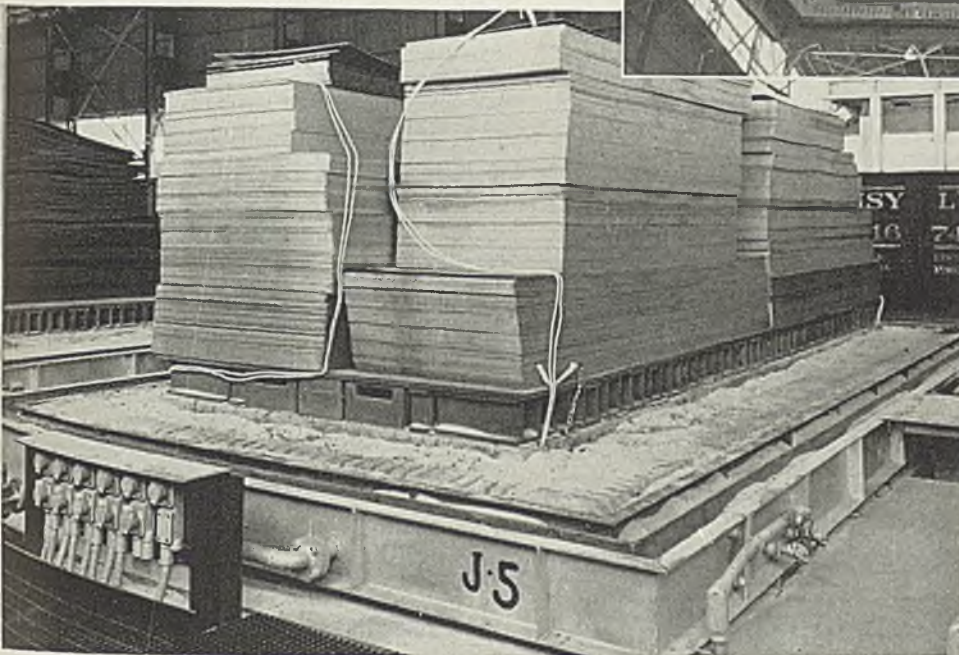
To do just this . . . study each conveyor belt problem . . . make recommendations, based upon years of experience and proved capabilities in their field, is the work of our engineers. Strategically located throughout the country they are quickly available for an efficient analysis of your problems.

## CAMBRIDGE WIRE CLOTH CO.

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Fig. 2 (below)—Sheets piled on furnace base ready for annealing. Thermocouples at four different points record the temperature of the sheets during the entire annealing cycle. Fig. 3 (right)—The three tiers of radiant tubes are plainly visible as the craneman swings the outer furnace cover into position



oven gas, of 300 B.t.u., is burned in these tubes and discharges into a common eductor, one on each side of the furnace, at the top. Air sufficient for complete combustion is drawn in at very low velocity, without turbulence, and the flame extends to the discharge end. The eductor lines are connected by sand seals to an underground flue with a stack for each battery. Due to the negative pressure a leak in the tubes will not cause any pollution of the protective atmosphere, and repairs of a defective tube may be postponed until a heat is completed.

#### Tubes of Special Alloy

The tubes are made of heat resistant nickel-chromium castings with about 25 per cent chromium and 12 per cent nickel, an alloy which will withstand temperatures up to 2100 degrees Fahr. and which is not appreciably attacked by oxidizing atmospheres or by gaseous sulphur compounds. The heat can also be generated under the most accurate control and at the points where it will have the greatest effect. Furthermore, this method permits the introduction of protective gas in the furnace.

In the sequence of operation the sheets are piled on the base to a maximum height of about 55 inches; the inner cover, which is made from 3/16-inch sheet steel, lightly braced, is placed over the pile. Strip annealed in coil form is first taken to a winding machine and re wound loosely to permit a more thorough annealing and to exclude any possibility of sticking under a high annealing temperature. The outer cover is then lifted into place. Two stakes on opposite corners of the base guide the cover into the proper position. Both the outer and the inner cover extend into sand seals. The temperature of the furnace is then raised as rapidly as possible to slightly above the predetermined annealing temperature; this requires 30 to 40 hours for sheets and about

to insure the necessary ductility and amenability to forming and deep drawing operations. The annealing process is one of the most vital and critical operations employed in the manufacture of high quality, deep drawing strip-sheet. Accurate control of the heating cycle and uniformity of heat distribution are most essential, and the strip must retain its bright surface and must not become oxidized or scaled.

#### Box Annealing Is Used

Box annealing is the process generally used for this purpose. Of particular interest is the radiant tube annealing furnace which represents the latest development in this field. With this furnace it is possible to attain a uniform heat distribution and an accurate temperature control which insure a product of excellent physical properties.

The annealing equipment at the Lackawanna continuous strip mill consists of 44 radiant tube furnaces each equipped with 3 bases or bottoms, and 3 inner covers, or shrouds. The bases are made in three different sizes, taking sheets 75 x 220 inches, 84 x 186 inches, and 90 x 250 inches, piled about 55 inches

high. They will also accommodate coils up to 72 inches wide. The furnaces are arranged in batteries of four, in a bay 1000 feet long and 100 feet wide, five batteries on each side of a central aisle which runs the full length of the building. This building has two 50-ton over head cranes, used for loading and unloading the furnaces, and for moving the covers from base to base.

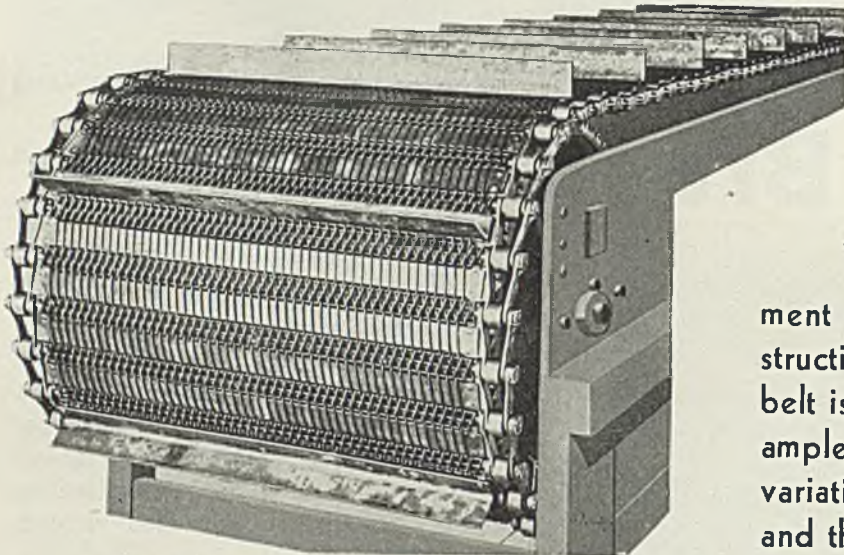
A furnace unit consists of a base on which the steel is piled, an inner cover by means of which a protective, deoxidizing atmosphere is maintained around the metal during annealing, and the bell or furnace proper, which is equipped with the radiant heat units.

The outer furnace cover or bell is a rectangular hood constructed of 1/2-inch steel plates braced by H-beam columns. It is lined with light weight insulating material and has a sprung arched roof. Inside, along each side, and extending from both ends toward the center, are three tiers of horizontal hair-pin tubes which rest freely on brackets to permit expansion and contraction, the open ends being securely bolted at the opening in the outer casing. A mixture of blast furnace and coke

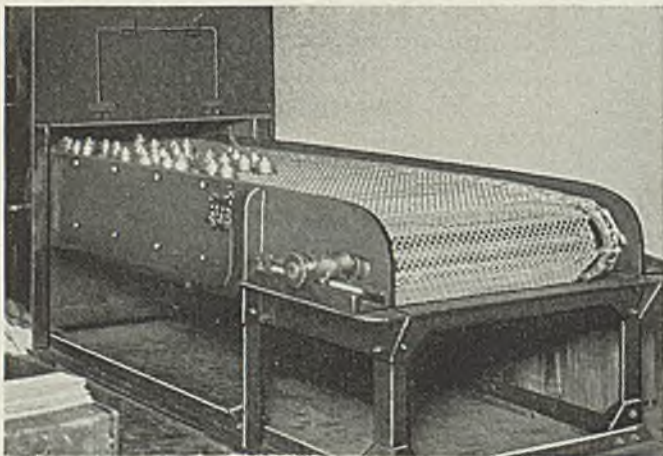
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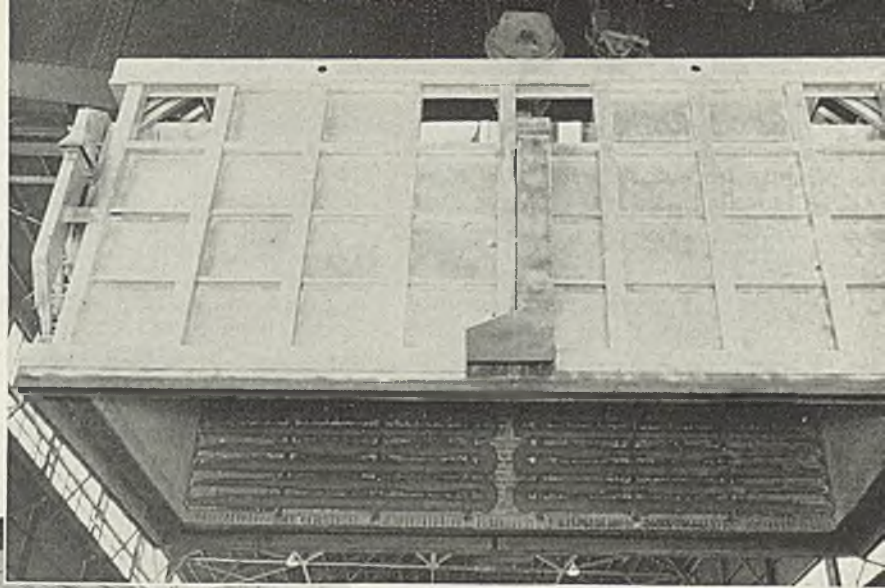
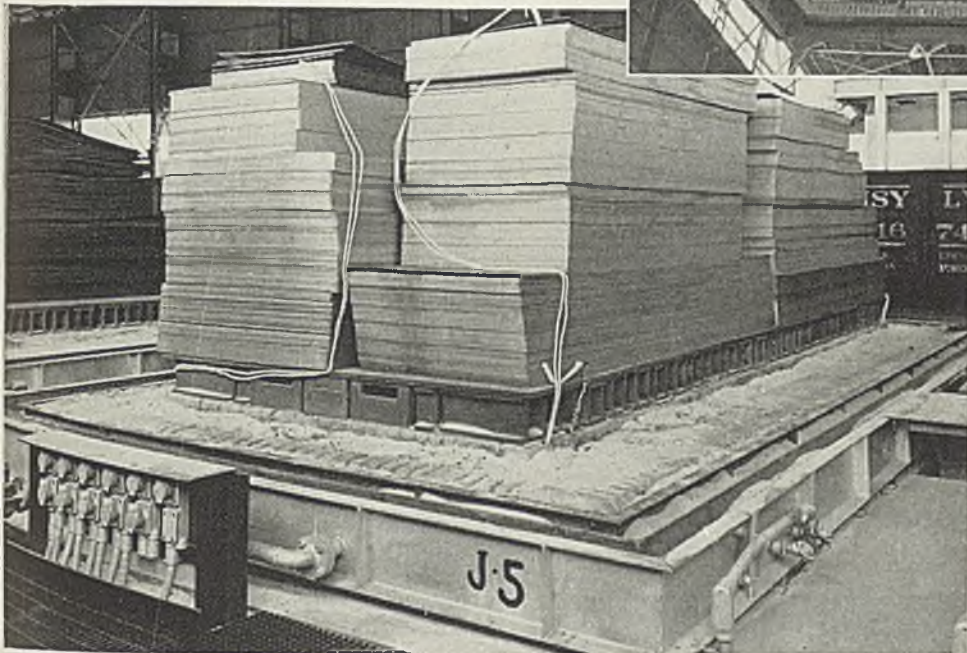
# CAMBRIDGE WIRE CLOTH CO.

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Fig. 2 (below)—Sheets piled on furnace base ready for annealing. Thermocouples at four different points record the temperature of the sheets during the entire annealing cycle. Fig. 3 (right)—The three tiers of radiant tubes are plainly visible as the crane swings the outer furnace cover into position



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20 hours for coils. The strip is then allowed to soak at this temperature for about 22 hours for sheets, and 6 hours for coil. The shorter soaking period for coil is possible because in loosely wound coils, and in the upright position strip is not subject to sticking to any appreciable extent, so that a higher temperature may be used. From the time the temperature reaches 900 degrees Fahr. and for the remainder of the annealing cycle the protective atmosphere is maintained under the inner cover, at a slight pressure. No air can enter from the outside and oxidize the steel. On the contrary, some of the protective gas leaks out and fills the space between the two covers; holding the scaling of the inner cover down to a minimum.

#### Customer's Needs Studied

After completion of the soaking period the burners are turned off and the outer cover is removed to an adjoining base, while the pile is allowed to cool, with the inner cover on, down to 200 to 250 degrees Fahr., when the pile is uncovered. The protective gas is kept on until the inner cover is removed.

Positive control of the temperature is essential in the annealing process. A thorough study of customers' requirements in regard to ductility

and drawing and forming properties must be made in order to adjust the temperature and annealing time to these requirements, and every precaution must be taken to produce sheet or coil capable of drawing or forming the parts for which they are intended.

During the entire annealing period each furnace is individually and automatically controlled by recording pyrometers. Each base has six pipe connections through which stationary thermocouple leads enter.

These leads are long enough to reach the following points: Two to the top, at diagonally opposite corners, where the couples are inserted in the pile about 1 inch down; a third couple is placed as nearly as possible in the center of the pile, and the fourth 12 inches from the bottom, at the center. These four couples which measure the temperature of the steel itself are connected to the same recording instrument and a complete time-temperature curve is made on each. The couples at the upper corners show when the desired annealing temperature is first reached, that at the center when the pile is uniformly heated. With proper firing the four curves gradually converge, to merge completely during the entire soaking period.

Of the two remaining couples,

which are used for direct control of the firing, one is placed near the bottom, at the back corner, the other diagonally opposite at the top corner. These are not buried in the pile, but are free. The first controls the burners on the two lower tiers, the second the burners on the upper tier. They are connected to separate potentiometers and are set for the firing temperature which will give the annealing temperature desired. Should this temperature be exceeded the fuel supply is automatically cut off, and remains off until the correct temperature is again established. All burners can also be operated by manual control if necessary. During the soaking period the burners in the top tier are shut off, and the heat is supplied by the two lower tiers of tubes only.

#### Instruments in Booths

All instruments are conveniently located in pyrometer booths directly back of the furnaces. Careful checks of all charts and instruments are made every half hour by an inspector whose time is devoted exclusively to that purpose. Any irregularities are therefore caught immediately, and all temperatures are maintained within the prescribed limits at all times. In addition the foreman makes a round of inspection every hour. When a base is loaded every couple is checked for breaks, shorts, and other irregularities, and any defective couple is immediately replaced or repaired as needed.

The deoxidizing (DX) gas used as protective atmosphere during annealing is prepared from natural gas in a battery of five DX machines, each of which has an hourly capacity of 15,000 cu. ft. of DX gas. Tests are taken at regular intervals to insure perfect purity. The natural gas is first burned with an insufficient supply of air, leaving a gas with a  $\text{CO}:\text{CO}_2$  ratio of about 2:1. After incomplete combustion the gas is carefully scrubbed with clean, filtered water to remove dust and ash, and is then freed from practically all its moisture by cooling to about 35 degrees Fahr. in a refrigeration unit. The pure, dry gas is

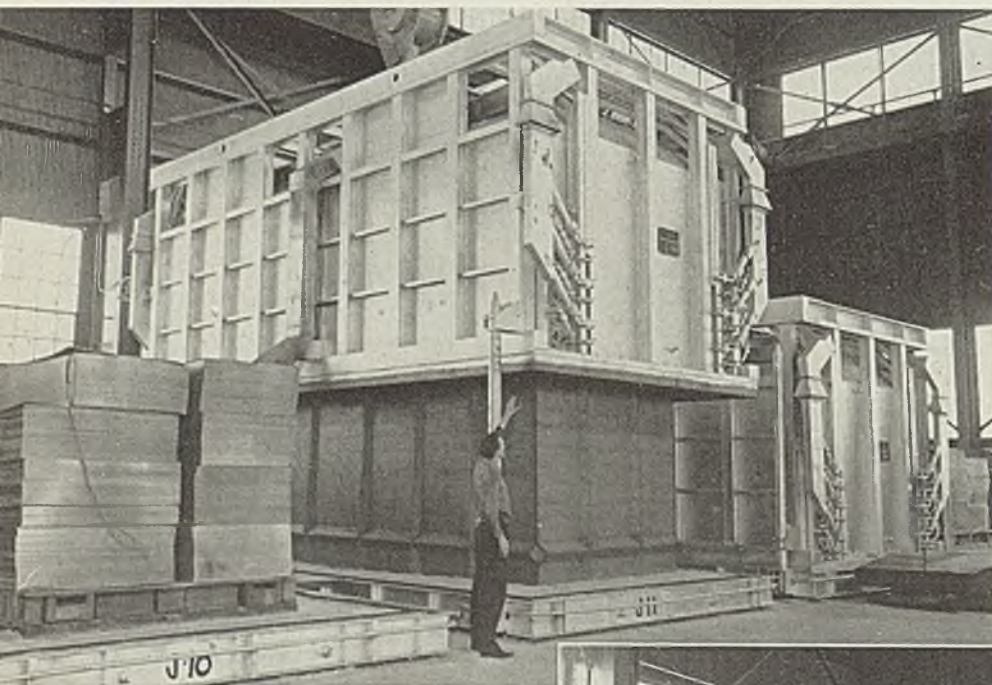
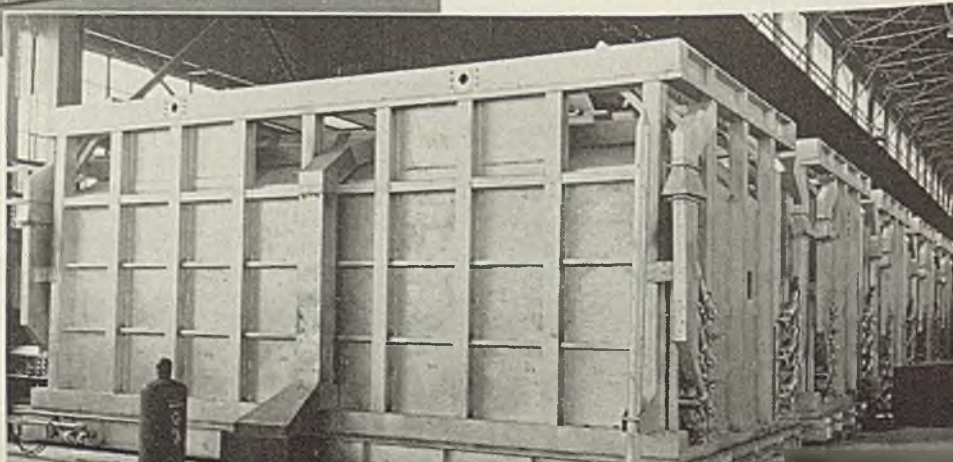


Fig. 4 (above)—Outer cover is placed over a pile of sheets protected by inner cover. Guide posts at corner insure proper alignment. Fig. 5 (right)—Front view of box annealing furnaces in operation. The sand seal is plainly visible on empty base in foreground



finally preheated and delivered to the furnaces at a line pressure of 1 to 1½ inches of water. At the beginning of the annealing cycle the gas is led into the inner cover through two pipes in the base; as the temperature is increased it gradually combines with the oxygen. Due to the pressure some gas also is forced through the sand seal and combines with the oxygen between the two covers.

### Hydrogen Raises Output

■ Electric generators housed in airtight steel tanks containing an atmosphere of pure hydrogen are making new records of production. The hydrogen atmosphere increases the output from 20 to 25 per cent according to test data. The generators "feel" what to a human being, holding his breath in the tank, would be a sense of coolness and lightness. This is because of the fact that in hydrogen heat flows from a body seven times faster than in air. The sensation of lightness comes from the extremely light weight of the hydrogen atmosphere, its weight being only seven per cent as much as air. The element has little wind resistance. The rotor of the generator revolves 3600 times, the equivalent of 6 miles a minute. Hydrogen also has intimacy of contact with the result that heat is picked up from the metal 1.35 times faster than air would do it.

### Study Mold Temperature

■ Steelmakers are giving more attention to mold temperature before permitting the molds to be placed in service at the pouring station. At one open-hearth shop molds with a temperature below 100 degrees Fahr. never are used inasmuch as they lead to scabby ingots and these, in turn, to scabby billets and high costs of chipping. At a plant in the Great Lakes district the molds are maintained at the proper temperature for receiving steel by a simple method. After being stripped of their ingots,

the molds are stored in an ordinary brick building equipped with doors at either end. The building receives heat from that radiated from the hot molds which are kept warm until ready for the pouring line.

### Ends Bearing Troubles

■ At an Ohio steel plant difficulty was encountered with the large mill drive motor bearing throwing oil in the windings. Inspection disclosed that the ring was too wide and, therefore, carried a larger quantity of oil than could be handled by the grooving. The trouble was eliminated by installing a narrow ring and by cutting larger grooves in the bearings. Windings now are dry and bearings well lubricated.

### Torch Removes Columns

■ Cutting cast iron for demolition and scrapping purposes is advancing rapidly. A recent job included the removal of some cast iron columns from a blast furnace. These were about 30 inches diameter. They had a wall thickness of about 3 inches and were filled with concrete. The usual custom of blasting with dynamite to dislodge the columns could not be followed on account of possible damage to an adjoining stack and it, therefore, was necessary to cut them at their base with an oxyacetylene flame. Correct cast

iron cutting technique made this a simple matter. The torch was applied around the base of each column leaving about 6 inches uncut for the purpose of holding the pillars in position until all had been cut. Following the cutting operation each column was pulled over with a cable to a predetermined location.

### Stainless Steel Tubing Is Drawn By New Method

■ Oak Chemical Products Co., Bechtelsville, Berks county, Pa., has developed two products and a process for cold drawing 18-8 chromium-nickel stainless steel tubing on rod mandrels. A base coating is produced on the tubes and after this has dried they are dipped in a specially prepared lubricant. The tubes then are ready for the drawbench. The method is said to be especially effective for cold drawing large sized stainless steel tubing on rod mandrels. Patents are pending.

### Welding Reclaims Moulds

■ Reclaiming ingot molds by the application of welding is practiced by a Pennsylvania steelmaker with highly satisfactory results. Recently large forging ingot molds were burned the first time they were placed in service. The surface was repaired by chipping and then by welding.

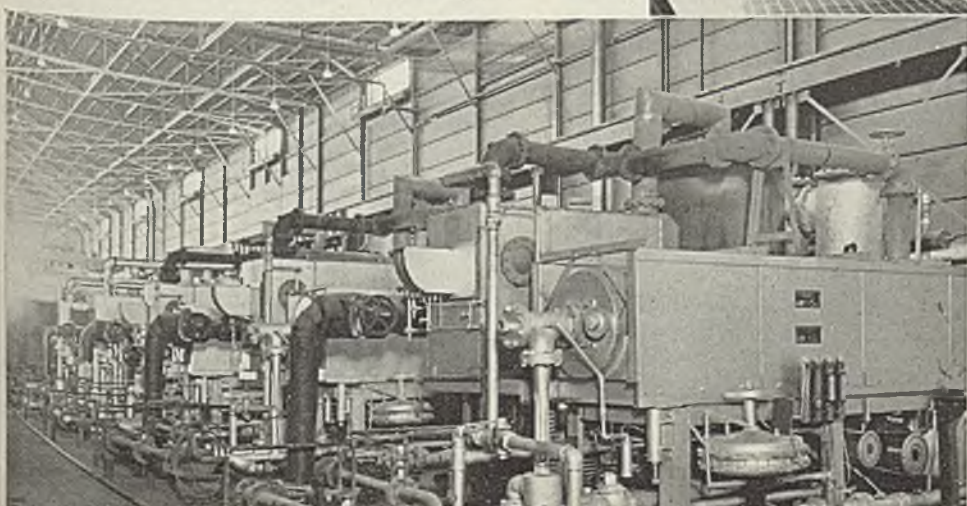
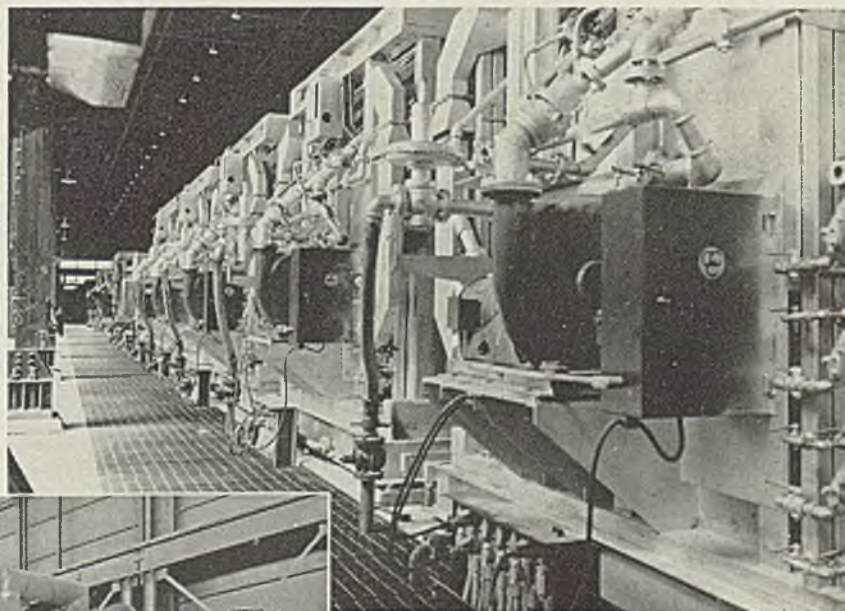


Fig. 6 (above)—Rear view of box annealing furnaces, showing blowers and gas lines. Fig. 7 (left)—Battery of five DX machines, each with an hourly capacity of 15,000 cubic feet of pure, deoxidizing gas used as protective atmosphere during annealing

# WHAT THE STOCKADE WAS TO THE PIONEER



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- Thomas Gregory Galvanizing Works  
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- Joslyn Mfg. & Supply Co., Chicago, Ill.
- L. O. Koven & Brother, Inc., Jersey City, N. J.
- Lehigh Structural Steel Co., Allentown, Pa.
- Missouri Rolling Mill Corp., St. Louis, Mo.
- The National Telephone Supply Co.  
Cleveland, Ohio
- Penn Galvanizing Co., Philadelphia, Pa.
- Riverside Foundry & Galvanizing Co.  
Kalamazoo, Mich.
- San Francisco Galvanizing Works  
San Francisco, California
- The Sanitary Tinning Co., Cleveland, Ohio
- Standard Galvanizing Co., Chicago, Ill.
- Wilcox, Crittenden & Company, Inc.  
Middletown, Conn.
- The Witt Cornice Co., Cincinnati, Ohio

# Salt Bath Furnace Used In Hardening Truck Gears

■ STEEL parts which are to be subjected to high stress must be hardened and this hardening process is the cause of two major evils—scale and distortion. Where parts are carburized, decarburization is equally as important as the other two.

Gearmakers are faced with a real problem in overcoming these two factors inherent in the process through which all their parts must pass. In order to combat the difficulties brought up in this situation, the White Motor Co., Cleveland, has installed an Ajax-Hultgren salt bath furnace in the heat treating department for the hardening of transmission gears, rear axle pinions and other small gears which are used in the manufacture of trucks and busses.

Naturally a small amount of warp or distortion in gears will tend to change the true proportions enough to make the gear noisy or subject to greater stress than had been intended. In the new furnace the parts are suspended on wires in the molten salts, leaving all parts of the gears exposed to the heating action evenly.

In many heat treating operations scale is formed, which must be removed before the gears can be placed in operation. This is accomplished ordinarily through sand blasting, which changes to a slight degree the dimensions of the gear, making it impossible to hold parts so treated to extremely close tolerances.

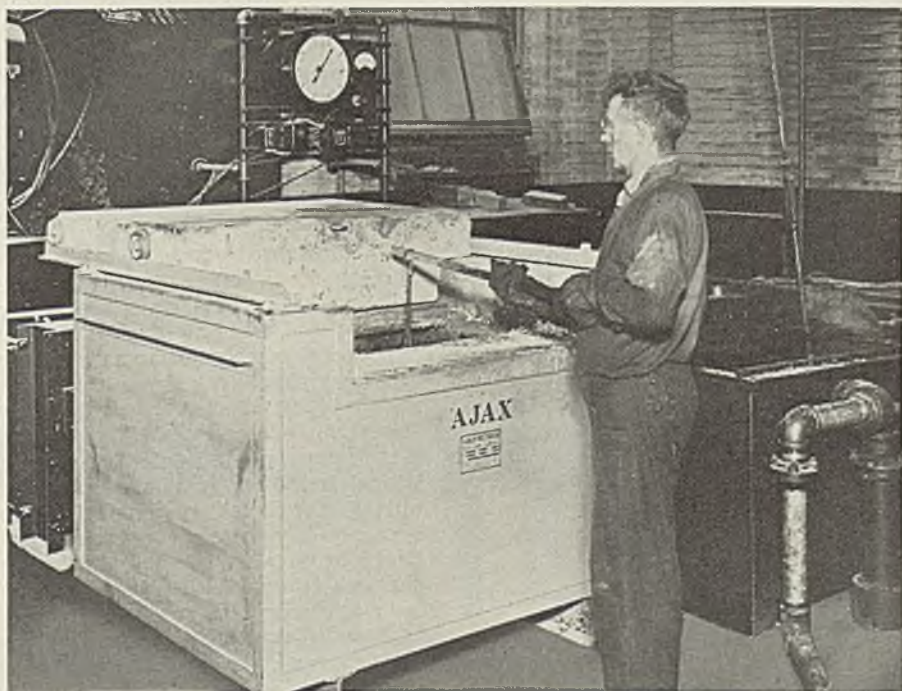
Considerable experimenting is now being carried out by the White company to determine best methods of operation of the new unit to hold distortion and decarburization to a minimum. In the production of automotive gears, after the part has been machined it is carburized in a pot furnace and sent to the salt bath furnace where it is hardened and quenched in oil. Following the quench it is merely necessary to wash the gears in warm water to remove all traces of the salt and give them a light polishing with a wire brush to remove surface color, since no scale can form in the salt bath.

The steels used in the production of transmission gears include S.A.E. 3115, 4620 and 2512, as well as a special analysis Krupp steel. The furnace bath consists of molten salts, 18 to 20 per cent of which are cyanides. Gears are hardened at temperatures running from 1425 to 1500 degrees Fahr.

The furnace is electrically operated, having two pairs of electrodes in the pot. These are placed at the back end of the pot in order to enable the operator to use the entire front and center sections for inserting the parts to be hardened without interference from the electrodes. Alternating current is used in the furnace to prevent electrolysis of the salts. Heat is created by the resistance of the salt itself between the electrodes by the salt itself, while close and positive control of the temperature is obtained by the automatic stirring. By varying the voltage to the electrodes the connected load can be adjusted for various production demands.

The pot is fabricated from electrically welded plate, backed with refractory and a rolling cover is provided. The gears are suspended on wires from bars placed across the top of the pot. Passage of the current through the bath sets up an electrical field which causes the particles of salt to move continually while the furnace is operating. This mass action of salt molecules, created by magnetic lines of force between the poles, prevents any one part of the bath reaching a different temperature from any other. This results in an even heat in all parts

Removing automotive gears from the salt bath furnace installed at White Motor Co.



of the bath and on all faces of the gear at once and helps prevent any warp or distortion due to uneven heating.

It has been found that as a result of the heat being created within the bath instead of being supplied from an external source, working temperatures around the furnace are greatly decreased, making working conditions better for the operator.

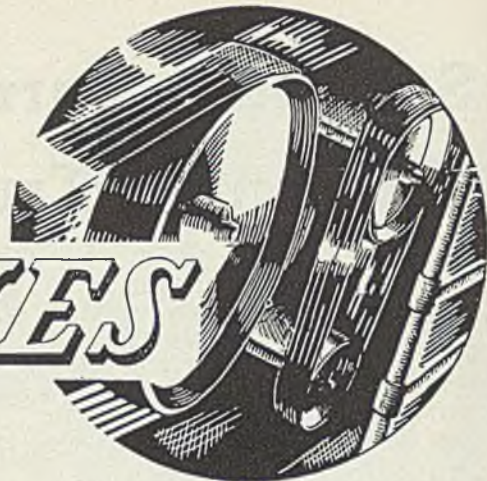
## Load Transmission Device Made of Malleable Iron

■ American Concrete Expansion Joint Co., Chicago, offers a new load transmission device for use in concrete highway construction. The device, known as the J-bar, is used in connection with expansion and contraction joints, and provides the means of transmitting vehicle loads from one slab to another.

Each J-bar unit consists of a pair of malleable iron sleeves with integrally cast radiating arms at one end. Malleable iron is used to give the sleeves strength, resistance to corrosion, and economy of manufacture. The castings weigh but one pound, and are reamed so as to permit a short cold rolled steel shaft  $\frac{3}{4}$ -inch in diameter to be fitted inside the cylindrical bearings of the castings. The flanges of the sleeves fit snugly against the sides of the expansion or contraction joint so that the shafts extending through the joint are located perpendicular to the joint material.

In Illinois, where J-bars are specified, 12 of these units are used in each 20 foot transverse road joint. About 176 joints are used per mile.

# POWER DRIVES



## Lubrication Problems Presented In Ball-Bearing Applications

BY H. R. REYNOLDS\*

Chairman, American Bearing Engineers lubricating committee, Chief Engineer, Fafnir Bearing Co., New Britain, Conn.

■ BALL-BEARING manufacturers, like other bearing makers, are dependent on the lubricant used for the operating success of their product. Ball bearings will not operate without lubricant.

Unfortunately, some lubricants do not work satisfactorily in ball bearings and, as failure of the lubricant to lubricate is promptly followed by failure of the bearing, the importance of the right lubricant cannot be overstressed.

Last year we described to the association equipment developed by the bearing engineers for checking the action of greases when applied to an operating ball bearing.

Obviously the equipment described is limited in its scope. Nevertheless, it has enabled us to choose promptly from a given manufacturer's product the grease which changes least under the churning action of ball-bearing service. We can then compare one with another and so select the product which best resists breakdown.

Comparing these data with actual

field experience enables us finally to make a choice of a select group from which we make a selection for particular cases. Particular cases are the subject of this article.

Ball-bearing lubrication has two main requirements: one, the rapidly growing use of prelubricated bearings, either the self-contained sealed bearing or the sealed mounting. The other is customer use, where renewal of the lubricant is arranged for and required.

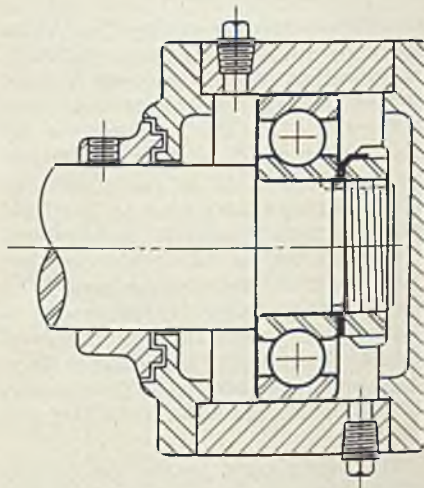
Unfortunately, designers seldom give much consideration to the application of lubricant. Cost and available space quite often restrict them when they do. So the average bearing application is much more critical of the lubricant used than would be the case if all conditions were worked out to give the lubricant most favorable conditions.

To illustrate: where floating dust is present in large quantities, external slingers are quite generally part of the housing design. These function perfectly as far as slinging dirt particles away from the bearing housing is concerned, but the same air eddies, which carry the dirt away, also create a vacuum which tends to drag the lubricant out of the bearing housing. This is especially true of greases that beat out to a liquid in ball-bearing service. Of course, leaking lubricant is not favorably received at any time, and especially where food or textiles are processed.

Many applications are subject to

considerable heat, as textile dryers, food cookers, pigment dryers, conveyor ovens, core ovens and numerous others. In most cases leaking grease in the form of oil will not be tolerated. Also, greases which dry out tend to destroy the ball bearings, as the hardening of the soap interferes with the bearings' free operation and eventually necessitates replacement.

Trouble is also encountered on



Grease is fed across the bearing, thus assuring a small quantity of lubricant reaching the balls and races at each application. Surplus may be drained off to prevent churning and heating at high speeds

\*Paper presented at fifth annual convention of the National Lubricating Grease Institute held Oct. 4-5, at the Blackstone hotel, Chicago.

fan applications, especially with fuel economizers, where a strong-current of heated air is drawn over the bearing housing. Obviously, any grease that breaks down will be carried along the air stream and deposited on adjacent equipment.

So much for external conditions. The internal arrangement is also a vital factor. If all ball bearing applications were so arranged that a limited amount of grease would positively reach the balls and raceways, then we could accept almost any grease that would maintain a satisfactory consistency to take care of conditions just described.

Unfortunately, the average hous-

ing for ball bearings is designed to use a minimum amount of space. Grease fittings are applied where they most conveniently fit in, sometimes in out-of-the-way places. Little regard, if any, is given to the question of getting the grease to the bearing. These conditions must all be considered in making a recommendation for lubricating ball bearings. It is sometimes impossible to fulfill them all, and in such cases it is generally more important to be sure the bearing is properly taken care of.

In connection with standard grease fittings and pressure guns, there is a vital objection to their

use. Overfilling is always to be avoided, as the surplus grease will churn, heat up and expand. With a pressure gun this condition is only prevented by a suitable vent, either automatic in action or removable by hand.

More serious than this is the condition that occurs when modern commercial seals are used, or plate shields or seals are built into the bearings. Numerous complaints are received which, on investigation, show effectiveness of the seal is its own destruction. The pressure built up behind a good seal by the use of a pressure-type grease gun actually forces the seal out of the bearing or housing. In most cases this destroys the assembly, and replacement with new material is necessary. Where ball-bearing housings are not vented, care must be taken by the operator of the pressure grease gun.

#### Storage Is Problem

Special lubricating problems are presented by the storage factor. No problem of lubricating ball bearings has caused as much grief and entailed as much expense as the failure of a lubricant under storage conditions. And, no problem connected with grease testing is given such careful consideration.

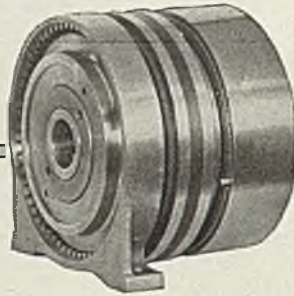
Far too many greases will not stand storage. The bearing maker prelubricates his product and then sometimes stores it for a long period. When a customer is ready to use the bearing, it is found to be either frozen from the complete drying out and hardening of the grease or, if it will still turn, there is a decided gritty feel to its operation, and the customer rejects it as rough and noisy.

Some greases are satisfactory when packed into a bearing and placed in stock storage. But if mounted into a machine and given a test run, then stored for an appreciable length of time, they dry out and fail. Here, housing design is not a factor, as the correct supply is applied when the unit is assembled. The grease simply entrained an extra supply of air or, as we say, "aerated," and oxidation set in shortly thereafter.

Result of this was a unit that would not run when it reached the ultimate user, or if oxidation of the grease had only gone part way and it did run, failure of the ball bearings soon followed. An oxidized grease acts as a solid and causes excessive pressures when it gets between balls and races. It may also act as a lapping agent causing wear, and looseness of the bearing follows.

Only a few of the problems are presented here. Memory could not produce all conditions which grease, as a ball bearing lubricant, must meet. In a day's run, we have ex-

## A MAGNETIC CLUTCH and BRAKE in one UNIT



A smooth start—a fast, positive stop, all in one device...snappy, dependable stop and go...perfectly synchronized action...safe...uniform torque...remote, accurate control.

Better engineering back of the STEARNS trade mark has made the STEARNS High Duty Combination Clutch and Brake (in one unit) an outstandingly popular friction device.

Designed in a wide variety of sizes and combinations, there is one for your job. Tell us about your problem. We are pioneers in the development of magnetic clutches, clutch-brakes and brakes.

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FORMERLY MAGNETIC MFG. CO.

650 S. 28th St.



MILWAUKEE, WIS.

Separators

Clutches

Magnets

tremes of speed from one or less to over 40,000 revolutions per minute. We have bearing diameters, from little fellows easily covered by a dime, to 30 or 40-inch outside diameters and loads which almost float to hundreds of thousands of pounds. We have single-row, double-row, radial and angular contact, sealed and shielded and open-type bearings. We have service from one or two movements a day to continuous operation till breakdown, clean and dirty, wet and dry, acid fumes and any or all in combination. What a given lubricant will do under possible combinations of these conditions is pure conjecture.

This makes ball-bearing lubrication sound complicated but it isn't as bad as it sounds. Good housing design will keep out dirt and moisture. Acids can be met with stainless steels; high and low temperatures can also be taken care of by selecting suitable grease.

Past trouble with lubricants has in a great measure been eliminated, largely by the ball bearing people themselves. In self defense we have been compelled to establish a lubricant testing department in our laboratory. Obviously, reports covering ball-bearing failure due to faulty lubrication are countered with a request for help. "What grease?" and "How do we apply it?" are still common questions.

#### Provides for Worst

In a correctly designed housing, the worst conditions to be met can be taken care of. Unfortunately, the average, commercial, ball-bearing pillow block is designed to suit average conditions, and it presents a serious lubricating problem when used under conditions which call for special features.

Almost any neutral stable grease will work satisfactorily in a housing so designed that the grease is applied on one side of the bearing, the application side to have minimum space adjacent the bearing, so that the application of even a small amount of grease will force some of the new material into the bearing. The opposite side of the bearing should allow ample space for surplus lubricant to drain off. This side should also be equipped with a drain plug, both to vent the housing and to allow surplus old lubricant to work out.

However, such a design is seldom found. More often we encounter fittings to allow application of lubricant only. Here the questions "How much?" and "How often?" can be answered only by trial. In such housings, trouble from unstable greases surely follows their use.

Extreme care should be exercised in studying conditions be-

fore making a recommendation, and only greases of known age-life under similar conditions should be suggested.

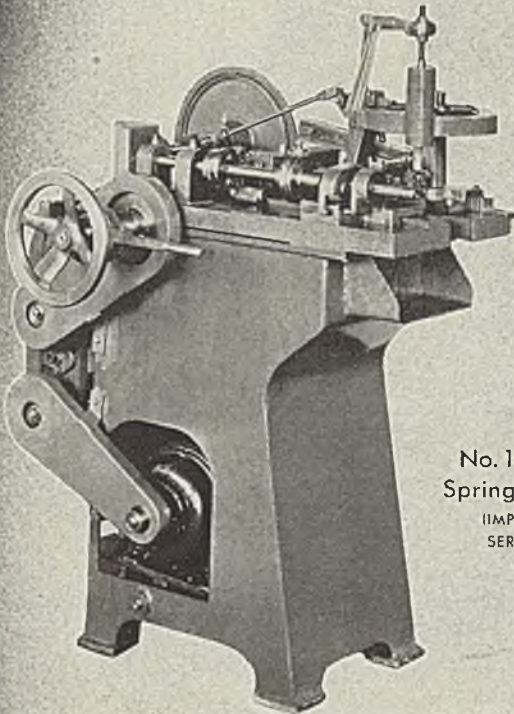
Beyond all these and becoming of increasing use are sealed bearings or sealed housings. Here the lubricated-for-life problem is met. Only the original supply of grease is ever applied.

#### Take Special Measures

In many cases, conditions of service are known and special measures can be taken to insure that a lubricant best suited to the require-

ments is used. However, thousands of sealed and prelubricated bearings are produced which are stocked against customers' orders in advance of our knowledge. These must be prelubricated with a universal lubricant that first of all can be stored for an indefinite time. Then, when called upon, they must give splendid, carefree service for several years more. That such greases are available is of great credit to their maker, and the ball bearing people have selected the grease after long and expensive testing.

"THE MACHINES THAT  
PUT THE  
'RINGS' IN SPRINGS"



No. 1 Torsion  
Spring Machine  
(IMPROVED)  
SERIES 614

DURING THE LAST  
**TWENTY-FIVE YEARS**  
MORE AUTOMATIC SPRING MAKING  
MACHINES HAVE BEEN MADE BY  
**SLEEPER & HARTLEY INC.**  
WORCESTER, MASSACHUSETTS  
THAN BY ALL OTHER MANUFACTURERS IN  
**THE WORLD**



## Cost Reduction Is Factor In Pickling Research

(Continued from Page 56)

pickling schedule is shown in the accompanying chart.

Stock used in these trials was one in common use for the manufacture of hollow ware. The surface was rough finished and its working and drawing properties were said to be good. The schedule shown in the chart is for this type of stock and it must be borne in mind that another type of stock might require

considerably different etching treatment to secure comparable results.

The enamel used in these tests was typical of what is used for one-coat light colored ware and is suitable for use as a light colored ground coat. It contained no antimony or adhering oxides. The enamel was applied by draining at 55 grams per square foot dry and fired for 2½ minutes at 1520 degrees Fahr. on hot points.

In the course of the work it was found that good adherence could not be obtained by the use of nitric acid, either alone or mixed with sulfuric, although the surface showed evi-

dence of vigorous etching under a microscope. Repickling of nitric acid etched sheets in the usual sulfuric acid bath failed to improve the results. Negative results were also obtained with hydrochloric and sulfuric acids even with extended pickling time, when used alone or in combination, at all temperatures tried.

In general, Mr. Sweely was unable to produce results comparable to those secured with iron sulfide by any means except by passing hydrogen sulfide gas into the pickling solution. However, there seems to be little advantage in the use of hydrogen sulfide gas unless better control can be secured by its use than can be accomplished by the use of iron sulfide.

By varying the pickling conditions several interesting facts were unearthed. Too high a concentration of hydrogen sulfide produced a rather pitted surface texture and adherence was fairly good though there was not much evidence of roughening at the interface. When pickling time is too short, the interface is very smooth with slight evidence of iron oxide even though hydrogen sulfide concentration is correct. Under the same pickling conditions, however, the slight variations and the addition of a nickel flash, texture and adherence become good, the interface becomes more even and there is evidence of more iron oxide.

### Good Adherence Without Nickel

When pickling conditions are correct (See chart) adherence is good without the use of nickel, the interface is rough and the layer of iron oxide is uniform. With the addition of a nickel flash, adherence becomes excellent, line of contact becomes very rough and iron oxide is present in the depressions in the metal at the interface.

Increasing pickling time to 15 minutes, other conditions being correct, decreases adherence of the enamel. The interface is somewhat more roughened but the oxide layer seems less pronounced. Again the subsequent use of a nickel flash produces very good adherence, a well roughened line of contact and a pronounced oxide layer.

Long pickling at low concentrations does not promote adherence although the surface appears to be well etched. The contact line is quite smooth with little evidence of iron oxide development. Here again, subsequent nickel flash treatment produces a much rougher contact line, greater development of oxide and improvement of adherence.

Mr. Sweely has not completed his work on this type of pickling. In summarizing his progress to date, he declared, that while it may be coincidence, all evidence appears to



Successful plating on steel or zinc depends on the perfection of the copper flash or base plate. Obtaining perfect copper base deposits has never troubled platers using Udylite Copper Ball Anodes.

### CONSTANT ANODE AREA MAINTAINED

In copper cyanide plating this is most desirable. Maintaining sufficient anode area at all times prevents the formation of sludge in the bath. Sludge causes "rough copper," which is not only unsatisfactory in appearance and protective qualities but troublesome to buff. Udylite Copper Ball Anodes also keep the metallic content of the bath constant, thus maintaining maximum plating efficiency at all times.

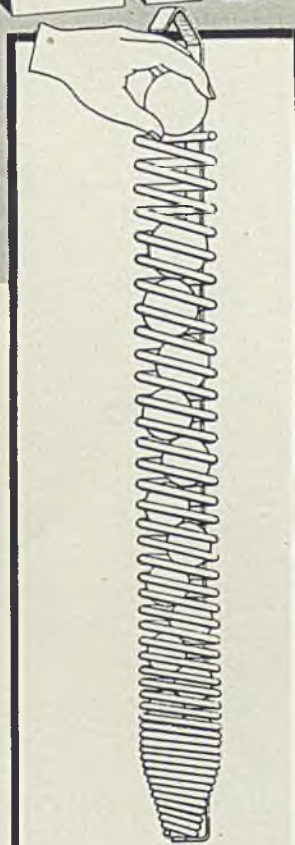
### SCRAP LOSSES ARE ELIMINATED

Full value is received from every particle of metal used. Ball anodes corrode evenly as they descend in the container. Even the smallest scraps are completely used up.

### CONVENIENT TO USE

The illustration to the right tells the story. Even in large installations it takes but a few minutes of one man's time to place balls in the containers as the bottom anodes corrode and leave space for them.

Complete information on Udylite Copper Ball Anodes may be obtained by writing the Udylite Office nearest you.



### SIMPLE AS A-B-C

The principle of the ball anode is extremely simple. Anode balls are merely placed in the helical coil container. As they corrode, their diameter decreases and a new ball is added at the top.

## THE UDYLITE COMPANY

1651 East Grand Blvd., Detroit, Mich.

New York Chicago Cleveland San Francisco  
30 E. 42nd St. 1943 Walnut Ave. 3736 Carnegie Ave. 114 Sansome St.

indicate that a nickel flash increases the formation of oxide film and the serration of the metal at the interface. In any event, there was a similarity of appearance in the sections at the interface of the samples which exhibited good adherence without nickel, to those with comparable adherence when nickel was used.

Future work will be directed toward securing better control of the process and eliminating the variations sometimes encountered with ware where this treatment is a vital part of the process. It is scarcely necessary to point out the savings possible if control can be developed to the point where use of the nickel flash can be eliminated.

### Protects Blast Furnaces, Open Hearth Roofs

■ Developed especially for outdoor protection of structural steel, James B. Sipe and Co., Pittsburgh, announce the Sipes Impervobond System of finishing. The complete system includes a material known as Kilrust, a clear film-forming material applied to the bare metal after removing loose rust; Impervobond compound, a high grade bituminous material; and aluminum paint.

The bituminous compound is said to form a tough hide on the exposed surface while it remains soft and pliable underneath. It is claimed to resist abrasion, chemical and acid fumes. According to the manufacturers, this compound has given perfect service on open hearth roofs for 12 years and on blast furnaces for 8 years. Thickness of coating in these cases varied from 1/64 to 1/32-inch.

Other Impervobond materials for use in pickling rooms, on boiler foundations and open hearth furnaces, for damp proofing concrete, brick and tile walls, and for roofing are also offered. Full information may be obtained by writing James B. Sipe and Co., Box 87, South Hills Station, Pittsburgh.

### Ebony Finish Improves Heating Unit Efficiency

■ Research engineers of Huntington Works, International Nickel Co. Inc., New York have produced "ebonized" monel with an ebony finish designed for use where appearance must be maintained under temperatures up to 1400 degrees Fahr.

The material is identical with standard monel except that a lustrous "blue-black" finish is imparted in a specialized oxidizing operation. It has been created particularly for a newly designed heat

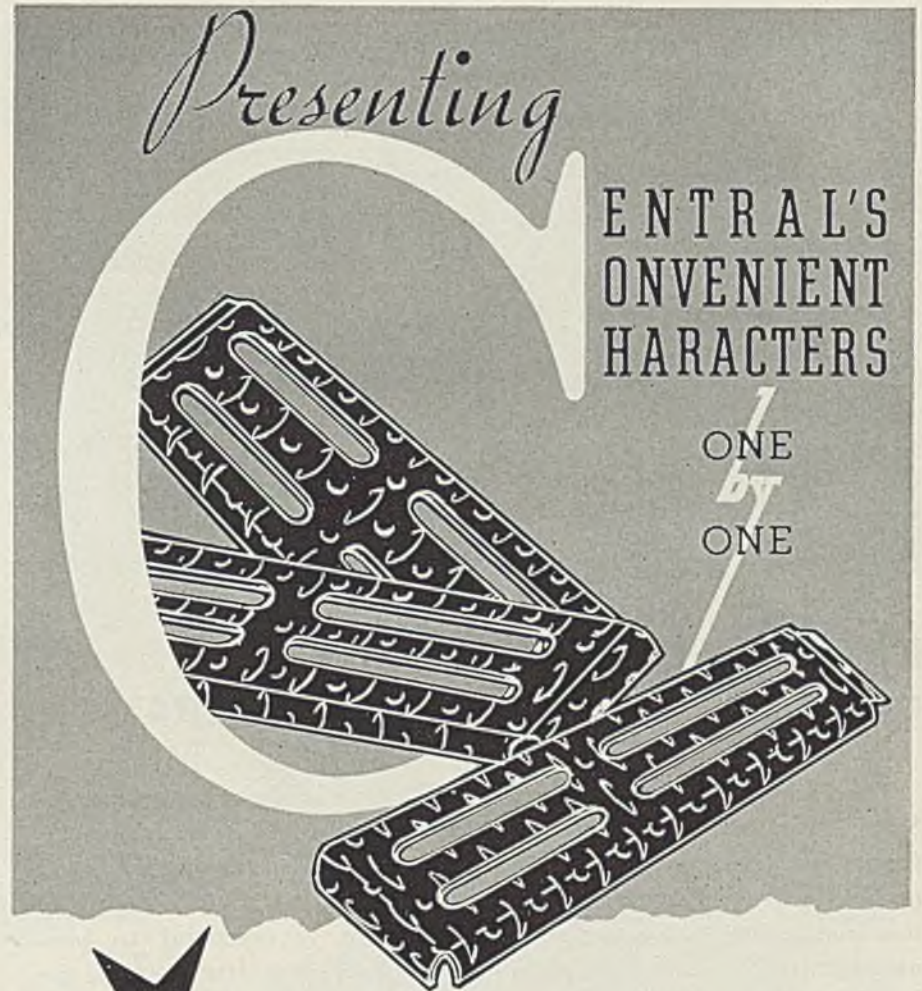
deflector for super-speed range units.

Element pans, reflectors and deflectors in all electric heating units have been source for complaints because the materials from which they are made invariably suffer heat discoloration or stain and rust. Since this new ebonized metal, like standard monel, possesses rust immunity and diversified resistance to corrosion in addition to its new ability to resist discoloration from relatively high temperatures, it helps provide insurance against costly replacements and unsightly appearance.

The deflector design is an inter-

esting one. Until now, most heating units were equipped with reflectors—pans of bright materials that tended to reflect heat back up toward the unit. The deflector presumes the operation of a flue. It convects air currents that in turn transmit escaping heat back towards the middle of the element. In this manner the heat is intensified by the up-draft air currents directed by the design of the ebonized monel deflector.

Tests by thermal experts demonstrate that an improved efficiency is obtained with the unit, as well as the advantages outlined above.



### Stair Treads

Add *character* and remove the "slipping" hazard from your stairways by installing CENTRAL Stair Treads and Floors. Self draining, durable and easy to install, they'll repay initial cost in short order. Booklet upon request!

**CENTRAL IRON AND STEEL COMPANY**  
HARRISBURG EST. 1853 PENNA.

## Carburizing—Its History And Production Practice

(Concluded from Page 50)

surface material high in carbon, and (b) the carbon then diffuses from this surface layer into the steel.

The mechanism whereby energizers have their effect is not known. Many energizers are carbonates, a particularly common one being barium carbonate. It has been thought that the CO<sub>2</sub> of these carbonates might enter into the reaction. This is one possibility but it should be borne in mind that

barium oxide is also a fair energizer, as are also a few other oxides.

It is perhaps sufficient to state that the role of the energizer is the same as though it acted to increase slightly the effective CO content in the carburizing box.

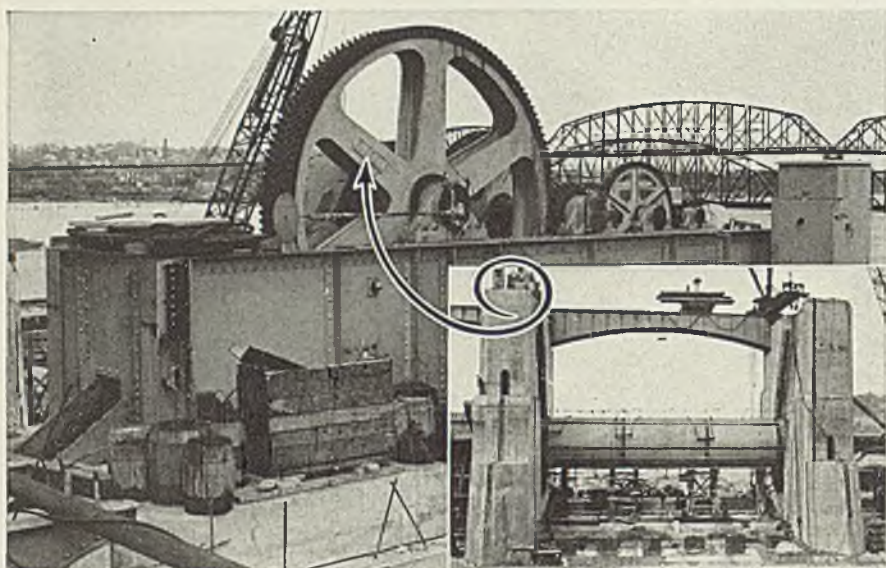
The carburizing compound influences the depth of case, through its influence on the surface carbon content. Thus, charcoal alone gives a carbon content at the outside of the piece which may be only 0.65 per cent, and this would give less "case" than charcoal used with an energizer which would give a surface carbon content of say 1.20 per cent.

It seems probable that the temperature 1700 degrees Fahr. has become established because it is a compromise in factors affecting speed of carburization, grain growth, change of shape of parts being carburized and depreciation of carburizing boxes and furnace parts. For the sake of carburization, to obtain the greatest depth of case in the shortest time, it would be desirable to use as high a temperature as possible. On the other hand, the factors against high temperature are the possibility that grain coarsening may take place in the steel if the temperature is too high, the danger of the piece changing shape at high temperature if it is of complicated shape, and finally the wear of furnace parts and the inconvenience incident to high temperatures.

In considering the absorption of oxygen into a piece being carburized, it must be remembered that oxygen absorbed into steel faces a mechanism which may be quite different from that in pure iron. In the case of pure iron, the oxygen need be considered only in its relation to metallic iron and to the carbon present. In the case of steel on the other hand, the presence of other elements, such as manganese, silicon and aluminum, is certain to affect the distribution and the rate of diffusion of the oxygen. These behaviors of oxygen with respect to the various elements in steel may have a marked effect on the phenomena of grain size and grain growth of the steel during carburization and upon subsequent heat treatment.

Other extraneous elements, in addition to oxygen, may also diffuse into steel during carburizing but their effects are not yet known. Thus when cyanides or ammonia compounds are present during carburization, it is to be expected that the behavior of nitrogen would be analogous to that of oxygen and carbon. Further, in gas carburizing, where some or all of the carburization is done by hydrocarbons, it is to be expected that the same considerations would apply to hydrogen, but data on this point are lacking. There is much yet to be learned about the effects of oxygen, nitrogen and hydrogen during carburization.

(To be continued)



## FARREL-SYKES PRECISION GEARS CHOSEN FOR LOW SPEED OPERATION

The advantages of Farrel-Sykes Precision Herringbone Gears for high speed operation are generally well known. Their use in the hoists for the roller gate dams shown in the illustrations also demonstrates their superiority for *very low speeds*.

The hoist mechanism contains three reductions of herringbone gears and one worm gear. The total ratio is 4850 to 1 and the largest herringbone gear operates at  $\frac{1}{8}$  R.P.M. . . . *one revolution in eight minutes.*

It can readily be seen that operating conditions in this application impose heavy loads on the gears and a high degree of precision is essential to prevent excessive stresses on the gear teeth.

That Farrel-Sykes Gears successfully meet all the requirements is shown by the fact that they are used in the hoists for fifteen roller gate dams. Their use has resulted in material savings in size, weight and cost, as well as increased efficiency and reliability of operation.

## To Discuss Metallurgy

Robert J. Raudebaugh, assistant research engineer, American Rolling Mill Co., Middletown, O., will deliver a series of lectures in Cincinnati under auspices of the Cincinnati chapter, American Society for Metals, dealing with such subjects as, solidification and crystallization, structure and properties of crystals, fundamentals of ferrous metallurgy and complex steels and their treatments.



**FARREL-BIRMINGHAM COMPANY, Inc.**

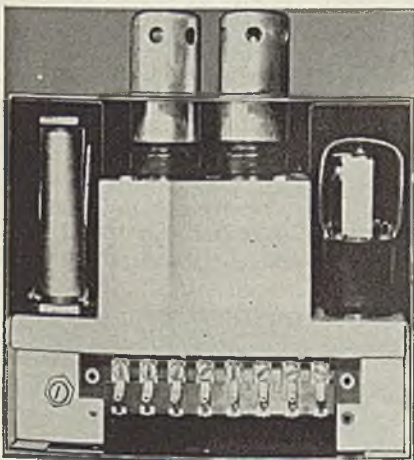
322 VULCAN STREET, BUFFALO, N. Y.

*The Gear with a Backbone*

# NEW EQUIPMENT

## Photo-Electric Control—

United Cinephone Corp., 43 Thirty-third street, Long Island City, N. Y., is manufacturing a photo-electric control known as the model 20A Electrophoto, a general purpose control suited for all applications requiring high sensitivity but not high speed. Unit is a two-stage cascade circuit, self-rectifying type and will operate on a minimum of one foot candle. Of compact and versatile design, light may enter from any of three directions by opening of the proper knock-out aperture. Relays will handle a maximum of 5 amperes directly; if more current is required it is necessary to install an additional relay. Unit runs well within ten degrees of room temperature due to fact that it is draft ventilated. It is designed for quick replacement merely by loosening terminal screws. Adjustments to control may be made externally without opening cabinet. This control is available only for operation



Electrophoto 20A control is for applications requiring high sensitivity rather than high speed

on 110 or 220 volts, 60 cycle alternating-current. Photocell is normally mounted internally, although provision can be made for external housing.

## Thread-Cutting Screw—

Shakeproof Lock Washer Co., 2501 North Keeler avenue, Chicago, has developed a new fastening method known as Shakeproof Thread-Cut-

ting screws. Sizes and threads of the main body are identical with standard machine screws, which they resemble. Difference lies in the spring-action slot cut longitudinally in the shank at a pre-determined angle, and the serrated cutting edge

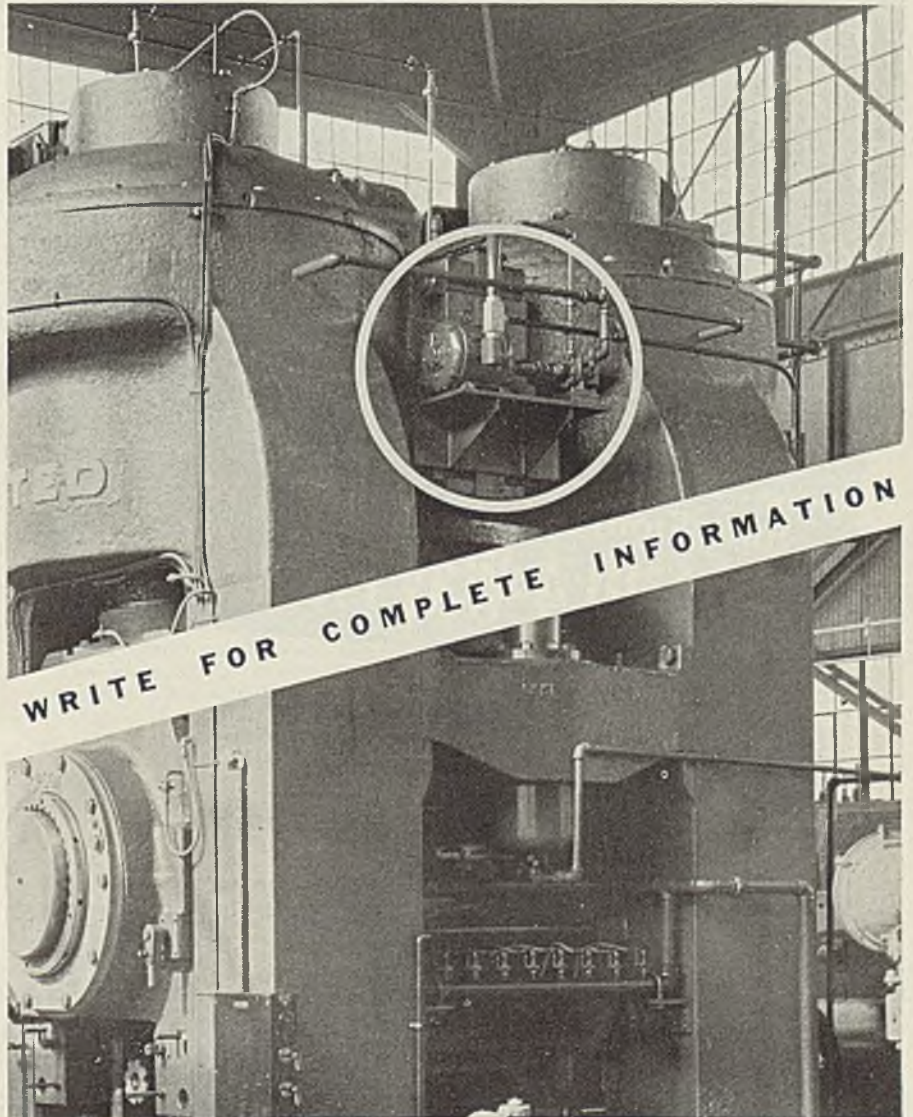
at the slot. These design features coupled with a special hardening process enable the screw to cut its own thread in metal or materials of practically any thickness. The yielding section of the screw springs inward as turning is started, permitting the serrated cutting edge to have free access to the material being threaded. The material removed in the thread-cutting operation is directed into the slot, and away from the cutting edge.

## Flashlight Screw Driver—

Stanley Rule & Level Plant, New Britain, Conn., is offering for me-

# ROPER Rotary PUMPS

are available in a wide range of sizes for every purpose requiring up to 700 gallons per minute and at pressures as high as 750 lbs. The ROPER shown here in connection with the lubrication of "screw downs" is further evidence of ROPER'S increasing popularity in the steel production field.



**GEO. D. ROPER CORPORATION**      **ROCKFORD, ILLINOIS**  
*Offices: PITTSBURGH and Other Principal Cities*

chanics and maintenance men a small, pocket-size, flashlight screw driver with clip. Octagon-shaped handle is made of brass finished in black with contrasting stripe. Unit holds one standard battery and light bulb. Blade of the screw driver is two inches long and of 1-inch diameter, made of tempered steel and with accurate machine cross-ground tip.

**Hand Truck—**

Sabin Machine Co., 6538 Carnegie Ave., Cleveland, Ohio has recently placed on the market its type A3

truck, for handling wood or steel barrels and drums from keg size to 36 inches high. Feature is an attachment device consisting of a hook and a tongue member adjustably mounted on the vertical column. In operation, tongue member is positioned about one inch above the lower edge of the barrel chime while the truck is held against the barrel at both top and bottom. Hook is then placed over edge of the barrel and wheels allowed to roll back until the tongue slips under lower edge of the chime. By handle and foot pedal the wheels are pushed up to the load, which is

thus raised off the floor and attached to the truck. It is then quickly tipped to the balancing position and easily moved. Wheels are 10 by 3 inches, mounted on roller bearings, and can be furnished with steel, hard-rubber or pneumatic tires. The axle is 1¼-inches in diameter and overall width of the truck is 25 inches. It is stated that



**Safe Floors that take Hard Wear—  
INLAND 4-Way Floor Plate**

**YOU** have to think of safety and economy, too, when installing floors. Inland 4-Way Floor Plate is industry's most successful answer to both needs.

You'll find it standard among leading firms... after thorough testing of all types of flooring.

You'll find it around machines, on steps, walkways, loading platforms and aisles where wheel or foot traffic is heaviest in all types of plants.

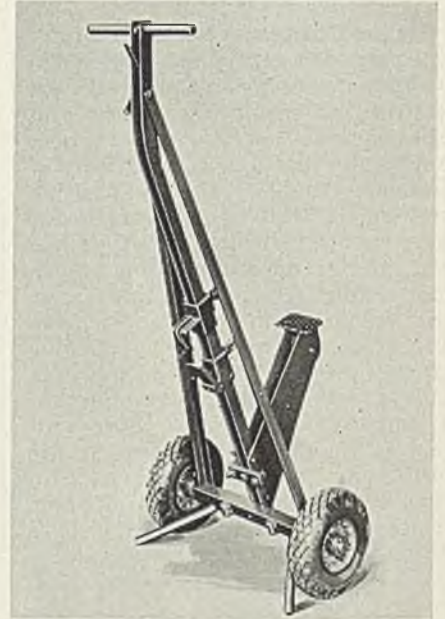
Inland originated the 4-Way Pattern for extra safety in all directions, extra stiffness, easy matching and cleaning. Write for an illustrated booklet on safer industrial floors.



SHEETS • STRIP • TIN PLATE • BARS • RAILS • REINFORCING BARS • PLATES • FLOOR PLATES  
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**INLAND STEEL CO.**

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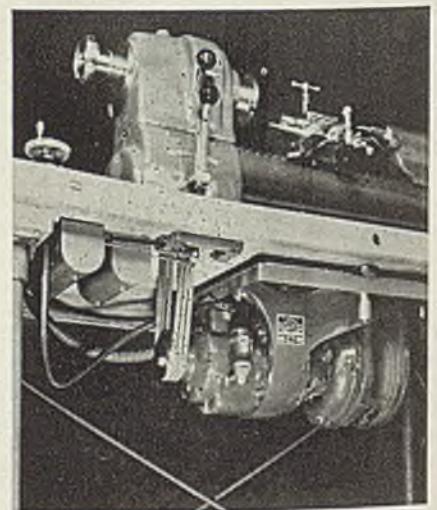


Sabin hand truck handles barrels and drums from keg size to 36 inches high

with this truck one man can pick up and transport loads up to 900 pounds, and design is particularly adapted for restricted spaces.

**Bench Lathe—**

Hardinge Bros. Inc., Elmira, N. Y., has announced the Cataract bench



Cataract bench lathe is equipped with New Departure variable speed transitorq drive and two-speed reversible motor

lathe with New Departure variable speed transitorq drive. Transitorq has a range of 1 to 10 ratio between low and high speeds and the two-speed reversible motor has 1 to 2 ratio, giving the machine spindle a double speed range of 1 to 20, or 150 revolutions per minute and all intermediate speeds to 3000 revolutions per minute. With transitorq hand wheel set for 1000 revolutions per minute, changing lever from low to high position immediately changes speed to 2000 revolutions per minute or vice versa; thus there are two immediate speeds in every position of the transitorq. It is not necessary to turn hand wheel slowly to get any low-high or high-low speed change. Long lever gives low, stop, high speed change, short lever gives reverse, brake stop, forward speed change. Levers operate electrical motor controls and the short lever also applies a spindle brake. Modern design places transitorq and motor toward back of bench out of the way of operator's knees and mounting for transitorq and motor is completely rubber insulated against vibration. Provision is made for quick and easy adjustment of belts. The lathe is available in five sizes from ½ to 1-inch collet capacity and 7 or 9-inch swing.

#### Right Angle Drill—

Independent Pneumatic Tool Co., Aurora, Ill., has announced the Thor U14R, 3/16 and ¼-inch capacity, right angle, portable electric drill, claimed to have smallest working clearance of any right angle drill. Drill head measures but 2½ inches overall and the angle attachment can be turned and clamped in any position, making it possible to drill in many places formerly considered inaccessible, it is claimed. Unit weighs 3 pounds and overall length is 9¼ inches. Streamlined design and compact construction permit one-hand operation. It is equipped with 1/16, 3/32, ¼, 5/32 and 3/16-inch collets for twist drills, offering a wide drilling range, and can also be supplied with spindle to take 3/16-inch chuck. Spindle



Thor U14R model is claimed to have smallest working clearance of any right angle drill

offset is 13/32-inch. The new unit operates at a speed of 2700 revolutions per minute, but a 3750 and a 5100-revolutions per minute model are also available.

#### Cable Cap—

Rattan Mfg. Co., New Haven, Conn., has designed a new cap for service entrance cable. Cap is made to require use of only one screw to hold it on, instead of two. It is secured by a pin-like formation on one side and a brass screw on the other, screw being upset so it cannot fall out. The entrance cap accommodates a large number of

sizes of service entrance cable, is a compact unit, and shim method of holding cable in place under brass set screw is claimed to be highly efficient.

#### Blenders—

Patterson Foundry & Machine Co., East Liverpool, O., has developed and placed on the market a complete line of blenders for use in oil refineries and in chemical process plants. The blenders, for which high efficiency is claimed, are suitable for rapid and uniform blending of asphalt cut-backs, oils, and similar substances. Units are available



The production of centrifugal castings . . . castings "spun" under pressure to purge them of all oxides and impurities . . . is an important service of Ampco Metal, Inc. to industry.

The greater density, longer life, and cleaner metal resulting from the centrifugal method are its outstanding advantages . . . and Ampco Metal, Inc. has developed the technique of centrifugal casting to provide these advantages in fullest measure.

Centrifugal castings can be had in any size range from one pound to two tons each . . . from small gears and bearings for machine tools to 4,000 pound screw down nuts for the steel industry . . . in either Ampco Metal or Aluminum Bronze.

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Dept. S 11-15, Milwaukee, Wis.

In some one of its six grades Ampco Metal can very probably solve a problem for you . . . why not check with us?



The book "Ampco Metal—Its Uses in Modern Industry" will interest you; write for a copy.

**AMPCO METAL**  
*"The Metal without an Equal"*

BEFORE YOU SPECIFY . . . INVESTIGATE AMPCO

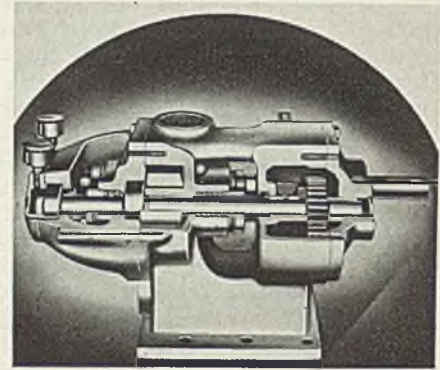
in several sizes and in plain steel, Monel metal, nickel clad and aluminum. They are built in both belt and motor-driven types.

#### Pump Units—

Bump Pump Co., La Crosse, Wis., is manufacturing a line of industrial pump units of positive displacement type. Operating at slow speeds, they eliminate churning and agitation of the product being handled. Liquid or semiliquid is drawn into the inlet port through a positive vacuum suction and expelled at the outlet side through a

piston action. Liquid drawn into the inlet port is handled but once, seal between the two rotors preventing possibility of any of the liquid returning to the pumping chamber. Accuracy of delivery is claimed under practically all existing conditions and against vacuums as high as 28 inches or against head pressures up to 100 pounds. Used as a metering pump, accuracy of delivery within 5 per cent by volume is claimed. Impellor face plate, ball-bearing face plate, impellor housing, gear case, gear cover and pump base are of quality cast gray iron. Impellers are furnished according to

requirements and are cast of iron or bronze. Shafts are quality steel. Ball bearings are used in the fore part of the pump and sleeve bearings in four places on each shaft to the rear of the pump. Capacities

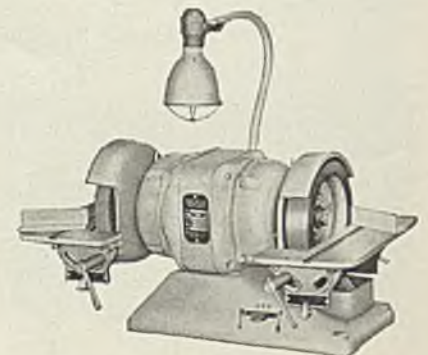


Bump pumps operate at slow speeds and eliminate churning and agitation of product being handled

of the pumps range from 600 to 6000 gallons per hour and the pumps are driven at 500 to 700 revolutions per minute.

#### Carbide Tool Grinder—

Baldor Electric Co., 4351 Duncan avenue, St. Louis, Mo., has announced the development of a grinder designed for the purpose of sharpening carbide tools. Machine is equipped with two wheels, one for roughing and one for finishing operations, and is powered with a ½-horsepower, reversible motor so that either right-hand or left-hand tools may be sharpened with the wheel always rotating toward the cutting edge of the tool. Unit is designed to take a silicon cup wheel on the left-hand side and a silicon or diamond cup wheel on right-hand side. Standard equipment includes 3½ x 10-inch tool rest tables, protractor at each end of grinder to indicate angle of tool table, light which may be swung over either wheel.



Baldor grinder was developed for express purpose of sharpening carbide tools

**For over  
70 years  
PORTERS**  
HAVE CONCLUSIVELY  
PROVED THEIR  
EXTRA POWER...  
EXTRA ECONOMY...  
EXTRA LONG LIFE  
IN MANY OF THE  
COUNTRY'S LARGEST  
STEEL PLANTS!

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ESTABLISHED 1866

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**PORTER**  
"better built"  
locomotives

# MATERIALS HANDLING



## Crushing of Turnings Simplifies Handling

(Concluded from Page 54)

ings and would cause damage to the crusher elements. From the crushers, the material passes to elevators of the continuous-bucket type, which in turn deliver it to the storage bin compartments, one for each of the two types of steel.

Located adjacent to a railroad spur, the storage bin has three compartments, each measuring 1200 cubic feet, the capacity of a 40-foot gondola car. Two of these compartments receive the two types of steel turnings while the third is provided for cast-iron borings. The latter material does not require crushing and is delivered to its compartment through a chute opening in the wringer-house floor direct to a third continuous bucket elevator. From the bin compartments, the crushed turnings and cast-iron borings are delivered to railroad cars through hinged chutes and vertical slide gates operated by hand winches. One of the illustrations shows the loading of a gondola car.

To summarize advantages of a turnings handling system, it has been found that: (1) Crushed turnings are handled, stored and shipped more conveniently; (2) handling cost is reduced materially; (3) a car may be loaded in 1 or 2 hours instead of as many days by usual methods; (4) workmen are safeguarded against injury; (5) fire hazards are eliminated; (6) freight charges are less as more tons can be shipped per car; (7) as short uniform chips are preferred by the scrap consumer, the material commands better prices; (8) the system facilitates shipping of several metals separately at still better prices; and (9) system adds to plant orderliness and general efficiency.

## Time in Handling Is Most Costly Item

J. R. Weaver, director of equipment inspection and test, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., in a recent address before a group of machine tool dealers, made the following statement on the subject of materials handling: "The most costly item in any industry is handling time. A number of industries have made checks of this particular item and handling time in an average

manufacturing plant is from 50 to 80 per cent of the production time. This is one of the things that the machine tool industry should take under advisement."

## Papers Presented In Published Symposium

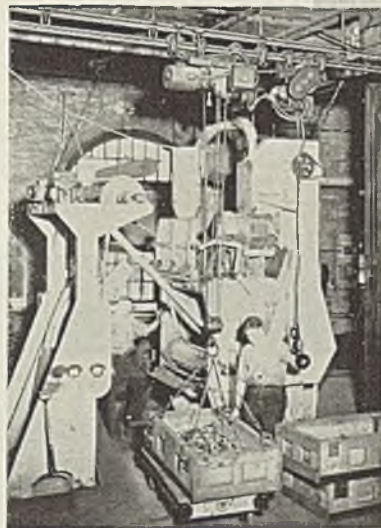
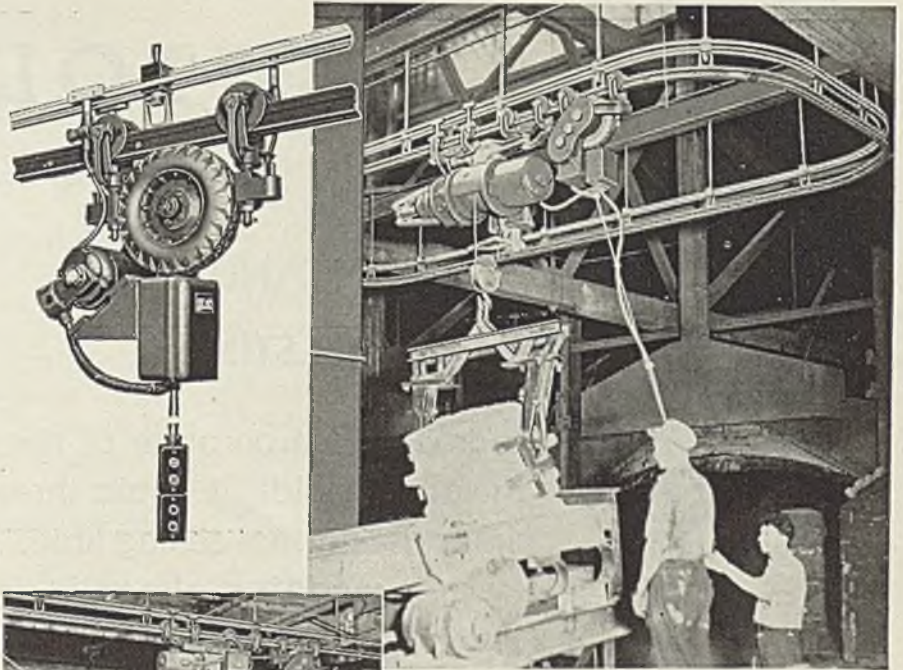
■ In the recently published symposium on "Wear of Metals" issued by American Society for Testing Materials, 260 South Broad street, Philadelphia, six technical papers are discussed. The papers are those presented at the society's

meeting in Philadelphia last April.

Subjects covered in the symposium include considerations involved in the wear testing of metals which covers the definitions of wear along with a bibliography of 137 important references, wear testing of cast iron, wear of metals from the automotive viewpoint, wear of metals from the power equipment viewpoint, wear of metals in the textile industry and wear of metals from the railroad viewpoint.

With the support of illustrations, graphs and drawings, the publication represents a compact and convenient source of information on this subject.

# American Mono Tractors accelerate foundry handling



By eliminating the "heave" and "tug" labor of handling loaded annealing pots through shakeout process, a modern foundry cut 64% from the cost of unloading its furnaces.

This remarkable saving lead to the installation of similar systems in the cleaning department. Small castings now are tumblasted, sorted and weighed with but one rehandling from original tote boxes.

A mere touch of the finger moves heavy loads on hoists, cranes or carriers by means of the rubber wheel drive. Unlimited application of electric controls permits remote and automatic operations.

Specialized engineering experience is available without cost to help solve your handling problems. Write for 24 page book describing the American MonoTractor.

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# 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

**Shop Equipment**—Atlas Press Co., Kalamazoo, Mich., has issued a folder on its lathes, drill presses and the new Atlas shaper.

2727 South Troy street, Chicago, has issued an illustrated folder on Kleen-Kut soluble cutting oil.

**Cutting Oils**—D. A. Stuart Oil Co.,

**Flame Hardening**—National Cylinder Gas Co., 205 West Wacker

drive, Chicago, has issued a bulletin listing the advantages of the National flame-hardening process.

**Gearing**—D. O. James Mfg. Co., 1114 Monroe street, Chicago, has published a new catalog covering gears and speed reducers of all types and with complete engineering data.

**Certified Instruments** — Foxboro Co., Foxboro, Mass., has issued a 16-page folder describing the significance of the seal of certification now attached to every Foxboro instrument.

**Strip Gages**—Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., has issued an illustrated bulletin entitled "Controlled Strip Thickness" and dealing with the use of Electrolimit Mill Gages to give continuous strip thickness readings to 0.010-inch.

**Industrial Lighting** — Benjamin Electric Mfg. Co., Des Plaines, Ill., has compiled catalog No. 26, a 352-page booklet on industrial lighting, flood lighting and signals. Included are data, specifications, engineering recommendations, floor layout plans and intensity formulae.

**Dust Information**—Mine Safety Appliances Co., Braddock, Thomas and Meade streets, Pittsburgh, has issued a new booklet entitled "Pertinent Questions and Answers Concerning Dusts." Insofar as possible, non-technical language is used. Dusts containing free silica are especially discussed.

**Alloys, Cutting Tools** — Haynes Stellite Co., 205 East 42nd street, New York City, Kokomo, Ind., has issued a booklet entitled "The Haynes Stellite Library" which deals with its eighteen publications on hard-facing alloys, cutting tools and alloys for chemical processing equipment.

**Potentiometers** — Brown Instrument Co. division, Minneapolis-Honeywell Regulator Co., Philadelphia, has issued a folder on its Multi-Color numeral recording instruments and announced its new potentiometer pyrometer catalog describing complete line of pyrometers.

**Electrical Equipment** — General Electric Co., Schenectady, N. Y., has issued two GEA bulletins, 2424B on transformers and protective equipment, 2790 on electric furnaces for scale-free hardening, and also bulletin GES-1092B on "How to Select Instruments for Motor Testing."



## Shrinkage Problems Solved with **LIQUITOL** for **IRON AND STEEL CASTINGS**

Increases temperature of riser metal.....Holds it liquid three times the normal setting time...  
Permits feeding of castings.

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Cupolas—Ladles  
Slag Holes—Crucibles

**THE  
ALPHA·LUX  
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192 Front St., New York City

# Quiet Steel Market Seen to Year's End

## Output at New Low; Scrap Down Further; Auto Output Off

**G**ENERAL buying of steel continues at a minimum and occasional awards of important tonnages are not sufficient to maintain production schedules. Consumers seem intent on reducing steel inventories and keeping them at a low point.

Outlets usually taking a steady flow of tonnage are buying almost nothing, such as the automotive and railroad equipment builders, although some small business is appearing in the latter field and the former is relied on to increase its requirements before the end of the year. Sentiment is increasing among steel-makers that fourth quarter will offer little major improvement in demand.

In keeping with light buying of steel producers have shortened production further and last week the national rate declined 8 points to 39 per cent of capacity, the lowest since July, 1935. In all centers except Buffalo, where there was a rise of 8 points to 30 per cent of capacity, the rate declined or remained stationary. Pittsburgh lost 9 points to 32 per cent, Chicago 7 points to 35, Youngstown 8 points to 43, Cleveland 19 points to 35, Cincinnati 29 points to 15, Detroit 8 points to 82 and St. Louis 9.1 points to 33.3. Eastern Pennsylvania is unchanged at 38 per cent, Wheeling at 54, Birmingham at 54 and New England at 30.

Some encouraging tonnages are being placed or are in prospect. Three plate producers have divided 13,950 tons for 45 large tanks for Japanese interests at San Francisco. The navy will open bids Nov. 16 for 21,474 tons of bars, plates and shapes for two battleships to be built in eastern yards.

Higher freight rates go into effect Nov. 15 and on hauls of more than about 30 miles will add one cent per 100 pounds to delivered prices of finished steel. On pig iron the maximum additional freight charge is 20 cents per ton. On shorter hauls it will be 10 per cent, with adjustment of fractions.

Steel ingot production in October was 3,392,691 gross tons, 21 per cent below that of September and 25 per cent lower than in October, 1936. In spite of this heavy decline the total for ten months, 45,891,460 tons, is only 4 per cent below the corresponding months of 1929. A possibility exists of equaling or exceeding the 1929 record, as December production that year was light. However, in the face of continued recession in November, a new record seems

### MARKET IN TABLOID

**DEMAND** . . . . . *Slow, consumers keeping stocks low for inventory.*

**PRICES** . . . . . *Steady, new freight rates make slight increase.*

**PRODUCTION** . . . . . *Operations down 8 points to 39 per cent of capacity.*

**SHIPMENTS** . . . . . *Light, most buyers asking prompt delivery.*

improbable, though 1937 will take at least second place on the basis of performance so far.

Finished steel shipped by the United States Steel Corp. in October totaled 792,310 tons, compared with 1,047,962 tons in September and with 1,007,417 tons in October last year. However, for ten months this year the aggregate was 11,749,156 tons, compared with 8,875,124 tons for the same period of 1936.

Automobile production continues slow in gathering momentum and last week totaled 85,325 units, compared with 89,770 the preceding week. General Motors last week made 45,110 cars, compared with 46,215, Chrysler 22,100 compared with 26,000, Ford 2650 compared with 1250 and others 15,465 compared with 16,305.

Pig iron producers generally have announced that current prices will be continued in effect for first quarter deliveries, thus stabilizing the market and ending all rumors that a change might be made. One factor in arriving at this decision has been the sharp decline in the price of steelmaking scrap, the direct competitor of pig iron.

Trade associations of Great Britain have reaffirmed current prices of basic pig iron to June 30, 1938, and steel products to the end of 1938. This is expected to release heavy inquiry previously held back by price uncertainty.

Scrap prices continue to recede, as a result of absence of buying, most quotations being largely nominal. Railroads have rejected bids on their offerings in many instances, preferring to hold the material rather than accept low prices. The composite price of steelmaking scrap last week dropped 63 cents, to \$13.41, the lowest since the last week of July, 1936. The decline at Chicago was about 75 cents, at Pittsburgh \$1 and in Eastern Pennsylvania no change was apparent. Adjustments in scrap items brought the iron and steel composite down 30 cents, to \$38.87. The finished steel composite is unchanged at \$61.70.

## COMPOSITE MARKET AVERAGES

	Nov. 13	Nov. 6	Oct. 30	One Month Ago Oct., 1937	Three Months Ago Aug., 1937	One Year Ago Nov., 1936	Five Years Ago Nov., 1932
Iron and Steel . . . .	\$38.87	\$39.17	\$39.33	\$39.59	\$40.34	\$34.65	\$28.79
Finished Steel . . . .	61.70	61.70	61.70	61.70	61.70	53.90	47.20
Steelworks Scrap..	13.41	14.04	14.46	15.93	20.41	16.05	6.87

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	Nov. 13, 1937	Oct. 1937	Aug. 1937	Nov. 1936	Pig Iron	Nov. 13, 1937	Oct. 1937	Aug. 1937	Nov. 1936
Steel bars, Pittsburgh . . . . .	2.45c	2.45c	2.45c	2.05c	Bessemer, del. Pittsburgh . . . . .	\$25.26	\$25.26	\$25.26	\$20.8132
Steel bars, Chicago . . . . .	2.50	2.50	2.50	2.10	Basic, Valley . . . . .	23.50	23.50	23.50	19.00
Steel bars, Philadelphia . . . . .	2.74	2.74	2.74	2.36	Basic, eastern del. East. Pa. . . . .	25.26	25.26	25.26	21.81
Iron bars, Terre Haute, Ind. . . . .	2.35	2.35	2.35	1.95	No. 2 fdy., del. Pittsburgh. . . . .	25.21	25.21	25.21	20.3132
Shapes, Pittsburgh . . . . .	2.25	2.25	2.25	1.90	No. 2 fdy., Chicago . . . . .	24.00	24.00	24.00	19.75
Shapes, Philadelphia . . . . .	2.45 ½	2.45 ½	2.45 ½	2.11 ½	Southern No. 2, Birmingham. . . . .	20.38	20.38	20.38	15.75
Shapes, Chicago . . . . .	2.30	2.30	2.30	1.95	Southern No. 2, del. Cincinnati. . . . .	23.69	23.69	23.69	19.69
Tank plates, Pittsburgh . . . . .	2.25	2.25	2.25	1.90	No. 2 X eastern, del. Phila. . . . .	26.135	26.135	26.135	22.68
Tank plates, Philadelphia . . . . .	2.43 ½	2.43 ½	2.43 ½	2.09	Malleable, Valley . . . . .	24.00	24.00	24.00	19.50
Tank plates, Chicago . . . . .	2.30	2.30	2.30	1.95	Malleable, Chicago . . . . .	24.00	24.00	24.00	19.75
Sheets, No. 10, hot rolled, Pitts. . . . .	2.40	2.40	2.40	1.95	Lake Sup., charcoal, del. Chicago . . . . .	30.04	30.04	30.04	25.87
Sheets, No. 24, hot ann., Pitts. . . . .	3.15	3.15	3.15	2.60	Gray forge, del. Pittsburgh. . . . .	24.17	24.17	24.17	19.6741
Sheets, No. 24, galv., Pitts. . . . .	3.80	3.80	3.80	3.20	Ferromanganese, del. Pittsburgh . . . . .	107.29	107.29	107.29	80.13
Sheets, No. 10, hot rolled, Gary. . . . .	2.50	2.50	2.50	2.05					
Sheets, No. 24, hot anneal, Gary . . . . .	3.25	3.25	3.25	2.70	<b>Scrap</b>				
Sheets, No. 24, galvan., Gary. . . . .	3.90	3.90	3.90	3.30	Heavy melting steel, Pittsburgh. . . . .	\$13.75	\$17.15	\$21.85	\$17.40
Plain wire, Pittsburgh . . . . .	2.90	2.90	2.90	2.50	Heavy melt. steel, No. 2, E. Pa. . . . .	12.25	14.01	18.00	13.75
Tin plate, per base box, Pitts. . . . .	\$5.35	\$5.35	\$5.35	\$5.25	Heavy melting steel, Chicago. . . . .	12.75	13.95	19.75	16.50
Wire nails, Pittsburgh . . . . .	2.75	2.75	2.75	2.05	Rails for rolling, Chicago . . . . .	15.25	17.25	21.75	17.25
					Railroad, steel specialties, Chicago . . . . .	16.75	19.35	22.25	18.25
<b>Semifinished Material</b>					<b>Coke</b>				
Sheet, bars, open-hearth, Youngs. . . . .	\$37.00	\$37.00	\$37.00	\$32.00	Connellsville, furnace, ovens. . . . .	\$4.37	\$4.40	\$4.50	\$4.00
Sheet bars, open-hearth, Pitts. . . . .	37.00	37.00	37.00	32.00	Connellsville, foundry, ovens. . . . .	5.25	5.25	5.30	4.25
Billets, open-hearth, Pittsburgh. . . . .	37.00	37.00	37.00	32.00	Chicago, by-product foundry, del. . . . .	11.00	11.00	11.00	9.75
Wire rods, No. 5 to ½-inch, Pitts. . . . .	47.00	47.00	47.00	40.00					

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

<b>Sheet Steel</b>	<b>Tin Mill Black No. 28</b>	<b>Corrosion and Heat-Resistant Alloys</b>	<b>Structural Shapes</b>
Prices Subject to Quantity Extras and deductions (Except Galvanized)	Pittsburgh . . . . . 3.30c	Pittsburgh base, cents per lb. Chrome-Nickel	Pittsburgh . . . . . 2.25c
<b>Hot Rolled No. 10, 24-48 in.</b>	Gary . . . . . 3.40c	No. 302 No. 304	Philadelphia, del. . . . . 2.45 ½ c
Pittsburgh . . . . . 2.40c	St. Louis, delivered . . . . . 3.53c	Bars . . . . . 24.00 25.00	New York, del. . . . . 2.50 ¼ c
Gary . . . . . 2.50c	Granite City, Ill. . . . . 3.50c	Plates . . . . . 27.00 29.00	Boston, delivered . . . . . 2.63 ½ c
Chicago, delivered . . . . . 2.53c	<b>Cold Rolled No. 10</b>	Sheets . . . . . 34.00 36.00	Bethlehem . . . . . 2.35c
Detroit, del. . . . . 2.60c	Pittsburgh . . . . . 3.10c	Hot strip . . . . . 21.50 23.50	Chicago . . . . . 2.30c
New York, del. . . . . 2.73c	Gary . . . . . 3.20c	Cold strip . . . . . 28.00 30.00	Cleveland, del. . . . . 2.45c
Philadelphia, del. . . . . 2.69c	Detroit, delivered . . . . . 3.30c		Buffalo . . . . . 2.35c
Birmingham . . . . . 2.55c	Philadelphia, del. . . . . 3.39c	<b>Straight Chromes</b>	Gulf Ports . . . . . 2.05c
St. Louis, del. . . . . 2.63c	New York, del. . . . . 3.43c	No. No. No. No.	Birmingham . . . . . 2.40c
Granite City, Ill. . . . . 2.60c	St. Louis, del. . . . . 3.33c	410 430 442 446	Pacific ports, f.o.b. cars, dock . . . . . 2.80c
Pacific ports, f.o.b. dock . . . . . 2.95c	Granite City, Ill. . . . . 3.30c	Bars . . . . . 18.50 19.00 22.50 27.50	St. Louis, del. . . . . 2.52c
<b>Hot Rolled Annealed No. 24</b>	Pacific ports, f.o.b. dock . . . . . 3.70c	Plates . . . . . 21.50 22.00 25.50 30.50	<b>Bars</b>
Pittsburgh . . . . . 3.15c	<b>Cold Rolled No. 20</b>	Sheets . . . . . 26.50 29.00 32.50 36.50	<b>Soft Steel</b>
Gary . . . . . 3.25c	Pittsburgh . . . . . 3.55c	Hot strip . . . . . 17.00 17.50 23.00 28.00	(Base, 3 to 25 tons)
Chicago, delivered . . . . . 3.28c	Gary . . . . . 3.65c	Cold stp. . . . . 22.00 22.50 28.50 36.50	Pittsburgh . . . . . 2.45c
Detroit, delivered . . . . . 3.35c	Detroit, delivered . . . . . 3.75c		Chicago or Gary . . . . . 2.50c
New York, del. . . . . 3.48c	Philadelphia, del. . . . . 3.84c	<b>Steel Plate</b>	Duluth . . . . . 2.60c
Philadelphia, del. . . . . 3.44c	New York, del. . . . . 3.88c	Pittsburgh . . . . . 2.25c	Birmingham . . . . . 2.80c
Birmingham . . . . . 3.30c	St. Louis . . . . . 3.78c	New York, del. . . . . 2.53c	Cleveland . . . . . 2.50c
St. Louis, del. . . . . 3.38c	Granite City, Ill. . . . . 3.75c	Philadelphia, del. . . . . 2.43 ½ c	Buffalo . . . . . 2.55c
Granite City, Ill. . . . . 3.35c	<b>Enamelling Sheets</b>	Boston, delivered . . . . . 2.65c	Detroit, delivered . . . . . 2.60c
Pacific ports, f.o.b. dock . . . . . 3.80c	Pittsburgh, No. 10 . . . . . 2.90c	Buffalo, delivered . . . . . 2.50c	Pacific ports, f.o.b. cars, dock . . . . . 3.00c
<b>Galvanized No. 24</b>	Pittsburgh, No. 20 . . . . . 3.50c	Chicago or Gary . . . . . 2.30c	Philadelphia, del. . . . . 2.74c
Pittsburgh . . . . . 3.80c	Gary, No. 10 . . . . . 3.00c	Cleveland, del. . . . . 2.44 ½ c	Boston, delivered . . . . . 2.85c
Gary . . . . . 3.90c	Gary, No. 20 . . . . . 3.60c	Birmingham . . . . . 2.40c	New York, del. . . . . 2.78c
Chicago, delivered . . . . . 3.93c	St. Louis, No. 10 . . . . . 3.13c	Coatesville, base . . . . . 2.35c	Pitts., forg. qual. . . . . 2.80c
Philadelphia, del. . . . . 4.09c	St. Louis, No. 20 . . . . . 3.73c	Sparrows Pt., base . . . . . 2.35c	<b>Rail Steel</b>
New York, delivered . . . . . 4.13c	<b>Tin and Terne Plate</b>	Pacific ports, f.o.b. cars, dock . . . . . 2.80c	To Manufacturing Trade
Birmingham . . . . . 3.95c	Gary base, 10 cents higher	St. Louis, delivered . . . . . 2.52c	Pittsburgh . . . . . 2.30c
St. Louis, del. . . . . 4.03c	Tin plate, coke, (base box), Pittsburgh . . . . . \$5.35		Chicago or Gary . . . . . 2.35c
Granite City, Ill. . . . . 4.00c	Waste-waste, 2.75c; strip . . . . . 2.50c		Cleveland . . . . . 2.35c
Pacific ports, f.o.b. dock . . . . . 4.40c	Long ternes, No. 24, unassorted, Pitts. . . . . 4.10c		Moline, Ill. . . . . 2.40c
			Buffalo . . . . . 2.40c
			Birmingham . . . . . 2.45c





# WAREHOUSE IRON AND STEEL PRICES

*Cents per pound for delivery within metropolitan districts of cities specified*

<p><b>STEEL BARS</b>                  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</p> <p><b>IRON BARS</b>                  Portland ..... 3.50c                  Chattanooga ..... 4.21c                  Baltimore* ..... 3.25c                  Cincinnati ..... 4.05c                  New York† (d) ..... 3.65c                  Philadelphia ..... 4.00c                  St. Louis ..... 4.09c</p> <p><b>REINFORCING BARS</b>                  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</p> <p><b>SHAPES</b>                  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</p> <p><b>PLATES</b>                  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, ½-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</p>	<p>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</p> <p><b>NO. 10 BLUE</b>                  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</p> <p><b>NO. 24 BLACK</b>                  Baltimore*† ..... 4.50c                  Birmingham ..... 4.40c                  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</p> <p><b>NO. 24 GALV. SHEETS</b>                  Baltimore*† ..... 4.70c                  Birmingham ..... 5.05c                  Buffalo ..... 5.45c                  Boston (g) ..... 5.30c                  Chattanooga* ..... 4.76c                  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                  New York† (d) ..... 5.47c                  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</p> <p><b>BANDS</b>                  Baltimore ..... 4.20c                  Boston† ..... 4.25c                  Buffalo ..... 4.22c                  Chattanooga ..... 4.41c                  Cincinnati ..... 4.25c                  Cleveland ..... 4.16c                  Chicago ..... 4.10c                  Detroit, R &amp; Und. 4.185c                  Houston ..... 3.35c                  Los Angeles ..... 4.80c                  Milwaukee ..... 4.21c                  New Orleans ..... 4.75c                  New York† (d) ..... 4.32c</p>	<p>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</p> <p><b>HOOPS</b>                  Baltimore ..... 4.45c                  Boston† ..... 5.25c                  Buffalo ..... 4.22c                  Chicago ..... 4.10c                  Cincinnati ..... 4.25c                  Detroit, 14 &amp; 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</p> <p><b>COLD FIN. STEEL</b>                  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</p> <p>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</p> <p><b>COLD ROLLED STRIP</b>                  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</p> <p><b>TOOL STEELS</b>                  (Applying on or east of Mississippi river; west of Mississippi l. up.)</p> <p>Base                  High speed ..... 69c                  High carbon, Cr. .... 45c                  Oil hardening ..... 26c                  Special tool ..... 24c                  Extra tool ..... 20c                  Regular tool ..... 16c                  Water hardening 12½c                  Uniform extras apply.</p> <p><b>BOLTS AND NUTS</b>                  (100 pounds or over)</p> <p>Discount                  Birmingham ..... 50-10                  Chicago (a) ..... 55 to 60                  Cleveland ..... 60-5-5                  Detroit ..... 70-10                  Milwaukee ..... 60 to 65</p>	<p>New Orleans .. 60                  Pittsburgh .... 65-5</p> <p>(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.</p> <p>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.</p> <p>†Domestic steel;                  *Plus quantity extras;                  **One to 9 bundles;                  *† 50 or more bundles;                  †New extras apply;                  ††Base 10,000 lbs., extras on less.</p>
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## Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 10

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
<b>PIG IRON</b>				
Foundry, 2.50-3.00 Silicon	\$30.00	6 0 0	\$20.95	£ 12 0
Basic bessemer			20.95	12 0
Hematite, Phos. .03-.05	36.25	7 5 0		
<b>SEMIFINISHED STEEL</b>				
Billets	\$39.38	7 17 6	\$43.20	5 7 6
Wire rods, No. 5 gage	\$4.13	10 16 6	49.22	6 2 6
<b>FINISHED STEEL</b>				
Standard rails	\$50.63	10 2 6	\$46.20	5 15 0
Merchant bars	2.73c	12 5 0	2.18c to 2.28c	6 0 0 to 6 5 0
Structural shapes	2.37c	10 12 6	1.96c	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	4.01c	11 0 0
Bands and strips	3.07c	13 15 0	2.37c	6 10 0
Plain wire, base	4.35c	19 10 0	2.54c	7 0 0
Galvanized wire, base	5.18c	25 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.	\$ 6.00	1 4 0		

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	\$25.25	5 1 0(a)	\$18.84	554
Basic bessemer pig iron	25.00	5 0 0(a)		\$27.20
Furnace coke	9.38	1 17 6	6.43	189
Billets	39.38	7 17 6	25.76	757.50
Standard rails	2.26c	10 2 6	1.62c	1,080
Merchant bars	2.55c	11 9 0	1.49c	995
Structural shapes	2.46c	11 0 6	1.46c	970
Plates, ¼-in. or 5 mm.	2.61c	11 14 3	1.86c	1,240
Sheets, black	3.51c	15 15 0r	2.25c	1,500f
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.35c	19 10 0	3.38c	2,250
Plain wire	4.35c	19 10 0	2.28c	1,520
Bands and strips	2.72c	12 4 0	1.68c	1,120
				800
				\$25.47
				28.10 (b)
				7.78
				19
				96.50
				132
				110
				107
				127
				144†
				370
				173
				127

\*Basic. †British ship-plates. Continental, bridge plates, ¼ ga. \$1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlebrough. b hematite. ††Close annealed.  
 \*\*Gold pound sterling carries a premium of 65.3 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 14.00  
Birmingham, † No. 2 13.00  
Bos. dock No. 1 exp. 13.00-13.50  
N. Eng. del. No. 1 13.50  
Buffalo, No. 1 13.00-13.50  
Buffalo, No. 2 11.00-11.50  
Chicago, No. 1 12.50-13.00  
Cleveland, No. 1 13.50-14.00  
Cleveland, No. 2 12.50-13.00  
Detroit, No. 1 9.00-9.50  
Eastern Pa., No. 1 14.00-14.50  
Eastern Pa., No. 2 12.00-12.50  
Federal, Ill. 12.50-13.00  
Granite City, R. R. 14.25-14.75  
Granite City, No. 2 12.50-13.00  
New York, No. 1 †13.00  
N. Y. dock No. 1 exp 13.00-13.50  
Pitts., No. 1 (R. R.) 14.00-14.50  
Pitts., No. 1 (dir.) 13.50-14.00  
Pittsburgh, No. 2 12.50-13.00  
St. Louis, R. R. 14.25-14.75  
St. Louis, No. 2 12.50-13.00  
San Francisco, No. 1 14.00-15.00  
Toronto, dirs. No. 1 12.00  
Toronto, No. 2 11.00  
Valleys, No. 1 14.50-15.00

**COMPRESSED SHEETS**

Buffalo, dealers 11.00-11.50  
Chicago, factory 11.50-12.00  
Chicago, dealer 11.00-11.50  
Cleveland 13.00-13.50  
Detroit 10.00-10.50  
E. Pa., new mat. 14.00-14.50  
E. Pa., old mat. 10.50-11.00  
Pittsburgh 13.50-14.00  
St. Louis 10.00-10.50  
Valleys 14.00-14.50

**BUNDLED SHEETS**

Buffalo 9.50-10.00  
Cincinnati, del. 9.50-10.00  
Cleveland 10.00-10.50  
Pittsburgh 13.00-13.50  
St. Louis 9.00-9.50  
Toronto, dealers 8.00

**SHEET CLIPPINGS, LOOSE**

Chicago 8.00-8.50  
Cincinnati 8.50-9.00  
Detroit 7.00-7.50  
St. Louis 8.00-8.50

**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 17.00-17.50

**STEEL RAILS, SCRAP**

Boston district †12.00  
Buffalo 15.50-16.00  
Chicago 12.50-13.00  
Cleveland 17.50-18.00  
Pittsburgh 14.50-15.00  
St. Louis 14.00-14.50

**STOVE PLATE**

Birmingham 9.50-10.00  
Boston district †7.00  
Buffalo 11.50-12.00  
Chicago, net 9.00-9.50  
Cincinnati, dealers 7.50-8.00  
Detroit, net 8.50-9.00  
Eastern Pa. 12.50-13.00  
New York, fdry. †8.50-9.00  
St. Louis 10.00-10.50  
Toronto, deal'rs, net 10.00

**SPRINGS**

Buffalo 18.00-18.50  
Chicago, coil 18.00-18.50  
Chicago, leaf 16.50-17.00  
Eastern Pa. 19.50-20.00  
Pittsburgh 17.00-17.50  
St. Louis 18.00-18.50

**ANGLE BARS—STEEL**

Chicago 14.50-15.00  
St. Louis 16.00-16.50

**RAILROAD SPECIALTIES**

Chicago 16.50-17.00

**LOW PHOSPHORUS**

Buffalo, billet and bloom crops 18.50-19.00  
Cleveland, billet, bloom crops 22.00-22.50  
Eastern Pa., crops 19.50-20.00  
Pittsburgh, billet, bloom crops 18.00-18.50  
Pittsburgh, sheet bar crops 17.00-17.50

**FROGS, SWITCHES**

Chicago 12.50-13.00  
St. Louis, cut 14.00-14.50

**SHOVELING STEEL**

Federal, Ill. 12.50-13.00  
Granite City, Ill. 12.50-13.00  
Toronto, dealers 10.00

**RAILROAD WROUGHT**

Birmingham 13.50-14.00  
Boston district †9.00-9.50  
Buffalo, No. 1 11.00-11.50  
Buffalo, No. 2 13.00-13.50  
Chicago, No. 1 net 11.00-11.50  
Cincinnati, No. 2 11.00-11.50  
Eastern Pa., No. 1 15.50-16.00  
St. Louis, No. 1 9.50-10.00  
St. Louis, No. 2 14.25-14.75  
Toronto, No. 1 dir. 16.00

**SPECIFICATION PIPE**

Eastern Pa. 15.50-16.00  
New York †9.50-10.00

**BUSHELING**

Buffalo, No. 1 11.00-11.50  
Chicago, No. 1 11.50-12.00  
Cincin., No. 1, deal. 12.00-12.50  
Cincinnati, No. 2 7.00-7.50  
Cleveland, No. 2 9.50-10.00  
Detroit, No. 1, new 9.00-9.50  
Valleys, new, No. 1 14.00-14.50  
Toronto, dealers 9.00

**MACHINE TURNINGS**

Birmingham 8.00-7.00  
Buffalo 9.00-9.50  
Chicago 7.00-7.50  
Cincinnati, dealers 7.50-8.00  
Cleveland 8.50-9.00  
Detroit 5.00-5.50  
Eastern Pa. 10.00-10.50  
New York †7.50-8.00  
Pittsburgh 7.50-8.00  
St. Louis 7.00-7.50  
Toronto, dealers 8.00-8.50  
Valleys 10.50-11.00

**BORINGS AND TURNINGS**

For Blast Furnace Use  
Boston district †3.50-4.00

Buffalo 9.00-9.50  
Cincinnati, dealers 6.50-7.00  
Cleveland 10.00-10.50  
Detroit 6.00-6.50  
Eastern Pa. 9.00  
New York †5.00-5.50  
Pittsburgh 7.50-8.00  
Toronto, dealers 8.00-8.50

**CAST IRON BORINGS**

Birmingham 8.00  
Boston dist. chem. †7.50-8.00  
Bos. dist. for mills †7.00-7.50  
Buffalo 9.00-9.50  
Chicago 8.50-9.00  
Cincinnati, dealers 6.50-7.00  
Cleveland 10.00-10.50  
Detroit 6.00-6.50  
E. Pa., chemical 12.50-13.00  
New York †5.00-5.50  
St. Louis 6.00-6.50  
Toronto, dealers 9.00

**PIPE AND FLUES**

Cincinnati, dealers 7.50-8.00  
Chicago, net 9.00-9.50

**RAILROAD GRATE BARS**

Buffalo 9.50-10.00  
Chicago, net 9.00-9.50  
Cincinnati 7.50-8.00  
Eastern Pa. 12.50-13.00  
New York †9.00-9.50  
St. Louis 11.00-11.25

**FORGE FLASHINGS**

Boston district †7.00  
Buffalo 11.00-11.50  
Cleveland 13.50-14.00  
Detroit 8.50-9.00  
Pittsburgh 12.50-13.00

**FORGE SCRAP**

Boston district †7.00  
Chicago, heavy 16.50-17.00

**ARCH BARS, TRANSOMS**

St. Louis 17.00-17.50

**AXLE TURNINGS**

Boston district †8.50  
Buffalo 13.00-13.50  
Chicago, elec. fur. 12.50-13.00  
Eastern Pa. 12.00-12.50  
St. Louis 10.00-10.50  
Toronto 9.50

**STEEL CAR AXLES**

Birmingham 19.00-20.00  
Buffalo 18.00-18.50  
Boston district †16.00  
Chicago, net 18.50-19.00  
Eastern Pa. 22.00-22.50  
St. Louis 19.50-20.00

**SHAFTING**

Boston district †16.00  
New York †16.50-17.00  
Eastern Pa. 20.00-20.50  
St. Louis 15.00-15.50

**CAR WHEELS**

Birmingham 17.00-18.00  
Boston dist., iron †12.50  
Buffalo, steel 18.50-19.00  
Chicago, iron 15.50-16.00  
Chicago, rolled steel 16.00-16.50

Cincinnati, iron 16.00-16.50  
Eastern Pa., iron 16.50-17.00  
Eastern Pa., steel 19.50-20.00  
Pittsburgh, iron 15.00-15.50  
Pittsburgh, steel 17.00-17.50  
St. Louis, iron 17.00-17.50  
St. Louis, steel 17.00-18.00

**NO. 1 CAST SCRAP**

Birmingham 15.50-16.00  
Boston, No. 1 mach. †12.50  
N. Eng. del. No. 2 14.00  
N. Eng. del. textile 15.50-16.00  
Buffalo, cupola 13.50-14.00  
Buffalo, mach. 14.50-15.00  
Chicago, agri. net 11.50-12.00  
Chicago, auto 12.00-12.50  
Chicago, rail'rd net 11.50-12.00  
Chicago, mach. net 12.50-13.00  
Cincin., mach. cup. 12.50-13.00  
Cleveland, mach. 18.00-18.50  
Eastern Pa., cupola 16.50-17.00  
E. Pa., mixed yard 14.00-14.50  
Pittsburgh, cupola 16.50-17.00  
San Francisco, del. 13.50-14.00  
Seattle 8.00-9.00  
St. Louis, No. 1 12.75-13.25  
St. L., No. 1, mach. 13.75-14.25  
Toronto, No. 1, mach., net 14.00-15.00

**HEAVY CAST**

Boston dist. break †9.50-10.00  
N. Eng., del. 12.50-13.00  
Buffalo, break 11.50-12.00  
Cleveland, break 15.50-16.50  
Detroit, break 10.00-10.50  
Detroit, auto net 12.50-13.00  
Eastern Pa. 14.50  
New York, break †11.00-11.50  
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. 15.00-15.50  
Cincin., agri. del. 12.50-13.00  
Cleveland, rail 16.50-17.00  
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 17.00-18.00  
Boston †12.00  
Chicago 15.00-15.50  
Eastern Pa. 18.50-19.00  
New York †15.50-16.00  
St. Louis 14.50-15.00

**LOCOMOTIVE TIRES**

Chicago (cut) 16.50-17.00  
St. Louis, No. 1 16.00-16.50

**LOW PHOS. PUNCHINGS**

Buffalo 17.50-18.00  
Chicago 16.50-17.00  
Eastern Pa. 19.50-20.00  
Pittsburgh (heavy) 16.50-17.00  
Pittsburgh (light) 15.50-16.00

**Iron Ore**

Lake Superior Ore  
Gross ton, 51½%  
Lower Lake Ports

Old range bessemer 55.25  
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. nominal  
Spanish No. Africa basic, 50 to 60% nom. 12.00  
Tungsten, sh. ton, unit, duty paid. nom. \$24.00  
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

# Sheets

Sheet Prices, Page 86

**Pittsburgh** — Activity in sheets shows no extensive change from last week, with specifications from automotive, household and agricultural sources in reduced volume compared to earlier months. Some consumers evidently are using more material than indicated by current orders, and thus it appears that sheet sellers must await until consumer inventories are depleted. Operations of common and full finished mills are down to 54 per cent, compared to 69 a month ago.

**Cleveland**—Producers report the rate of recession has shown signs of reversing and leveling off, for the first time in 30 days. It is believed that finishing operations have reached the low point, although some minor curtailments might still be necessary in some departments. Inventories of most consumers are still ample to satisfy current operations. However, the reverse is true in more instances than generally realized, as shown by the demand for prompt delivery on current specifications.

Some orders were placed recently by grave vault manufacturers, who are starting their season's production. One local stamping plant has received sizable releases from Chevrolet.

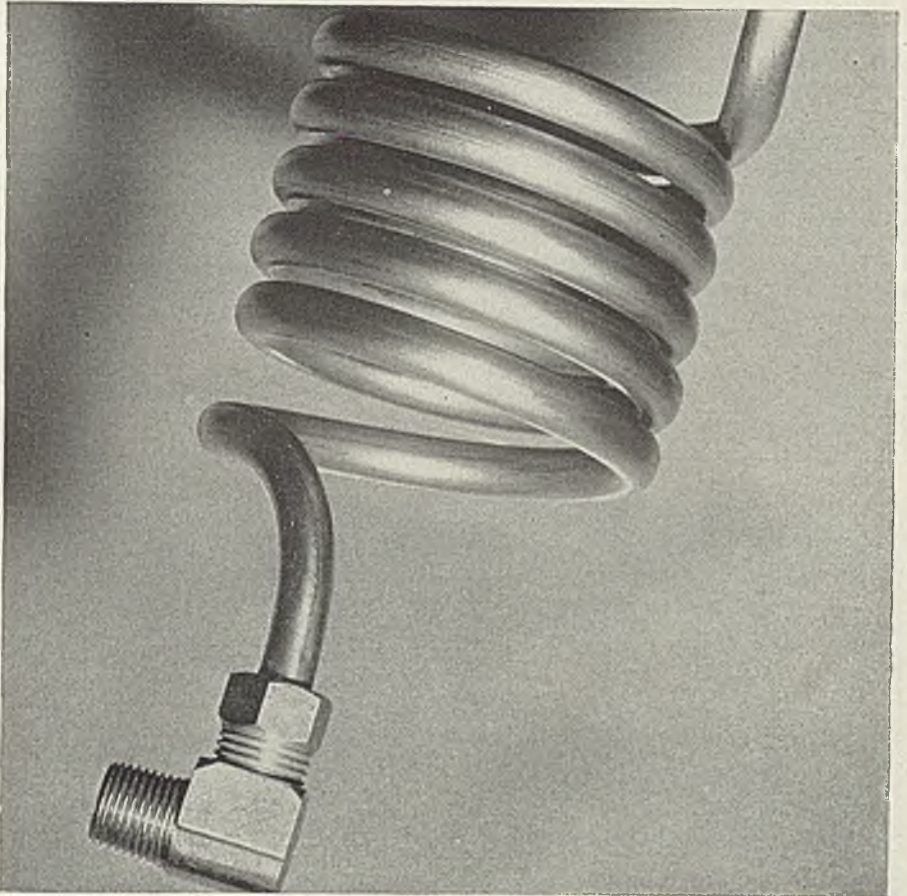
**Chicago**—Sheet mills still await the appearance of heavier demand from the automotive industry and bookings show little change. While favorable reports were made at the auto show here last week, motor car interests are cautious regarding increasing commitments for sheets. Occasional gains in demand from miscellaneous sheet users are small.

**Boston**—Sheet specifications from several larger industrial consumers are smaller, including needs of refrigerator and stove builders. One of the larger range producers received a cancellation from a mail-order house, which was followed by curtailment in operations. Jobbers are releasing little tonnage.

**New York** — Sheet buying shows little change, with specifications light. Most jobbers and consumers have fair stocks which they seek to reduce before inventory.

Effective Nov. 15, the delivered prices on all grades of sheets will be up 1 cent per 100 pounds because of the advance in the freight rates from Pittsburgh, the basing point on sheets for this district.

**Philadelphia** — Sheet backlogs show even further reduction with most grades now available within a week or so. Deliveries on hot-rolled annealed sheets average about two



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weeks. Galvanized sheets are available in three weeks or less. Even tin plate now may be had within a week or two. The easier delivery situation, of course, reflects further recession in buying and releases against contracts. Automotive releases are estimated at only 20 to 30 per cent of normal. Stove makers are reaching the end of their fall season, which has proved somewhat disappointing. Little business is expected from miscellaneous sources over the balance of the year since most consumers are inclined to work

off inventories before purchasing.

**Baltimore** — The decline in sheet buying is less pronounced, with volume showing little change over the past fortnight. In fact, business has now reached a point, where sellers are hopeful that the next change will be upward. They are looking for little change, however, before January. Most consumers and jobbers have fair stocks on hand, and, with a state tax on inventories, are not likely to buy much over the remainder of the year than is absolutely necessary. Effec-

tive Nov. 15, sheet prices will be advanced one cent per 1000 pounds as a result of new freight rates.

**Cincinnati**—Sheet demand is fluctuating within narrow limits, adequate to support rolling schedules at 45 to 50 per cent of capacity. Orders by automobile and refrigerator manufacturers, although disappointing in volume, indicate no large inventories. Some consumers who did have large sheet stocks are reappearing in the market.

**St. Louis**—Both new business and specifications in sheets have receded further during the past week or ten days. Outlet through the building industry is said to be the narrowest in many months and manufacturing demand has failed to develop the usual seasonal expansion. Peak of the radio demand has passed, and requirements of makers of household appliances are less than heretofore.

**Birmingham, Ala.**—Production of sheets continues practically at capacity with the largest tonnage of any steel product.

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**D**AMASCUS STEEL CASTINGS  
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## Strip

Strip Prices, Page 87

**Pittsburgh**—Operations of hot and cold-rolled strip steel mills on the national scale show further curtailment in line with quiet buying. In some consuming industries, inventories are being drawn upon to a large extent, indicating producers must await a depletion of these stocks. Deliveries are prompt. Hot strip mills on the national scale are operating at 45 per cent; cold strip mills at 48 per cent.

**Cleveland** — Consumers of wide and narrow strip still have ample stocks for current needs and are intent on reducing inventories before making further commitments. Decline in operations by local electrical equipment manufacturers, auto partsmakers and other miscellaneous consumers also has not eased present unfavorable conditions. However, producers feel inventories will soon reach the point where further buying will be compulsory. Prices remain firm.

**Chicago**—Strip buying has varied slightly despite occasional betterment in orders from miscellaneous users who have permitted stocks to run low. Automotive buying still is disappointing and outlook for heavier demand is uncertain. Average inventories of consumers have been cut to the lowest level in several months.

**Boston**—Narrow cold strip producers have adjusted operations lower in most instances, there being no improvement in incoming orders.

Releases are for prompt delivery and limited largely to scattered replacement needs. While there has been some further reduction in strip consumption, most industrial consumers are still consuming more tonnage than they are placing with mills. Hot strip is stagnant. Prices are holding firmly.

**New York**—While aggregate volume of new narrow cold strip business shows slight change, a few producers finding indications of spotty improvement, better orders arriving some days with dullness prevailing others. There is little indication a sustained buying movement has developed and most sellers expect little change during the remainder of the quarter. All specifications are for prompt shipment and advance buying is entirely absent. Dullness continues in hot strip. Cold-rollers in a few instances are operating 45 per cent, but the average in the East is not much above 40 per cent. Prices are firm with sellers unanimous in belief concessions at this time would result in further delay in buying in addition to creating more uncertainty.

**Philadelphia**—Consumers are reported comfortably covered for the remainder of the year and are placing few new commitments. Prompt delivery is available on both hot and cold-rolled specifications. Prices are steady.

**Birmingham, Ala.**—Strip, because of continued demand for cotton ties, continues in steady production. Current orders are somewhat below rate of shipments and not as active as a few weeks ago.

## Plates

Plate Prices, Page 86

**Cleveland** — Little improvement is noted in recent demand for plates, in combination with structural projects or other miscellaneous requirements. However, some tonnage has recently been placed for ship repair work and additional orders are expected from this source next month. Deliveries can now be made within a week and still further drop in operations is expected in the near future. Prices are firm.

**Chicago** — Plate business still suffers from quiet in railroad equipment building. Miscellaneous outlets are unable to offset the slack in railroad needs, though occasional inquiries appear for tanks and pipe lines.

**Boston**—Buying is light and no new tonnage has appeared in this district which would severely test mill prices on plates. Demand, in fact, has declined with miscellaneous

needs smaller and boiler shop backlogs about worked off. Shipyards have plenty of work, but requirements for steel will be spread over a considerable period. There has been a moderate flurry in floor plate buying recently, several projects taking more than 100 tons each. One seller has booked almost as much floor plate business recently as all other plate tonnage.

**New York** — Domestic plate buying shows little change, with material for the Lackawanna freight car inquiry the most important pending

item. A firming market on export business may drive in some fairly large tonnages on which brief protections have been given. It is expected that export prices of 2.41½c, New York, and 2.38½c, Baltimore, will become firmly established in a short time.

The increase in freight rates, effective Nov. 15, brings the delivered price on plates here up 1 cent per 100 pounds to 2.54c.

**Philadelphia** — Some miscellaneous plate orders for carlots or less are noted but jobs of consequence

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# Behind the Scenes with STEEL

## Orchid

■ This week's orchid goes to Westinghouse E. & M. Co. for the excellence of their press relations department. Last week in East Pittsburgh Westinghouse had an editorial preview of its new alternating current motor production line. The whole thing was staged in such a way that editors in attendance got a small view of what an editorial heaven might be like, with all releases, photos and publicity material neatly prepared and waiting for each individual editor. The inspection trip itself was well handled, and a complete picture of the whole line was given to all those in attendance.

## Security Plus

■ We were immediately taken by the Joslyn story appearing as the lead in this week's book. At this early date we have not yet decided whether to petition the management for establishment of a similar plan here or to throw up the whole thing and go out to work for Joslyn. Of course we don't think the plan is another cure-all. What we are searching for is a plan which will let us retire at age 30 with enough money to spend the rest of our natural life doing only the things we want to do. We have joined all movements in the right direction so far, only to be disillusioned. We think that Joslyn has the right idea, though, and we'll bet plenty of his employes are willing to take the old boy up on his plan.

## Gargantuan

■ Already occupying the major attention of STEEL's art staff is plan after plan for the huge and beautiful Yearbook of Industry we will foist on an already expectant public just seven weeks hence. We were permitted to see some of the more prominent

features the other day, and we are sure nobody in the metal producing and metalworking industries can well afford to be without it. On the other hand, we know darn well everyone in those industries can afford to have it, and a thick slice of them will have it. We wouldn't want to influence your judgment in any way, but you had better make plans now to get a copy of it.

## Reinstated

■ We felt we were slipping some weeks back when the Committee for Industrial Organization failed to renew a subscription to STEEL. We felt we were not doing right in the campaign to get a square deal for American business, if our pages no longer were of interest to the gentlemen who seem to be in direct opposition to our policies. This week we were somewhat mollified, however, by an order for a subscription from Labor's Nonpartisan League, which is the same thing. We won't have that feeling of knifing the organization in the back when they aren't looking, now that Lewis et al. are enrolled as cover-to-cover readers of our weekly blast again.

## Beauty

■ Seems like the A. F. Holden Co., builders of heat treating baths, get all kinds of fan mail from their "bathing beauty" series of front covers you have been seeing on STEEL. Lately the advertising department has been called upon to settle a dispute between a couple of movie-mad wenches, one of whom claims the gal called "Moly" is really Madeleine Carroll of the silver screen, while the other seems to be slightly dubious on this point. According to our best information, the gal is not the blonde beauty of the screen, but is equal-ly blonde and quite beautiful.

—SHRDLU

are few. Little business is expected from the railroads this year since projected freight rate increases, if granted, would not benefit earnings in the immediate future. Activity of tank fabricators has slowed. Shipbuilding prospects are poor at present. Most platemakers are maintaining both base prices and quantity differentials despite the small amount of business available.

**Baltimore** — Plate sellers feel strongly the lack of railroad demand and tank work. Considerable tonnage is being consumed by shipyards, most against contracts, and current volume continues low. Effective Nov. 15, the freight rate from Sparrows Point, Md., the basing point on plates for delivery here, will be increased 10 per cent, from 3.75c to 4.125c.

**Birmingham, Ala.** — Buying of plates continues to show some improvement with specifications momentarily looked for on at least one major booking. Shipments are somewhat above the figure for last week, although no large business is reported.

**San Francisco**—The largest plate order of the year has just been awarded and calls for 13,950 tons for forty-five 82,000-barrel tanks for Japanese interests. Western Pipe & Steel Co. secured 9 tanks, requiring 2790 tons and Bethlehem Steel Co. and Chicago Bridge & Iron Co. booked 18 tanks each, involving 5580 tons in each instance. Pittsburgh-Des Moines Steel Co. booked 200 tons for a 50,000-gallon tank and tower for San Diego, Calif. Awards for the week aggregated 14,150 tons and brought the total for the year to 59,952 tons as compared with 107,720 tons for the corresponding period in 1936.

**Seattle** — Fabricating shops have had little work during the last two months but several important pipe line jobs are pending or about to be released. Tacoma will ask bids this month for Unit No. 2 of the municipal system calling for about 700 tons of plates. Seattle is completing plans for a cross city line calling for an unstated tonnage.

## Plate Contracts Placed

13,950 tons, forty-five 82,000-barrel tanks for Japanese interests awarded as follows: 5580 tons, 18 tanks to Bethlehem Steel Co., Bethlehem, Pa.; 5580 tons, 18 tanks to Chicago Bridge & Iron Co., Chicago, and 2790 tons, 9 tanks, to Western Pipe & Steel Co., San Francisco.  
210 tons, elevated tank, Bristol, Pa., to Chicago Bridge & Iron Co., Chicago; tonnage includes supporting members.  
200 tons, 500,000-gallon tank and tower, San Diego, Calif., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

## Plate Contracts Pending

1159 tons, pipe line, Ft. Peck dam, Wlota, Mont.

200 tons, 24-inch welded steel or cast iron pipe, Bellingham, Wash.; bids opened.

Unstated, 10,000 feet, 28-inch land dredge pipe for Fort Peck, Mont.; bids in.

## Bars

Bar Prices, Page 86

**Pittsburgh** — Demand for hot-rolled bars continues comparatively quiet, with producers hopeful of a better volume from the automotive and railroad equipment fields. Alloy bar requirements are slightly better maintained. Many jobbers and consumers apparently are unwilling to build up inventories until absolutely necessary. Releases from the bolt and nut industry are light.

**Cleveland** — Producers of hot and cold-rolled carbon steel bars report a moderate increase in demand from a few miscellaneous consumers, but most have more than ample inventories. Demand from local forging concerns serving the auto trade has been particularly disappointing. Recent orders are for prompt delivery, indicating that stocks of some consumers are below normal.

**Chicago** — Delay in automotive demand continues to restrict steel bar buying here, despite sustained requirements of the farm equipment industry. Miscellaneous bar users contribute little business though steady reductions are being made in inventories.

**Boston** — Demand for carbon steel bars continues light, small-lot specifications for quick delivery predominating. Most tonnage consumers are practically out of the market, including warehouse distributors. Alloy bars are relatively more active than commercial steel bars, but demand has slipped off recently, although some sellers report tonnage thus far this year still well ahead of last. Government shops continue good buyers of alloy bars, bids being in on 135 tons of nickel-steel for chain-making, Boston navy yard, and a fair tonnage of high speed molybdenum tungsten material for Newport, R. I.

**New York** — Commercial bar tonnage has shown little change so far this month, the freight rate advance of 1 cent per 100 pounds, effective Nov. 15, having little influence on volume. Most consumers are well stocked and with inventory not far off are keeping releases down as much as possible. The new delivered price, under the freight advance, is 2.79c.

**Philadelphia** — Some demand for merchant bars comes from the ware-

house trade for fill-in purposes but interest in other directions is small. Deliveries are available in a week or less. Prices appear steady.

**Birmingham, Ala.** — Buying of bars continues irregular, although inquiries are suggestive of an early upturn. Shipments are light.

## Pipe

Pipe Prices, Page 87

**Pittsburgh** — Tubular plant operations show further contraction, with demand continuing light and stocks built up in better shape. While the easier tone is noted in all lines, seamless mechanical is slightly better than some other products and there is the prospect of increased activity in boiler tubes. Prices are steady.

**Cleveland** — Pipe requirements have leveled off and in some instances jobbers report a moderate increase within the last few days. November is expected to at least remain on a par with October. Jobber stocks are ample to satisfy current demand. This is reflected in mill operations. Prices are general-

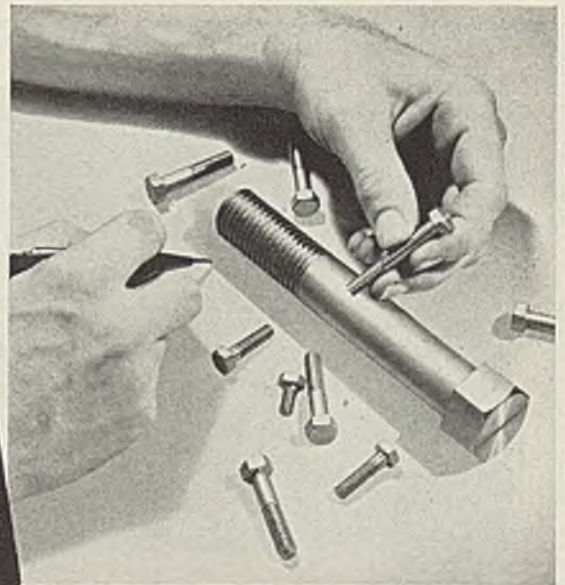
ly firmer than for some time and it is assumed they will remain unchanged for first quarter. Bids went in last week on 150 tons of 2, 4, 6, and 8-inch cast pipe, for a water distribution system at Edon, O. Inquiries include 140 tons of cast pipe for a new water works, Bloomsdale, O.; bids Nov. 26.

**Chicago** — Despite continuation of a small volume of new business cast pipe producers are cheered by a growing number of proposed municipal jobs. In a few instances financing difficulties have held up contemplated work, but this is not generally true.

**Boston** — Merchant steel pipe demand is slower following a mild seasonal improvement in requirements for heating work and general building construction. Resellers' stocks, however, are not heavy, most mills supplying distributors' requirements largely from stock at primary sources. Wrought pipe demand is steady, but small. Cast pipe buying is confined largely to miscellaneous needs.

**Birmingham, Ala.** — No appreciable improvement is noted in pipe demand, although there is reason to believe, from inquiries, an increased

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volume of business is in prospect. Operations are at approximately 35 per cent, on a shortened weekly basis.

**New York** — Resellers of merchant pipe are experiencing a good seasonal demand for heating work. Line pipe demand is negligible.

**San Francisco**—Cast iron pipe lettings are limited to lots of less than 100 tons. So far this year 25,114 tons have been booked, compared with 42,917 tons for the same period a year ago.

**Seattle** — Specifications for projects involving cast iron pipe are slow in developing and dealers expect no improvement during the current quarter. District 7, King county, Washington, will open bids Nov. 15 for a water system, calling for an unstated tonnage. Golden-dale, Wash., has awarded contract for an unstated tonnage of 6-inch spiral well dipped and wrapped steel pipe to Washington Corrugated Culvert Co., Portland, Oreg.

### Cast Pipe Placed

325 tons, 12-inch and smaller, Muskegon, Mich., to Alabama Pipe Co., Anniston, Ala.

### Cast Pipe Pending

378 tons, feeder mains, Akron, O.; bids

Nov. 19.  
150 tons, 2, 4, 6 and 8-inch, water distribution system, Edon, O.; bids in.

### Steel Pipe Pending

Unstated tonnage, 2840 feet, 20 and 24-inch o. d., United States engineer, Washington; bids Nov. 23.

## Wire

Wire Prices, Page 87

**Pittsburgh** — Wire producers continue to show slightly better activity than some of the other divisions. During the past week demand has shown little change, some consumers continuing to specify cautiously in line with immediate needs. Buying in the rural areas has shown improvement during the past few weeks, but many jobbers appear to have comfortable inventories.

**Chicago**—Wire demand continues slow, retarded by lack of better orders from the automotive industry as well as by continued quiet in business from miscellaneous users of manufacturers' wire. Jobbers restrict purchases of merchant wire products, stocks on hand in many instances being sufficient to meet current needs.

**Cleveland** — Consumers of mer-

chant and manufacturing wire continue to show little interest in replenishing stocks. Most have inventories in excess of current needs and are intent on cutting them down, now that year-end inventory period is nearing. Some producers have curtailed operations approximately 50 per cent over the past 60 days in some instances, but this is not true for all departments.

**Boston**—Wire mill operations are down slightly, the aggregate volume of new buying showing slight improvement. Production schedules are irregular. Replacement buying for prompt delivery continues. There has been some improvement in merchant wire buying.

**New York** — Incoming wire tonnage barely sustains finishing mills at 40 per cent operations, few eastern producers exceeding that rate. While new volume is small there has been little additional recession and demand is well spread as to products. Some sellers have considerable tonnage traceable to the automotive industry on books, but shipments and releases are held up. Not much of this volume is expected to be released before the first of the year. Meanwhile miscellaneous buying for manufacturing needs continue spotty and light for fill-in replacements. Wire prices are steady without much apparent pressure on the part of consumers for concessions.

**Birmingham, Ala.** — Slight improvement, although nothing like expectations, has developed in demand for wire products. Jobbers have not bought in anticipated quantities, but some restocking is in evidence as shipments continue to gain slightly over previous weeks.

## Rails, Cars

Track Material Prices, Page 87

Some activity is developing in the market for rails and rolling stock, though not of much volume. In addition to the Delaware, Lackawanna & Western inquiry for 500 hoppers Louisville & Arkansas is seeking 100 to 300 woodpulp cars and the Chicago, Burlington & Quincy has placed 11 passenger cars. The Reading has placed eight oil-electric locomotives and the Chicago, Milwaukee, St. Paul & Pacific inquiring for seven. The South Manchurian railroad has issued an inquiry for 25 to 100 locomotives. A report persists that the Atchison, Topeka & Santa Fe will enter the market shortly for about 4500 freight cars.

Bids were opened Nov. 10 on 10-

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—The Market Week—

720 tons of rail joints and 59,416 tons of angle bars for the Fort Peck, Mont., dam project.

### Car Orders Placed

Chicago, Burlington & Quincy, 11 passenger cars to Edward G. Budd Mfg. Co., Philadelphia.

### Locomotives Placed

Reading Co., eight oil-electric switch engines, six to the Electro-Motive Corp., Chicago, of 600 horsepower each and two to the American Locomotive Co., New York, of 900 horsepower each.

### Car Orders Pending

Boston Elevated Railway Co., 10 track less trolleys.  
Louisville & Arkansas, 100 to 300 wood-pulp cars; bids asked.  
Philadelphia Rapid Transit, 40 trackless trolleys.

### Locomotives Pending

Chicago, Milwaukee, St. Paul & Pacific, seven locomotives.  
South Manchurian Railway, with New York offices at 60 East Forty-second street, 25 to 100 2-8-2 type locomotives, bids asked.

## Shapes

Structural Shape Prices, Page 86

**Pittsburgh**—Inquiry for structural shapes includes 550 tons for a boiler house in Peekskill, N. Y., several bridges, each around 500 tons in the mid-west, and 900 tons for a lift bridge over the Savannah river in Georgia. Bethlehem Steel Co., Bethlehem, Pa., has been awarded 620 tons for a state highway bridge at Kennedy, N. Y.

**Cleveland** — Awards are limited to small tonnages from private sources, and inquiries have been disappointing, particularly for projects requiring 100 tons or more. However, an encouraging amount of state work is pending, involving over 1000 tons. Most fabricators have substantial stocks, with mills offering deliveries within a week to ten days. Heyl & Patterson Co.,

### Shape Awards Compared

	Tons
Week ended Nov. 13 .....	10,242
Week ended Nov. 6 .....	57,885
Week ended Oct. 30 .....	8,061
This week, 1936 .....	25,671
Weekly average, 1936 .....	16,332
Weekly average, 1937 .....	24,441
Weekly average, October..	15,654
Total to date, 1936 .....	1,024,211
Total to date, 1937 .....	1,124,306

Includes awards of 100 tons or more.

Pittsburgh, was awarded the contract for fabrication of an unloader, requiring 1000 tons of structurals, for the Pennsylvania railroad's expansion program at its Sandusky, O., dock.

**Chicago**—Inquiries for small lots of fabricated shapes are fairly numerous, but total business is restricted by the small number of larger projects. Few inquiries involving more than 100 tons have appeared lately.

**Boston**—With most of the larger pending structural project now under contract, a slight improvement in small construction inquiry has developed. A 600-ton high school, Rochester, N. H., closes this week. Most active bridge needs are individually small with a substantial inquiry for a Bridgewater, N. H., bridge expected out within a month. Awards are fewer, but include 400 tons for buildings, fish pier, Gloucester, Mass.

**Philadelphia**—McCloskey & Co., Philadelphia is low bidder on the Finance building, Harrisburg, Pa. The company bid \$3,112,000, John McShain Inc., Philadelphia \$3,122,200 and Consolidated Engineering Co., Baltimore, \$3,144,000. A number of other jobs also are becoming active, all part of the Pennsylvania state

program, and include several armories, hospitals, schools and state institutions. This work will continue active through January and February, although several jobs will be bid before the end of the current month. Private work continues to lag. Additional pressure is noted on erected steel prices although mill base quotations continue steady.

**Baltimore** — Apart from a 2500-ton state bridge at Hancock, Md., and the 1100-ton municipal airport here long pending, little outstanding work is active. However, district fabricating shops are operating at a fairly good rate on old orders, and with the backlog on hand, hope to sustain operations over the remainder of the year.

**San Francisco**—Demand for structural shapes has shown little improvement and business up for bids or pending does not exceed 5500 tons. Bids on 108 tons for a crossing at Livingston, Calif., have again been postponed until Nov. 24. So far this year 134,972 tons have been placed, compared with 147,027 tons last year.

### Shape Contracts Placed

1650 tons, bridge approach and grade crossing elimination, Cypress avenue, Bronx, N. Y., to American Bridge Co.,

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Pittsburgh; through J. Leopold & Co., New York.  
 665 tons, factory building and garage, Circle Wire & Cable Co., Brooklyn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., H. Rosen, Brooklyn, general contractor.  
 620 tons, state highway bridge RC-3917, Kennedy, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.  
 560 tons, grade crossing, Broadview, Ill., to Bethlehem Steel Co., Bethlehem, Pa.  
 460 tons, state administration building, Raleigh, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.  
 445 tons, bridge, University avenue, Minneapolis, to American Bridge Co., Pittsburgh.  
 425 tons, woman's building, Penn State College, State College, Pa., to Anthracite Bridge Co., Scranton, Pa.  
 400 tons, post office and court house, Nome, Alaska, to unnamed interest.  
 400 tons, S. H. Kress Co. building, El Paso, Tex., to Austin Bros., Dallas, Tex.  
 400 tons, power plant, Madison, Wis., to Worden Allen Co., Milwaukee.  
 400 tons, bridge, Clinton, Iowa, to Iowa Steel & Iron Works, Cedar Rapids, Iowa.  
 390 tons, stores and cold storage building, fish pier, Gloucester, Mass., to New England Structural Co., Everett,

Mass.; H. L. Hauser Building Co., Boston, general contractor.  
 295 tons, bridge FAP 84, LeFlore county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, OKla.  
 275 tons, three bridges, Natrona county, Wyoming, to American Bridge Co., Pittsburgh.  
 260 tons, telephone building, Arlington, Va., to Lehigh Structural Steel Co., Allentown, Pa.  
 250 tons, state hospital building, Farview, Pa., to Pine Brook Iron Works, Scranton, Pa.  
 245 tons, highway bridge, Williamson county, Illinois, to St. Louis Structural Steel Co., St. Louis.  
 197 tons, two bridges, Garfield county, Colorado, to unnamed interests.  
 180 tons, bascule bridge, Lake Mantoloking, N. J., to Bethlehem Steel Co., Bethlehem, Pa.  
 170 tons, Central school, Kingston, N. Y., to Utica Structural Steel Co., Utica, N. Y.  
 155 tons, building, E. I. du Pont de Nemours & Co., Arlington, N. J., to Belmont Iron Works, Philadelphia.  
 150 tons, bridge span, Thayer county, Nebraska, to St. Joseph Structural Steel Co., St. Joseph, Mo.  
 150 tons, I-beam spans, Dawes county, Nebraska, to Fremont Foundry &

Machine Co., Fremont, Neb.  
 140 tons, bridge over Pecos river, SP-612-A, Santa Rosa, N. Mex., to American Bridge Co., Pittsburgh.  
 135 tons, bridge Sec. 12F, Grand Chain, Pulaski county, Illinois, to Hansell-Elcock Co., Chicago.  
 130 tons, post office, Union City, N. J., to J. G. Breen Iron Works, Hillside, N. J.; through Wyckoff Engineering Corp., New York.  
 130 tons, building addition, Whittaker Paper Co., Pittsburgh, to Keystone Engineering Co., Pittsburgh.  
 130 tons, Montgomery-Ward warehouse, Colorado Southern railway, Denver, to Midwest Steel & Iron Co., Denver.  
 115 tons, bridge, Rock Island county, Illinois, to Midland Structural Steel Co., Cicero, Ill.  
 110 tons, boiler house, H. P. Hood & Co., Charlestown, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.  
 110 tons, service building and laboratory, University of New Hampshire, Durham, N. H., to New Hampshire Structural Steel Co., Manchester, N. H.  
 100 tons, shapes and bars, state bridge, Mahan river, Easthampton, Mass., to Bethlehem Steel Co., Bethlehem, Pa., and Northern Steel Co., Boston; Daniel O'Connell's Sons Co., Inc., Holyoke, Mass., general contractor.

## Unit Steel Bids, Coolidge Bridge, Northampton, Mass.

Tenders to Department of Public Works, Boston, G. H. Delano, Chief Engineer, Nov. 2

Material	Unit	A	B	C	D	Lowest Total
Structural carbon steel, lbs.....	4,750,000	\$0.0675	\$0.067	\$0.0663	\$0.066	*\$308,750
Structural silicon steel, lbs.....	1,410,000	0.075	0.0735	0.073	0.072	101,520
Reinforcing steel, lbs.....	1,100,000	0.035	0.035	0.0375	0.04	38,500
Steel sheet piling, lbs.....	100,000	0.03	0.03	0.025	0.06	25,000
Steel bridge railing, lin. ft.....	2,450	7.00	8.00	7.50	7.50	17,150

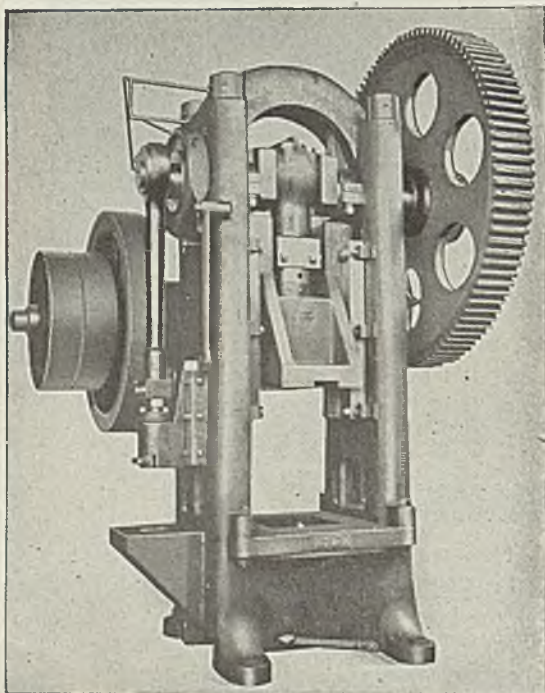
A—T. Stuart & Son Co., Watertown, Mass., contract, at \$1,192,230.95; B—Coleman Bros. Corp., Boston, second, \$1,198,049.80; C—D. O'Connell's Sons Inc., Holyoke, Mass., third, \$1,222,048.84; D—V. Barletta Co., Boston, fourth, \$1,237,752.30.

Structural and reinforcing steel awarded Bethlehem Steel Co., Bethlehem, Pa. by general contractor.

\*By A. I. Savin Construction Co., East Hartford, Conn., sixth low bidder, quoting \$0.065 per pound.

## Shape Contracts Pending

5400 tons, Finance building, Harrisburg, Pa.; McCloskey & Co., Philadelphia, low on general contract.  
 2500 tons, Maryland state bridge, wicker truss and girder type, Hancock, Md., bids asked.  
 1125 tons, public school 259 Brooklyn, N. Y., Post & McCord, New York, low; bids Nov. 9 on steel direct, fabricating and erecting.  
 1100 tons, including steel doors, municipal airport, Baltimore, Lehigh Structural Steel Co., Allentown, Pa., low bidder; Kauffman Construction Co., Baltimore, general contractor; W. W. Pegan, Baltimore, architect.  
 1000 tons, unloader, for Pennsylvania railroad's unloading dock, Sandusky, O.; Heyl & Patterson Co., Pittsburgh, to fabricate.  
 900 tons, lift bridge over Savannah river, Seaboard Air Line railway, Savannah, Ga.  
 600 tons, high school, Rochester, N. H.; bids Nov. 19.  
 550 tons, piling, canal repairs and widening, Frankfort, N. Y.  
 550 tons, boiler house, Standard Brands Inc., Peekskill, N. Y.  
 500 tons, oil derricks, Chase, Kans.  
 450 tons, Washington state Skagit river bridge; MacRae Bros., Seattle, general contractor.  
 450 tons, public school 55, Queens, N. Y., Lehigh Structural Steel Co., Allentown, Pa., low; bids Nov. 9 on steel direct, fabricating and erecting.  
 450 tons, bridge No. 1810, Chicago & North Western railroad, Wisconsin, Wis.  
 380 tons, bridge over Flat Head river, Columbia Falls, Mont.  
 350 tons, plant, Coca Cola Bottling Co., Providence, R. I.  
 300 tons, plant addition, Climatool Co., and Sheffield Gage Corp., Dayton, O.; bids Nov. 15.  
 250 tons, curbing, New York state procurement division, U. S. treasury department, New York.  
 250 tons, tuberculosis hospital, Hamburg, Pa.; bids Nov. 16.  
 240 tons, administration building, Polish National alliance, Cambridge Springs, Pa.  
 230 tons, Ripley station, Kansas Gas & Electric Co., North Wichita, Kans.  
 150 tons, armory, Philadelphia; F. W. Mark, Philadelphia, general contractor.  
 150 tons, fire and police station, Greenwich, Conn.



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150 tons, grain storage building, John Elchler Brewing Co., Bronx, New York.  
 140 tons, beam spans, Silver City, Ontonagon county, Michigan, for state of Michigan.  
 135 tons, chemical research laboratory, Brown university; new bids Nov. 24.  
 130 tons, grade separation bridge, Butler county, Ohio; bids in.  
 125 tons, three Pennsylvania state armories at Lewisburg, Gettysburg and Tunkhannock, respectively.  
 108 tons, crossing, Livingston, Merced county, California; bids postponed until Nov. 24.  
 100 tons, bureau of roads span, Moose Pass highway, Alaska; R. J. Sommers Construction Co., Juneau, Alaska, general contractor.  
 100 tons, State school for boys, Batavia, N. Y.; bids Nov. 17.  
 Unstated, vocational training school, Scranton, Pa.; bids Nov. 27.  
 Unstated, State Industrial Home for Women, Muncy, Pa.; bids Nov. 23.

## Reinforcing

Reinforcing Bar Prices, Page 87

**Pittsburgh**—Inquiry for concrete reinforcing bars includes 750 tons for a sewage plant in Des Moines, Iowa, and a number of other jobs under 500 tons. Bethlehem Steel Co., Bethlehem, Pa., has been awarded 500 tons for the treasury department at Boston.

**Cleveland** — Awards from private sources are noticeably absent. The same condition is true on state projects, for road or bridge work. Mill deliveries can be made within a day or two in most instances, despite the fact operations have been curtailed. Great Lakes Dredge & Dock Co., Cleveland, have been awarded the general contract for dredging and driving the piling for the Pennsylvania railroads expansion project at its Sandusky, O., dock, for which it will award 375 tons of reinforcing.

**Chicago** — While the contract bar market is not brisk, inquiries are sufficient to keep sellers fairly well occupied. Awards are headed by 410 tons for International Harvester Co.'s new Indianapolis plant and formal closing on 700 tons for Chicago sanitary district work is im-

minent. Public projects constitute a sizable portion of pending business but private building is slightly heavier. Prices continue weak and some extremely low figures are reported to have been named on recent lettings.

**Boston** — On approximately 500 tons for the Huntington avenue subway extension, Boston, three sellers submitting identical low bids on three sizes, 30-foot lengths, delivered Boston, quoted \$50.80 for one-half inch; \$48.80, five-eighths inch; and \$46.80, three-quarter inch. These

prices include no bending or trucking charges which will be done by the city. Award was made by lot to the Bethlehem Steel Co. This tonnage, with close to 400 tons for the Gloucester, Mass., fish pier buildings, is outstanding and most large projects are now placed. Inquiry is limited mostly to small lots.

**Philadelphia** — Approximately 750 tons of bars and mesh will go into the Finance building at Harrisburg, on which McCloskey & Co., Philadelphia, is low bidder at \$3,122,000. Several other state jobs also are current.



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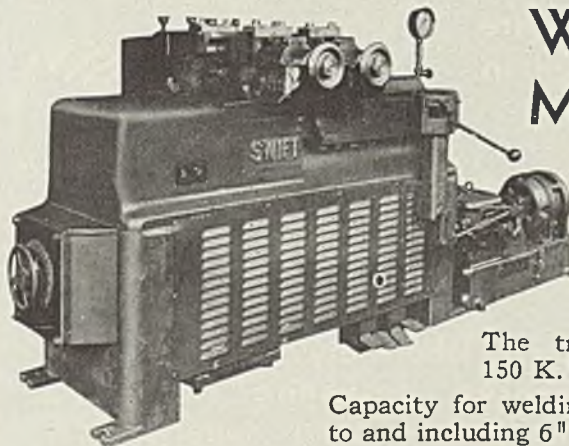
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## Concrete Bars Compared

	Tons
Week ended Nov. 13 .....	3,640
Week ended Nov. 6 .....	12,137
Week ended Oct. 30 .....	4,394
This week, 1936 .....	5,678
Weekly average, 1936 .....	6,065
Weekly average, 1937 .....	6,299
Weekly average, October ...	4,732
Total to date, 1936 .....	306,771
Total to date, 1937 .....	289,370

Includes awards of 100 tons or more.

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requiring up to 350 tons of bars individually. Mill prices remain firm, although some weakness is noted in fabricated material.

**Baltimore** — Several fair-sized bar jobs are being figured, headed by the Sears-Roebuck project at North avenue and Hartford, on which bids will be opened Nov. 22. Other projects include a building for the Rothstein Laboratories, dormitory at Howard university, Washington, and government hospital work at Bethesda, Md. Awards recently have been light.

**San Francisco** — Reinforcing bar awards were the smallest for any week so far this year and aggregated only 100 tons. This brought the total to date to 86,621 tons compared with 216,034 tons in 1936. Pending business does not exceed 5200 tons. The general contract for a crossing in Sutter county, California, involving 653 tons, has been placed, but no sub-award for the bars has yet been made.

**Seattle** — First quarter prospects are more promising, but orders in hand are small and local mills operate intermittently on carlot tonnages for schools and other small construction jobs. MacRae Bros., Seattle, have the contract for the Washington state Skagit river bridge calling for 215 tons which has not been subcontracted.

### Reinforcing Steel Awards

1760 tons, including 160 tons reinforcing trusses, Weehawken, N. J., approach, Lincoln tunnel, New York, to Bethlehem Steel Co., Bethlehem, Pa.

525 tons, Huntington avenue subway extension, Boston, to Bethlehem Steel Co., Bethlehem, Pa., by lot through state procurement officer, treasury department, Boston; bids Nov. 3, proposal C4-N1-298. Small tonnage also awarded Avery & Saul Co., Boston, under proposal C4-N3-132, bids Nov. 4, same office.

410 tons, plant building, International Harvester Co., Indianapolis, to W. J. Holliday & Co., Indianapolis.

375 tons, stores and cold storage building, fish pier, Gloucester, Mass., to Morrison-Stevens Co., Boston; H. L. Hauser Building Co., Boston, general contractor.

250 tons, for pile caps, National Art gallery, Washington, to Hudson Supply & Equipment Co., Washington; through Marc Eidlitz & Son, New York, general contractors.

120 tons, dormitory, Bryn Mawr, Pa., to American Steel Engineering Co., Philadelphia.

100 tons, dormitory building "A," Lehigh university, Bethlehem, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, addition, Western Hills high school, Cincinnati, to Pollak Steel Co., Cincinnati, through Charles Messer & Sons, general contractors, Cincinnati.

### Reinforcing Steel Pending

1157 tons, bureau of reclamation, invitation A-33,681-A, Moxee City, Wash.; bids opened.

750 tons, Finance building, Harrisburg, Pa.; McCloskey & Co., Philadelphia, low on general contract. Includes 75 tons mesh.

653 tons, Sutter by-pass, Sutter county, California.

650 tons, sewage plant, Des Moines, Iowa. 600 tons, store, Sears, Roebuck & Co. Baltimore; bids Nov. 22.

375 tons, dredging and building additions to dock, for Pennsylvania railroad, Sandusky, O.; Great Lakes Dredge & Dock Co., Cleveland, general contractors.

300 tons, Torrance state hospital, Torrance, Westmoreland county, Pennsylvania; Matthew Cummings Co., Bos-

ton, low on general contract at \$1,327, 567.

250 tons, Panama schedule 3301; bids Nov. 29.

250 tons, chapel, Loyala university, Chicago.

225 tons, building, Socony Vacuum Oil Co., St. Louis.

215 tons, Washington state Skagit river bridge; MacRae Bros., Seattle, general contractor.

165 tons, men's dormitory, Howard university, Washington, D. C.

150 tons, health building, University of Minnesota, Minneapolis.

140 tons, high school, Rochester, N. H. 125 tons, school, Stillwater, Minn.

121 tons, King county, Washington, Kenmore bridge; bids at Seattle, Nov. 15

113 tons, crossing, Livingston, Merced county, California; new bids due Nov. 24.

111 tons, Kenmore-Juanita bridge, Ning county, Washington; bids Nov. 15.

106 tons, Jughandle Creek bridge, Mendocino county, California; bids opened.

105 tons, Valentine boys' club, Chicago. 100 tons, public school, Norwood Park, Chicago.

100 tons, office building, United Air Lines, Chicago.

100 tons, officers quarters, Hickman Field, T. H.; bids Dec. 1.

100 tons, apartment building, Seventy-third street and Yates avenue, Chicago.

100 tons, school, St. Cloud, Minn.

100 tons, state highway bridge, Vermilion county, Illinois.

Unstated, Veterans hospital, Bethesda, Md.; bids Nov. 23.

Unstated, 8-story building, 50 by 100 feet, Rothstein Laboratories, Baltimore; bids asked.

## Pig Iron

Pig Iron Prices, Page 88

**Pittsburgh**—Pig iron sellers here will quote unchanged prices for first quarter of 1938. From Neville Island base, No. 2 foundry and malleable are \$24 per ton; basic, \$23.50; and bessemer, \$24.50. Buying continues light from practically all sources, with deliveries against contracts maintained.

**Cleveland** — Sellers see little improvement in new business over the remainder of this quarter, despite the fact prices have been announced unchanged for the first quarter next year. Most foundries have substantial stocks and in some instances will be forced to carry over tonnage contracted for fourth quarter delivery.

**Chicago** — Announcement of extension of current prices into first quarter has been without effect on new business. Most foundries already are covered through this quarter and with consumption failing to measure up to expectations, some tonnage under contract will be carried into next period. Inventories continue to be reduced and while foundry operations are fairly steady, pig iron shipments are off moderately from the October rate.

**Boston**—Mystic furnace, Everett, Mass., probably will go out of blast

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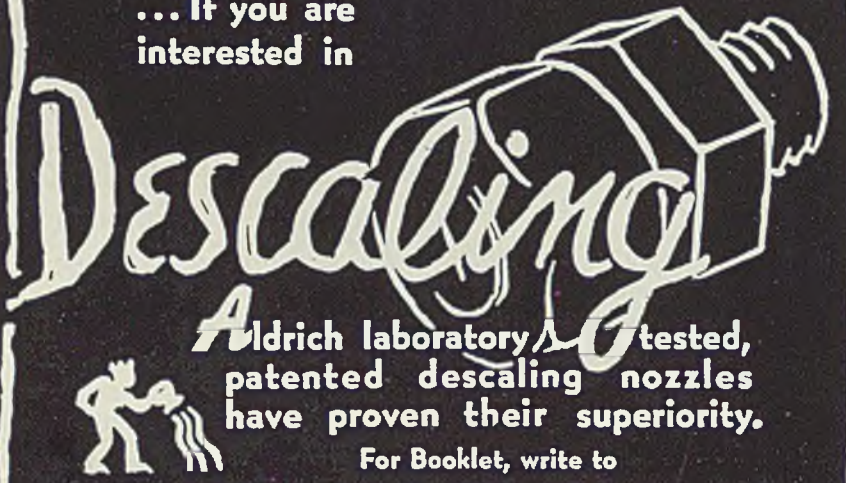
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about Dec. 1, having been producing 700 tons daily since mid-spring. Close to 40,000 tons have been exported during that period. Recently stocks have been accumulating. Buying is listless as foundry melt continues light. Shipments are in small lots to consumers with light stocks, while those with iron on hand continue to reduce inventories. Some foreign inquiry is evident, but at prices which producers are not willing to meet. Prices for first quarter will be unchanged.

**New York** — With new freight schedules, the delivered price on No. 2 foundry, at Newark, N. J., effective Nov. 15, is \$26.53 and on malleable, \$27.03. These increases involve an advance of 10 per cent in the original rate of \$1.39 from Bethlehem, Pa., the basing point. Calculation of this increase eliminates a fraction, which, since the original announcement by the interstate commerce commission, has been made permissible. This ruling allows, in the figuring rates in cents per ton, that 0.49 and less can be eliminated and 0.50 and up can take the full cent. In the above cases, the increase, figured out in fractions, would be \$1.529 per ton, but under the special ruling the new rate is \$1.53. The Brooklyn rates involve a flat increase of 20 cents per ton, and bring the delivered price on No. 2 up to \$27.47 and on malleable up to \$27.97. The increases were too small to bring out any particular increase in buying before the effective date. Trading generally continues quiet.

**Philadelphia** — Shipments against contracts are holding up better than anticipated although general tendency continues downward. Indicating declining activity, the foundry department of one of the largest stove makers has laid off 45 men. Machine tool builders, however, still have fairly substantial backlogs. Announcement of unchanged prices for first quarter has had little effect. Buying is extremely thin and for spot needs only. Most consumers are covered through the end of the year and some are asking deferred shipments.

**Buffalo** — Buying of pig iron is showing no noticeable improvement. Shipments are up slightly. Little new business is expected this quarter as most foundries are under contract.

**Cincinnati**—Shipments have been holding at a fair level. Most large buyers previously covered conservative needs and these tonnages have proved adequate for the quarter. Demand for machine tool castings is relatively good. Prices on both Northern and Southern iron have been reaffirmed for first quarter.

**St. Louis** — Southern blast fur-

naces have reaffirmed current pig iron prices for first quarter delivery and have opened books for that period. Buying of pig iron has dwindled almost to the vanishing point and shipments have also tended downward since the first of the month.

Blast furnaces, however, still have comfortable backlogs and unless much of the iron so represented is carried into 1938, the movement during the balance of this year will be of considerable size.

**Birmingham, Ala.**—Pig iron pro-

duction dropped this week when Sloss-Sheffield Steel & Iron Co. blew out No. 3 North Birmingham furnace and Woodward Iron Co. took a furnace out of production, leaving Sloss-Sheffield with three in production and Woodward with two. Not a great deal of iron is being stocked and the recession, it is believed, is temporary.

**Toronto, Ont.**—Pig iron demand continues at a favorable level with sales all for spot delivery. Local blast furnace representatives say business is in good volume and it

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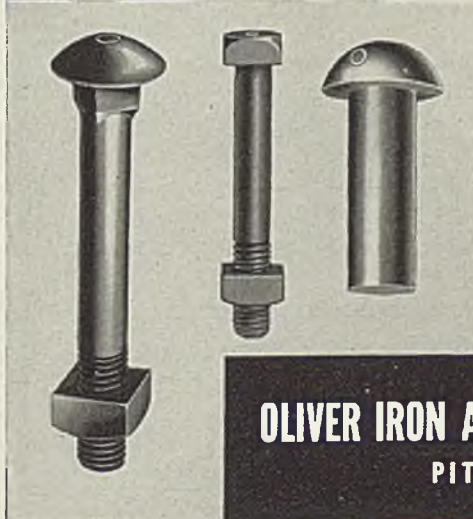


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is expected the current year will run close to 1936. Sales are holding around 2500 tons weekly. Foundries are taking immediate delivery on iron for current needs and some are taking iron to carry them to year-end. Deliveries over the water routes have been suspended. Production continues high. Prices are firm and unchanged.

## Scrap

Scrap Prices, Page 90

**Pittsburgh**—The market is weaker, with virtually every grade below last week's quotations. Railroad heavy melting is \$14 to \$14.50; No. 1 heavy melting, \$13.50 to \$14; railroad specialties, \$17 to \$17.50; billet crops, \$18 to \$18.50, and numerous other grades are softer. Sales into mill consumption are absent, but recent railroad lists provided indications upon which current quotations are based.

**Cleveland** — The scrap market is the quietest in many months, reflecting the low rate of steelmaking. Foundries are taking some tonnages at the current market. Shipments are restricted mostly to small lots. Dealers are buying lightly and holding their stocks.

**Chicago** — Scrap prices have slipped further, heavy melting steel being off 75 cents and a number of other grades down 50 cents to \$1.50 a ton. Consumer buying is near a standstill and dealers and brokers have curtailed trading correspondingly. The further reduction in

scrap consumption dims hopes for any appreciable new business. Scrap is coming out slowly and railroads have restricted their lists. In some instances bids on railroad scrap have been rejected.

**Boston**—Scrap prices continue to sag, with buying sluggish. While additional cargo space for export will shortly be available, shippers have covered on most of material to be loaded at Boston, doing some buying at \$13 to \$13.50, dock, mostly the former. This price is still well above that on which domestic shipments could be made. Cast grades show further weakness and most other grades are soft.

**New York** — Buying is limited to scattered lots for export and prices for domestic shipment continue to lag, although not subject to much test. Practically all domestic consumers are holding up shipments and most grades for rail shipment are 50 cents to \$1 lower. Prices for dock delivery are steadier and No. 1 heavy melting steel and other active grades are unchanged with No. 2 steel slightly weaker and off 50 cents to \$12, dock.

United States maritime commission has received bids for two steel cargo vessels at Seattle, the last of the fleet laid up there. Pacific Coast Shipwrecking & Salvage Co., Oakland, Calif., bid \$15,300 and \$12,600; Dulein Steel Products Co., New York, bid \$16,666.60 and \$17,777.70, both on a scrap basis. No bids were received for purchase for domestic operation.

**Philadelphia** — Scrap continues weak with several items off 50 cents

to \$1 a ton. No. 1 heavy melting steel, however, remains at a minimum of \$14 with both mill interests and the scrap trade doubting whether other than small distress lots could be had under this figure. Renewal of interest on the part of foreign scrap users has injected an element of strength. A large Philadelphia yard dealer is reported to have sold 5000 tons for delivery abroad on the basis of \$14 for No. 2 and \$15 for No. 1. One cargo left last Tuesday but most of the material was purchased some time ago. Domestic consumers are almost entirely out of the market and steelworks, especially, are well covered in view of the low rate of operations. Restricted shipments are permitted in several directions.

**Buffalo** — An undercurrent of weakness continues to rule the scrap market, with prices receding \$1 a ton during the week. Complete absence of bids has left the market purely nominal. An embargo on shipments to mills remains in effect with no immediate prospect of being lifted. The leading consumer reports the abrupt recession in ingot production has resulted in a record-breaking supply of scrap on hand.

**Detroit**—With buying at a standstill, the only tonnage dealers are moving is to apply on orders. Current quotations on practically all grades are off \$1. Heavy melting scrap has been subject to even greater pressure and is quoted at \$9 to \$9.50. Some instances of scrap being laid down are reported by dealers who have no outlet for tonnage which has come in on bids set purposely low but nevertheless accepted.

**Cincinnati** — Quotations on iron and steel scrap have receded \$1 to \$1.50 as inactivity continued and some district mills, on shutting down open hearths, disclosed a considerable stock of ingots, precluding imminent tonnage demand. Lack of interest in and low bids on recent railroad offerings have caused withdrawal of many items. Covering on contracts is giving no support to the market as little tonnage remains unfilled.

**St. Louis** — There has been no change from the dull, weak condition which has prevailed in the market for iron and steel scrap. Sales are few and at lower prices than the last recorded transaction. However, in absence of sales, quotations on most items are nominal.

**Toronto, Ont.** — While movement of scrap into dealers' yards fell off during the week demand continues and both steel and iron grades have a steady call from consumers. Shipments of steel scrap to mills are not as pressing as a few months ago but

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heavy consumers are taking all heavy melting steel offered. It is stated that while no change has been made prices are beginning to show a stronger tone.

**Seattle** — Sales are confined to a few miscellaneous orders and the small requirements of local foundries. Rolling mills are out of the market and the export situation has not improved. Prices are nominal in the absence of representative sales. Receipts are below normal.

## Warehouse

Warehouse Prices, Page 89

**Pittsburgh** — Warehouse activity continues quiet, and from all indications no large increase can be expected over the balance of this year. Shapes and plates appear duller than lighter products, but this can generally be expected at this time of year. Movement in wire products, sheets, and tubular goods is fairly well maintained, considering all conditions.

**Cleveland** — Decline in shipments from warehouse has eased somewhat and in a few instances has leveled off at the rate reported around the first of the month. There is little difference in the requirements for most steel products, with the possible exception of plates, attributed to discontinuance of mill production locally. Prices generally have held firm, with only minor shading by smaller distributors.

**Chicago** — Sales show no improvement and a seasonal decline is expected during balance of quarter. Sales continue fairly well diversified but prompt mill deliveries on most products are causing some steel users to turn from warehouses as a source of supply.

**Boston** — Warehouse volume continues quiet, the decline in orders which started about Oct. 15 continuing. Jobbers, however, are experiencing a wide divergence as to total volume of sales. Some are doing much better than others with some price shading. There is also a tendency on the part of smaller manufacturing consumers to turn to warehouses for small miscellaneous needs. Bars and small shapes are steady at 4.05c in 10,000-pound lots; also floor plates at 5.58c.

**Philadelphia** — Further reduction in mill schedules is reported to have made it more economical to divert some small orders to jobbers. Total volume of warehouse business is comparing favorably with October. Lighter products are relatively more active than such items as plates and shapes. Prices are fairly steady, but less so than three or four months ago.

**Buffalo** — Warehouse distributors

report a further slight falling off in sales. Demand for reinforcing bars and structural items is low. Specialties continue in best demand.

**Baltimore** — Steel distributors have experienced a sharp letdown in business recently, and are now more or less reconciled to a quiet period until at least after the turn of the year. Most jobbers are fairly well stocked, but are holding prices steady in anticipation of an upturn after the year-end inventory period.

**Cincinnati** — Sales from warehouse continue poor. Light inquiries hint little expansion may be expected throughout the remainder of the year. Individual orders are light.

**St. Louis** — Distribution of iron and steel from store tends to lag, with purchasing by all groups strictly on a necessity basis. Structural and the entire line of building materials are particularly quiet. There has been a recession in purchasing by the general manufacturing trade, the usual seasonal pick up being entirely absent.

**Seattle** — Turnover is below normal for this season. Demand is spotty and no item is outstanding although sheets are probably in best demand. October showed improved volume in the latter half but the month is below October, 1936.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 87

While announcement of first quarter prices is deferred, producers of bolts, nuts and rivets expect a continuation of present levels in view of extensions of current prices

on other steel products. Business continues slow and November shipments are expected to approximate or be slightly below those of October. Railroad demand is poor and prospects for an early upturn are equally unfavorable. Needs of farm equipment builders continue substantial and constitute a bright spot in the general picture. Jobbers still are well supplied with stocks and are under little necessity to enter the market actively for a number of weeks.

## Iron Ore

Iron Ore Prices, Page 90

**New York** — Tungsten ore prices are dipping sharply, with the market now holding nominally at \$24, duty paid, per short ton unit on Chinese wolframite, for prompt shipment from China. Present prices are based purely on seller offerings, with buyers here showing no interest. Domestic scheelite is nominally easier also, but sellers are not pressing tonnage by making offerings.

The sharp decline in tungsten ore is reflected in a rapid decline in ferrotungsten, which is holding at around \$2 per pound of tungsten contained freight allowed in carlots.

Manganese ore, 50 to 52 per cent, is down nominally to around 45c, without duty, and 45 per cent material to 40c to 42c. However, there is too little buying to afford a real test, with consumers here well stocked, and, with the steel out-



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look dull, not inclined to enter into long-term contracts at this time.

Foreign manganiferous is off to nominally 12c f.a.s. and Spanish north African basic to around the same figure. Were it not for the continued scarcity of boats and generally sustained high freight rates, foreign ore prices would be even lower.

While the navy has rejected bids on manganese ore and ferromanganese opened last month and has not indicated whether new bids will be asked or not, it has just entered the market for a sizable amount of

chrome ore, with bids to be opened Jan. 4. Bids have been asked on three alternates—3,000,000 pounds, 3,500,000 pounds and 4,000,000 pounds, for delivery within 120 days after date of contract. As in the case of manganese, deliveries are to be made to the Philadelphia navy yard.

**Cleveland**—Receipts of iron ore at lower lake ports this season to Nov. 1, shipments to interior furnaces and dock balances follow:

Port	Month	Season
Detroit .....	243,562	1,298,706
Indiana Harbor ....	363,863	2,505,099
Gary .....	536,028	5,607,258
So. Chi. (local furs.)	867,765	7,059,506
Sault Ste. Marie, Ont.	13,107	417,547
Hamilton, Ont. ....	105,781	635,912
<b>Total .....</b>	<b>2,130,106</b>	<b>17,524,028</b>
Year ago .....	1,989,115	11,394,375

Receipts at other than Lake Erie ports for October and the season to Nov. 1 follow:

Port	Season		Dock bal. Nov. 1, '37
	Receipts	Shipm'ts	
Buffalo ....	5,538,133	683,878	98,384
Erie .....	2,722,755	2,493,960	286,287
Conneaut ..	9,432,737	8,802,850	1,907,209
Ashtabula ..	6,509,445	5,322,106	1,940,327
Fairport ...	1,904,419	1,830,850	480,218
Cleveland ..	9,682,274	7,031,875	777,687
Lorain .....	3,817,338	1,559,827	289,812
Huron .....	939,579	926,892	216,988
Toledo .....	1,927,835	1,126,232	59,660
<b>Total .....</b>	<b>42,474,515</b>	<b>29,778,470</b>	<b>6,056,572</b>
Year ago .....	28,297,787	21,560,700	4,779,539

### Ferroalloys

Ferroalloy Prices, Page 88

**New York**—Due to the action of the Pennsylvania tariff commission in refusing to permit the increases announced by the interstate commerce commission on interstate shipments to become effective on intrastate shipments within the boundaries of Pennsylvania, speculation has arisen here as to the effect on the base point for ferromanganese, delivered, Pittsburgh.

Under the old schedule, the freight rate from Baltimore has been \$4.79 per ton and from Philadelphia, \$4.99. The new rate from Baltimore, which involves an interstate haul, will be up 20 cents a ton, or \$4.99, the same as has prevailed from Philadelphia to Pittsburgh, and consequently in any event the delivered price on ferromanganese will be up 20 cents, to \$107.49, with the base price unchanged at \$102.50.

But will Philadelphia also share with Baltimore as a favored point of shipment as a result of the Pennsylvania commission's refusal to increase rates on intrastate shipments? The best opinion is that it will not. The contention is that the movement of ferromanganese in-

volves both rail and water and that the rate under this combination is governed by interstate schedules, so that the rate from Philadelphia to Pittsburgh will take a 20 cent a ton increase, the same as the Baltimore rate and hence Philadelphia will continue at a disadvantage.

Reflecting the drop in tungsten ore prices, ferrotungsten is off sharply, now holding around \$2 per pound tungsten contained, freight allowed, in carlots.

The movement in ferroalloys in general continues to decline, in line with the reduction in steelmaking operations.

## Steel in Europe

Foreign Steel Prices, Page 89

**London** — (By Radio) — Basic pig iron association of Great Britain has decided to maintain present prices until June 30, 1938. Following this decision the steel associations covering basic steel products, under recommendation of the British Iron and Steel federation, have decided to maintain present prices on steel to the end of 1938. This is expected to release a heavy volume of inquiry held back by previous price uncertainty. The price of Middlesbrough pig iron has been raised 5s, with a corresponding loyalty rebate to users not buying abroad.

Production of steel ingots and castings in October was 1,133,600 gross tons, 29,400 tons less than the alltime record set in September. Pig iron production in October was 769,600 gross tons, compared with 726,000 tons in September, a gain of 43,000 tons. At the end of October 133 blast furnace stacks were active, compared with 132 at the end of September.

The Continent reports continuation of the dull export trade conditions of the past few weeks.

### Tin Plate

Tin Plate Prices, Page 86

**Pittsburgh** — Incoming business, shipments and tin plate operations continue to fall off, as usual at this time of year. Mills in this district still have a fair total of miscellaneous and export requirements to fill, but the entire situation is much easier than before Sept. 30. With November now at the half-way mark, announcement of the 1938 contract price is expected soon, with remote likelihood of any lower price than \$5.35 per base box, Pittsburgh.

**New York** — Tin plate sellers experience the lull that comes between seasons. Foreign buying is less, due to refusal of sellers to meet export buyers' demands for conces-



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sions. Some foreign buyers are seeking second quarter delivery at current prices. Sellers expect a stronger market on export tonnage by that time and refuse to meet these offers.

## Nonferrous Metals

Nonferrous Metal Prices, Page 88

**New York** — Undertone of non-ferrous metal markets strengthened last week as prices recovered from earlier lows. Sentiment improved on the upturn in security values and increased buying interest.

**Copper** — Prices were still mixed with electrolytic available on the outside market and from a custom smelter at 11.00c and from other first hand sellers at 12.00c, Connecticut. Export copper advanced over 1 full cent per pound to around 10.60c, c.i.f. European ports.

**Lead** — Lead was the first metal to respond to stimulating factors with sales picking up markedly. Sellers held prices unchanged at 4.85c, East St. Louis, and 5.00c, New York.

**Zinc** — Unfilled orders continued to decline as shipments held up well while new demand remained dull. Prime western was unchanged at 5.75c, East St. Louis.

**Tin** — The domestic market was extremely erratic with prices fluctuating in line with the foreign market. Straits spot closed at 45.62½c.

**Antimony** — American spot eased to 16.75c, New York, while Chinese spot held at 16.50c, duty paid New York.

## Simplified Practice For Bolts Adopted

■ Simplified practice recommendation for machine, carriage and lag bolts has been approved by the industry, effective Nov. 1, according to the national bureau of standards. Reduction from about 900 to 584 sizes of these types of bolts, a 35 per cent elimination, is effected.

## \$25,000,000 Spent For Steel by WPA

■ Nearly \$25,000,000, or about 5 per cent of the nearly one-half billion dollars spent for materials, supplies and equipment for WPA projects up to Sept. 1 went for structural and reinforcing steel, according to the WPA research division. The total expended for steel was \$24,280,437, of which \$15,175,366 was in federal funds, and \$9,105,071 in funds of project sponsors.

This does not by any means represent the total purchases of fabri-

cated metal for WPA projects. Listed also were extensive purchases for cast iron pipe and fittings, plumbing equipment and supplies, heating and ventilating equipment and supplies, tools, electrical machinery, paving machinery, motor trucks, other machinery and equipment, steel office equipment, and other iron and steel products. Bulk of the purchases was made in comparatively small lots for individual projects.

## Canada's Steel Output Down; Pig Iron Gains

Output of steel ingots and castings in Canada in September was 114,622 gross tons, compared with 126,695 tons in August, a loss of 9.5 per cent, and 86,077 tons in September, 1936, an increase of 33 per cent. Pig iron production in September was 77,180 gross tons, an increase of 3 per cent over the 74,578 tons made in August. It was 49 per cent greater than 51,892 tons produced in September last year. Ferroalloy production in September was 7720 tons, compared with 9913 tons in August and 5027 tons in September, 1936.

For nine months this year steel ingot and castings production totaled 1,077,462 gross tons, compared with 813,734 tons in the corresponding period of 1936. Pig iron produced in nine months this year totaled 655,438 tons, compared with 465,785 tons in ten months of 1936. Ferroalloy output in nine months showed a decline from 56,087 tons in 1936 to 55,636 tons in 1937.

## U. S. Steel Shipments Drop 24.3 Per Cent

■ Shipments of finished steel by the United States Steel Corp. in October were 792,310 tons, a decline of 255,652 tons, 24.39 per cent, from

U. S. STEEL CORP. SHIPMENTS (Inter-company shipments not included)				
	(Tons)			
	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	1,133,724	676,315	583,137	385,500
Mar.	1,414,399	783,552	668,056	588,209
April	1,343,644	979,907	591,728	643,009
May	1,304,039	984,097	598,915	745,063
June	1,268,550	886,065	578,108	985,337
July	1,186,752	950,851	547,794	369,938
Aug.	1,107,858	923,703	624,497	378,023
Sept.	1,047,962	961,803	614,933	370,306
Oct.	792,310	1,007,417	686,741	343,962
Nov.	.....	882,643	681,820	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'rly adj. ....	.....	†40,859	†23,750	†19,907
Total	.....	10,784,273	7,347,549	5,905,966

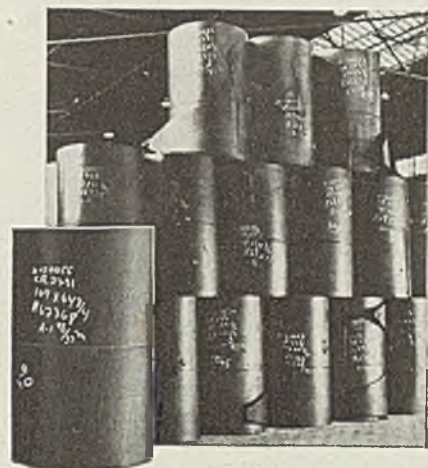
†Deduction.

the 1,047,962 tons shipped in September. October shipments were 215,107 tons less than the 1,007,417 tons shipped in October, 1936.

For ten months aggregate shipments were 11,749,156 tons, compared with 8,875,124 tons in the same period of 1936, an increase of 2,874,032 tons, or 32.28 per cent.

## Ore Imports Hold Well

**Baltimore**—While steel and iron production is off sharply throughout



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the country, ore importations here, as indicated by latest reports, are being fairly well sustained. From Oct. 13 to Oct. 29 inclusive the following iron ore shipments were received:

Eleven thousand eight hundred and fifty tons, Cruz Grande, Chile, Oct. 13; 21,800 tons, Cruz Grande, Oct. 15; 21,000, Cruz Grande, Oct. 18; 21,500, Cruz Grande, Oct. 22; 11,500 Daiquiri, Cuba, Oct. 25; 21,800 Cruz Grande, Oct. 25; 11,000 tons, Felton, Cuba, Oct. 27; 21,600 tons, Cruz Grande, Oct. 27; and 3505 tons, Wyhalla, Australia, Oct. 29.

Manganese ore shipments comprised 1800 tons from Calcutta, India, Oct. 14; 8620 Poti, Russia, Oct. 14; 1800 Calcutta, Oct. 15; 8750 Poti, Russia, Oct. 16; 5710 Durban, Oct. 17; 1300 tons, Calcutta, Oct. 18; 8330 tons, Takoradi, Gold Coast, West Africa, Oct. 18; 8300 tons, Takoradi, Oct. 18; 6850 tons, Poti, Russia, Oct. 21; 6500 tons, Rio de Janeiro, Oct. 24; and 7565 tons, Poti, Russia, Oct. 27.

Chrome ore importations comprised 1931 tons from Beira, Portuguese East Africa, Oct. 17; and 500 tons, Lourenco Marquis, Portuguese Africa.

Other arrivals included 28 tons of kyanite from Calcutta, Oct. 18; 86,091 cases and 11,108 pieces, virgin spelter, Antwerp, Belgium, Oct. 20; and 500 cases of ferromanganese, Yokohama, Oct. 20.

tions for reopening of the Youngstown mine in the Connellsville, Pa., district of the H. C. Frick Coke Co., leased by the Bortz Coal Co., are under way. It is expected that the mine, employing around 100 men, will be ready for work by Jan. 1.

## Equipment

**Chicago** — Plant machinery and equipment markets are quieter. Sales of small tools have dropped sharply, the decrease estimated by some sellers as one-third below volume a month ago. Inquiries for larger equipment also are less numerous though the reduction has been more moderate than in smaller items. Only a few inquiries previously pending have been withdrawn but effects of present uncertainty over the general business outlook are expected to be more pronounced during coming weeks unless a turn for the better develops. While some railroads are preparing 1938 budgets, only a few inquiries

for machine tools have been issued. Deliveries on machine tools steadily are improving but most builders have sufficient unfilled business to keep them well occupied into first quarter. Foundry equipment sales and inquiries are off markedly from the rate of 60 days ago and earlier.

**Seattle** — Highway maintenance machinery continues in good demand while electrical equipment and pumping units also are moving in fair volume. Industrial replacement items are slow, in tune with the generally reduced operations. Stoking and heating appliances dealers report a fair turnover.

**Pittsburgh** — Announcement of new foreign and domestic orders by United Engineering & Foundry Co., Pittsburgh, has been the principal feature of the equipment market. Included are mills for Russia, Youngstown Sheet & Tube Co., England and Canada, as outlined in the news columns of STEEL this week. Heyl & Patterson, Pittsburgh, has been awarded the contract to furnish and erect a new dumper for the Pennsylvania railroad coal dock at Sandusky.

# Construction and Enterprise

## Metallurgical Coke

Coke Prices, Page 87

Demand for by-product and bee-hive coke remains dull. Prepara-

## Ohio

**ALLIANCE, O.**—Taylor-Young Airplane Co., C. S. Taylor, president, is considering an extensive plant expansion program. The community is subscribing to a \$105,000 stock issue of the

company in order to finance program and keep industry in Alliance.

**COLUMBUS, O.** — Clark Grave Vault Co., 375 East Fifth avenue, plans one-story boiler house at factory, costing \$25,000, with equipment. Raymond Cornelius, 232 High street, engineer.

**GREENVILLE, O.** — Darke County Rural Electric Co-operatives Inc. has plans under way for primary and secondary lines for rural electrification, totaling about 220 miles, with outdoor power substations and service facilities. Cost \$200,000. W. R. Cutnaw, chief engineer, Ohio Farm bureau, 246 North High street, Columbus, O., is in charge.

**SOUTH ZANESVILLE, O.** — Burley Clay Products Co. will install power equipment in connection with proposed rebuilding of flower pot and stoneware products manufacturing plant recently destroyed by fire.

**TOLEDO, O.**—Great Lakes Coca Cola Bottling Works, 1235 Summit street, will build a bottling plant, costing about \$125,000.

## Indiana

**COLUMBUS, IND.** — Bartholomew County Rural Electrification Corp., Fred H. Suhre, president, plans primary and secondary lines for rural electrification, totaling close to 100 miles, with power substations and service facilities. Fund amounting to \$95,000 secured through federal aid. Work to begin soon.

**NEW HAVEN, IND.** — American Fork & Hoe Co. has purchased the International Fork & Hoe Co., here, and the New Haven plant and the Fort Wayne, Ind., branch of the American company will be merged, with headquarters for



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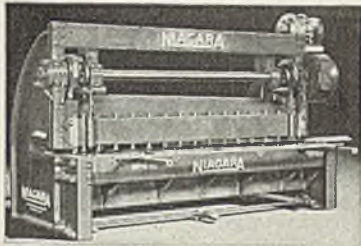
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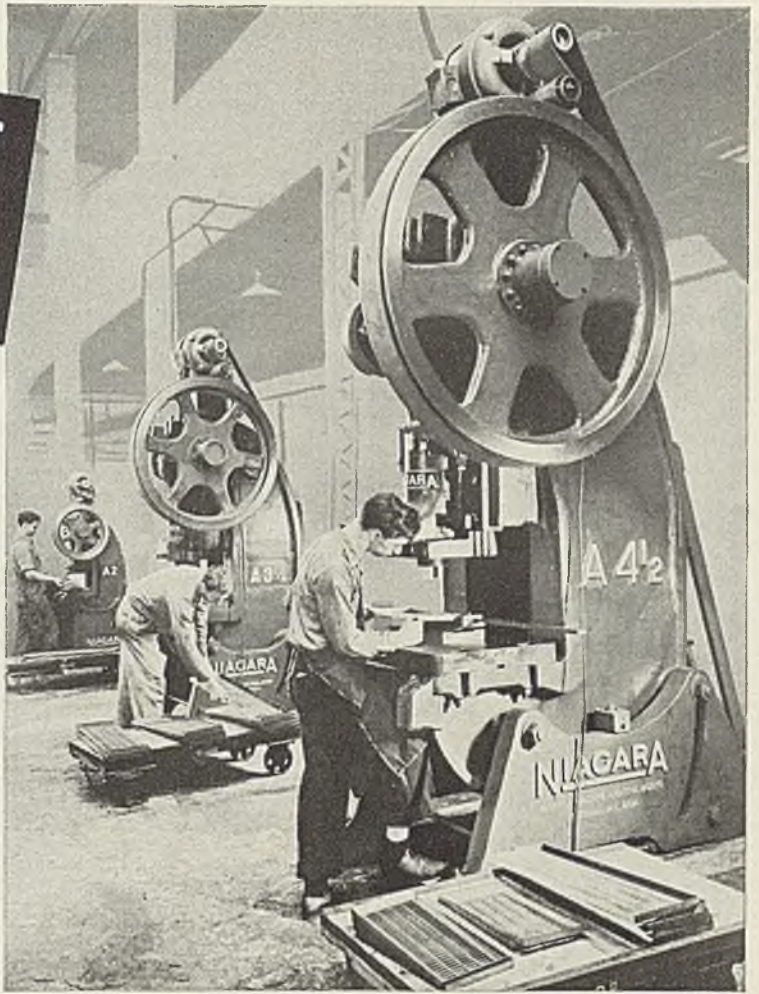
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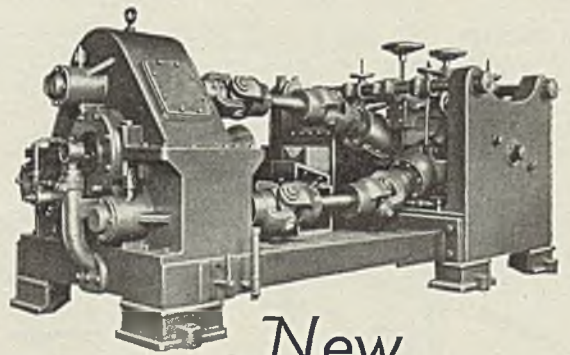
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both plants in Fort Wayne. An expansion program is planned.

**TERRE HAUTE, IND.** — Frank Prox Co., boiler manufacturer, has filed papers with the Indiana secretary of state showing a reorganization of the company under the name of Frank Prox Co. Inc., and a capital stock of 3000 shares having a declared par value of \$50 per share.

### Illinois

**ARLINGTON HEIGHTS, ILL.**—Creamery Package & Mfg. Co. will erect a factory, and will install motors and controls, conveyors and other equipment. Cost \$200,000.

**CHICAGO**—H. S. Kaiser Co., 3336 Franklin boulevard, plans rebuilding two-story factory recently damaged by fire. Cost \$50,000.

**GALESBURG, ILL.**—Peru Wheel Co., Peru, Ill., plans erection of new plant building and rehabilitating old Frost Mfg. Co. building for factory. Estimated cost \$200,000.

**SOUTH ELGIN, ILL.**—City plans constructing a municipal waterworks system, costing \$40,000. Kenzie Engineering Co., Pekin, Ill., engineer.

### Connecticut

**DANBURY, CONN.** — Danbury hospital, Arthur E. Tweedy, president, plans central heating plant for proposed three-story addition in 1938. Cost about \$300,000. William Sperry, Danbury, is chairman of building committee.

**NEW BRITAIN, CONN.**—Cremo Brewing Co., J. Shritulsky, president, Beiden street, has plans prepared for erection of four-story brew house, one-story bottling plant and one-story additions to cooperage and carpenter shops. Cost \$250,000.

### Massachusetts

**FALL RIVER, MASS.**—Firestone Tire & Rubber Co., Akron, O., has acquired plant of American Plating Co. here for its subsidiary, Firestone Rubber & Latex Co., for the manufacture of rubber latex

products. Buildings will be remodeled and new machinery installed. Cost \$200,000.

### New Hampshire

**EAST SWANZEY, N. H.**—C. L. Lane Co. plans building a wood products plant. Cost \$40,000 with equipment.

### New York

**BALDWINVILLE, N. Y.** — Village plans erection of municipal power plant.

**BUFFALO**—Buffalo Niagara Electric Corp. has secured permit to build a new power substation on Best street. Total cost with transformers and other equipment, \$60,000.

**LONG ISLAND CITY, N. Y.**—C. Srebroff, 35-19 Thirty-sixth avenue, will make alterations to building for Radio Engineering Laboratories, 25-14 Forty-first avenue, Long Island City lessee. Cost with equipment \$40,000.

**SYRACUSE, N. Y.**—Haberle Congress Brewing Co. has acquired property and building of packing company here and plans converting same into bottling plant. Cost to exceed \$100,000.

### New Jersey

**BAYONNE, N. J.** — International Nickel Co., 67 Wall street, New York, will soon take bids for constructing laboratory, foundry, storage building and supply house. Cost \$100,000. Epple & Kahrs, 17 Washington street, Newark, N. J., architects.

### Pennsylvania

**PHILADELPHIA** — Keystone Pipe Line Co. will lay welded steel pipe line from terminal to be built at Tonawanda, N. Y., to Utica, N. Y., a distance of 220 miles, including booster service. Cost over \$1,000,000.

**PHILADELPHIA** — Heintz Mfg. Co., maker of stampings for the automotive and other industries, has under construction a new building 60 x 200 feet in which it will consolidate production of its specialty lines. The company also has a number of other new improve-

ments under way, including facilities for handling scrap and unloading gondola cars. The new building will be ready for use about mid-December. A considerable amount of new equipment already has been purchased.

**YORK, PA.**—International Chain & Mfg. Co. is considering plans for erection of plant, cost of which will exceed \$100,000.

### Michigan

**DETROIT**—Electromaster Inc., 1801 East Atwater street, has plans by Giffels & Vallet, architects, 100 Marquette building, for erection of factory, costing \$150,000.

### Maryland

**BALTIMORE**—Boston Street Construction Co. has let contract to E. Eyring & Sons Co., 808 South Conkling street, for erection of manufacturing and office building. Work consists of wharves, bulkheads, heating and power plant, elevators, conveyors, etc. John F. Eyring, architect, 810 South Conkling street.

### District of Columbia

**WASHINGTON** — Bureau of supplies and accounts, navy department, will take bids until 10 a.m., Nov. 19, schedule 2061, for gasoline-engine driven electric generating sets, delivered Quantico, Va.; schedule 2070, one electric heat treating furnace, delivered Newport, R. I.; until Nov. 23, schedule 2058, hydraulic pumps and motors, delivered Portsmouth, N. H., and Mare Island, Calif.; schedule 2065, one motor-driven horizontal shaper, delivered Mare Island, Calif.; schedule 2074, seamless copper tubing; schedule 2080, nickel-copper alloy; rod and sheet, delivered Portsmouth, N. H., and Mare Island, Calif.

### Mississippi

**MORTON, MISS.** — Adams-Edgar Lumbar Co. will install power equipment in connection with rebuilding of portion of mill destroyed by fire recently, including power station, saw mill, machine shop and other structures.

### North Carolina

**ASHEBORO, N. C.** — Asheboro Hosiery Mills Inc. will install electric power equipment in new one-story mill, 117 x 120 feet, costing over \$65,000. H. V. Blierstein, 1600 Elizabeth avenue, Charlotte, N. C., architect.

### South Carolina

**CHARLESTON, S. C.** — School board will install central heating plant in new three-story junior high school. Cost \$280,000.

### Louisiana

**NEW ORLEANS, LA.** — Pelican Cold Storage & Warehouse Co. Ltd., 1561 St. Louis street, has purchased group of four multi-story buildings and will remodel and equip it for new terminal with cold storage and refrigerating units. Charles Behre, president.

**PLAQUEMINE, LA.** — City has authorized purchase of diesel generating set, deep well turbine pumping machinery, service pumping units and accessories for municipal waterworks. Cost over \$60,000.

### Virginia

**LANGLEY FIELD, VA.** — Purchasing and contracting officer, signal corps, base signal office, takes bids until Nov. 18 for five 125-foot vertical steel towers, with necessary ground net, tower

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### Missouri

ST. LOUIS — Shell Pipe Line Corp. Shell building, will lay a welded steel pipe line from Roxana, Ill., to Indianapolis, a distance of about 260 miles, for transmission of crude oil. Cost \$3,000,000.

### Oklahoma

HOLLIS, OKLA.—City has voted \$135,000 light plant bonds.

TULSA, OKLA.—Public Service Co. of Oklahoma has plans under way for expansion and improvements in steam-electric generating plant, including installation of new 20,000-kilowatt turbine generator unit and auxiliary equipment, high pressure boilers and miscellaneous apparatus. Work scheduled to begin early in 1938. Estimated cost \$1,000,000.

### Wisconsin

GREEN BAY, WIS.—Atlas Storage & Warehouse Co. has let contracts for construction of \$65,000 addition to plant in Preble township, occupied by Shefford Cheese Co. Architect Harry Williams, Green Bay, is in charge.

MILWAUKEE—Atlas Sheet Metal Works, 2348 North Teutonia avenue, has leased shop quarters at 1609-1611 North Third street.

MILWAUKEE — Premier-Pabst Corp., formerly Pabst Brewing Co., has let complete contract to Burrell Engineering & Construction Co., 400 West Madison street, Chicago, for building new barley cleaning plant at 1520 North Commerce street, at estimated cost of \$100,000.

OSHKOSH, WIS.—Winnebago county board contemplates construction and equipment of new highway garage and service station estimated to cost \$75,000 or more. E. M. Bird is county highway commissioner.

### Minnesota

LAKEFIELD, MINN. — Board of ed-

ucation has plans for steam-power house at local school. Bond issue of \$20,000 has been authorized.

WESTBROOK, MINN. — Plans for erection of municipal power plant costing \$70,000 are being considered. Bond issue being arranged.

### Texas

DALLAS, TEX. — Canada Dry Ginger Ale Co. Inc. is erecting a one-story, 160 x 260-foot plant on a five-acre tract, costing \$130,000. The company will spend approximately \$150,000 for machinery. P. O'B. Montgomery, 913 Akard street, is builder and engineer.

FORT WORTH, TEX. — City council and board of Tarrant county commissioners plan steam power house at central heating service in new city-county hospital and nurses' home. Estimated cost \$500,000.

McALLEN, TEX. — Valley Pipe Line Co. will lay 5½-inch welded steel pipe line from oil field area in Samfordyce to Port Isabel, for transmission of crude oil. Cost \$100,000.

SAN ANTONIO, TEX.—San Antonio Brewery association, B. B. McGinsey, manager, 312 James street, will erect a new office building, and install additional steel tanks and other equipment in its brewery.

SOMERSET, TEX. — Crane Porcelain & Pottery Mfg. Co., recently organized, care of Murray Rice, 516 West Laurel street, San Antonio, Tex., architect, plans installation of electric power equipment in proposed new pottery plant here. Cost over \$60,000. (Noted Oct. 18).

### Kansas

GODDARD, KANS. — Sedgwick County Rural Co-operative Electric association, L. V. Decker, chairman, has been allotted \$222,000 by REA to finance construction of 221 miles of rural transmission lines in Sedgwick county.

WATHENA, KANS. — Rural Co-operative Electric association is being formed with William Groh, Wathena,

as chairman. REA has allotted \$160,000 to finance construction of 151 miles of rural transmission lines to serve 386 customers in Doniphan county.

### South Dakota

FREEMAN, S. DAK. — City, E. Schamber, auditor, is taking bids to Dec. 8, 2 p.m., for construction of a complete new municipal electric light and power plant costing about \$98,000. Certified check of 5 per cent to accompany bid. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineers.

### Iowa

ALLERTON, IOWA — A municipal waterworks system, costing \$48,000, will be constructed by the city, for which PWA funds are pending. Hall Engineering Co., Centerville, Iowa, engineer.

MORNING SUN, IOWA — City is taking bids to Nov. 29, 10 a.m., on three 360-horsepower diesel engines with necessary equipment for electric distribution system, to cost about \$65,000. Ralph W. Gerhart, Cedar Rapids, Iowa is consulting engineer.

WEST BEND, IOWA — Farmers' Creamery Co. will construct a one-story cold storage and refrigerating plant, costing \$30,000, with equipment.

### Nebraska

GRAND ISLAND, NEBR.—City light department plans purchasing large generator, boiler and auxiliary equipment for city light and power system.

### Pacific Coast

LOS ANGELES — Packard Motor Car Co., 1580 East Grand boulevard, Detroit, will install motors and controls, conveyors, transformers and accessories, electric hoists and other equipment in new branch assembling plant at South Gate, Los Angeles. Work to begin early in 1938. A power plant will also be built. Total cost \$850,000.

SEATTLE—Seattle Chain & Mfg. Co., 6921 East Marginal Way, has been incorporated with \$300,000 capital, by W. J. McElroy and associates.

SPOKANE—Specifications for completion of the Coulee Dam and construction of a power plant, bids to be opened here Dec. 10 by bureau of reclamation, will allow four years for the job. The government will furnish materials which include 7,000,000 barrels of cement and 79,000 tons of steel. Cost of power plant and equipment is estimated at \$67,425,000. Specifications include the following items: 25,000 tons reinforcing steel; installing 433,000 lineal feet ceiling strip; 700 tons contraction joint tubing and fittings; 2350 tons tubing and fittings for concrete cooling system; 25,067 tons gates and appurtenances; 1125 tons penstocks and pump inlet pipes, 16,078 tons miscellaneous metal; 1965 tons metal tubings and fittings; 140,000 feet electrical conduit; dismantling and installing 1000 tons cooling headers and fittings. The power house will accommodate nine main generating units, each of 105,000-kilowatt capacity.

### Canada

KENTVILLE, N. S.—Dominion Atlantic railroad, M. K. McQuarrie, engineer, making plans for constructing car repair shops and purchase of machinery. Cost \$60,000.



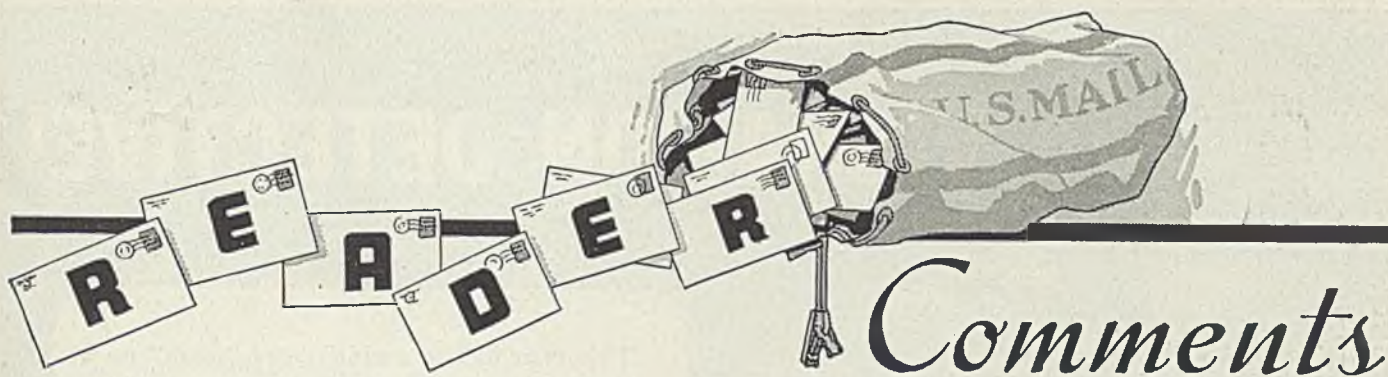
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## Bankers Helped Farm Buying

To the Editor:

Business has been excellent the past year; in fact, the trade press has said in a great many articles that probably 1937 would be one of the best years the farm equipment industry has had, equaling probably 1929. I think possibly that this will be proved true when the books are closed for 1937 and we are all very anxious to forecast 1938.

One of the things that affected us this year was shortage of inventories. The pent-up demand for our product, built up during the depression years, has made it impossible for any of us to supply as many goods as the market would take.

The one outstanding thing that has entered into our industry this year, I think, is a change in financing. The willingness of bankers to handle our class of paper has made the job of financing this industry easier than I believe it has ever been before in its history.

We face a leveling out of our manufacturing program for the coming year. We can't go on an ascending scale, as we have in the past three years, forever; and probably it is not healthy for any industry to have a condition of that kind.

If we do get leveled out on a foundation on which we can do some real planning, it will be better for the industry.

Some of our friends in the steel industry tell me that there is no indication of an increased price in steel; in fact, the decline in the steel industry may make some changes in the other direction.

But we will close the year very grateful for one of the best years of business that we have had for

the past six or seven years, and we look forward with a great deal of hope and a great deal of confidence in the prospects for the coming year.

H. C. MERRITT

Chairman Executive Committee,  
Farm Equipment Institute,  
Chicago.

## Steel Looks to Future

To the Editor:

As a constant reader of STEEL for many years I have been impressed through the lean years with the innate optimism of the men at the head of steel companies. However black the immediate prospect has been there has been no intermission in improving and enlarging plants to make better steel in larger quantities.

The industry seems to feel, and I believe rightly, that there will be need for more steel than can be produced. When continuous strip mills were being built in the past few years some computed the total tonnage they could produce and shook their heads in doubt whether an outlet would be found for it all. Yet in the first half of this year demand for strip was so heavy that deliveries were weeks behind.

The United States Steel Corp. is adding four large freighters to its lake fleet, a sign of faith in an increased need.

While these material elements are being added there is in the background a constant research for better methods and better materials.

Charles F. Kettering's observation at the dedication of the American Rolling Mill Co.'s new research laboratory at Middletown, O., that research is insurance for industry could be made a text for a business sermon that would quicken interest

in going from here to the better things that are to follow and keeping at the head of the procession.

FABRICATOR

Cincinnati.

## United Front Beats CIO

To the Editor:

*It Can Be Done!* Right in the "hotbed" of one of the CIO strongholds in Coraopolis, Pa., (an industrial and residential community of about 15,000 population near Pittsburgh), where CIO-ism once flourished in its fullest bloom and with the enthusiastic aid and co-operation of New Deal state and county executives and police authorities staged the infamous Standard Steel Spring Co. strike, a young Republican organization comprised of both young men and women supported by their parents and co-operating with the older and more experienced Republicans and old style Democrats rose up just prior to the recent election and covered themselves with glory by decisively defeating every CIO-supported New Deal candidate from the burgess down, and won a 100 per cent victory.

Of course, this triumphal result was not accomplished by the mere waving of a magic wand or blowing of trumpets but was the direct result of a very well planned and hard fought campaign.

It appears that it might be well for some of the larger nearby communities to make an earnest effort to emulate the striking example of sound American political resourcefulness exhibited by this splendid group of young men and women and the older ones that supported them.

HENRY N. HOLDREN SR.  
820 Seventh Avenue,  
Coraopolis, Pa.

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