Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, Ohio. JOHN A. PENTON, Chairman of Board; E. L. SHANER, President and Treasurer; J. R. DAWLEY and G. O. HAYS, Vice Presidents; F. G. STEINEBACH, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

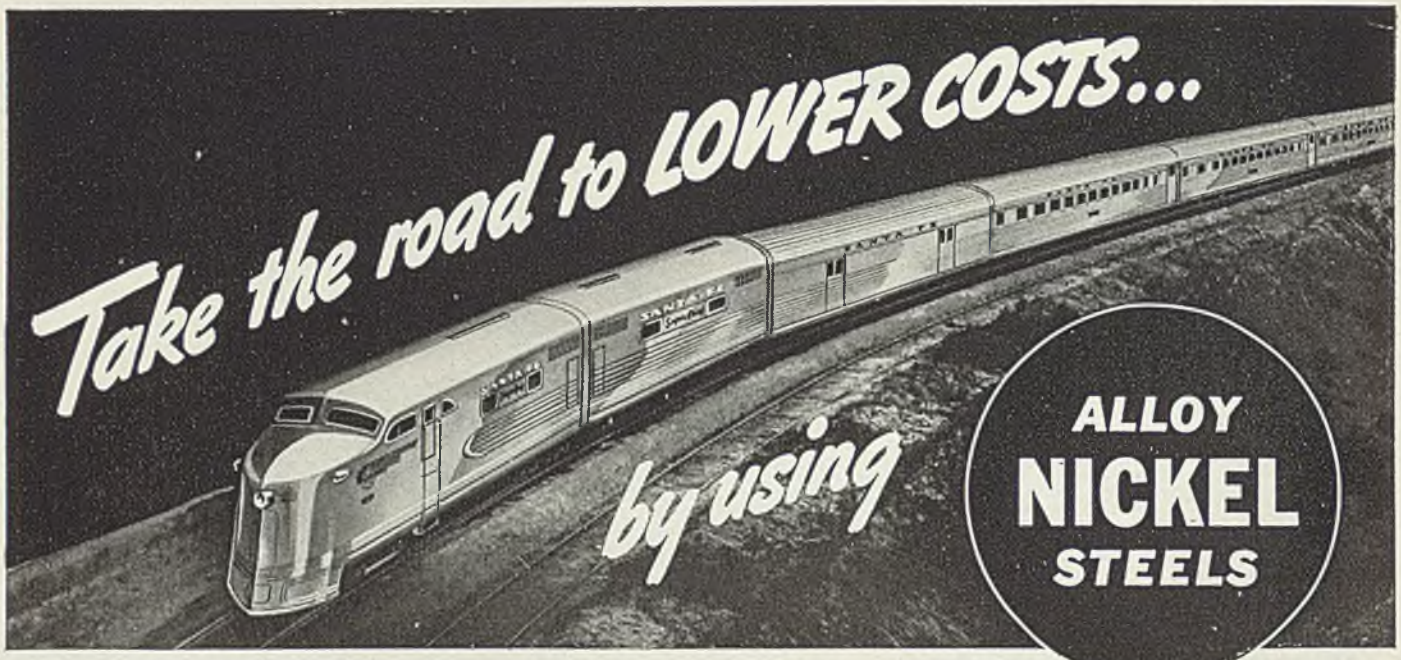
Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

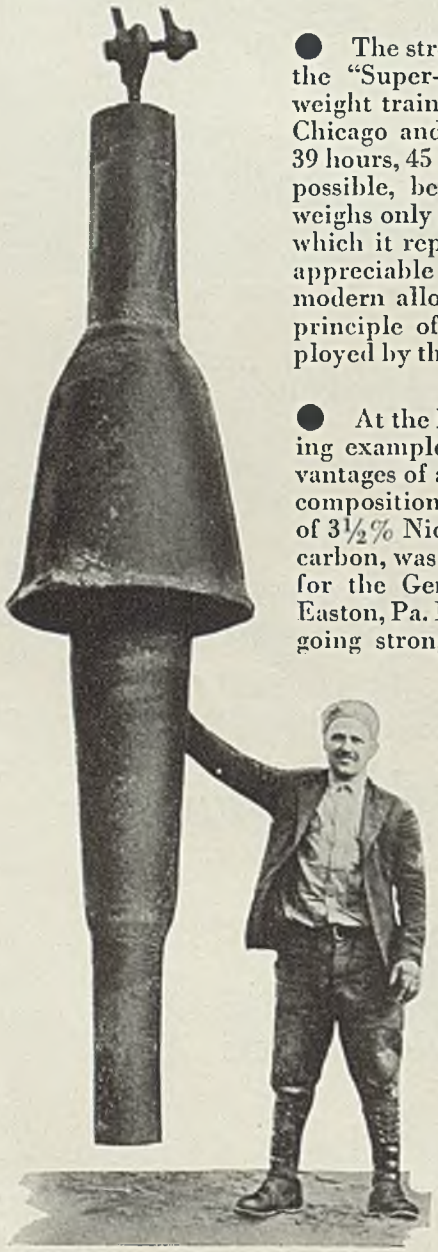
STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

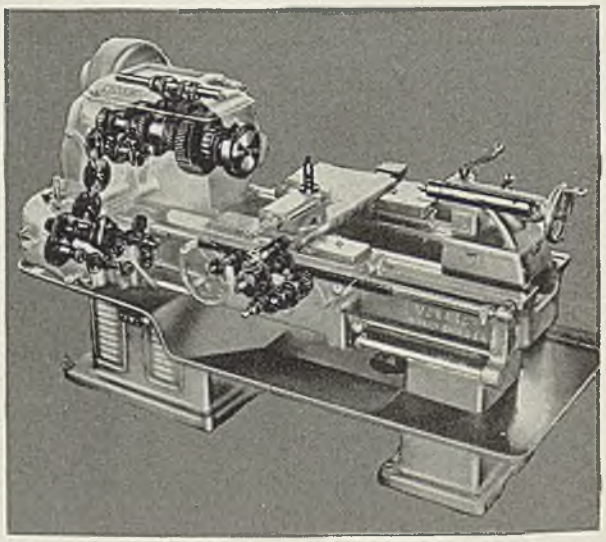
Vol. 101-No. 18 **November 1, 1937**





● The streamlined flier pictured above is the "Super-Chief," Atchison's new light-weight train which makes the run between Chicago and Los Angeles (2,228 miles) in 39 hours, 45 minutes. Such fast time is made possible, because this train of eight cars weighs only half as much as the steam train which it replaces. And responsible for this appreciable weight-reduction is the use of a modern alloy of Nickel, stainless steel. The principle of light-weight construction employed by the Edward G. Budd Manufacturing Co. calls for the use of stainless chromium nickel steel which is fabricated by the Budd "shotweld" process. When you consider the saving in fuel costs and the saving in costs of maintaining road bed and rails, it's easy to understand the constantly growing popularity of stainless steel construction. Perhaps there's equipment in your line of business where the high strength-weight ratio of the Nickel Alloy Steels may be used to bring about worthwhile economies.

● At the left we have another striking example of the cost-reducing advantages of another Nickel Alloy Steel composition. This huge crusher shaft of 3½% Nickel Steel with about .30% carbon, was made by Bethlehem Steel for the General Crusher Stone Co., Easton, Pa. Installed in 1906 it was still going strong in 1930. It was retired from service then, but only because the crusher was obsolete. When equipment parts stand such gruelling service for 24 years, they've certainly paid for themselves over and over again. But that's characteristic of the Nickel Alloy Steels.



● If you have a grumbling gear in your plant it's fairly safe to wager it isn't made of Nickel Alloy Steel. The dark detail in the phantom cut pictured here shows a typical installation of gears and other parts made of Nickel Alloy Steels. The lathe is a product of The Monarch Machine Tool Company, of Sidney, Ohio. Nickel Alloy Steels by Crucible Steel Company of America. Maintenance costs are kept low with Nickel steel gears because they have such high resistance to wear, shock and fatigue.

If frequent gear failures is one of your problems, or if you want to be sure your production cycle has no vulnerable points, Nickel Alloy Steel gears are the ones to specify.

THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

CONSIDERING the volume of desirable work to be done to adapt the country's physical facilities to modern needs it is a pity we seem unable to conduct affairs so as to avoid interruptions such as the current faltering in the progress of recovery. Today we witness a general feeling of hesitancy. Yet all around us are important tasks begging for action. If we had unlimited funds, we could work at capacity several years and yet could not in that time rehabilitate cities, streets and highways sufficiently to adjust them to requirements of present standards of motorized life.

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America Tomorrow

In the approaching decade America will be rebuilt in many respects, and the sooner we can pave the way for rebuilding the sooner we will release a strong new force for recovery. Members of the steel construction industry in convention last week (p. 26) were given vivid outlines of elevated highways, new designs for buildings, grade separation, housing, and numerous other types of work necessary to relieve congestion in cities and promote safety. This constitutes a new frontier which will challenge the skill and resources of the nation. Steel and allied industries will play an important role in this work.

• • •

Young Men To the Top

Because changes had been expected, the announcement by Chairman Myron C. Taylor of U. S. Steel (p. 29) that Edward Stettinius, Jr. and Benjamin Fairless soon will become chairman and president, respectively, of the world's largest steel corporation did not elicit widespread surprise. Nor will an industry that repeatedly has witnessed the thrusting of great responsibilities upon young shoulders be unduly moved by the fact that posts now held by 63-year-old incumbents will go to men aged 38 and 47 years. Outsiders may say that this shift to youth is a sign of the times—a recognition of the new school of economic thinking. Maybe so, but steelmakers recall youngsters in high positions 30 years ago. There is always room at the top for old and young who have ability. All industry unites in congratulating U. S. Steel's new chiefs upon their forthcoming promotions.

• • •

Acetylene in Chemistry

Centerpiece in this week's issue is the section devoted to the 38th annual convention of the International Acetylene association to be held in Birmingham Nov. 10-12. Rapid developments in this industry (p. 96) have provided much of interest for discussion purposes in the annual round table sessions, feature of the meeting (p. 106). Of unusual interest is the marked trend toward wider use of acetylene in the chemical industries, as outlined in the presidential address (p. 108). One of the most rapidly growing uses of flame hardening is in selective work where only parts of metal pieces require hardening, allowing the balance of the article to remain free from any tendency to scale or distort (p. 48). Several interesting applications have been developed along these lines.

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Cadmium Nears Record

Continuous rails of a mile or more in length are now in use in several sections of trackage on American railroads. Field welding apparatus for rapid laying of this joint-free track (p. 52) features many interesting developments, including a special locomotive which supplies steam for the turbogenerators. Pronounced successful after two years' operation (p. 62) are boilers using waste heat from gas engines used in steel plants. These units supply the necessary steam economically, lowering fuel costs. According to metal men (p. 68), the upper limit in cadmium production is approximately 4,000,000 pounds, and it may be reached this year. Present sources of cadmium, which is obtained only as a by-product in refining other metals, are being worked to the utmost to supply the growing automotive demand.

E. L. Shaner

When You Change the Product

Let INLAND Change the Steel

INLAND STEEL

Change the design of your product and often it becomes necessary to change the kind of steel you are using.

Whenever this problem arises Inland field men can be of real service to your plant.

FOR EXAMPLE:

Recently a large equipment manufacturer, seeking to improve his product, adopted a heat-treated part. This part required a minimum hardness (Rockwell C-43) after quenching and drawing.

Samples had been satisfactory, but mass production brought a great deal of loss from cracking in the quench. A steel of different analysis was ordered, but after the quench it lacked sufficient hardness.

A SUGGESTION

This manufacturer then followed the suggestion which is now being passed on to you. He called his nearest Inland office for some special help on the problem. Within a few days Inland metallurgists had the proper analysis steel moving swiftly and economically through his plant.

IT'S PRACTICAL

Inland is especially equipped and organized to perform this kind of service for steel users. Others are finding it highly valuable—so will you.

SHEETS STRIP TIN PLATE BARS RAILS TRACK ACCESSORIES PLATES FLOOR PLATES STRUCTURALS PILING REINFORCING BARS

INLAND STEEL CO.

General Offices: 30 South Dearborn Street, Chicago, Illinois — Offices in: Detroit, Kansas City, Milwaukee, St. Louis, St. Paul

Steel Profits for Nine Months

143% More Than in 1936

PROFITS of steel producers thus far this year are nearly two and one-half times larger than they were in the corresponding period of 1936.

This calculation is based on reports from the 12 leading makers, including the United States Steel Corp., Bethlehem Steel Corp. and Republic Steel Corp. These 12 have 82 per cent of the nation's ingot capacity.

Using total ingot production as a measure, this year is 26.8 per cent ahead of 1936. In profits, as indicated by financial reports of the 12 companies, 1937 is 143 per cent better than last year.

In the nine-month period this year, steelworks operations averaged 83.12 per cent of capacity, and in the comparable period last year 65.4 per cent.

Net profits of the 12 producers for the first nine months this year aggregate $193,371,350, as compared with $79,604,755 in the three quarters of last year.

On this basis, total net profit in the nine months for the whole industry was $236,000,000. For the full year 1936, the industry's net profit was approximately $137,572,488.

Third Quarter Profits Down

Net profits of the 12 companies in the third quarter this year totaled $62,205,335, against $67,514,573 in the second quarter, and $35,566,602 in the third quarter of 1936.

Indicated average profit per ton of ingot capacity for nine months this year for the 12 producers is $4.59, compared with an indicated $1.89 for the nine months last year.

Estimated individual profit per ton, based on each company's ingot capacity for nine months, was higher than last year, as shown by the following detailed figures:

	1937	1936
National Steel Corp.	$8.36	$4.21
Inland Steel Co.	7.19	5.14
U. S. Steel Corp.	4.93	1.55
American Rolling Mill Co.	4.89	2.30
Sharon Steel Corp.	4.88	2.44
Allegheny Steel Co.	4.73	3.63
Youngstown Sheet & Tube Co.	4.48	2.92
Otis Steel Co.	4.33	2.25
Bethlehem Steel Corp.	3.87	1.21
Wheeling Steel Corp.	3.81	1.58
Continental Steel Corp.	3.78	1.89
Republic Steel Corp.	1.87	1.28
Average	$4.59	$1.89

COMMON DIVIDEND RESUMED BY UNITED STATES STEEL

United States Steel Corp. directors last week declared a dividend of $1 per share on common stock, the first common dividend since March 30, 1932. The regular quarterly dividend of $1.75 per preferred share also was declared.

Earnings for the third quarter were $48,213,455, compared with

Third Quarter and 9-Month Financial Comparisions for Steel, Iron

All figures are profits except where asterisk denotes loss

	Third quarter 1937	Second quarter 1937	Third quarter 1936	Nine months 1937	Nine months 1936	Annual ingot capacity, gross tons
U. S. Steel Corp.	$30,617,638	$36,173,682	$13,663,177	$95,352,853	$29,901,904	25,772,400
Bethlehem Steel Corp.	9,249,560	10,022,874	4,575,058	27,566,267	8,609,514	9,360,000
Republic Steel Corp.	3,237,155	487,251	3,311,555	9,291,470	6,333,649	6,533,000
Youngstown Sheet & Tube Co.	3,586,495	2,022,112	2,359,998	10,494,627	6,845,385	3,120,000
National Steel Corp.	5,227,071	6,013,077	3,359,704	16,935,967	8,542,419	2,700,000
American Rolling Mill Co.	2,646,525	4,321,854	2,063,603	9,289,296	4,368,668	2,531,120
Inland Steel Co.	4,433,375	3,178,383	3,788,199	12,620,532	9,021,022	2,340,000
Wheeling Steel Corp.	1,230,192	2,463,034	1,186,660	5,002,033	2,068,859	1,750,000
Otis Steel Co.	948,285	1,040,424	495,110	2,691,105	1,395,459	828,000
Allegheny Steel Co.	271,579	864,449	349,277	1,687,082	1,297,045	476,000
Sharon Steel Corp.	498,570	672,258	342,418	1,646,606	823,370	450,000
Continental Steel Corp.	258,890	255,175	71,843	793,512	397,461	280,000
Totals	$62,205,335	$67,514,573	$35,566,602	$193,371,350	$79,604,755	56,140,520
FINISHING CAPACITY ONLY						
Acme Steel Co.	305,863	669,441	538,847	2,070,245	1,444,474	.....
Superior Steel Corp.	103,492	120,648	118,010	310,260	205,824	.....
PIG IRON CAPACITY ONLY						
Interlake Iron Corp.	837,371	572,835	99,311	1,782,408	67,634	1,215,000
Virginia Iron, Coal & Coke Co.	30,335*	33,135*	8,029*	93,168*	89,984*	200,000

$30,044,389 for the third quarter, 1936. For the first nine months this year earnings totaled $147,190,286, nearly double the $75,786,019 for the first nine months last year.

Net income on capital stock for the third quarter amounted to $30,617,638, against $13,636,177 in the corresponding 1936 period. For nine months this year net income was $95,352,853, compared with $29,874,904 in nine months of 1936.

Earnings and net income figures are stated before deduction or allowance for federal surtax on undistributed profits. Amount of this tax can be determined only after final results for the entire year are known. However, the statement for the nine months comprehends an estimated allowance for such taxes of $4,500,000.

Expenditures during the first nine months this year for additions and betterments to plants and property, and for payment of maturing bonds and other capital obligations of subsidiaries, amounted to approximately $81,000,000. Unexpended balances on authorized appropriations for additions and improvements are approximately $113,000,000.

Net working assets of the corporation and subsidiaries, exclusive of dividends declared and unpaid, were as follows:

Dec. 31, 1935	$389,123,253
Dec. 31, 1936	391,330,566
Sept. 30, 1937	419,031,875

Operations for the third quarter as measured by finished product output averaged 73.6 per cent, compared with 88.4 per cent in the previous quarter, and 63.6 per cent in third quarter of 1936.

For the nine months this year shipments totaled 10,956,846 tons, or at the rate of 81.4 per cent of capacity. In recent weeks a rather marked falling off in shipments to customers occurred resulting in an October average to date of approximately 54 per cent of capacity.

Approximately 276,000 employes were on the payroll in September. Employment and payroll statistics for the first nine months of 1937 and the corresponding period of 1936:

	9 months ending Sept. 30 1937	1936
Employes	263,542	216,709
Payroll	$354,217,827	$242,635,540

BETHLEHEM EARNS $6.88 IN FIRST NINE MONTHS

Bethlehem Steel Corp. reports net profit of $27,566,267, equal to $6.88 per common share, for the first nine months of 1937. This compares with $8,609,514 for the corresponding period in 1936.

For the third quarter, net profit was $9,249,560, equal after preferred dividends to $2.31 per common share, compared with $2.56 per share in the second quarter and 84 cents per share in the third quarter of 1936.

Directors declared a dividend of $1.50 per common share payable Dec. 24 to stockholders of record Dec. 17. Dividends of $1.75 on the 7 per cent cumulative preferred, and of 25 cents on the 5 per cent cumulative preferred, payable on or before Jan. 3 of record Dec. 3, also were declared.

The $1.50 common dividend is the fourth consecutive quarterly disbursement, payments having been resumed on common stock with the declaration of $1.50 per share last Dec. 8. This was the first dividend on common since Feb. 15, 1932, when 50 cents a share was paid. For the first quarter this year $1 per share was paid, and in the second quarter $1.50.

E. G. Grace, president, reported current operations are approximately 65 per cent of capacity. Operations in the third quarter averaged 85.1 per cent compared with 92.9 per cent in the second quarter and 69.5 per cent in the third quarter last year.

Current rate of bookings is at 45 per cent of capacity. Estimated value of orders on hand Sept. 30 was $125,820,124, compared with $147,216,591 at the end of the second quarter and $93,272,198 Sept. 30, 1936.

Wages in the first nine months amounted to approximately $134,000,000 as against $86,000,000 in the corresponding period a year ago. Bethlehem reached its peak in employment in the third quarter with 103,000 men on the domestic payroll, as compared with 85,000 in the third quarter last year. Since the end of the third quarter there has been approximately no change in number of men employed.

Average hourly earnings last quarter per employe amounted to 89 cents, against 71.6 cents in the similar period last year.

Average number of hours worked per week was 40.2 for the first quarter, 39.4 for the second and 37.8 for the third. Last year the average was 3.57 for the first quarter, 39.5 for the second, 39.3 for the third and 40.3 for the fourth.

Capital expenditures during the first nine months this year were $35,000,000, with $14,000,000 yet to be expended. Mr. Grace estimated $10,000,000 would be spent in the fourth quarter bringing the total to $45,000,000 for the year and leaving $4,000,000 unexpended. Last year $16,000,000 was spent for capital equipment.

REPUBLIC'S NINE MONTHS NET UP 46 PER CENT

Third quarter net profits for Republic Steel Corp., Cleveland, after deducting all charges, amounted to $3,237,155. Net profits for the first nine months are $9,291,470, compared with $6,333,649 for the same period in 1936.

The provision for estimated federal income tax for the nine months period this year ending Sept. 30, 1937, was $3,600,000, including $1,350,000 for estimated surtax on undistributed profits.

The new 98-inch continuous mill in Cleveland, is nearing completion with the hot mill and the hot mill finishing going into production last week. The cold mill is expected to start operating about Nov. 15.

INLAND'S NET UP 39 PER CENT; $1 DIVIDEND

Inland Steel Co., Chicago, has declared a dividend of $1 a share, payable Dec. 1 to stockholders of record Nov. 15. In the nine months ending Sept. 30 indicated net profits were $12,620,532 against $9,021,022 in the same period last year, an increase of approximately 39 per cent. Third quarter net was $4,433,375 compared with $3,178,383 in the preceding quarter and $3,788,199 in the September quarter last year. No provision for undistributed earnings tax was made in the third quarter figures.

NATIONAL STEEL PROFIT EQUAL TO $7.81 PER SHARE

National Steel Corp., Pittsburgh, reports third quarter net income after all charges except provision for federal surtax on undistributed profits was $5,227,071.04, equal to $2.41 per share on 2,167,777 outstanding shares. These earnings compare with $3,359,704.57, equal to $1.56 per share on 2,157,777 shares in the third quarter 1936. Nine months net profit is $16,935,967.16, equal to $7.81 per share, against $8,542,419.36 or $3.96 per share in the same period 1936.

JONES & LAUGHLIN POSTPONES QUARTERLY MEETING

The regular quarterly dividend meeting of Jones & Laughlin Steel Corp., Pittsburgh, scheduled for Oct. 26, was indefinitely postponed. It was understood that directors wished a clearer view of this year's operating results and profits prior to taking dividend action. At the present time the company is paying dividends at the rate of $7 annually on the preferred stock, on which there still are dividend arrears of $26.25 a share.

AMERICAN ROLLING MILL DOUBLES NINE MONTHS NET

For the nine months ending Sept. 30, American Rolling Mill Co., Middletown, O., reports net profit of $9,289,296, equal to $3.09 a common share, more than double the $4,363,-

(*Please turn to page* 151)

With Steel Executives at Fall Outing

■ Executives of member companies of the American Iron and Steel institute enjoyed an informal outing at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 23-25. At the left is Tom M. Girdler, chairman of the board, Republic Steel Corp. Below, in golf togs, are left to right, F. R. Frost, president, Superior Steel Corp.; B. F. Fairless, president, Carnegie-Illinois Steel Corp.; S. E. Hackett, president, Jones & Laughlin Steel Corp.; F. B. Hufnagel, president, Crucible Steel Co. of America. The group of three at the extreme left, left to right, are W. A. Irvin, president, United States Steel Corp.; Frank Purnell, president, Youngstown Sheet & Tube Co., E. G. Grace, president, Bethlehem Steel Corp.

■ R. J. Wysor, president, Republic Steel Corp., demonstrates his skill at tennis

■ In the group at the trapshooting range are the following: E. L. Wyman, vice president, Clayton Mark Co., Chicago; Hayward Neidringhaus, president, Granite City Steel Co., Granite City, Ill.; A. K. Andrews and W. N. Andrews, vice presidents, Andrews Steel Co., Newport, Ky.; Paul Kruesi, president, Southern Ferro Alloys Co., Chattanooga, Tenn; G. W. Connors, president, Connors Steel Co., Birmingham, Ala.; D. P. Sommer and R. E. Sommer, vice presidents, Keystone Steel & Wire Co., Peoria, Ill.

Cummins Photos

Modernize Cities! Meet Traffic Demands!

Heard at Structural Convention

WHEN the United States gets around to tackling the job of rebuilding America to meet the new requirements of automotive transportation, a heavy share of the responsibilities and opportunities involved in this work will fall upon the steel construction industry. This was the outstanding conclusion to be drawn from the extensive program of the fifteenth annual convention of the American Institute of Steel Construction held at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 26-29.

The necessity of extensive rebuilding was stressed by Henry M. Stevens, vice president, J. Walter Thompson Co., New York. Speaking on "Rebuilding Our Cities," Mr. Stevens said:

"You hear of snarled traffic conditions in every size city. The description is fitting. It embodies the annoyance of those endless traffic jams, the aggravation of being stopped at every corner by cross traffic, the despondency that has resulted in forsaking the private automobile by five to ten million Americans. These five to ten million would own automobiles today if they could drive safely to their destinations in good time, and park their cars without difficulty.

Traffic Is at Saturation Point

"Today there are 26,000,000 cars on our roads. Particularly in metropolitan sectors, our streets are jammed almost to what is called stagnation point. Could any traffic at all move if 37,000,000 cars suddenly tried to use these same roads? That is the number Charles F. Kettering, research engineer for General Motors, estimates will be on our streets in 1960."

Reconstruction of roads for the increase in traffic as well as to make driving safer and faster will necessitate more elevated express highways, Mr. Stevens said.

Development of this type of highway will enlarge steel's market along a broad front, not only for the steel used in constructing the new roadways, but also for its resulting effect on sales of steel to automobile manufacturers, he declared.

"While we regard Park avenue in New York as the best example of a submerged market, where the per capita ownership of cars is lower than that of a small town sidestreet, the submerged market extends from coast to coast—from New York with its 'horse and buggy' traffic speed, to Los Angeles, where 15 miles an hour is averaged by our 80-miles-an-hour cars. And this average is maintained by dangerous crest speeds of 35 to 40 miles an hour."

Mr. Stevens also referred to the parking problem. "Its solution, as much as preparing the roadways of tomorrow, rests with the steel industry," he said.

Reconstruction Needed

E. J. Russell, St. Louis, carried the theme a step further, when in an address "Construction Industry Prospects," he declared that the need of rebuilding involves not only the reconstruction of streets and highways, but also the redesign of buildings to fit into the new requirements.

Something must be done to permit the use of automobiles in congested districts and this requires the design of new buildings which recognize the acute parking problem. He cited the Grant building in Pittsburgh as one in which provision has been made for parking tenants' cars within the building.

Further emphasis on this subject was given at the Thursday morning session when F. H. Frankland, chief engineer of the institute, devoted a large part of his annual report to a discussion of rigid frame construction for bridges and buildings. He was followed by H. D. Hussey, American Bridge Co., New York, who presented an illustrated address on the "Design, Fabrication and Erection of Rigid Frame Structures in Buildings and Bridges."

Mr. Hussey described the application of this type of construction to the parkway system in Westchester county, New York, and to the West Side improvement project in New York city where 397 rigid frames were used in a 2½ mile stretch of elevated highway work.

The discussion of this subject at the convention served to accentuate the timeliness and importance of the national competition recently announced by the institute for the most suitable design of an elevated highway.

F. E. Schmitt, editor, *Engineering News-Record,* New York, in an address, "Steel Construction Progress," reviewed the record of steel construction in the past 50 years and touched upon its opportunities in the future. He said:

"Taking the normal construction demand as of 1930 at 8½ to 9 billion dollars, we would be justified in counting on a 1940 normal of about 11 billion. When we apply this same ratio of growth to steel construction, we find that the present normal requirement, which may be placed at 3½ million tons, will increase to about 4½ million tons by the end of the next decade."

In one of the most comprehensive addresses of the convention, F. T. Llewellyn, research engineer, United States Steel Corp., New York, spoke on "Light-Gage, Flat-Rolled Steel in Housing." Said Mr. Llewellyn:

"More than 1400 homes using steel as a major building material have been built in the United States. Some 3000 others have used steel to lesser degree.

Steel House Is Potential Market

"With the small steel house requiring 5 tons of steel, our annual demand of 300,000 homes in the country makes a potential market of 1,500,000 tons of steel every year.

"Steel construction would elimin- 70 per cent of residential fires which start below the first floor and 15 per cent more which start on the roof, but this is not an outstanding advantage because residential fires are rare and insurance rates already quite reasonable."

Mr. Llewellyn cited as affecting the utilization of steel housing the tendency towards no basements; an increase in flat roofs with portions used for living purposes; more glass in walls; disposition of windows

near corners; and the increasing demand for standardized, mechanical units such as fabricated kitchens and bathroom equipment.

Part of his paper was devoted to taking the "bunk" out of steel housing and dispelling belief that it will be an immediate panacea for all residential ills. "Steel is seeking its own level of usage in housing," he said.

Close attention was given to an address by Edward L. Ryerson Jr., vice-chairman, Inland Steel Co., Chicago, on "Market Problems."

Mr. Ryerson chose to place the major emphasis in the marketing of structural steel upon the broader aspects of the service of steel construction to the public than to the specific applications of this type of construction. Therefore instead of stressing the opportunities for steel in housing, bridges, etc., he touched upon the importance of effective promotion whereby the public may acquire a better appreciation of the value of structural steel. Such promotion, he declared, is more effective in the long run than effort expended to produce prompt, tangible returns in the form of immediate tonnage.

Mr. Ryerson discussed the effect of the high tax burden upon industry. Drawing from his extensive experience with relief work in the Chicago district, he outlined the advantages and disadvantages of the Works Progress administration and the Public Works administration.

He criticized the policy of the former, wherein workers were placed on the federal payroll under conditions which made for waste of public money and demoralization of the persons thus employed. The taxpayers, he declared, received much more for their money under PWA, wherein the government provided the funds for certain projects which were carried out under private contract and under conditions which not only guaranteed a better and a more economical job but also afforded a sounder basis of employment for the workers thus engaged.

Urges Self-Regulation

In his annual address as president of the institute, Clyde G. Conley, president, Mt. Vernon Bridge Co., Mt. Vernon, O., touched upon problems confronting the steel construction industry. Mr. Conley said:

"Next year we are promised a complete overhauling of the antitrust laws of our country. Are we to understand our political leaders have failed to learn well the lessons of 1933-34?

"Industry in this country has grown great because we have followed a system of competition. The purpose of the antitrust laws was to preserve the freedom of competition. We would never have had any demand for a change in those laws had we been mindful of the rights to free competition and careful to restrain all forms of commercial license.

"If license has grown so rampant as to warrant the intervention of the government, then probably we deserve no better. It should be made impossible for any company to compete so freely as to destroy either its competitor, itself, or the industry, or to injure the customer. I, for one, do not believe we have reached such a dire extreme.

"Through voluntary co-operation we can erect that measure of self-regulation as to make governmental interference unnecessary."

Lags Behind General Business

Mr. Conley reviewed the industry's experience with the code and contacts with the government, saying: "It has been sufficient to convince us that government can do almost nothing for business that business cannot to better for itself.

"At this crucial day in our political life let us continue to do all in power to preserve the elements of democracy for a guide to the rest of the world."

Referring to the consumers' situation in the industry, he said:

"Our operating capacity is still less than our plant capacity but we are no longer slipping. Generally, I would say, the structural steel industry is lagging one year behind general business. As other activities gain, we will gain. The nation must prosper before we can prosper."

In the present disturbed state of social unrest, industry has a more serious public relations problem before it than at any other time in history, V. G. Iden, secretary of the institute, stated in his report.

Instead of petitioning the government for special legislation, he pointed out, industry could serve itself better by developing its product to serve mankind better. Not only research, but market development and advertising should be undertaken to tell the world what great things can be built of structural steel.

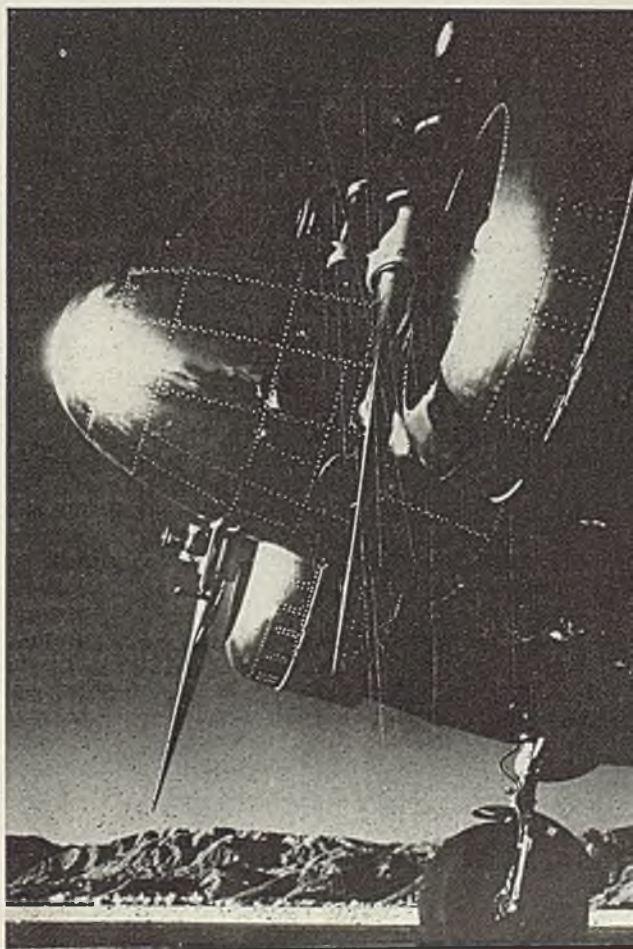
"Collective bargaining with labor, even though accomplished under the most altruistic system, is but the first step towards a rigid price structure," said Mr. Iden. "If the government intends to control this most fundamental cost of production, it will sooner or later find it necessary also to control selling prices.

"Inflexible costs will quickly advance prices and give us an unheard of level of cost of living. By thus artificially advancing the cost of living, we will fail entirely to achieve the abundant life which is alleged to be the goal of our political leaders."

He reviewed briefly proposed legislation schemes, and said:

"What all this means we can only surmise, but very definitely we

Moonlight and Rivets



■ The effect of light on this new Lockheed Electra, all-metal plane, built by the Lockheed Aircraft Corp., Burbank, Calif., was to reveal myriads of rivets used in its construction

can expect that an effort will be made to bring all industry under more rigid inspection and control."

Robert T. Brooks, executive vice president, in his report reviewed the scope of the organization's work. In the ten months from Nov. 1, 1936, to Sept. 1, 1937, he pointed out, as a direct result of its engineering staff's efforts, the tonnage for the year had been increased 117,796 tons.

"At present more than 200 companies, representing 85 per cent of the industry by volume, are assisting in collection of our statistical data," T. H. Hendrix, director, institute's statistical department, reported.

Bookings of fabricated structural steel in the first eight months of 1937 —1,197,381 tons—were 12 per cent over the tonnage in the comparable period in 1936. Shipments amounted to 1,082,844 tons, 9 per cent more than in the eight months in 1936.

Robert C. Post, treasurer of the institute, reported that its finances are "in an especially strong position," resulting from larger shipments this year, and payment of dues based on that tonnage.

Efforts are being made to have lifted the requirement for bonding government contractors for protecting material men and labor, according to the committee on bonds. The committee recommended that the movement be resisted and government be petitioned to continue the practices as set down in the Miller act.

This year 38 per cent of the structural steel sold went into industrial and commercial buildings, against 31 per cent in 1936. Government work also took 38 per cent, compared with 48 per cent in the previous year. Bridge and grade crossing eliminations, included in government work, dropped from 32.7 per cent of the total in 1936 to 24.7 per cent of the sales this year.

The committee on technical research reported that a number of research problems were successfully prosecuted during the year.

Thomas H. Beck, president, Crowell Publishing Co., New York, banquet speaker Thursday evening, declared the belief that "trade follows the flag" is outmoded. "Today trade follows advertising," he said. "Improved air transportation, better communication systems, are shrinking the world, presenting the opportunity to show the masses of people all over the world the virtues of American products." Mr. Beck described his experiences on the first trip of the China Clipper to Hong Kong.

At the session Friday morning, C. Oliver Wellington, McKinsey, Wellington & Co., New York, spoke on the fallacy of selling below costs. Discussion elicited many criticisms of the present federal tax structure.

The convention elected Paul Coddington, Lakeside Bridge & Steel Co., Milwaukee, a director to succeed the late J. Lloyd Kimbrough. C. H. Blakeley, vice president, Bethlehem Steel Co., and Charles R. Michael, president, Virginia Bridge Co., Roanoke, Va., were elected honorary members of the institute.

Navy Opens Bids for Ferromanganese, Ore

■ Bids for approximately 50,000 tons of manganese ore or 11,000 tons of ferromanganese were opened last week by the navy department.

Bids for ore were received from Leonard J. Buck Inc., Jersey City, for full ore tonnage at 46.7 cents per unit, but was of lower grade than asked for; Cuban American Manganese Corp., New York, on 10,000 tons only, at 59 cents per unit.

Bethlehem Steel Co. submitted bids for 11,000 tons ferromanganese, also lower grade than asked for, at $128.75 per long ton of contained manganese; Carnegie-Illinois Steel Corp. and the E. J. Lavino Co., Philadelphia, bid the same; Jones & Laughlin Steel Corp., Pittsburgh, bid $125.953. Electro Metallurgical Co., Alloy, W. Va., bid $139 per ton in barrels and $132 in bulk.

Electrical Manufacturers Convene in Chicago

■ More than 600 delegates gathered at Chicago last week for the annual meeting of the National Electrical Manufacturers association. Principal business of the six-day convention consisted of nearly 150 separate meetings of various divisions, sections and groups of the association.

A feature of the program was the presentation of the James H. McGraw award for the most important personal contribution to progress in the electrical manufacturing industry. The recipient was C. E. Swartzbaugh, president, Swartzbaugh Mfg. Co., Toledo, O.

D. Hayes Murphy, president, Wire Mold Co., Hartford, Conn., was elected president of the association for the coming year, succeeding F. R. Fishback, Electric Controller & Mfg. Co., Cleveland. Other officers chosen include: Vice presidents, F. W. Magin, Square D Co., Detroit; Matthew Porosky, Gamewill Co., Newton Upper Falls, Mass.; Walter Robbins, General Cable Corp., New York; C. E. Swartzbaugh; and N. G. Symonds, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. H. C. Petty, Crocker-Wheeler Co., Ampere N. J., was chosen treasurer.

Lull Brings New Labor Problems

The steel industry's shift from high gear into low has brought certain features of the labor situation into prominence, particularly in regard to CIO contracts that were signed seven months ago when activity was strong.

Mill forces, overtime and hours per week have been reduced. In some plants the fact that overtime was paid in the boom months in preference to hiring additional men has helped cushion the dismissals.

Seniority clauses in contracts are facing tests, although the Steel Workers Organizing committee has made few protests. The time is not advantageous for the union to complain too loudly. It is exceedingly anxious to renew its contracts in the early part of next year; its officers have been tied up recently in negotiations with the AFL, and it faces a lean period from the standpoint of dues.

In regard to seniority, some mills, which hired numerous men during the peak months of this year, are adhering fairly closely to seniority, but in some of the smaller plants any reasonable arrangement to spread the work is permitted.

14,500 Idle at Pittsburgh

Under an arrangement supplementary to the contract, some companies and their employes have agreed that the company may put into effect for one month a share-the-work plan, while awaiting a pickup in business, but at the end of the month the grievance committee may require the company to reduce its forces so that senior employes may get full time.

Rough estimates show that around 14,500 persons have become idle in the Pittsburgh district alone in the steel and allied industries due to the subsidence in activity in the last month. Allegheny county relief officials report that applications are on the increase and now coming in at the rate of around 1000 a week.

Pennsylvania steel mills, metalworking plants and foundries face the necessity of obtaining exemptions or else revising some of their operating schedules in continuous operations when the new 44-hour state law becomes effective Dec. 1. The law is expected to be used as a pattern when congress starts to write a new wage-hour law.

Under the new Pennsylvania law no employer shall employ any person for more than 44 hours in any one week or 8 hours in any one day or on more than 5½ days in any period of consecutive days.

Youth for Action, Age For Counsel, in Steel

WHEN Myron C. Taylor publicly announced last week his intention to retire as chairman of the United States Steel Corp. at the next annual meeting of directors April 4, he signalized the virtual completion of the vast job for which he was drafted to undertake 10 years ago.

This job, briefly, was to revise the capital structure, revamp the plants and physical properties and reorganize the personnel, injecting younger and newer blood into positions of high responsibility. Attention to this latter objective was stressed only last week, when coincident with the stated intention of Mr. Taylor to retire, came the announcement of the selection of 37-year old Edward R. Stettinius Jr., (37, Oct. 22) as his successor; 47-year old Benjamin F. Fairless as president and 45-year old Enders M. Voorhees, a relative newcomer in steel, as chairman of the finance committee.

Appointees Are Young

Men still young as big-time executives go were also elected to the presidency of the Carnegie-Illinois Steel Corp., the Steel corporation's largest subsidiary and the largest steel producing organization in the world, and of the up-and-coming Tennessee Coal, Iron & Railroad Co., namely, J. L. Perry, 57, and Robert Gregg, 52, respectively.

However, that the Steel corporation is not unmindful of the value of counsel of older heads was emphasized by the retention of William A. Irvin, 43 years in steel and retiring president, as vice chairman of the board of directors, and by the intention of Mr. Taylor to continue on (with officers still on the top floor of 71 Broadway) as member of the board and of the finance committee.

Seldom, if ever, have a greater number of important personnel changes in the ranks of the Steel corporation come at one time, than were announced last week. Yet the changes in no respect were startling. They involved no drafting from the outside, such as has been the case upon occasion in recent years, of men new to the steel industry or new to the organization of the Steel corporation itself. Perhaps the nearest approach is in the appointment of Mr. Voorhees, former vice president and director of the Johns-Manville Corp., who became affiliated with the United States Steel Corp. and the industry for the first time only last April.

Edward R. Stettinius Jr.
Chairman of the finance committee, United States Steel Corp., who will succeed Mr. Taylor as chairman of the board April 5, 1938

As a matter of fact, the changes, and especially those at the top, were expected about this time. Certainly Mr. Taylor has indicated strongly upon various occasions his intention of retiring when his program was completed. He undoubtedly would have retired long ago had it not been for the depression, which not only retarded his work but made mandatory his staying on the job until conditions became more settled.

His successor, Mr. Stettinius, has been groomed for the post since he resigned from the General Motors Corp. to join the Steel corporation in 1934, to become, first, vice chairman of the finance committee and then, Jan. 1, last year, chairman of the committee.

Fairless 23 Years in Steel

Likewise, the appointment of Benjamin Fairless to the presidency is hailed generally as a "natural." Coming along fast, since his first affiliation with the steel industry 23 years ago, at Massillon, O., he left the Republic Steel Corp., as vice president, in 1935 to become head of the newly organized Carnegie-Illinois Steel Corp.

His succession to the presidency of the Steel corporation itself was regarded only as a matter of time, and not too long a time at that, as Mr. Irvin, the present incumbent, was approaching the voluntary retirement age. Mr. Irvin will be 65 Dec. 7.

The appointment of Mr. Perry as head of the Carnegie-Illinois, is re-

Benjamin F. Fairless
President, Carnegie-Illinois Steel Corp., elected to succeed William A. Irvin as president of the United States Steel Corp., Jan. 1, 1938

Robert Gregg
Vice President, United States Steel Corp., who on Jan. 1 will become president, Tennessee Coal, Iron & Railroad Co.

J. L. Perry
President, Tennessee Coal, Iron & Railroad Co., who on Jan. 1 will succeed Mr. Fairless as president, Carnegie-Illinois Steel Corp.

William A. Irvin
President, United States Steel Corp., elected vice chairman of the board of directors, effective Jan. 1

Myron C. Taylor
Chairman of the board of directors, United States Steel Corp. He will retire as chairman, April 4, 1938, but will continue as a member of the board and of the finance committee

Enders M. Voorhees
Vice chairman of the finance committee, United States Steel Corp., who will succeed Mr. Stettinius as chairman

garded as highly logical, for, still vigorous and active at 57, his association with the Steel corporation goes back to its founding—in fact, he started his business career in 1899 with the wire plant at Worcester, Mass., which a couple of years later was merged by the United States Steel Corp. Becoming on Jan. 1, 1933, vice president of the American Steel & Wire Co. and on Feb. 1, 1935, president of the Tennessee company, he possesses a well-rounded experience, an experience that has taken him from New England to the Mid-West (Cleveland) to Birmingham in the South.

As for his successor, Robert Gregg, his change will be like going home, for it was in the South that he was born and raised and spent much of his life in steel. Before joining the Steel corporation, he was president of the Atlantic Steel Co., Atlanta, Ga. Following a few years as president of the Tennessee company, he was brought to New York as vice president in charge of sales for the United States Steel Corp. Now he is going back to his old job. He likes it down there.

His successor has not been announced, and it is believed that with this possible exception, no further important changes are in the offing.

Oldest Member Resigns

Along with his new duties as president, Mr. Fairless also becomes a director, succeeding Thomas Morrison, resigned, of Pittsburgh, who was the oldest member. With James A. Farrell, he was one of the two Andrew Carnegie men still remaining.

In winding up his work as active head of the United States Steel Corp., Mr. Taylor has wrought many changes. Coming into active charge in 1927 (he had been a director since 1925) at the request of J. P. Morgan, then serving as temporary chairman of the board, he evolved the three-point program mentioned. The corporation, he was told, was in need of rehabilitation; the job was his to perform.

Revamping of its capital structure was his first objective, and this culminated in 1929 in the retirement of bonds valued at $340,000,000, a refunding operation which was to reduce the fixed annual charges from $24,000,000 to $5,000,000, a particularly welcome saving in the depression years soon to follow.

Progress with respect to physical properties and personnel was naturally to come more slowly by virtue of the character of these undertakings. The depression made advancement along these lines particularly difficult, but slow at first, progress became highly accelerated over the past three years.

Expansion Costs Half Billion

Reorganization of the physical properties called for the abandonment of some units, modernization of others and the construction of various new plants, with the emphasis on light, flat-rolled products for the consumer trade. Up to the beginning of this year $364,000,000 had been expended, with $157,000,000 appropriated for additional work, which is now going forward.

These changes were made not only with a view to improving facilities, but to giving them the best possible geographical location. Thus expansion has been particularly notable in the Chicago-Gary and Birmingham, Ala., districts, as well as around Pittsburgh, Youngstown, Cleveland and other points.

Along with this change in physical properties, came a revamping in various lines of personnel, particularly the sales force, with a centering of executive direction, as important subsidiaries were merged to accomplish this end and to simplify the corporate structure of the organization. As well known, the outstanding consolidation is that now represented by the Carnegie-Illinois Steel Corp., effected in 1935.

Mr. Stettinius was reared in the realm of finance and industry. His father, now dead, was a partner in J. P. Morgan Co., and the younger Stettinius upon being graduated from University of Virginia was given first a minor post with the Hyatt Roller Bearing division of the General Motors Corp., then made assistant to the vice president in charge of General Motors accessory division and four years later assistant to Alfred Sloan, head of General Motors.

He displayed keen interest in public and industrial relations from the first and it was in charge of this work that he in 1931 was made a vice president of General Motors Corp. So capable was he in this field that General Hugh Johnson drafted him as liaison officer when the N.R.A. was organized. His continued interest in industrial relations, as well as in financial problems, has been manifest since his affiliation with the Steel corporation.

Kettering To Speak at Laboratory Dedication

■ Charles F. Kettering, vice president in charge of research, General Motors Corp., will be the principal speaker and guest of honor at the dedication of the American Rolling Mill Co.'s new research laboratory building at Middletown, O., Nov. 5. Mr. Kettering will speak on "Research, Industry and Progress," before 250 leading scientists, research men, editors, and scientific writers.

George M. Verity, chairman, and Charles R. Hook, president of the company, also will speak.

The new laboratory building was described in STEEL, Oct. 4, p. 68.

How Freight Rise Affects Steel

Railroad executives in session at Chicago last week, formulating their petition to the interstate commerce commission for a general increase of 15 per cent in freight rates, estimate increased costs of operation total close to $460,000,000 annually. Revenue to be derived from the 15 per cent increase is estimated at about $440,000,000 on the basis of 1936 traffic, or $485,000,000 on volume of the first eight months of 1937.

Meanwhile, new tariffs embodying the 10 per cent increase recently granted are being prepared.

The carriers were authorized to make the rates effective on five days' notice, waiving all regulations in conflict. It is believed the effective date will be between Nov. 10 and 15.

Under the ruling, applying to finished steel, all rates under 10 cents per 100 pounds will take an added 10 per cent. At 10 cents and higher per 100 pounds the increase will be a flat 1 cent, the maximum. The effect of this is to limit the full 10 per cent addition to hauls of 30 to 35 miles from the point of origin and all shipments moving to a greater distance will be at 1 cent over the former rate. On finished steel the rate from Pittsburgh to New York is 33 cents and will become 34 cents under the new tariff; from Pittsburgh to Baltimore it rises from 27 to 28 cents.

Consumer Bears Increase

On finished steel the consumer will bear the increase but in the case of a mill some distance from the basing point some absorption will be necessary, as usual. The increased cost to a consumer on a carloaod of 50,000 pounds will not exceed $5 for the 25 tons.

In pig iron the situation is confused and additional transportation costs are unequal, as between users of Michigan or Minnesota iron ore and between lake furnaces and those located inland.

Michigan ore will pay 6 cents more per ton for movement to upper lake docks and an equal addition for movement from lake dock to furnace. Minnesota ore pays no additional rate from mine to upper lake dock but will pay 6 cents additional for shipment to interior furnaces. The result is that the higher cost of freight on iron ore used in production of one ton of pig iron will vary from no increase to 24 cents per ton. Minnesota ore used by a lake furnace has no increase but used by an inland furnace the rate is 12 cents more for the two tons of ore to make one ton of pig iron. Michigan ore to a lake furnace bears 12 cents additional on the two tons, and to an inland smelter 24 cents.

With an addition of 10 cents per ton on coal the cost for coke to produce a ton of pig iron will be increased about 15 cents. Thus the added cost of pig iron will vary from 15 cents to about 40 cents per ton. A small additional cost will be carried by limestone but as this commodity often is practically a local product or moved by water this will not have much effect on cost of the iron.

J. & L. Scrapping Two Shape Mills

Jones & Laughlin Steel Corp. announced last week that it will scrap the No. 12 and No. 14 structural mills at its Pittsburgh works, and has suspended the manufacture of certain structural sections pending future arrangements.

Actual dismantling of these mills, which are 20 to 35 years old, has not yet started but will begin in the near future. No 12 mill rolled beams, channels and angles and at one time universal plates.

Jones & Laughlin officials emphasized that scrapping of the mills is not to be construed as meaning that the company is going out of the structural business. For example, the 14-inch mill at Aliquippa is still rolling shapes.

Space occupied by the two old mills will be available for expansion.

With the new continuous mill in operation, open-hearth capacity has at times been greatly taxed. Too much finishing capacity at Pittsburgh has been going into capital goods products and not enough into the consumer goods classification.

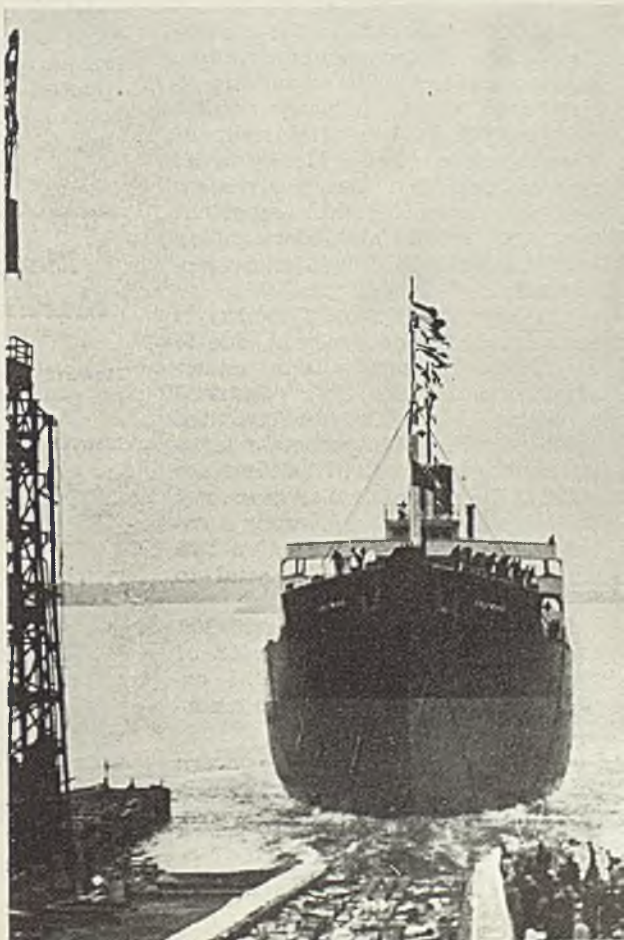
Sales of structurals and piling have been consolidated under the hot rolled department, resulting in the retirement Nov. 1 of C. C. Dornbush and George H. Danforth, the former with Jones & Laughlin 40 years and the latter, 37 years.

To meet increasing demand for sulphate of ammonia in the southern states, the corporation announces the construction of a sulphate of ammonia warehouse and bagging plant at Memphis, Tenn.

The warehouse, designed to store and handle 8000 tons of sulphate of ammonia, will provide the corporation with improved facilities for quicker deliveries and better service to the cotton growers of the Delta states.

All-Steel Tanker Entirely Fireproof

■ Steel construction throughout makes the tanker GULFWAVE entirely fireproof. Even berths, furniture and fittings in the officers' and crew's quarters are steel. The tanker, which was launched recently at Bethlehem Shipbuilding Corp.'s yards, Sparrows Point, Md., is a 11,000-dead-weight-ton craft, over-all length 442 feet, molded breadth 64 feet, draft 27 feet, 6 inches. Welding was used extensively. It will be used for coastwise runs between gulf ports and the eastern seaboard. Photo by Bethlehem Steel Co.



Tool Builders Review Great National Issues

MCRE than 225 members and guests of the National Machine Tool Builders' association, representing 84 member companies, attended the thirty-sixth annual convention at the Homestead hotel, Hot Springs, Va., Oct. 25-27.

In this meeting, perhaps to a more marked degree than in previous conventions, emphasis was placed upon the broad economic problems confronting industry. The program dealt with important national issues, such as distribution of goods, employment, training, federal regulation of business, man versus machines, trade practices, politics, foreign trade, preparedness.

Typical of the discussions on these subjects was an address "More Goods for More People," by Clayton R. Burt, president of the association and president and general manager of the Niles-Bement-Pond Co., Hartford, Conn.

"The great objective of our machine tool industry, the objective which all our engineers and designers, executives and operators are striving to accomplish is the extension of that general well-being so concisely expressed in the phrase 'More Goods for More People,' " declared Mr. Burt.

Industry Hampered

Although this also is the avowed aim of the national administration, government has imposed serious restrictions upon industry which makes difficult the attainment of that objective. The difficulty is, he pointed out, that the government has overlooked some important requisites, chiefly an understanding of the problems of industrial management.

"As an example of misdirection on the part of the government, due to a lack of comprehensive understanding of industry's financial problems, I cite the undistributed profits tax . . . This particular legislation, if continued, will defeat the aims of the administration in several directions, not the least among them the stabilization of production and employment, which is so vital to prosperity."

Net result of the law, said Mr. Burt, is to favor the expansion of the large corporations at the expense of the smaller ones, so essential to national well-being.

"Another matter of deep concern to every American business man is the constant increase in government expenditures and the apparent inability of the government to come

Howard W. Dunbar
Heads National Machine Tool Builders' association

appreciably near to a balanced budget."

Resulting higher taxes constitute a burden which hinders industry in the production and distribution of more goods to more people.

"Rising labor costs, without commensurate increases in labor efficiency, likewise constitute a restriction on production . . . We are not opposed to increased wages. We believe in so improving the efficiency of the industry as to increase the output per man employed, thereby making higher wages possible. We are opposed to arbitrary increases by legislative measures. Such increases are unsound—they cannot be maintained and only benefit a few at the cost of other workers not equally favored. They inevitably cause higher prices and decreased consumption."

Another outstanding address was that entitled "Man Power and Machine Tools," in which A. C. Danekind, General Electric Co., Schenectady, N. Y., discussed the much misunderstood subject of mechanization.

"Management's responsibility, as a result of the changed conception of relationship between man-power and machine operation, has been to establish an adequate and fair evaluation of the comparative skill required to operate each basic type of machine as expressed in hourly wages. In other words, the job or machine, and not the man's skill has come to be evaluated," said Mr. Danekind.

"No wonder, then, that man-power has slowly but steadily developed a different mental complex toward his job than the highly skilled mechanic of the slow, leisurely type, who took so much pride in the part his all-around skill played in the parts he produced."

However, it was not until the depression and after that man-power really became concerned, Mr. Danekind pointed out.

Attitudes Have Changed

"The new conceptions of men as to their privileges and their responsibilities which have been a concomitant of the New Deal in Washington, is the biggest single problem in management today. A true inventory of man-power will reveal new and radically different attitudes as compared with those of but a few years ago."

James A. Emery, general counsel, National Association of Manufacturers, Washington, addressed the convention on "Federal Regulation of Private Employment."

In speaking on "The Business Horizon," Dr. Lewis Haney, New York university, New York, analyzed many factors contributing to the present situation and fitted them into his belief that this nation still is progressing inflation-ward.

Raymond Moley, editor of *News Week*, who was to have talked on "The National Outlook," was not able to be present on account of illness.

Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., spoke on "The Maintenance of Ethical Standards."

A glimpse into the future of aviation was presented by Igor Sikorsky,

Elected by National Machine Tool Builders

PRESIDENT
Howard W. Dunbar, vice president, Norton Co., Worcester, Mass.

FIRST VICE PRESIDENT
Newton A. Woodworth, president, Ex-Cell-O Corp., Detroit

SECOND VICE PRESIDENT
Wendell E. Whipp, president, Monarch Machine Tool Co., Sidney, O.

TREASURER
T. Heberton Doan, president, Foote-Burt Co., Cleveland

GENERAL MANAGER
Tell Berna

SECRETARY
Mrs. Frida F. Seibert

ELECTED TO THE BOARD
Henry W. Wendt, chairman of the board, Buffalo Forge Co., Buffalo; Samuel F. Newman, vice president, Landis Machine Co., Waynesboro, Pa., and Mr. Whipp.

engineering director, Sikorsky Aircraft division of United Aircraft Corp., Bridgeport, Conn. Mr. Sikorsky presented an illustrated lecture in which he envisioned tremendous strides in transportation by air.

In his report as general manager, Tell Berna described essential features of the work of the association during the past year. The treasurer's report was presented by Henry C. Pierle, R. K. LeBlond Machine Tool Co., Cincinnati.

Prior to the installation of officers at the final session Wednesday, Clayton R. Burt, retiring president, introduced A. C. Higgins, president and general manager, Norton Co., Worcester, Mass. Mr. Higgins touched briefly upon the opportunities afforded by an efficient organization of machine tool builders.

Howard W. Dunbar, vice president of the Norton Co. and the incoming president of the National Machine Tool Builders' association, was escorted to the chair by R. K. LeBlond, president, R. K. LeBlond Machine Tool Co., Cincinnati. Following brief remarks by the outgoing and incoming presidents, Mr. Dunbar assumed his duties, the first of which was as presiding officer of the final session of the convention.

Foreign Affairs Discussed

An interesting feature of the program was a discussion of foreign affairs. Mr. Burt described a recent visit to Russia, touching briefly upon examples of workmanship he saw in a number of plants. He declared that the Russians are putting much emphasis on jigs and fixtures, are building machine tools similar to those built in Germany, England and the United States, and have developed a high standard of workmanship on certain operations.

Erik Oberg, editor of *Machinery*, New York, outlined impressions gained in a recent visit in Sweden. Practically all workmen belong to a union, he said, but similarly all employers belong to trade associations. Strong unions and strong trade associations negotiate for agreements, which are mutually respected. Mr. Oberg stressed the point that these organizations are voluntary and that there is no inclination to seek governmental aid or interest in the relations between employer and employe. He also spoke briefly of the retail co-operatives in Sweden.

Thorvald S. Ross, president, Rivett Lathe & Grinder Inc., Boston, highspotted a recent trip which included visits in Iceland, Denmark, Finland, Norway, Sweden, Esthonia, and other countries of northern Europe, and England and France. He emphasized the sense of security which seemed to prevail among the people of the Scandinavian countries.

James Blair, Alfred Herbert Ltd., Coventry, England, spoke briefly of the machine tool business from the British point of view. He stated that the recent period of feverish demand definitely came to an end some months ago and that the tool business in England and on the continent now is on a more orderly basis.

An analysis of the Chinese-Japanese situation, particularly from the standpoint of American interests in the Orient, was presented by F. S. Dickson, secretary, Waley-Eaton Service, Washington. After outlining the background of the present conflict, Mr. Dickson concluded that Japan will not annex China, but will set up local governments in certain sections with Chinese friendly to Japan in control. The speaker dwelt upon Japan's financial situation and the increasing difficulty Japan would encounter in attempting to obtain financial assistance from Western powers. American manufacturers, he declared, should consider the matter of credit in dealing with principals in the Far Eastern situation.

Col. C. T. Harris, director of procurement planning, United States war department, spoke briefly upon planning for the procurement of machine tools to meet requirements in time of national emergency.

At the conclusion of the last session, President Dunbar announced the appointment of the following committee chairmen:

Legislation, Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt.; dealer relations, Henry C. Pierle, secretary and sales manager, The R. K. LeBlond Machine Tool Co., Cincinnati; depreciation reserves, Eugene C. Clarke, Chambersburg Engineering Co., Chambersburg, Pa.; co-operation with government departments, Walter W. Tangeman, vice president, Cincinnati Milling Machine Co.; apprenticeships and employment, Everard Stubbs, factory manager, Fellows Gear Shaper Co., Springfield, Vt.; publicity, Clifford S. Stilwell, vice president, Warner & Swasey Co., Cleveland; and technical standards, F. O. Hoagland, master mechanic, Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn.

Dr. Merica Awarded John Fritz Medal

■ Dr. Paul Dyer Merica, director of research, International Nickel Co., and vice president, International Nickel Co. of Canada, has been awarded the 1938 John Fritz Gold Medal for "important contributions to the development of alloys for industrial uses."

The award, highest of American engineering honors, is made annually by a board representing the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

Dr. P. D. Merica

Dr. Merica's research in theoretical and practical metallurgy has increased scientific knowledge in both ferrous and nonferrous fields, the board's citation points out. His work has covered the magnetic mechanical properties of steel railway material, failure of brass, the constitution, manufacture and application of light alloy of aluminum, heat treatment of cast aluminum alloys, the precipitation theory of hardening of metals, and nickel and nickel alloys. He is a member of many scientific societies.

Manufacturers' Products Exhibit Attracts 6000

■ More than 6000 visitors attended the Manufacturers' Products exhibit held recently at the Lord Baltimore hotel, Baltimore, sponsored by the Purchasing Agents Association of Baltimore. There were 108 exhibits. Peter A. Frasse & Co. Inc., Philadelphia was awarded the cup for having the most artistic and decorative booth and Willson Products Inc., Reading, Pa., which displayed industrial safety equipment, received the cup for having the most informative and instructive exhibition.

Honorable mention in these two classes was received, respectively by the Baltimore Health Department and L. A. Benson Co. Inc., Baltimore, distributor of mill and factory supplies.

Frank H. Carter, Dietrich Bros. Inc., was chairman of the exhibit committee.

PRODUCTION

With lower operating rates in nearly all centers the national operating rate last week was at 51 per cent of capacity, down 2 points from the preceding week. The rate of downward movement has slowed, indicating approach to the bottom the decline.

Central eastern seaboard—Down 4 points to 43 per cent, due to further reduction of activity by one of the leading interests. Several mills are now operating only one or two furnaces.

Cleveland-Lorain — Off 6 points to 59 per cent. National Tube Co. at Lorain had all 12 units melting, Republic Steel Corp., 5 and Otis Steel Co., 6. Republic blew out its No. 3 blast furnace Saturday.

Youngstown, O. — Off to 54 per cent, a loss of 1 point, with 48 open hearths, two bessemers and 14 blast furnace operating. Carnegie-Illinois Steel Corp. will drop one unit at its Farrell plant, but this will be offset by resumption of an idle bessemer by Republic Steel Corp.

Buffalo—Down 7 points to 51 per cent. Bethlehem Steel Co. withdrew three more open hearths from operation during the week, leaving 16 of the company's 20 units active.

St. Louis—Held at 51.6 per cent last week.

Pittsburgh—Open hearth operations are down 8 points to 41 per cent. Removal of one more blast furnace during the week leaves 34 operating in the district.

Cincinnati—Operations gained 4 points to 70 per cent, but are due for a dip this week, as the schedule calls for reduction of active open hearths to 16.

Birmingham, Ala.—Unchanged at 64 per cent, with no immediate revision indicated. Fifteen open hearths are active.

Detroit—Down 5 points to 90 per cent, 19 of 21 open hearths continuing in production, with no likelihood of any sharp immediate recession.

Chicago—Declined 2 points to 44 per cent, the smallest drop in six weeks but bringing operations to the lowest rate since July, 1935. While a further curtailment is regarded as not unlikely, schedules are believed to be near bottom. Blast furnace schedules are lower, 21 of 39 stacks being active.

Wheeling—Operations are down 8 points to 62 per cent.

New England—Off 40 points to approximately 25 per cent, the lowest in several years. Ingot production will move up slightly this week.

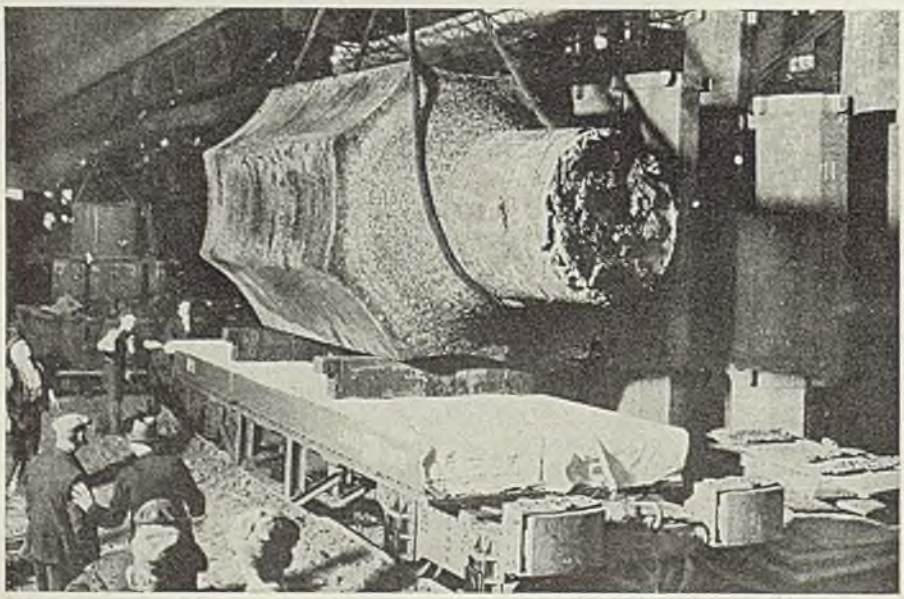
District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Oct.30	Change	Same week 1936	Same week 1935
Pittsburgh	41	—8	69	47
Chicago	44	—2	76	55
Eastern Pa.	43	—4	48	38.5
Youngstown	54	—1	76	63
Wheeling	62	—8	86	84
Cleveland	59	—6	77	72
Buffalo	51	—7	87	42
Birmingham	64	None	61.5	58.5
New England	25	—40	75	70
Cincinnati	70	+4	96	†
Detroit	90	—5	95	94
St. Louis	51.6	None	†	†
Average	51	—2	73	54.5

†Not reported.

230-Ton Steel Ingot Cast in England



■ Steel from four acid open-hearth furnaces was required for this 230-ton steel ingot, the largest ever cast in England. It was produced recently by the English Steel Corp. at its Vickers Works in Sheffield. Twenty-five feet long and 8 feet 9 inches in diameter, it will be used for large forgings in connection with the government's armament program

Maritime Commission Sells Three More Ships

■ United States maritime commission has accepted the bid of G. E. Marden of New York, a British subject, for three ships aggregating 24,657 tons, for $194,500. This completes sale of 25 obsolete steel cargo vessels, tenders which were opened Oct. 20. The commission realized $1,185,611 for the 25 vessels. Ships purchased by Mr. Marden will be operated abroad and not in competition with the American merchant marine.

Ministers Invited, Inspect Steel Mill

■ South works of Carnegie-Illinois Steel Corp., South Chicago, Ill., was the scene of an unusual gathering recently when 250 Chicago ministers were guests of the corporation at an inspection trip of the plant. Members of the Chicago Church Federation were invited to obtain first-hand information regarding steel mill practice and working conditions. The inspection covered bessemer and open-hearth departments, and blooming, slab, plate, structural and alloy bar mills.

Metal Export-Import Values in September

■ September exports of iron and steel semimanufactures were valued at $18,665,000; steel mill manufactures at $5,191,000. Imports in September of iron and steel mill products were valued at $1,708,000; ferroalloys at $2,319,000; nonferrous metals at $17,268,000; nickel at $1,759,000 and tin at $13,794,000.

Record River Shipments

■ Carnegie-Illinois Steel Corp., Pittsburgh, set a new record in September when it barged 33,300 tons of steel products to southern points by way of the Monongahela, Ohio and Mississippi rivers. During the same month it moved 1,148,000 tons of coal and coke on the three local rivers in the Pittsburgh district.

Activities of Steel Users and Makers

Assets and good will of the Hutto Machine division of the Carborundum Co. have been sold to the Micromatic Hone Corp., Detroit, and the Barnes Drill Co., Rockford, Ill. Purchasers will subdivide the business, the Barnes company absorbing that part relating to manufacture, sales and service of honing machines and gear lapping machines, and the Micromatic Hone Corp. taking over the manufacture, sales and service of honing tools and tool replacement parts.

The Hutto plant is at 515 Lycaste avenue, Detroit. Closed by a strike for the past five weeks, a settlement was reached and the plant reopened Oct. 25 under the name and management of Micromatic Hone Corp., Hutto division.

Kirke W. Connor will be chief executive of the combined organizations relating to honing tool manufacture.

♦

Marmon-Herrington Co., maker of all-wheel drive motor vehicles, Indianapolis, has purchased the 16-acre tract of land at Washington and Harding streets, including the modern factory buildings, of Duesenberg Inc., and will move from its present location in the old Nordyke-Marmon plant to the new quarters. Considerable new equipment will be purchased and the company plans to be in full operation by Dec. 1.

♦

Newport Rolling Mill Co., Andrews Steel Co., and Globe Iron Roofing & Corrugating Co., of Newport, Ky., have established a permanent office in Cleveland, with S. A. Richardson as district sales representative. Mr. Richardson will be located in the Auditorium building.

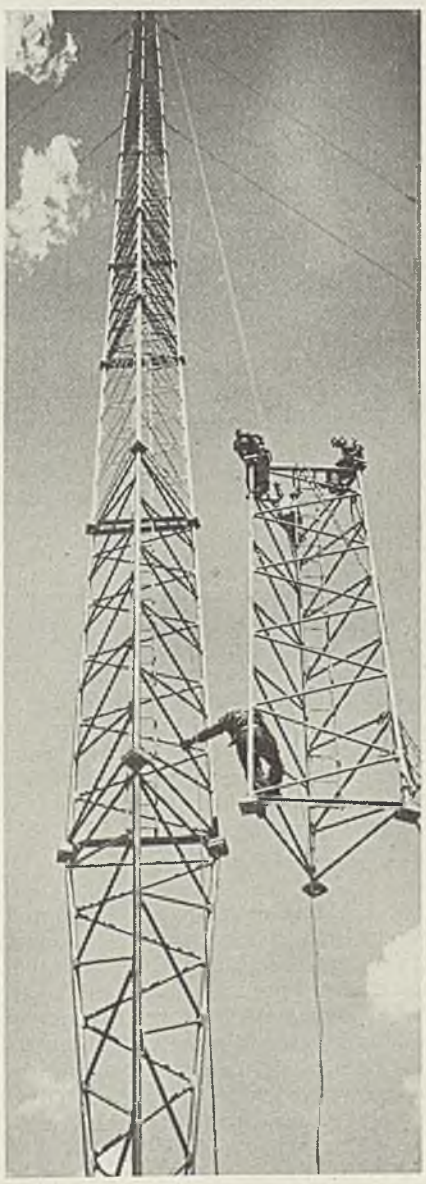
♦

F. M. Young, president, Young Radiator Co., Racine, Wis., announces a number of changes in its manufacturing facilities. Several new departments, handling a large battery of press brakes, shearing equipment, electric welders and other machinery for welding and machining have been established. The machine and sheet metal shops are now entirely self-contained and separate from other activities, which provides more space and allows for a wider range of facilities to better handle the increase in business. Laboratory facilities have also been greatly improved.

♦

Vacuum Systems Inc., 436 The Arcade, Cleveland, has been formed and has taken over assets of the Crescent Pump Co., Detroit, manufacturer of the roto-piston dry vacuum pump. Manufacturing space has been taken in the Power building, Power avenue, Cleveland, where production will be carried on and pumps serviced. The new company will add to the range of sizes of pumps using this principle and seek to apply it to a larger range of applications. Louis H. Mesker is president, B. E. Hathaway and H. W. Dosey vice presidents and W. L. Holloway secretary. William A. Hatcher, inventor of the Crescent pump, will head the engineering department as general consultant.

Steel Up 718 Feet



■ Section by section, KDKA's new vertical antenna was raised until it reached a height of 718 feet. The 32 triangular welded sections, only 5 feet wide, were bolted together, supported by two sets of heavy guy wires. The complete spire, located at Saxonburg, Pa., near Pittsburgh, weighs 60 tons, mainly steel

MEETINGS

PITTSBURGH OPEN HEARTH MEN TO MEET NOV. 12

First winter meeting of the Pittsburgh section of the Open Hearth committee, American Institute of Mining and Metallurgical Engineers, will be held Nov. 12 at the bureau of mines, Pittsburgh. The meeting will start at 2 p. m. and will conclude with a dinner at Hotel Schenley in the evening. R. C. Good, metallurgical engineer, Electro Metallurgical Co., Pittsburgh, is chairman.

WILL ADDRESS STANDARDS GROUP ANNUAL MEETING

Frank B. Jewett, vice president, American Telephone & Telegraph Co., New York, will be guest speaker at the annual meeting of the American Standards association, Astor hotel, New York, Dec. 1. The address will be preceded by a luncheon and reports by the association's president, Dana D. Barnum, and chairman of the Standards council, F. M. Farmer. Board of directors will hold a meeting in the afternoon.

GALVANIZERS HOLD THIRD MEETING IN CINCINNATI

Third meeting of the Galvanizers committee, organized in 1936 under sponsorship of the American Zinc institute, will be held Nov. 16-18, Netherland-Plaza hotel, Cincinnati. There will be three technical sessions and two plant inspections, Newport Rolling Mill Co., Newport, Ky., on the afternoon of Nov. 17, and American Rolling Mill Co., Middletown, O., morning of Nov. 18.

Some 50 technical men, representing 17 or more galvanized sheet producers, are expected to attend.

Convention Calendar

Nov. 9-12—American Petroleum institute. Eighteenth annual meeting at Stevens hotel, Chicago. Lacey Walker, 50 West Fiftieth street, New York, is secretary.

Nov. 10-12—International Acetylene association. Thirty-eighth annual convention at Tutwiler hotel, Birmingham, Ala. H. F. Reinhard, 30 East Forty-second street, New York, is secretary.

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

MEN OF INDUSTRY

CARL W. MEYERS, assistant district manager of the Central Alloy district, Republic Steel Corp., Massillon, O., since 1934, has been promoted to district manager, succeeding E. A. Portz. The district includes operations in Canton and Massillon, O. Mr. Portz, who has been ill, is to be assigned home office duties as soon as his health permits.

Mr. Meyers became associated with the Upper works of Carnegie Steel Co., Youngstown, in 1907 and in 1918 went with the McDonald mill where he stayed until 1931, the last eight years as superintendent. He then joined Republic as superintendent of the rolling mill in Chicago, and in 1933 was transferred to Youngstown, O.

Frank C. Farrell, assistant district manager of the Warren, O., district, is being transferred to Massillon to succeed Mr. Meyers as assistant district manager, while George W. Putnam, superintendent of open hearths in Youngstown since 1933, has been promoted to assistant district manager, Warren-Niles district, succeeding Mr. Farrell. Other changes in Republic personnel follow: Jones N. Cahill, formerly assistant superintendent of open hearths at Youngstown, has been promoted to superintendent of open hearths, succeeding Mr. Putnam; H. J. Sweeney, formerly chief metallurgist, has been made assistant superintendent of open hearths at Youngstown, and Howard J. Weigel, heretofore assistant metallurgist, has been appointed metallurgist to succeed Mr. Sweeney.

♦

Edward I. Evans, since 1934 assistant district manager for the Buffalo district, Republic Steel Corp., has been promoted to general superintendent of the Gulfsteel district, with headquarters in Gadsden, Ala. Born in Glasgow, Scotland, he started his steel career in that city at the age of 12. He came to the United States in 1907 and became associated with Worth Steel Co., Coatesville, Pa., now Midland Steel Co. In 1915 he joined United States Steel Corp., then returned to Worth Steel Co. a year later. Mr. Evans joined Bourne-Fuller Co., Cleveland, in 1929 as general manager, and three years later became assistant manager of the Canton district for Republic.

Carl W. Meyers

H. F. Marquardt, formerly superintendent of the finishing mills, Buffalo, has been appointed assistant district manager, succeeding Mr. Evans. J. L. Edwards, assistant superintendent of the finishing mills since 1934, has been promoted to superintendent, to succeed Mr. Marquardt, and Charles DeZutter has been named assistant superintendent of finishing mills.

♦

H. S. Schuler has been appointed division manager of industry advertising, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Mr. Schuler formerly was associated with the advertising agency of Ketchum, McLeod & Grove Inc., where he was an account executive. Other division advertising managers recently appointed are T. H. Cable and J. H. Thompson.

♦

J. L. Mauthe has been appointed general superintendent of Youngstown Sheet & Tube Co.'s Youngstown district plants. He will be in direct charge of the Campbell, Brier Hill and Hubbard plants. Mr. Mauthe has been with the company slightly over two years, becoming assistant general superintendent of the Campbell plant in May, 1935.

A. W. Smith, district manager, is on an extended leave of absence due to illness.

♦

Charles M. Schwab has been elected a director, Chicago Pneumatic Tool Co., New York, to fill the vacancy caused by the death of Eugene V. Thayer.

♦

Louis A. Almgren, formerly chief tool designer, Service Tool Die & Mfg. Co., Chicago, has joined Tool Equipment Sales Co., Chicago, as a sales engineer.

♦

W. E. Buck, for 20 years metallurgist for Granite City Steel Co., Granite City, Ill., has become metallurgist of the sheet division, Continental Steel Corp., Kokomo, Ind.

♦

L. H. Dunham, Cleveland district metallurgist, American Steel & Wire Co., has been transferred to Chicago as Chicago district metallurgist. Raleigh H. Barnes, formerly assistant to Mr. Dunham, has been promoted to Cleveland district metallurgist.

♦

George H. Corliss, advertising and sales promotion manager for the past four years for Lewis-Shepard Co., Boston, manufacturer of materials handling equipment, has been appointed regional manager for the company, with headquarters in Los Angeles at 1401 Santa Fe avenue.

♦

A. J. Ackerman has been appointed development engineer for the engineering works division and the contracting division of Dravo Corp., Pittsburgh. A graduate of the University of Wisconsin in electrical and civil engineering, he has been active in the design and construction of various types of dams and hydraulic structures. For the last four years he has been head construction plant engineer for the Tennessee Valley Authority.

♦

Cassius F. Biggert, vice president in charge of International Harvester Co.'s iron and coal mines and

Edward I. Evans

Cassius F. Biggert

Wisconsin Steel Works, Chicago, will retire Nov. 1, after 47 years of service. He will be succeeded by George E. Rose, who has been his assistant since August, 1936, and has just been elected a vice president.

Mr. Biggert began service in 1890, and by 1898 was in charge of all raw material purchases except lumber and fiber, devoting himself especially to steel supplies. In 1904 he was called in to the general office of the newly formed Harvester company, and in 1915 was made assistant to Herbert F. Perkins in the conduct of the company's steel and coal operations. He was elected a vice president in 1931.

Mr. Rose has had 31 years of service, spent entirely in connection with

George E. Rose

Wisconsin Steel Works. He began as superintendent of blast furnaces at the Wisconsin Steel plant; was promoted to assistant general superintendent of steelworks in 1909 and in 1912 was appointed general superintendent.

♦

Alfred H. Werner, foreman of the 43-inch strip mill at the McDonald, O., works of Carnegie-Illinois Steel Corp., has been named superintendent of the hot strip mill at the Irvin works. John H. Elliott, heretofore assistant general superintendent of Shenango works, New Castle, Pa., has become tin finishing superintendent, Irvin works. Harry C. Ford, since 1936 assistant to the general superintendent, New Castle, Pa., works, has been made superintendent of the production and shipping departments, Irvin works.

♦

Charles L. Weiler, vice president, James J. Weiler & Sons Inc., structural steel fabricator, Huntington, W. Va., has been elected president of the Huntington Kiwanis club.

♦

James M. Kobabe has joined Lee B. Mettler Co., maker of combustion gas burners, as executive general manager. Affiliated with the company the past 11 years as a direct factory engineer, he will be located at the general offices of the company in Los Angeles.

♦

Frederick D. Benz, formerly manager of wire sales, Chicago branch, United States Rubber Products Inc., New York, has been appointed district manager of wire sales, Pacific division, with headquarters at San Francisco. This division comprises the Los Angeles, San Francisco, Portland, Seattle, Spokane and Salt Lake City territories.

♦

Robert K. Hungerford, representative for Roxalin Flexible Lacquer Co. Inc., Elizabeth, N. J., in the New England area for the past 12 years, has been appointed sales manager of the company. Frank Thomas and John Towart, who have been under Mr. Hungerford's supervision in the field, have been named to take over his former territory.

♦

Bruce M. Jones has been transferred from the Beaver Falls, Pa., office of Babcock & Wilcox Tube Co., to the New York office. He formerly was associated with the Symington Co., Gould Coupler Co. and Ross Meehan Foundries.

Edward D. Emerson, formerly identified with Jones & Laughlin Steel Corp. and Air Reduction Sales Co., has been named New York manager of domestic and export sales for Babcock & Wilcox Tube Co.

♦

Laurin D. Woodworth and Philip Schane Jr. have been appointed chief metallurgists in the Youngstown, O., plant and at the Duquesne steelworks, respectively, for Carnegie-Illinois Steel Corp. Mr. Woodworth entered the steel industry in 1922 as a metallurgist and in 1927 joined the former Carnegie Steel Co. at Youngstown in the metallurgical department. Mr. Schane, who was chief metallurgist at Duquesne from November, 1932, until January, 1936, when he went to Youngstown in the same capacity, succeeds James A. Ogilvie, who is no longer with the company.

♦

R. C. Moss, recently manager for American Steel Foundries at its Newark, N. J., plant, has been transferred to the company's Verona plant near Pittsburgh as sales manager in that district. At Pittsburgh he succeeds A. L. Cawthon, resigned. Mr. Moss has been succeeded at Newark by Harold Wallis. The latter at one time was associated with American Steel Foundries, recently having been identified with the Smith Steel Casting Co., Milwaukee.

DIED:

Percy C. Brooks, 65, former executive vice president, Fairbanks, Morse & Co., Chicago, in that city, Oct. 15. Mr. Brooks started his business career with the Atlanta Machine Works, following graduation from the Georgia School of Technology in 1891. In 1898 he began nearly 40 years' association with the Fairbanks organization.

♦

Walter C. Haucke, 42, president, W. C. Haucke & Co., San Francisco, reinforcing steel bar jobbers, in an automobile accident, Oct. 17. He was well known in the steel trade on the Pacific coast. Mr. Haucke organized and incorporated his company in May, 1931; and prior to that was

Walter C. Haucke

associated with W. S. Wetenhall Co., and the Shasta Steel Co.

♦

Hector Macleod, assistant manager, Drummond, McCall & Co. Ltd., Toronto, Ont., producer of iron and steel products, in that city, Oct. 20.

♦

D. A. Usina, 66, general patent attorney, United States Steel Corp., at his home in Nutley, N. J., Oct. 23.

♦

Thomas J. Kauffman, former president and chairman of the board, Square D Switch Co., Detroit, in Gainesville, Ga., Oct. 21.

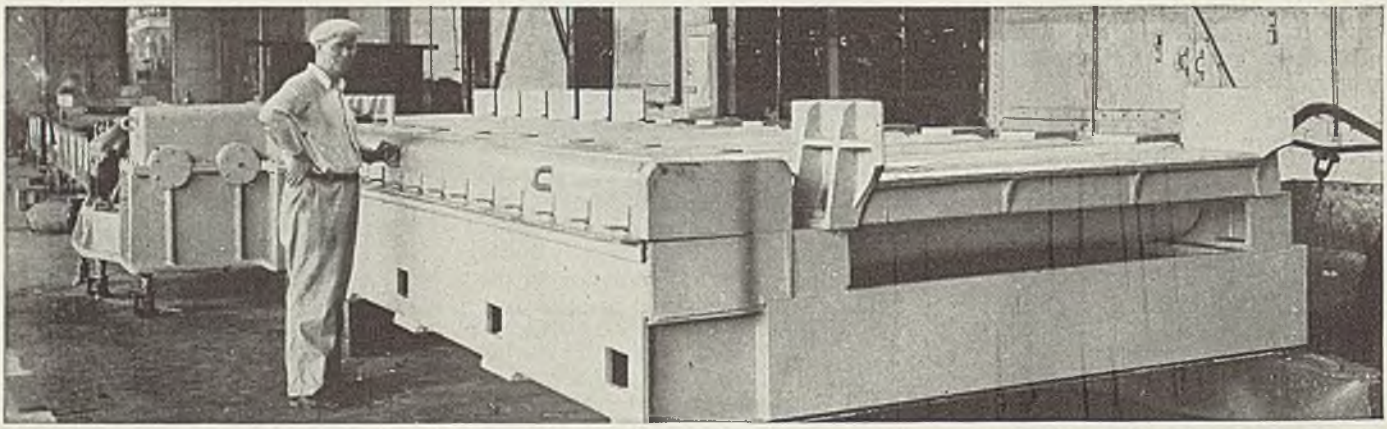
♦

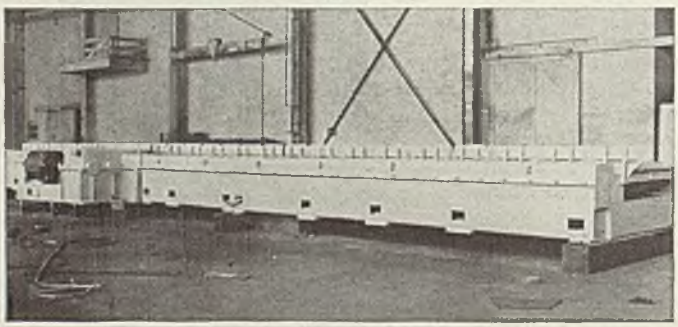
Herbert C. Ballord, 58, Baltimore manager of Crucible Steel Co. of America, in that city, Oct. 23. He had been with the Crucible company 30 years and was a member, American Society for Metals.

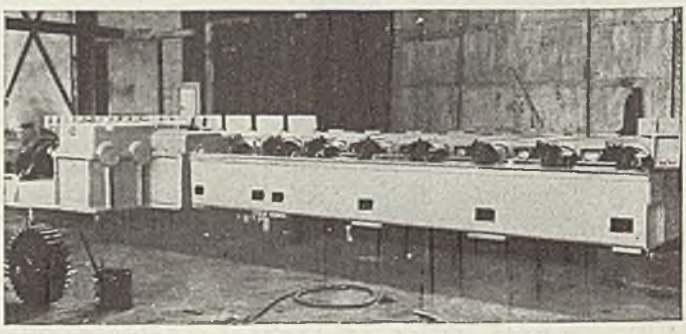
♦

Allen N. Lukens, 70, chief engineer, Railway Steel Spring Co., New York, at his home in Elizabeth, N. J., Oct. 20. He had been with the company 50 years and was a member, American Society of Mechanical Engineers.

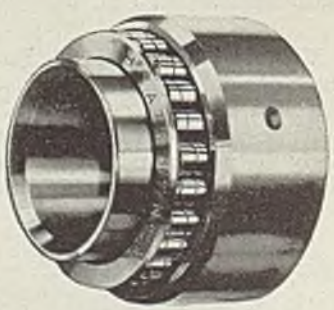
SECURITY with HYATT *Roller Bearings*







These photographs show Hyatt equipped tables being built recently in the shop of the **PENNSYLVANIA ENGINEERING WORKS** for one of the large mills in the Pittsburgh district.



HYATT Roller Bearings are built into steel mill equipment with the utmost security because they protect vital working parts against shocks, wear and misalignment. Years of successful experience have proved that these dependable bearings help extend equipment life and assure smoother, quieter, and more efficient operation with less care.

Thus is Hyatt protection—the result of correct bearing design, sound application, and precision manufacture by Hyatt engineers and craftsmen—generously contributing to greater production. Is there any further way we may serve you? Hyatt Bearings Division, General Motors Corporation, P. O. Box 476, Newark, New Jersey.

MIRRORS OF MOTORDOM

DETROIT

CHAINED to a slowly rotating pedestal in the central lobby of the General Motors building here, roped off from crowds and flanked by armed guards, reposed last week the historic Crown of the Andes, the multimillion-dollar bait which Chevrolet is using to attract attention of passersby to its new cars.

Despite ugly rumors floating around that the crown was only a "phony," elaborate precautions were taken to protect the treasure. Concealed machine guns, gas masks to use in case an attempt was made to gas the guards, all of whom were bristling with firearms, and other dramatic effects appeared to be slightly on the hokum side, but at the same time heightened the interest of the crowd.

Plan Intensive Sales Campaigns

The crown, incidentally, contains 453 genuine emeralds with a total combined weight of 1521 carats, valued at something over $4,500,000. It was carved from a 100-pound block of pure Incan gold by 24 goldsmiths who worked for six years at the job. It was fashioned in 1593 at Popayan, Colombia, South America, and passed through many a vicious battle and revolution until its sale last year to a Chicago syndicate which will dismantle it and sell the gems.

Chevrolet is planning to take the crown on an exhibition tour to leading cities soon. Connection between a $5,000,000 crown and a 1938 automobile may seem a bit vague, but these days automobile sales departments are not overlooking any good bets in merchandising their product.

Intensive merchandising campaigns are being planned by all producers. Records probably will be broken in use of newspaper space and radio time to put across new cars. It has become apparent for the next 12 months it is going to be a matter of concentrated selling and not so much the routine signing of new orders which characterized automobile business the past year.

BY A. H. ALLEN
Detroit Editor, STEEL

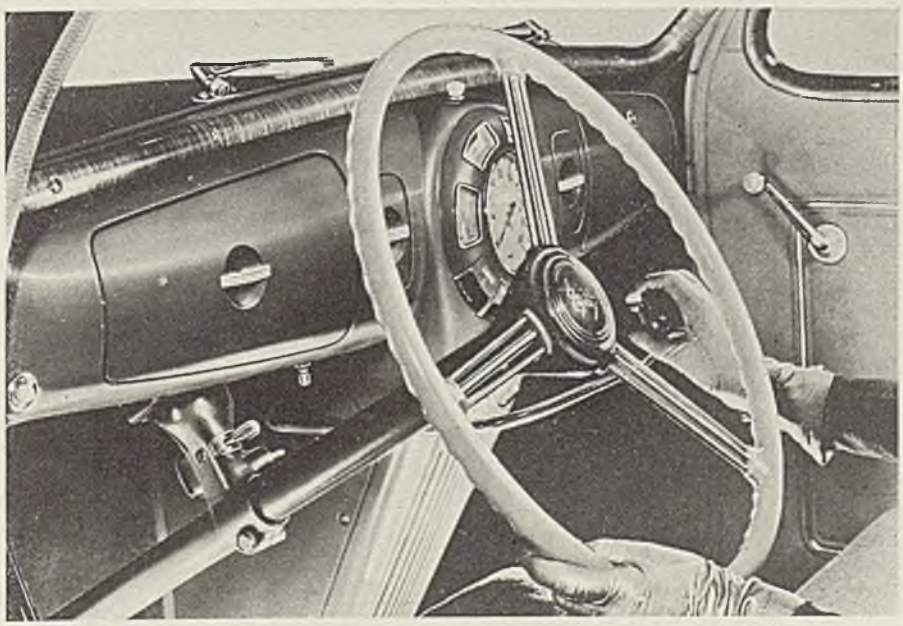
Pass by the radio department of any of the larger advertising agencies these days and you will hear a conglomeration of tenors, sopranos, comedians and commercial chatter being auditioned for prospective programs. Copy-writers are racking their brains for new adjectives to inject in printed campaigns.

The industry has come sharply to realization of the necessity for intensive merchandising. Scattered reports indicate interest in new cars is distressingly weak. For example, one dealer in a city about 60 miles from Detroit who in past years has averaged 100 sales on the first day's showing of new models this year was able to sign up only 14.

Practically all plants now in production have caught up on deliveries. One Detroit dealer said he could have any model in a customer's hands within a few hours, whereas not so long ago a wait of a month for delivery was not unusual. Reports were heard last week that two of the largest plants in this district were contemplating reduction from five to four days' production.

Most frequently heard explanation

More Room for Driver



■ Driver compartments in the 1938 Lincoln-Zephyrs have been enlarged. Transmission is located under the cowl, housing has been lowered and the gear-shift lever moved out of the way of driver and front-seat passengers. The new instrument panel, which also includes a closed grille to screen heater and radio installations, is flanked by glove compartments. Controls are grouped around the speedometer, with engine recording instruments arranged about the dial

MIRRORS OF MOTORDOM

behind the dwindling public interest in new cars is, of course, the serious break in the stock market coupled with the uncertainties and fear which it has generated. For another thing, the so-called "cream" of public buying power is considered to have been skimmed in the past two years, and some feel the industry is approaching the point where it is going to require considerable cultivation of the market to maintain the sales pace of recent months.

■ WITH formal introduction of the Ford and Lincoln lines last week at the company's metropolitan showrooms in New York, all the 1938 models have taken their bows. From here out, the race is on in earnest.

Reception of the new Lincoln Zephyr around Detroit has been highly enthusiastic. The radical front end treatment, summarized in these columns several weeks ago, is a distinctive touch which sets the car apart from anything now on the road. Fenders are larger, with deeper draws. Body and rear end lines are similar to last year.

Use of hypoid gears in the rear axle has not eliminated the tunnel across the floorboards, but has cut it down by about 20 per cent. Gearshift lever has been removed from the floor, now emerging from the central pillar below the dash which carries the radio speaker and heater units. A complicated series of twists is required in the lever to make connection with the transmission which has been turned over on its side. Hydraulic tappet controls are touted as a signal improvement contributing to engine quietness.

Minor difficulties have not been overcome entirely at the Lincoln plant, and the weekly total is holding at around 300 jobs. Some of the show models revealed ragged edges under fenders which would indicate difficulties with trim dies.

De luxe and standard lines were announced by Ford last week, with eight body styles in the former and three in the latter. The standard is supplied with either the 60 or 85-horsepower V-8 engine, while the de luxe is equipped with the higher-power motor. Both are on 112-inch wheelbase.

De luxe models show entirely different treatment of grille and front end from the standard line and resemble to some extent the front appearance of the Lincoln Zephyr, although the grille is carried up to the louvre line. Ford has managed to overcome the objection to the Zephyr that it looked "just like a big Ford," and has also made a sharp distinction between the standard and de luxe model appearance.

There is still plenty of ground for belief Ford will introduce another series of cars around the first of the year, but it is entirely possible the present business recession may change Ford's plans completely on this score. Mr. Ford's quick decisions and sudden changes of mind are too well known to make any definite statement of what is ahead at the Rouge plant worth much.

■ TOOL and die shops have just about finished tail-end cleanups and duplicate dies, and are approaching a slack season. However, they look for a resumption of activity within the next month or two as some of the preliminary work on 1939 models makes its appearance.

Die suppliers are always thinking about a year ahead, and are encouraged over prospects for extensive changes on models appearing a year from now in view of the scarcity of important revisions this year. The further possibility that 1938 models may not meet the ready reception from the buying public which was anticipated might lead to moving ahead plans for 1939 by several months, with a resultant benefit to manufacturers of tools and dies.

■ REPORTS of a new alloy steel mill in the Detroit district, summarized in a recent issue of STEEL, now center about a location on the St. Clair river, between St. Clair and Marine City. A few weeks ago, eastern interests represented by T. R Murphy of New York, acquired a 374-acre site with 4442 feet of river frontage, and a few days later a 400-acre site adjacent to this property was acquired by eastern capital.

It is understood a man long active in the alloy steel field proposes to erect a new plant for electric melting and processing of alloy steel, with initial capacity of 19,000 tons monthly, capable of being expanded ultimately to 50,000 tons monthly.

However, the present unsettlement in the money market has deferred his plans. The location appears none too favorable for a plant which would depend upon scrap for raw material, inasmuch as it is some 70 miles from Detroit by road.

Steel purchases continue on a restricted basis throughout the automotive industry, and it is apparent purchasing officials are keeping a weather eye on what the retail sales picture is going to be. Steel inventories are being worked off and there is no disposition being shown to buy ahead, especially in view of the fact mills now can give good deliveries on most grades.

Such tight buying is interpreted by some observers as the forerunner of pressure for a reduction in steel prices, but so far no demands have appeared here for lower prices, the feeling being that buyers would not order in any greater volume even if they were offered concessions on prices. The policy is simply one of closely fitting material requirements to production demands and holding down stocks.

With regard to the retail sales picture, it seems evident production of a minimum of 250,000 cars was required to stock the 40,000 dealers in the country, assuming an average of six or seven cars per outlet. October production came pretty close to 350,000 cars, without any help from Ford.

Thus at the moment all dealers, excepting Ford, are well stocked, and the immediate trend of production will be determined by the public's ability and willingness to buy.

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	.....

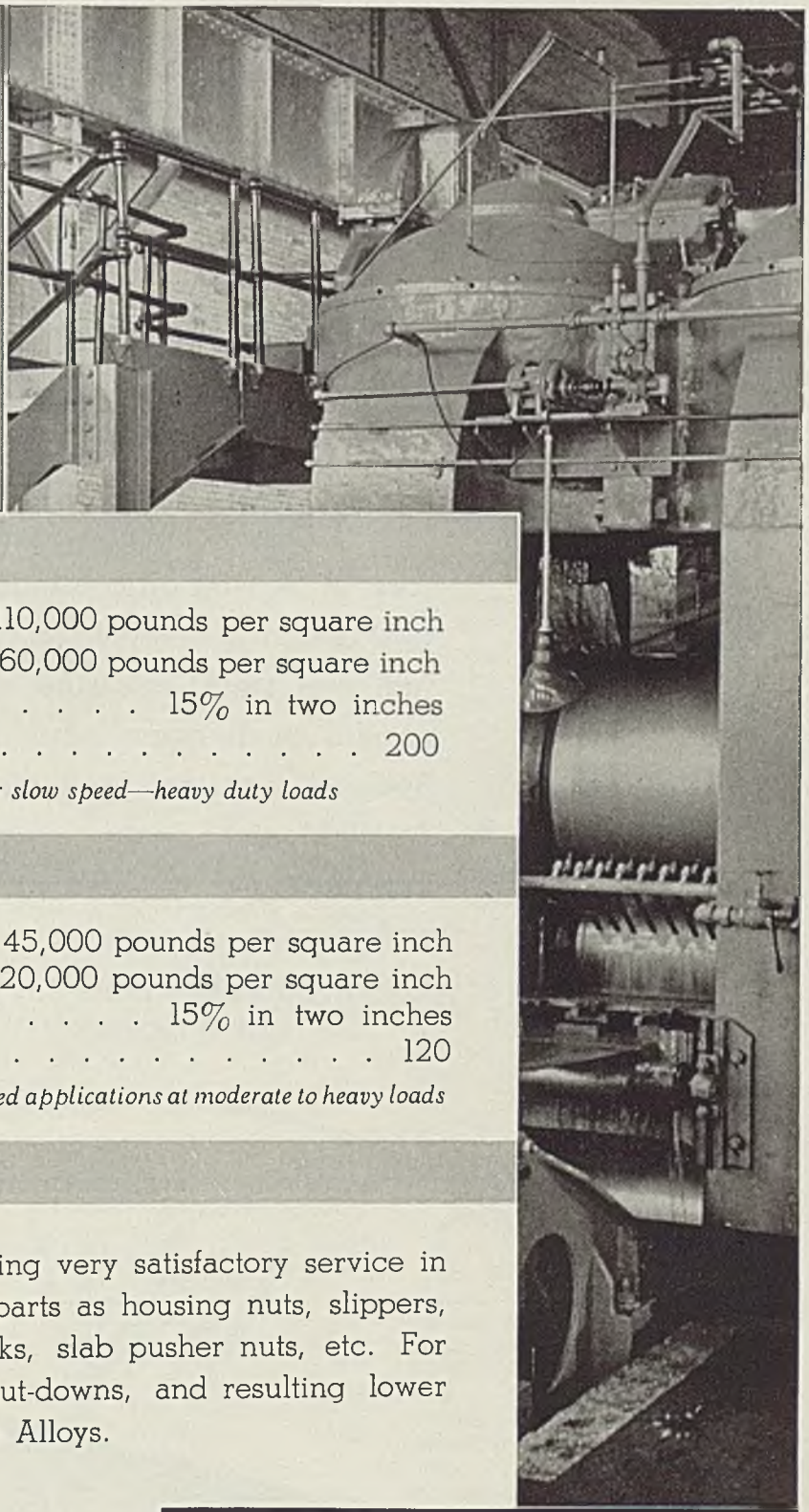
Estimated by *Ward's Automotive Reports*

Week ended:	
Oct. 2	44,330
Oct. 9	71,958
Oct. 16	89,680
Oct. 23	91,905
Oct. 30	90,155

	Week ending Oct. 30	Oct. 23
General Motors	45,225	44,970
Ford	1,375	765
Chrysler	27,775	27,675
All others	15,780	18,495

*Estimated

SPECIAL ALLOYS *for* STEEL MILLS



CRAMP ALLOY NO. 49

Tensile Strength . 110,000 pounds per square inch
Yield Point . . . 60,000 pounds per square inch
Elongation . . . . . 15% in two inches
Brinell Hardness 200

Recommended for slow speed—heavy duty loads

CRAMP ALLOY NO. 99

Tensile Strength . 45,000 pounds per square inch
Yield Point . . . 20,000 pounds per square inch
Elongation . . . . . 15% in two inches
Brinell Hardness 120

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WINDOWS OF WASHINGTON

BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

THERE is much preliminary talk in Washington regarding the forthcoming special session of congress and what it will take up. Of course, one of the main matters under discussion is the hours and wages bill.

All indications point to the fact that industry did not furnish the last congress with facts and figures dealing with the labor situation. There are many industries, like steel and automobiles, for instance, which are of the opinion that they will not be hurt by this labor bill. They believe their present rates are above those which will be placed in the bill.

It is reported here that Donald Richberg, who has been close to this labor legislation, probably on behalf of the administration, is not at all in sympathy with the bill now pending in the house, but the fate of the bill depends very much on the attitude of the A. F. of L.

Some industrial leaders who come to Washington occasionally have expressed the opinion that this hours and wages bill may be defeated at the coming session, but this is not the consensus of opinion.

Seek New Antitrust Law

The feeling among those who know the southern situation is that the opposition of the South generally to this bill is that it is more social than economic. It will be hard to supplant the present measure but this does not mean that it will be impossible.

Another measure which will come before the session probably is some proposed antitrust changes. It is said in well informed circles here that the administration does not know just what it wants, and it is a foregone conclusion that while there may be much talk, that the trust laws will not be revamped and completed during the coming sessions. It will take longer than that to get this law into proper form. It is known that the President has asked that a complete survey be made of this situation and while no one admits that it is under way there is no doubt the department of justice is hard at work on it.

There is much talk also regarding the tax situation. The President stated at a press conference last week that the work of treasury experts on their tax study is proceeding with as much dispatch as possible. He believes that while their information is not supposed to be ready for the special session they will be able to go before the house and senate committees when they begin their hearings on taxes. It is expected that this will be early in November.

May Modify Profits Tax

Some comfort was forthcoming to industry last week in strong hints that administration leaders were looking with favor on some changes in the undistributed profits tax.

The United States chamber of commerce has been putting a lot of work and effort into the tax situation and in that way has assembled a mass of material, especially with regard to the workings of the surtax on corporate income.

The chamber circularized many of the leading industrials in all lines in the country and without divulging the name the national chamber has the following to say about a north west steel corporation:

"This company, one of the well established independent producers with about 2800 employes, had earnings in 1936 of approximately $2,626,000. Because of the surtax it paid larger dividends than it considered prudent, but retained $690,000 to meet certain obligations and to provide additional working capital made necessary by an increase in business. A surtax of about $85,000 had to be paid. This is equivalent to 12½ per cent of the amount retained, and is a high financing cost. The tax was characterized by the company as being in effect 'a penalty on conservative management and sound financing of the business which must be done to protect the investment of the shareholders.'

"The surtax is having the effect of delaying expenditures for needed expansion and improvements, deterring accumulation of sufficient reserves and adversely affecting employment. The impossibility of determining earnings and making dividend distributions before the end of the year is also pointed out."

TRADE COMMISSION SEEKS BROADER AUTHORITY

The first of the many government annual reports has been issued, that of the federal trade commission. It makes two recommendations to congress, one for a proposed amendment to the trade commission act and the other to the Clayton act, over which the commission also has jurisdiction.

As far as its own law is concerned the commission asks that section 5 be amended so as to declare unlawful, not only "unfair methods of competition," as the present law declares, but also "unfair or deceptive acts and practices." Another suggestion deals with the effectiveness of its own orders if no appeal is taken within 60 days. Both of these items are taken care of in a bill which has already passed the senate and which has been reported by the house committee on inter state commerce and is now on the house docket for action.

The other recommendation deals with section 7 of the Clayton act. While this section now declares unlawful the acquisition by one corporation of the capital stock of a competing corporation where certain monopolistic tendencies and conditions may result, it does not purport to declare unlawful the acquisition of physical assets where

similar tendencies and conditions may result. The commission asks congress for action on this point.

JAPAN NEAR SUFFICIENCY IN FINISHED GOODS

The far eastern survey, a non-governmental publication, says that in munitions and other types of finished goods "Japan has nearly attained the goal of self sufficiency," though her output of machinery, automobiles and aircraft lags behind demand and "she still relies upon imports for certain types of heavy metalworking machinery and precision instruments."

China, on the other hand, the survey states, "must depend on imports for her heavy ordnance, trucks, railway equipment, aircraft etc."; as her 20 arsenals turn out chiefly small arms.

TRADE AGREEMENT WITH VENEZUELA IS SOUGHT

The state department announced last week that the United States government contemplates the negotiation of a trade agreement with Venezuela. No date for hearing has yet been announced.

The steel industry will undoubtedly be much interested in this proposed agreement because many iron and steel items are exported to that country.

During the first eight months of this year there has been a considerable increase in our iron and steel exports to Venezuela. Among some of the leading items exported are: Seamless casing and oil line pipe, structural shapes, sheets, tanks etc.

Figures available at the department of commerce show that in 1929 our exports of iron and steel to Venezuela amounted to 3.1 per cent of all of our exports of those commodities while this year, for the same period they equal only 1.9 per cent of the total iron and steel exports, showing that there is a chance that the trade agreement may be able to help steel product exports if that develops into one of the trading points.

For the first eight months of this year, on the other hand, exports of iron and steel products to Venezuela increased 27,991 tons over similar exports for the same period of last year.

COLLEGE MEN STUDY GOVERNMENT FIRST HAND

The national institute of public affairs is trying out something new in connection with the government. This institute, which is backed by the Rockefeller foundation, has placed some 30 graduates from colleges throughout the country in various branches of the government service.

They are appointed as $1 a year men, take competitive examinations and spend one year in the service with expenses paid partly by the foundation and partly by their own college. At the completion of their government work they go back to college work.

It is said that most of these men are studying economics and it is felt that if they get some practical experience they will be better prepared for their work. Several are in the commerce department, with one each in the metals and minerals division, and the machinery division.

AMERICAN MACHINE TOOLS GAIN IN WORLD TRADE

Sales of American machine tools in foreign markets this year have continued at the record levels reached last year, and aggregate $24,368,000 for the first eight months, which is 96 per cent of the total 1936 shipments valued at $25,266,000, according to Lewis M. Lind, chief of the machinery division of the department of commerce.

Discussing machine tool exports Mr. Lind said that "on the basis of the January-August volume, sales for the entire year will reach approximately $36,600,000 an increase of 45 per cent over 1936.

"Compared with last year," he said, "American machine tool builders are obtaining a larger share of the increased business in world markets this year than either German or British producers. British machine tool exports during the first eight months were valued at $6,245,000 representing only 62 per cent of the total of 1936, of $10,000,000. The January-August German exports of 'metal working' machinery totaled $44,500,000 and represents 87 per cent of last year's sales valued at $51,100,000."

FISHERIES COMPLAIN OF JAPANESE COMPETITION

Anything goes now, apparently, to catch the eye of the newspapers. Judge William S. Snow, Washington representative of the American fisheries co-operative, is charging that American fisheries are being compelled to witness a situation in the United States-Japanese trade which he says might aptly be termed "scrap for scrap to promote a scrap."

In a statement to the press last week Judge Snow pointed to the unusually large exports of iron and steel scrap from the United States and to a similar large import of fish scrap and meal from Japan. He states that some 3,000,000 tons of scrap iron and steel have been exported from this country during the first eight months of this year, and of this amount about 2,000,000 tons went to Japan. Meanwhile, he says, imports of fish scrap and meal have increased to such an extent that the total imports of these items for the first eight months of this year already exceed by 5000 tons the total imports for all of last year, and Japan has been responsible for 4000 tons of this increase. In other words, the judge contends that "it may be truly said that our American fisheries are paying the penalty for the exchange of "scrap for scrap to promote a scrap."

LABOR PEACE EFFORT FAILS

Representatives of the CIO and A. F. of L. who have been in session for several days have reached an impasse in their efforts to achieve peace between the labor unions and have adjourned to Nov. 4.

At the opening of the conference both sides were optimistic and they easily reached an agreement as to how to proceed. Everyone thought that something would develop to reunite the labor interests.

However, the CIO made a definite proposal which would have made the CIO the major organization of the two and this seemed impossible of acceptance by the A. F. of L. The latter made a counter proposal and this was turned down by the Lewis organization.

Forecast Increase in Last Quarter Carloadings

■ Carloadings during the fourth quarter of 1937 will be 6.2 per cent greater than in the corresponding period of 1936, estimate the regional shippers' advisory boards in listing anticipated requirements for 29 principal commodities. The boards forecast 6,638,840 cars will be required, compared to 6,248,684 in the final period of 1936.

Requirements for iron and steel will be 465,978 cars, against 437,832 last year, an increase of 6.4 per cent. Ore and concentrates will require 419,197 compared with 359,326, an increase of 16.7 per cent, according to the boards' estimate.

World Tin Consumption Increases 9.1 Per Cent

■ World apparent tin consumption in the 12 months ended in August totaled 175,580 gross tons, compared with 160,950 tons in the year ended August, 1936, an increase of 9.1 per cent.

United States used 80,857 tons in 1937, against 71,583 tons in the year ending August, 1936, an increase of 13 per cent. United Kingdom's consumption increased 18.5 per cent, Russia's 37.1 per cent, and Japan's 21.9 per cent.

Progress in Metals Industry Has Origin in Scientific Research

THE several thousand executives, engineers, metallurgists and technicians who attended and participated in the nineteenth National Metal congress and exposition in Atlantic City week before last could not help being impressed by the size and completeness to which this annual event has grown, and, thereby, its significance to metal producing and metalworking plants scattered throughout the United States and Canada.

During the first five days, participating technical societies conducted 40 technical sessions at which approximately 110 papers were presented and discussed. At several periods, five and six sessions were held simultaneously.

Although a considerable number of the papers dealt with the manufacture, treatment, fabrication and service of metals available commercially and generally well known, perhaps half of the total number of papers reported research initiated, continued or completed during the past year.

Research Projects Now in the Laboratory Forecast Developments Which Will Be Commercial Shortly

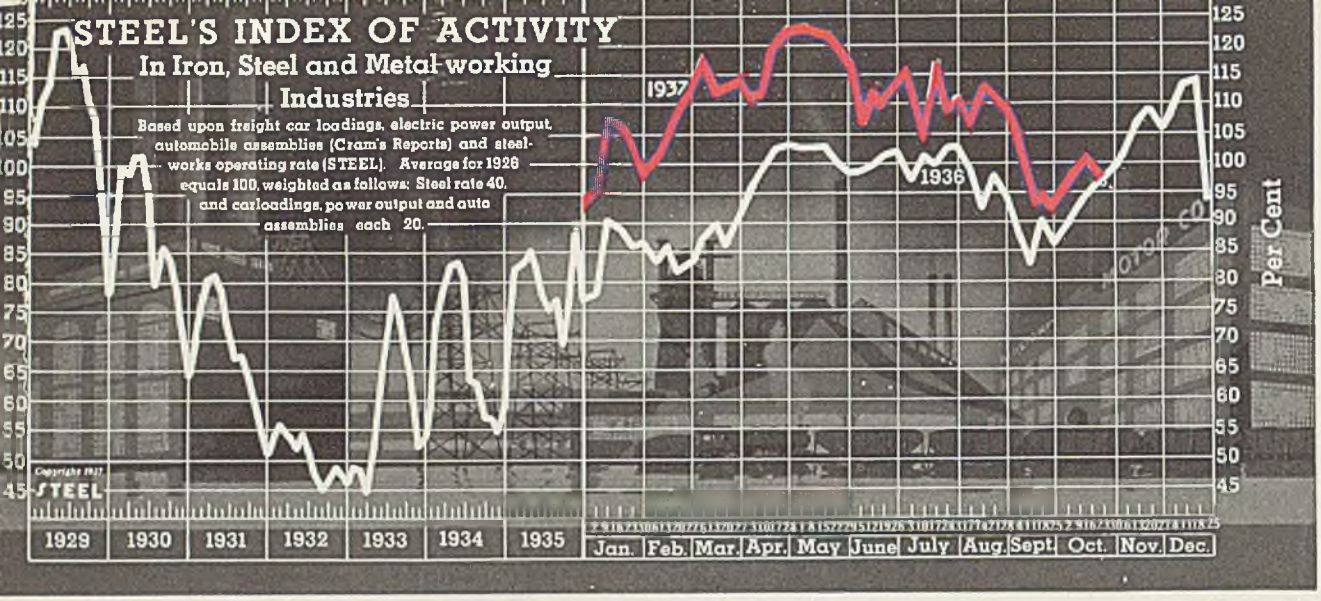
Appraisal of research projects active in laboratories indicates that industry is laying the groundwork for new materials and processes to become commercial a few years hence. All too frequently, one hears the comment that Metal congress papers tend too heavily toward the research or scientific type, to the detriment of practical problems. But let it be remembered that many of today's accepted materials and procedures were objects of intensive research and investigation not so long ago.

Proof of this situation was to be obtained by even a most casual examination of exhibits in the National Metal exposition in which about 230 manufacturers displayed their latest products. Consider that some types of tool steels, cemented carbides, stainless steels, alloy steels, low-alloy high-tensile steels, heat and corrosion-resisting alloys, heat treating methods, welding techniques, just to mention a few items, have been introduced only recently and that for several years they were brain children of research laboratories.

America's Dominant Position in Metals Attributed To Free Interchange of Research Information

Scanning the comprehensive and voluminous mass of information contained in Metal congress technical papers, one is amazed with the frank and open-minded attitude with which research and experimental data acquired at great cost by perhaps competing companies are revealed and interchanged.

The rise of America's metal industry to its dominant position can be attributed in no small part to this liberal and unselfish attitude. Technologically, the industry will continue its uninterrupted progress with its experts convening regularly and freely discussing their common problems.



STEEL'S index of activity declined 4 points to 97.8 in the week ending Oct. 23:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Aug. 14	113.8	92.6	71.5	61.4	74.2	44.6	67.4	86.2
Aug. 21	110.3	97.9	77.0	60.3	71.6	44.9	67.3	88.5
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	93.4	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	97.8*	97.1	82.4	56.3	58.0	48.7	58.2	78.8

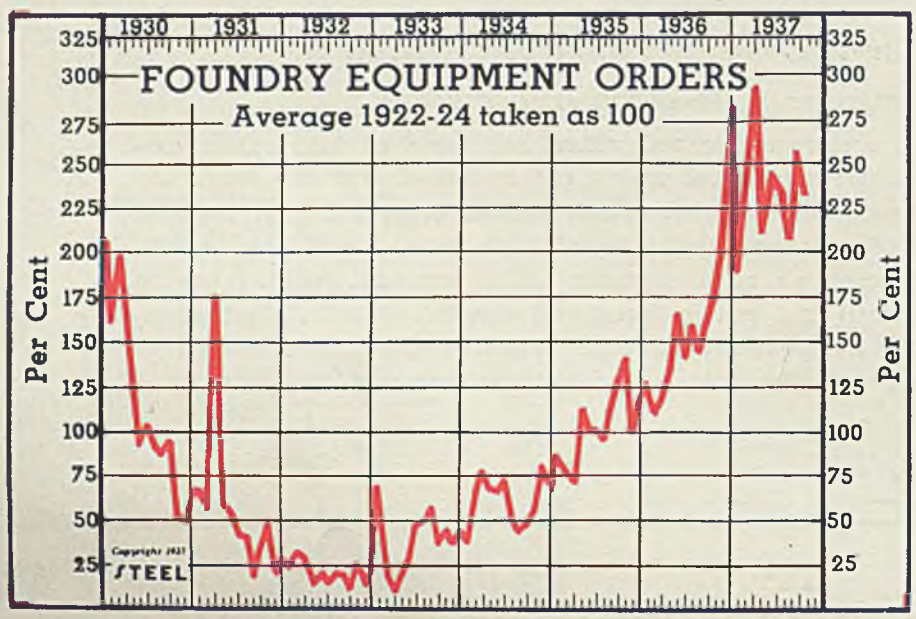
*Preliminary. †Revised.

Decline in Steel Rate Causes Break in Activity Index

AS EXPECTED, STEEL'S index of activity has succumbed to the overpowering influence of the steady decline in the rate of steelworks operations. Until the week ending Oct. 15, at which time the steel rate had descended to 63 per cent of capacity, gains in automobile production and the comparatively high levels of revenue freight car loadings and electric power output had been sufficient to more than compensate for the losses in the heavily-weighted steel rate. As a result the index had mounted gradually from a low of 93.0 in the week ending Sept. 25 to 101.8 in the week ending Oct. 16.

However, the drop from 63 to 53 per cent in the steelworks operating rate in the week ending Oct. 23 was too much of a burden for the three other barometers in the index to support. Automobile output climbed from 89,680 to 91,905 units, electric power output was 2,281,636,000 kilowatt hours and revenue freight car loadings were about 790,000; yet these relatively good showings were not sufficient to offset the drop in steel. Consequently the index receded from 101.8 to 97.8.

This brings the index trend line perilously close to the 1936 curve.

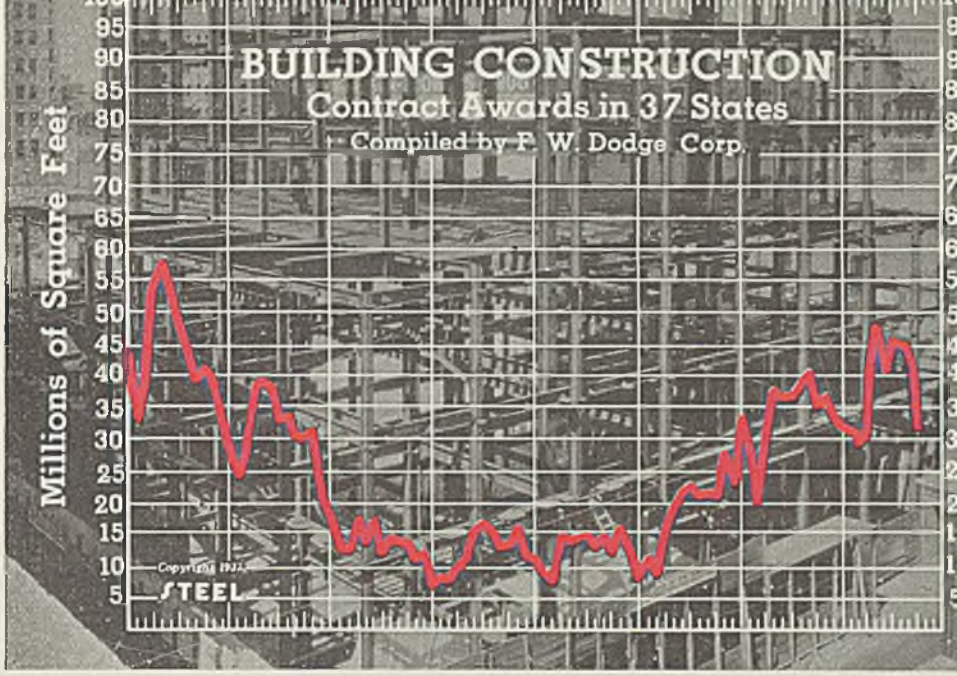


	Per Cent			
	1937	1936	1935	1934
Jan.	190.9	127.0	76.6	37.2
Feb.	249.5	110.4	75.7	65.8
March	294.2	115.0	69.4	75.4
April	208.3	134.0	113.2	67.9
May	242.0	165.4	100.7	66.5
June	228.2	141.4	100.2	70.4
July	204.0	159.6	94.0	50.7
Aug.	257.5	144.8	113.0	43.1
Sept.	231.8	161.0	128.5	46.4
Oct.	.....	173.8	140.0	55.3
Nov.	.....	200.4	100.4	80.4
Dec.	.....	283.3	118.1	66.9

BUSINESS TREND

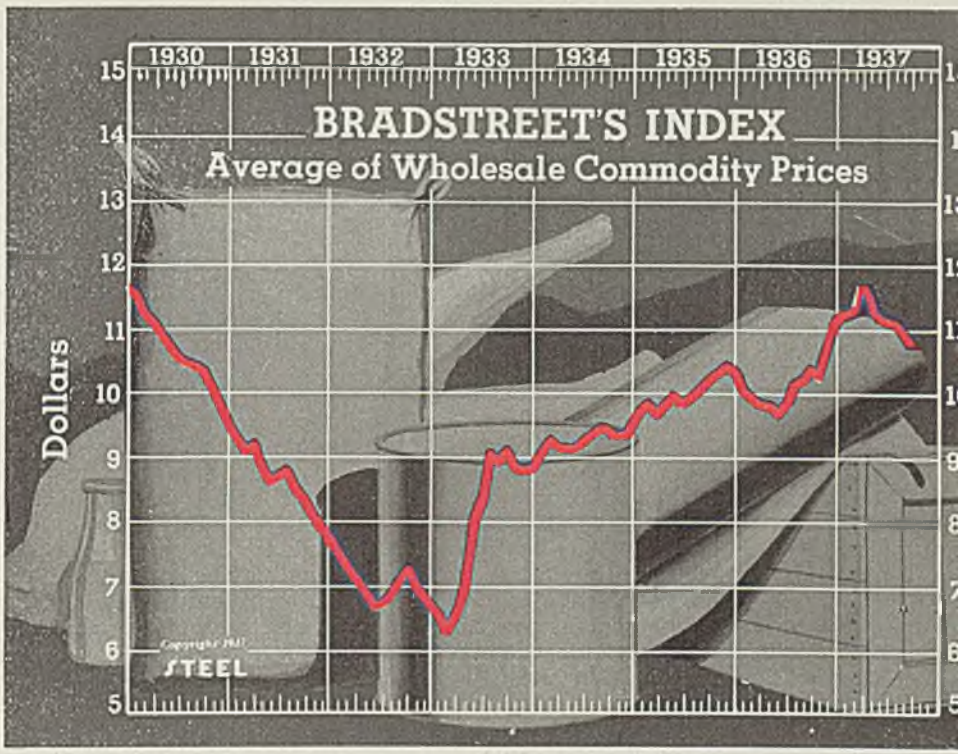
September Building Awards Show Sharp Decline; Below Year Ago

	Three-Month Average Square Feet		
	1937	1936	1935
Jan....	33,470,000	27,053,300	11,245,100
Feb....	29,942,100	20,856,700	9,670,300
Mar.	41,567,800	31,257,900	15,845,300
Apr....	48,396,100	37,490,200	19,917,300
May...	40,287,900	36,362,100	22,276,200
June .	46,393,100	36,883,900	22,878,000
July...	45,812,600	38,762,500	21,565,900
Aug...	42,077,100	40,285,100	21,545,400
Sept...	32,364,300	35,448,000	21,365,700
Oct...	.....	36,718,900	27,775,900
Nov..	.....	34,947,500	24,120,700
Dec..	.....	33,632,600	33,441,900



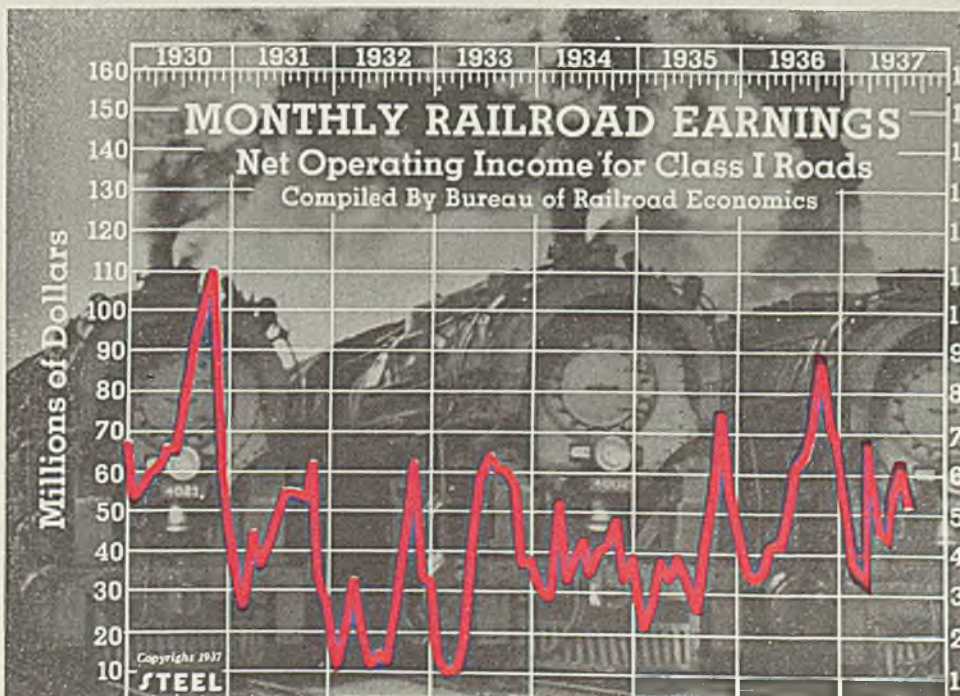
Commodity Price Index Shows Slight Loss on Sept. 1

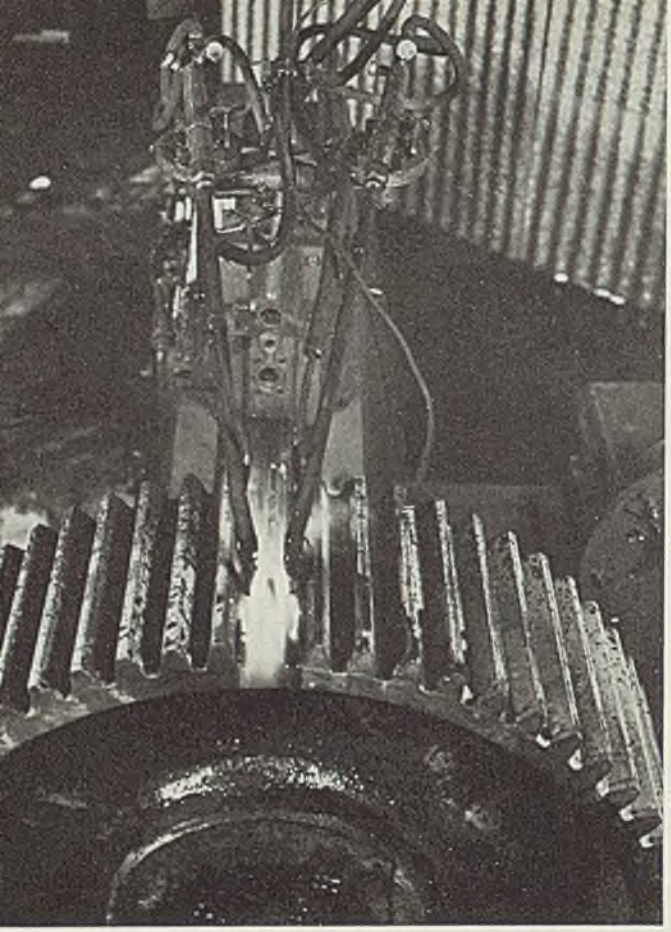
	1937	1936	1935	1934
Jan. 1.....	$11.13	$10.36	$9.49	$9.01
Feb. 1.....	11.23	10.02	9.78	9.26
Mar. 1.....	11.34	9.92	9.79	9.17
Apr. 1.....	11.81	9.85	9.66	9.16
May 1.....	11.51	9.81	9.79	9.14
June 1.....	11.33	9.73	9.90	9.24
July 1.....	11.27	9.85	9.84	9.32
Aug. 1.....	11.19	10.14	9.91	8.48
Sept. 1.....	10.96	10.19	10.00	9.45
Oct. 1.....	....	10.27	10.17	9.27
Nov. 1.....	....	10.22	10.28	9.29
Dec. 1.....	....	10.78	10.40	9.49



Railroads Earn 1.77 Per Cent On Investment in August

	1937	1936	1935
Jan....	$38,436,679	$35,728,532	$21,934,645
Feb....	38,358,638	33,594,718	26,296,411
March.	69,379,328	35,205,513	38,129,871
April..	47,807,447	41,493,455	34,708,718
May...	43,662,959	41,797,047	39,598,511
June .	58,939,875	50,312,580	34,102,703
July...	60,527,576	61,773,765	26,919,343
Aug...	50,307,881	64,680,717	42,156,706
Sept...	.....	70,166,026	57,349,265
Oct....	.....	89,851,409	75,454,501
Nov...	.....	72,410,571	54,224,290
Dec....	.....	70,519,601	46,020,695





Selective Hardening Oxyacetylene

BY R. L. ROLF
Metallurgical Engineer
Lakeside Steel Improvement Co.
Cleveland

Fig. 1—Set up used in torch hardening spur gears

EXTENSIVE commercial use of the oxyacetylene flame in the heat treating industry has brought widespread attention as to the possibilities of enlarging its scope in the manufacturing field.

With rapid development in equipment design, there appears to be no limit as to its application, and what only a short time past was considered an impossibility is today of wide commercial importance.

Manufacturers are proposing new parts or are making plans to convert present designs for adaptation to the process. In most instances the cost is lower than that of any other means of fabrication and the rejections are negligible.

With a new process, it is often common practice among those not familiar to draw erroneous conclusions as to its application for their particular problem.

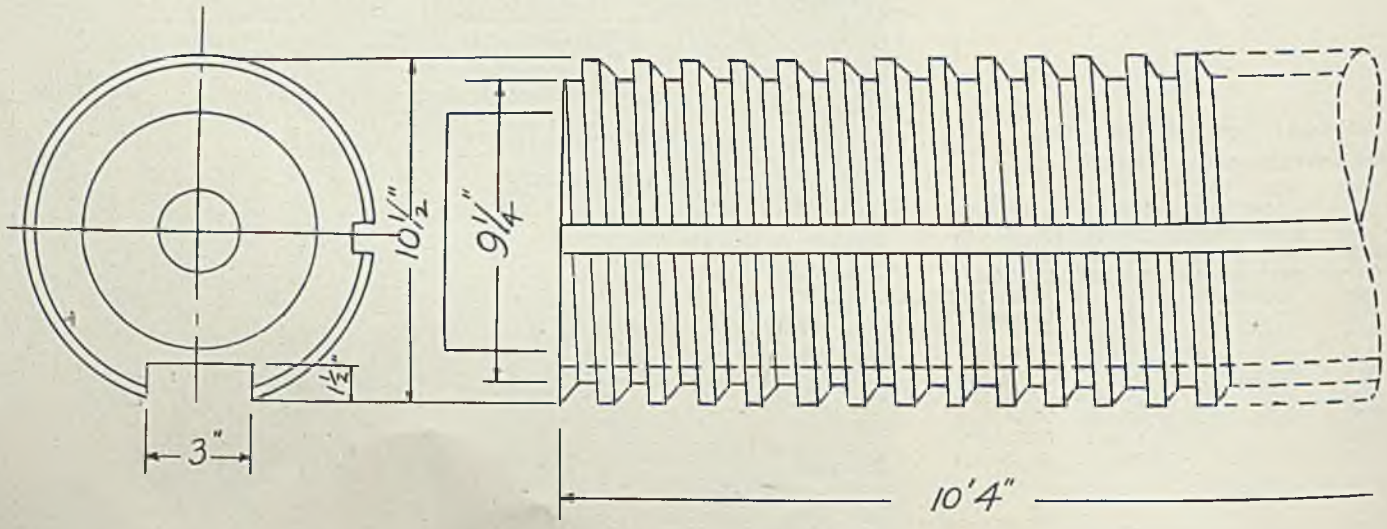
Experience has shown that it is far simpler to secure enlightenment on these subjects by analysis of case histories than by any other means of approach, and bearing this in mind, the following cases are cited to illustrate how torch hardening may be applied with comparative ease, lending itself to both quality and quantity production.

Gears of all descriptions present an ideal application. Size or shape is no longer a problem. The design may be helical, spiral, bevel or spur. If they are small they may be hardened by the spinning method, while on the large units progressive hardening may be used.

A typical set-up for spur gears is illustrated in Fig. 1. The twin torches heat and quench both sides of the tooth simultaneously, reducing time of operation and minimizing tooth distortion. Varying the speed from slow at the start to a more rapid finish insures uniformity of hardness and depth of penetration.

During the early stages of torch hardening it was impossible to obtain a uniform case depth on tapered teeth. When the torches were adjusted to the large end the small section would show a shallow case, as the torches moved only in one plane and once adjusted for the heavy end of the tooth, the flame and quench would be too far away at the small end to permit proper heating and quenching, or when designed to follow tooth contour it

Fig. 2—This large screw presented a grave straightening problem



With the Flame

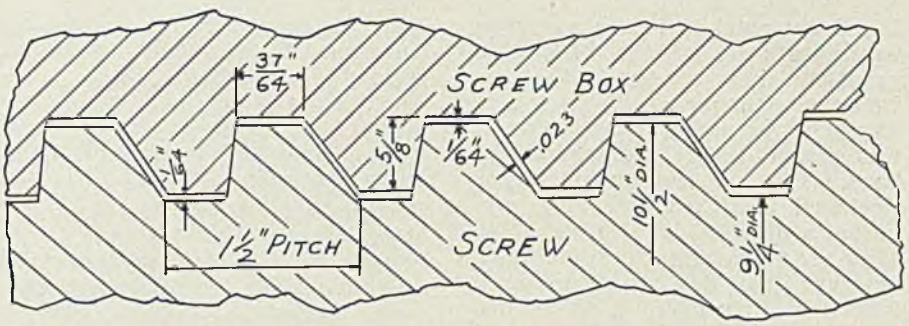


Fig. 3—Cross section of the nut and screw showing the small runout permissible

would result in overheating the small end.

Today, with an arrangement such as illustrated in Fig. 4, the torches are contracted or expanded automatically insuring the same relation between the work and the flame at any position of the tooth.

A leading manufacturer of heavy equipment found it was necessary to reduce wear on a large elevating screw and nut, which, due to distortion and close tolerances, were machined from untreated material and left in that state.

The screw, shown in Fig. 2 being 9 inches in diameter and 10 feet long, presented a grave straightening problem as the permissible runout was very small, as may be evidenced from the cross sections of both nut and screw, shown in Fig. 3.

Machining from heat treated bar stock gave small additional life, but not sufficient to warrant the large increase in machining costs. Fabricating from a medium carbon alloy steel and flame-hardening would produce the necessary hardness and eliminate distortion, but this presented a new torch-hardening problem, for up to this time, work of this character had not been attempted.

A simple but ingenious setup solved this problem. The screw was mounted in chucks and rotated by a variable speed drive; the monitor carrying two small torches was mounted parallel to the screw. Coordinating the horizontal travel of the monitor with the rotation of the screw permitted this unit to be hardened uniformly for the entire length.

While the nut shown in Fig. 5 presented a problem of internal hardening, its similarity to the screw made the solution comparatively simple. This component was mounted on rollers and driven from one end by a variable speed drive. The torch monitor was mounted at the open end and a guide with one end attached to the monitor and the other in the nut thread automatically fed the torches through the nut. In this manner, both screw and nut were hardened to a Shore hardness of 8085 without scale or distortion, and this was the solution to the problem.

Worm threads present a difficult hardening problem, since the gradually increasing thickness of the lead, together with tooth form and depth, add complications to an already complicated situation.

With proper head design and camming action, satisfactory hardening may be achieved.

Worms should be fabricated from the low carbon steels and carburized and hardened. However there are cases where this is not essential and a plain heat-treated worm will suffice.

In such instances, if the core strength is not important, flame hardening may be substituted. For several years the worm shown in

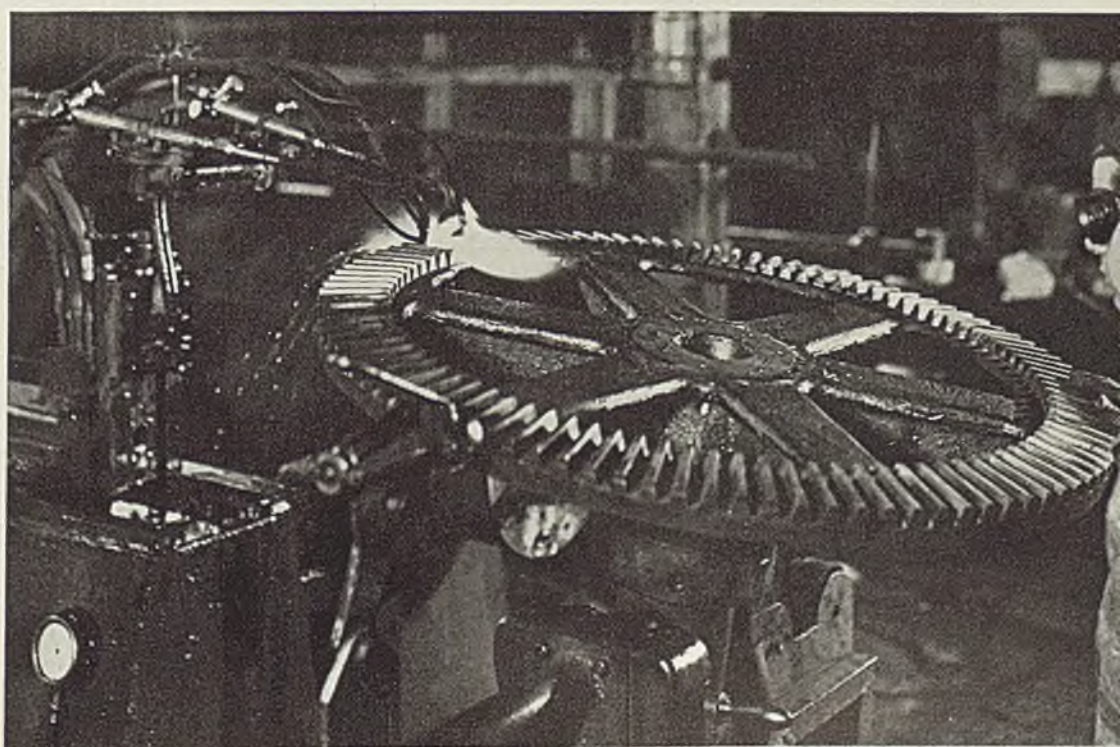


Fig. 4—This machine insures the proper relation between flame and work in gear hardening

Fig. 6 was machined from a chrome vanadium steel of the SAE 6150 grade and heat treated in the conventional manner. While core strength was not a prime factor, it was essential that the threads be hard. The specification called for Rockwell 50-55C, which only permitted a draw of 400 degrees Fahr. after the quenching operation. Two keyways 180 degrees from each other added considerably to the distortion of the shanks, which could not be drawn back to permit easy straightening without reducing the hardness of the threads. The straightening costs and the scrap loss due to breakage during this operation were extremely high.

Makes Ideal Application

With a change in analysis this made an ideal application for the acetylene flame. The specification was modified to a lower carbon, S.A.E. 6130, to prevent checking, and the threads were hardened except for a distance of one inch from either end, to Rockwell 5862, without any distortion either in the worm threads or journals.

Engineers demanded that the ball socket on the spindle illustrated in Fig. 7 be hardened to Rockwell 50 minimum. They further specified that the parts be free of scale and distortion. To satisfy these requirements by conventional methods would have been impossible as it would have necessitated the quenching and drawing of the socket end prior to a machining operation with a resulting hardness under the specification.

If hardness was to be maintained, then the heat treating would have to follow the machining operation and this procedure would be accompanied by the usual amount of scale and distortion. Being fabricated from a carbon manganese steel of the analysis given below, this presented an ideal flame hardening problem:

Carbon	.40- .50
Manganese	1.60-1.90
Phosphorus	.040 Maximum
Sulphur	.050 Maximum

The spindle was mounted on rollers and the small end fastened in a chuck. A special head was designed to fit the curvature of the path and at the same time compensate for the difference in speed of rotation between the large and small diameters. By rotating the forging, and permitting the torch to remain stationary, it was possible to meet the engineering requirements.

The crank shown in Fig. 8 was cast with the gear integral, from "Meehanite" and for all intended purposes this material was more than satisfactory in the as cast state, except that the crankshaft bearing was not sufficiently hard for maximum service.

If the assembly were treated to a hardness satisfactory for the bearing, the pieces could not be machined, and heat treating after machining made the cranks unsatisfactory for service because of distortion.

Supporting the cranks as illustrated and applying the torch to the bearing surface, the hardness of the desired portion was increased to Rockwell 58 C without distortion, leaving the rest of the assembly unchanged.

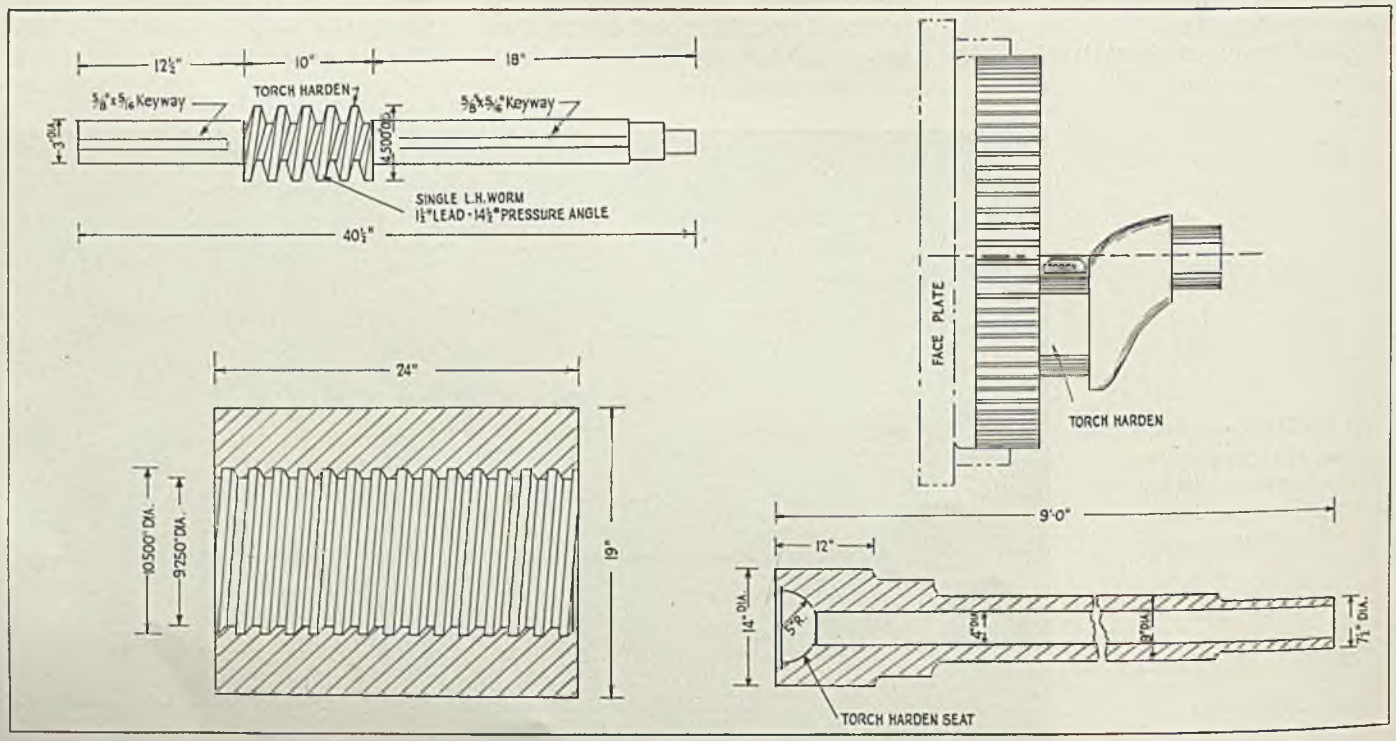
For years designers of heavy equipment have sought for a safe and economical method for hardening integral gears and shafts. The sections were usually large enough to give ample factor of safety without resorting to heat treatment but there always existed that problem of wear, which in the majority of instances was confined to the gear teeth, but frequently parts were scrapped as the result of scored journals as well as scored or worn teeth.

Presents Complicated Problem

The gear shown in Fig. 9 was selected as an illustration, not for its size and weight, but chiefly to demonstrate the feasibility of torch hardening large heavy areas. The teeth were hardened in the usual manner, but the 8-inch path on the journals presented a more complicated problem. Using a 4½-inch torch head, the torches were adjusted so that overlapping would leave a narrow oblique soft path about 1/64-inch wide along the horizontal plane, and a soft spiral path of equal size around the periphery.

"Soft" in connection with the above is in reality a misnomer as these areas are not soft as the word implies, but they are softer than the abutting hardened areas and when checked with instruments

Fig. 5 (bottom left)—Internal hardening was accomplished on this nut. Fig. 6 (top left)—Hard threads are required on this worm. Fig. 7 (bottom right) — Distortion-free hardness was a requirement of the ball socket. Fig. 8 (bottom right)—Crankshaft bearing on this piece required greater hardness than the remaining sections



they did not show over four points on Shore reading below the hardened sections.

Figs. 10 and 11 illustrate two types of sprockets which should afford no manufacturing complications. In both instances, the type of service demanded only maximum hardness of the teeth, allowing the remaining portion to be in the as cast state.

The most logical solution to the design shown in Fig. 10, would be selective hardening of the rim only. With sound castings and proper equipment under careful supervision this procedure is very satisfactory, but handled in the average manner this method generally leads to disaster as invariably the spokes separate from the rim. Heat treating the entire casting is the practice most generally followed to eliminate the breakage, but this has several disadvantages, such as the teeth warping out of plane with the hub, increased machining costs and difficulty of holding maximum hardness because of machining requirements.

Long Raceways Hardened

Probably the longest progressive operation so far undertaken was the hardening of raceways in tracks 9 inches x 4 inches x 30 feet, weighing approximately 3000 pounds each shown in Fig. 12.

These parts, machined from a 0.40-0.50 carbon steel, required the raceway hardened to a Rockwell of 52-55C and at the same time no distortion was permissible. Hardening by the conventional process may have been possible providing an elaborate and expensive set of quenching jigs were used, but even then there would have been the possibility of sufficient distortion which would have required a long and expensive straightening operation or possibly the scrapping of one or more of the components.

Designing a special head to accommodate the radius, and mounting the torch on a monitor running parallel to the raceway, these tracks were hardened at the rate of 2 hours and 45 minutes each without scale or distortion and at a cost far under that of any other method of heat treatment.

Anneal Following Service

It is important, that where parts have been previously hardened, or have been in operation, that they be annealed before hardening. An excellent example of this was observed when attempting to flame harden forming dies.

The manufacturer in this instance was behind schedule and decided to run off several hundred pieces on the soft dies to satisfy his customer's immediate needs and then to remove the dies from the machine for hardening. This procedure is only logical and in all respects satisfactory, except in this instance he failed to inform the hardening room of the fact that the dies had been in operation. While flame hardening, the operator observed considerable checking of the hardened surface, which he attributed first to the flame and later to the analysis of the material. Considerable time was lost checking these factors only to find that they had no bearing on the trouble at hand.

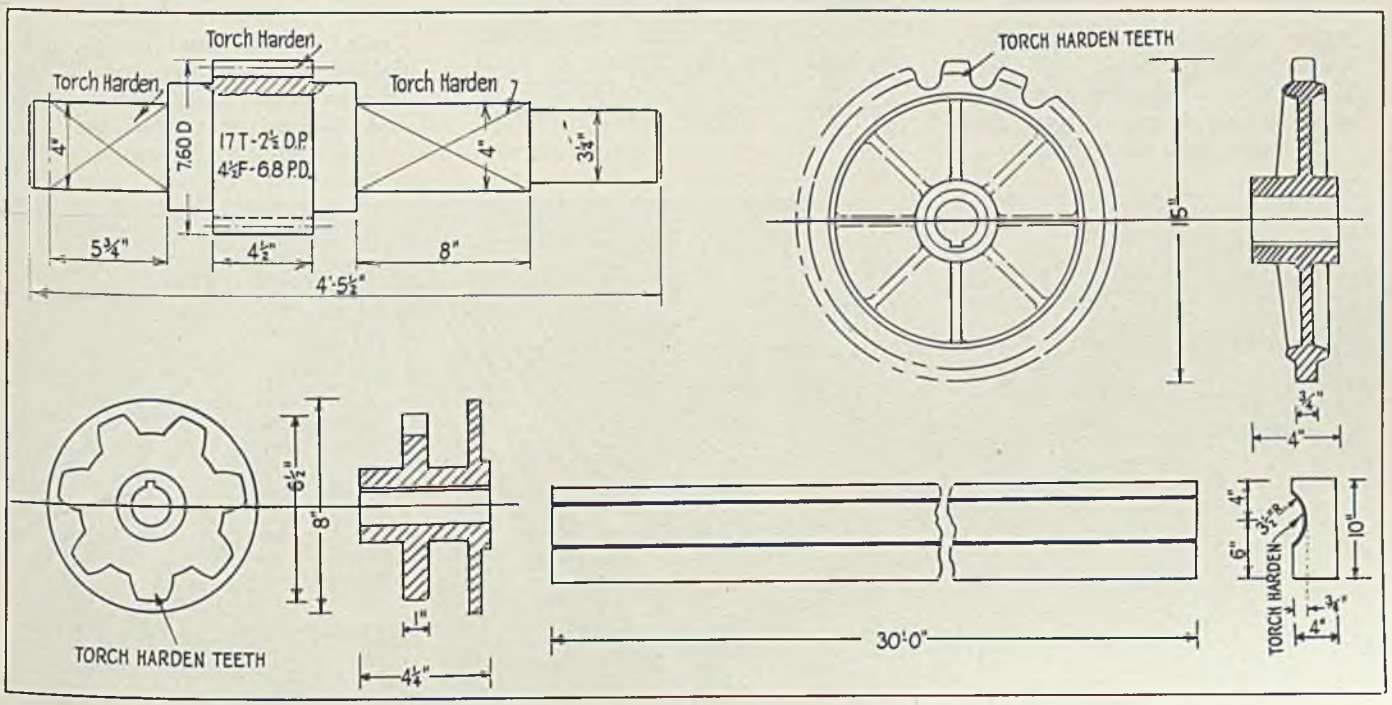
On further investigation it was finally revealed that the parts had been in service. By turning off the quenching medium and slowly passing the torch over the area to be hardened, the parts were stress relieved to a sufficient degree so that no further complications arose during the hardening operations.

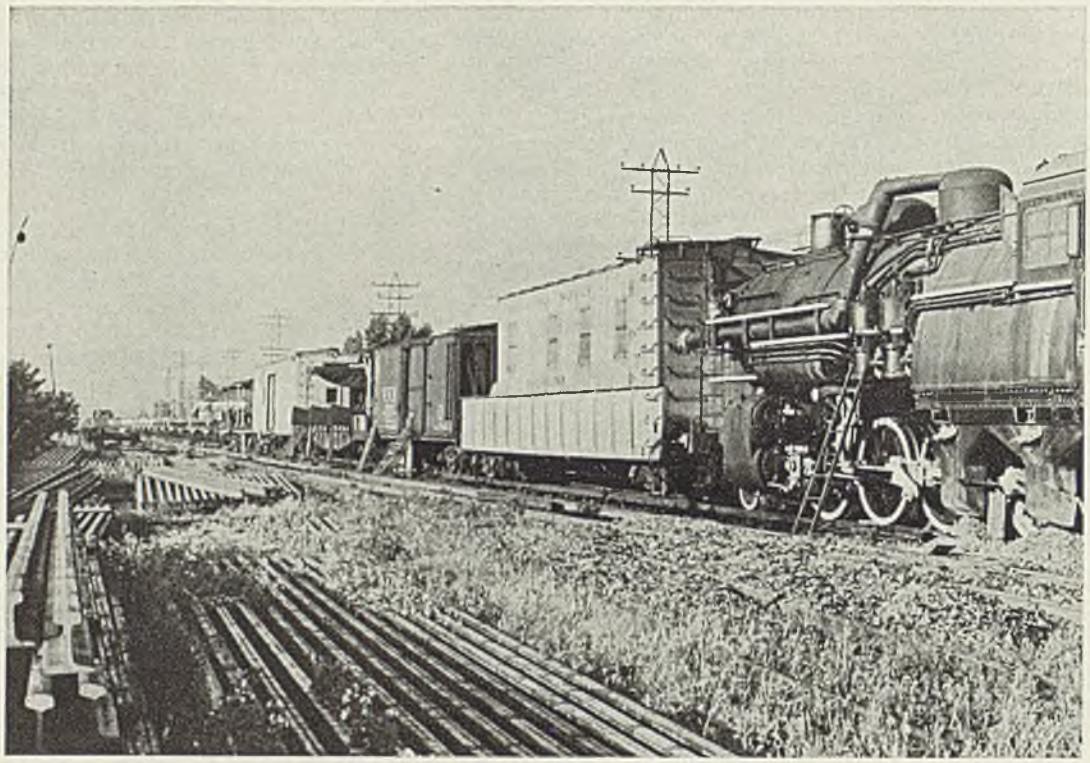
Fig. 9 (top left)—This gear shows how large heavy areas may be torch hardened. Figs. 10 (top right) and 11 (bottom left) show two types of sprockets, both requiring maximum tooth hardness. Fig. 12 (bottom right)—One of the longest progressive hardening operations yet undertaken was on the raceways of tracks 30 feet long

Lincoln Welding Awards Arouse Wide Interest

■ Governors of 29 states have expressed interest in the $200,000 prize award program of the James F. Lincoln arc welding foundation, Cleveland, trustees of the foundation were informed at a recent meeting. These governors have co-operated by bringing the award program to the attention of individuals and departments of state governments as possible participants.

The trustees also received information that redesign studies for arc welded construction are being made of aircraft and automotive engines, railroad locomotives, naval and commercial vessels and industrial buildings as well as machines and industrial and domestic appliances. The data being accumulated are expected to yield facts of great importance. The award program, the first activity of the foundation's plan to encourage scientific progress in electric welding, closes June 1, 1938.





General view of the Sperry flash welding unit in operation, showing locomotive used to supply steam, rack car, welder car and string of flat cars

Flash Butt Welding of Rails Lowers Track Maintenance

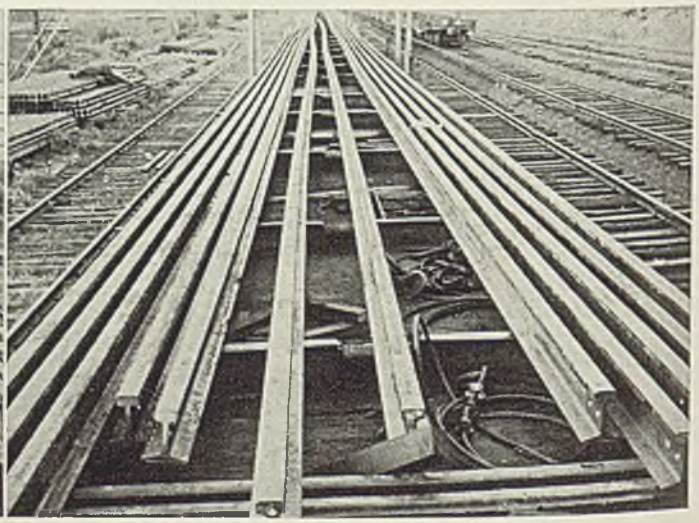
CONTINUING after experiments of recent years have proved the practicability of welded rail, Delaware & Hudson railroad is having welded into continuous lengths of a mile or more, 316,800 linear feet of rail—which represents the D & H new rail program for 1937.

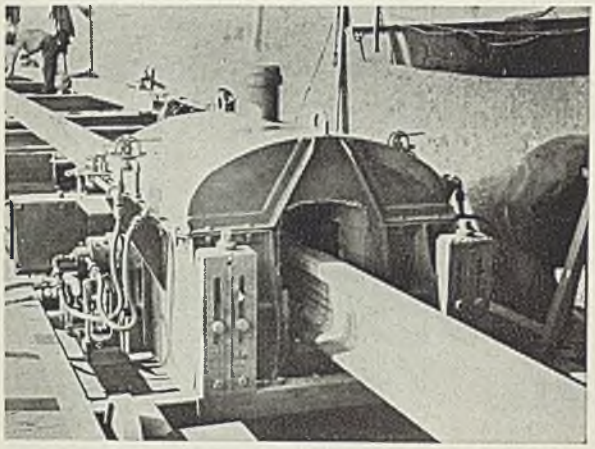
Standard rails of 39-foot length and 131-pound section are being flash butt welded by Sperry Products Inc., New York, into lengths of approximately 1000 feet on flat cars, then pulled out onto the road and distributed at points where they are to be laid into track. When laid in track, the long strings of flash welded rail are joined together by "closure" welds to give continuous rail, punctuated only by the insulated joints required for signal circuits.

The equipment employed in Sperry flash butt welding involves a welding car, housing a specially constructed flash welding machine; a generator car, housing two turbo-generators for supplying current for welding machine and auxiliary equipment; a steam locomotive for supplying steam for the turbo-generators; a rail-rack car for lining up rail preparatory to movement into the welder car; and a series of

Fillet grinder removes upset metal below rail head and above base. This eliminates possibility of a fatigue fracture developing when rails carry load

Train of flat cars loaded with welded rails 970 feet long. These lengths will be laid out on roadbed and themselves welded together into longer lengths





Stress relieving furnacesituated on first flat car following welding operation

five flat cars on which are situated respectively a stress relieving oven and four grinders.

Attached to the above set-up is a train of flat cars, or open gondola cars, onto which lengths of welded rail are hauled by means of a winch located at the rear of the train.

All operations are simultaneous, i. e.: while a weld is being made in the welding machine, the weld previously made is being stress relieved in the oven, and the four welds made prior to this are being ground at the four grinding stations.

The first grinder, the gage grinder, removes upset metal from the sides of the rail-head; the second, or fillet, grinder removes upset metal from fillet beneath rail head and from portion immediately above base of rail—this removal of upset metal reduces chance of any fatigue fracture developing at these points; the third, intermediate, grinder removes part of the upset metal from the rail head; the fourth, finishing, grinder smooths off and contours the rail head at point of weld.

Forms Complete Cycle

Making the weld, stress relieving, and grinding may, therefore, be looked upon as a group of operations forming a complete cycle. Upon completion of each group of operations, the rail is hauled one rail's length along the flat cars, thus permitting all operations to start afresh without moving from stations. When fully loaded (with approximately 12 strings of welded rail) the flat cars bearing welded rail are unhitched and the rail is transported to the site of laying.

In order to unload a long string of rail from the flat cars, the end of the rail is attached, with a cable, to an anchorage on the ground; the train is then pulled from under the rail, and the rail is hauled from the rear of the train.

Welded rail is easily transported, conforming to curvature of track while on flat cars without necessity of its being fastened down.

Flash welding machine is essentially a two-part unit on a steel bed. One portion is rigidly fixed, while the other is a movable platen which supports the end of the rail which is to be welded to the rails already joined into one long string. Both fixed and movable portions of the welding machine are equipped with hydraulic clamps which grip the rails, and with electric contact pads.

Making the weld consists of three phases: (1) pre-heating (2) flashing (3) pushup. The generator car is a specially constructed steel box car which houses two steam turbo-generators. The steam demand for the turbine driving the generators varies from 15,000 to 22,000 pounds per hour, with pressure at the turbine nozzles between 175 and 200 pounds per square inch. The weld requires approximately 6 minutes to make.

Construction Material Made of Wood on Steel

■ Wood veneers, backed up with and permanently cemented to a steel sheet, constitute a new product called Robertson Bonded Metal, just announced by H. H. Robertson Co., 2000 Grant building, Pittsburgh. Developed through the company's fellowship at the Mellon Institute of Industrial Research, the new product is used for interior walls, elevator cabs, air-conditioning cabinets, bars and furniture, and combines the richness of real wood with the fire-resistance, strength and stability of steel.

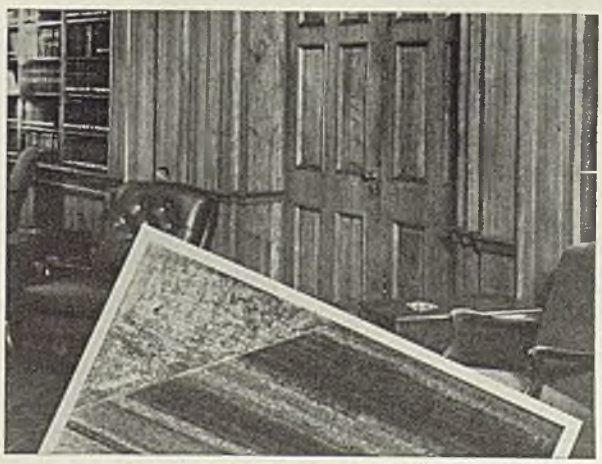
The new sheet material is available in sheets up to 3 x 8 feet, and with the steel reinforcement in gages from 30 to 18, permitting either great stiffness or sufficient flexibility to form the sheets into the small radii and curves used in modern furniture and interior design. The sheets may be cut with metal-cutting tools, stamped, spot-welded, drilled and bent, without damage or separation, and when used for panelled walls and partitions, may be installed without noticeable seams or joints. Thirty different American and foreign woods are supplied as surface veneers, and fire-resistant insulating cores are cemented to the steel backing to make one-piece partitions.

Reasons for the durability of the material are found in the phenolic resin adhesive used for bonding, which is supplied by General Plastics Inc., North Tonawanda, N. Y. Boiling water tests of 12 hours and alternate four hour soaking and two hour baking cycles at 120 degrees Fahr., repeated twenty times, do not affect either the bond or the surface veneer, it is stated. Shrinkage, warping and cracking are thereby eliminated, despite extreme humidity or dryness.

Refrigerated by Night

■ With manufacture of a new compressor arrangement that may be plugged into any ordinary power circuit, long-haul refrigerator trucks now have practically an unlimited touring range, according to recent announcement of Kold-Hold Mfg. Co., Lansing, Mich.

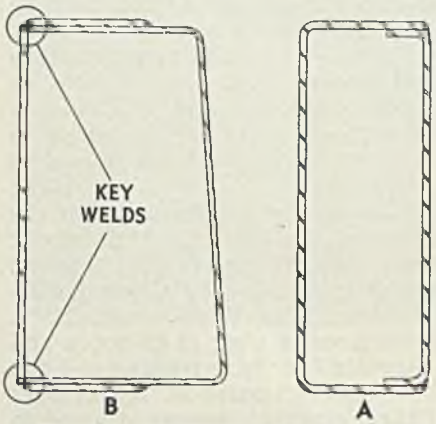
Using this method, a truck's refrigeration is fully restored during a night's layover. The compressor is easily mounted and is the logical arrangement for a truck that is away from the home garage for more than a day at a time, say its builders.



Robertson Bonded Metal consists of steel in gages from 30 to 18 covered with wood veneer

New Auto Frame Is More Rigid

INCREASE of 70 per cent in overall torsional rigidity with an 18 per cent reduction in weight is claimed for the frame of the 1938 Studebaker line, shown in accompanying illustrations. Key to the strength of the new frame is said to be the straight tie, without offset, of the center cross member between the frame side members,



CROSS SECTION of new frame member (left), compared with the old (right). Greater width and use of "key" welding add to strength

eliminating twisting or crank action from the X-shape cross members, which carry only tension and compression loading. A quadruple overlap and deep section at the center of each member provides maximum strength for such loading.

Analysis of stresses and torsion requirements pointed the way to unit section box members for the frame. The two U portions of the sections have been pulled together, giving the effect of a one-piece section, as shown in an accompanying sketch.

Referring to this sketch, the greater depth at point B in comparison with point A on the former design has yielded increased rigidity. Additional strength has been obtained by "key" welding throughout the frames. Such welding, in contrast to the ordinary type of welding merely fuses two parts together, incorporates a projection of one part extending through a slot in the other, with a weld at the junction.

Frame steel of the side members is 11-gage on one model, 12-gage on another. Cross members are 13-gage, depth at their junction being 9⅝ inches. Side members are 6¼ inches deep at the maximum depth.

INCREASED torsional rigidity is provided by the new frame design (left) in comparison with the former type (right)

Springs Redesigned For Improved Ride

REDESIGNED springing arrangement on the two junior 1938 Packard models—the six and the eight on 122 and 127-inch wheelbases respectively—is claimed to provide a much improved ride. Leaf springs are used, but the static friction between them is minimized by cup-like depressions formed in the ends of the leaves, in which are placed buttons, some rubber and some oil-impregnated bronze. Accompanying illustrations show the new springs and indicate how the leaves are separated by the buttons.

SIDE view of rear leaf spring, showing rubber and bronze buttons inserted at ends of leaves to give added flexibility

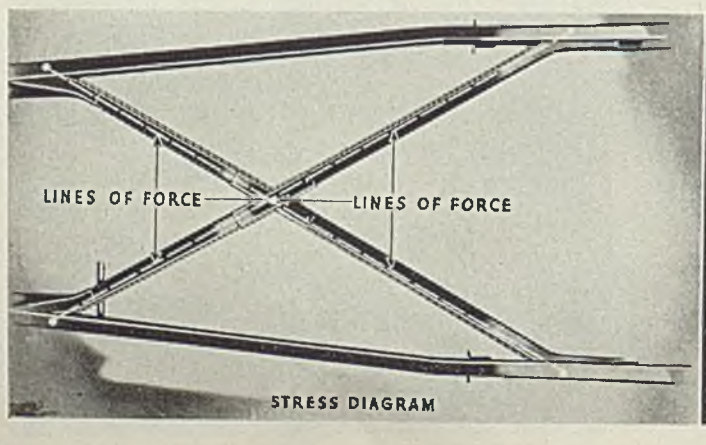
Forward ends of the springs are mounted in rubber and rubber bushings are used in the spring shackles. One end of the bushing has a thick rubber flange, and a flange is formed on the other end when the shackles

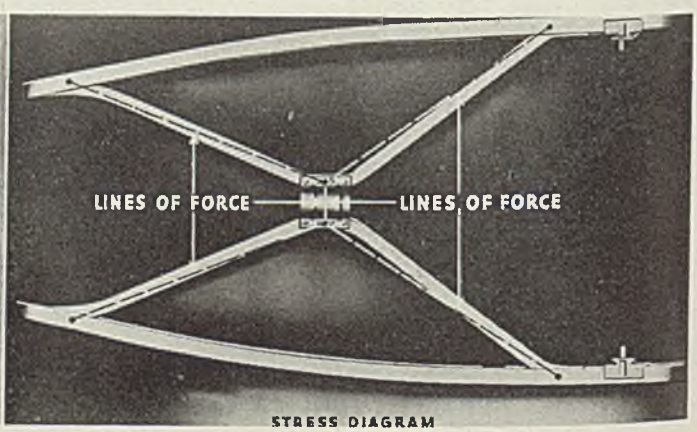
DEPRESSIONS in ends of leaves are formed in the steel to accommodate button inserts

are drawn up due to the fact that the bushing is longer than the spring eye. This avoids any metal-to-metal contact in the shackles.

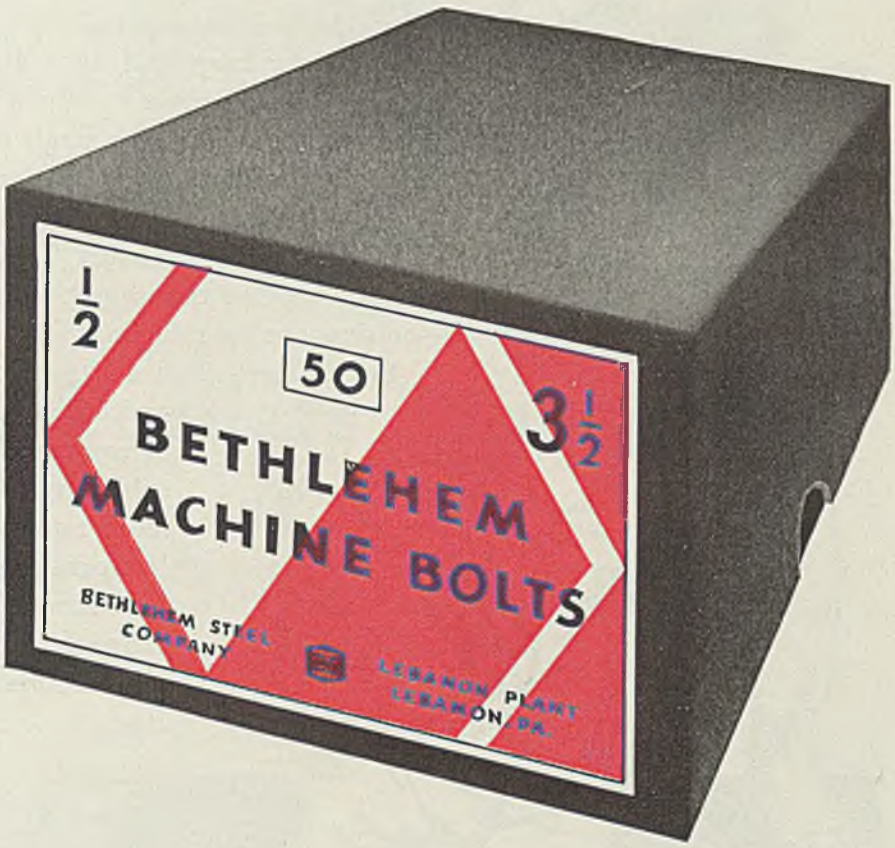
As a part of the suspension system there is a lateral stabilizer as well as a roll control bar. The stabilizer, rubber insulated, comprises a steel tube extending from the right rear spring pad to the end of a vertical bracket attached to the left side rail. On larger models there are two of these tubes, the second extending from the bracket to the right side rail.

Two-way shock absorbers are so mounted that on one the arm extends forward while on the other it extends to the rear, thus supplementing the resistance of the more flexible springs against braking or starting torque reaction of the rear axle.





A fine package for fine Bolts



ALL standard Bethlehem Bolts and Nuts are regularly packed in strong and sturdy cartons that will hold up, not tear, not split, even under rough handling. Each package is clearly identified by a bright, attractive label. Your stockroom will appreciate this—the clean appearance, the plain marking, the ruggedness.

Here's another point, too. Standard wood cases used for packaging these cartons of bolts and nuts are all of uniform width—are clearly marked on the end of the box. They stack into neat, solid piles; make it easier to estimate storage space required, easier to locate the size you want.

Incidentals, perhaps, compared with the outstanding quality of the product itself. Nevertheless, these sturdy, clearly-marked, clean-looking cartons—the uniform, convenient size of boxes—are two more details that Bethlehem has considered as an aid to you.

Cases of uniform width stack neatly

BETHLEHEM STEEL

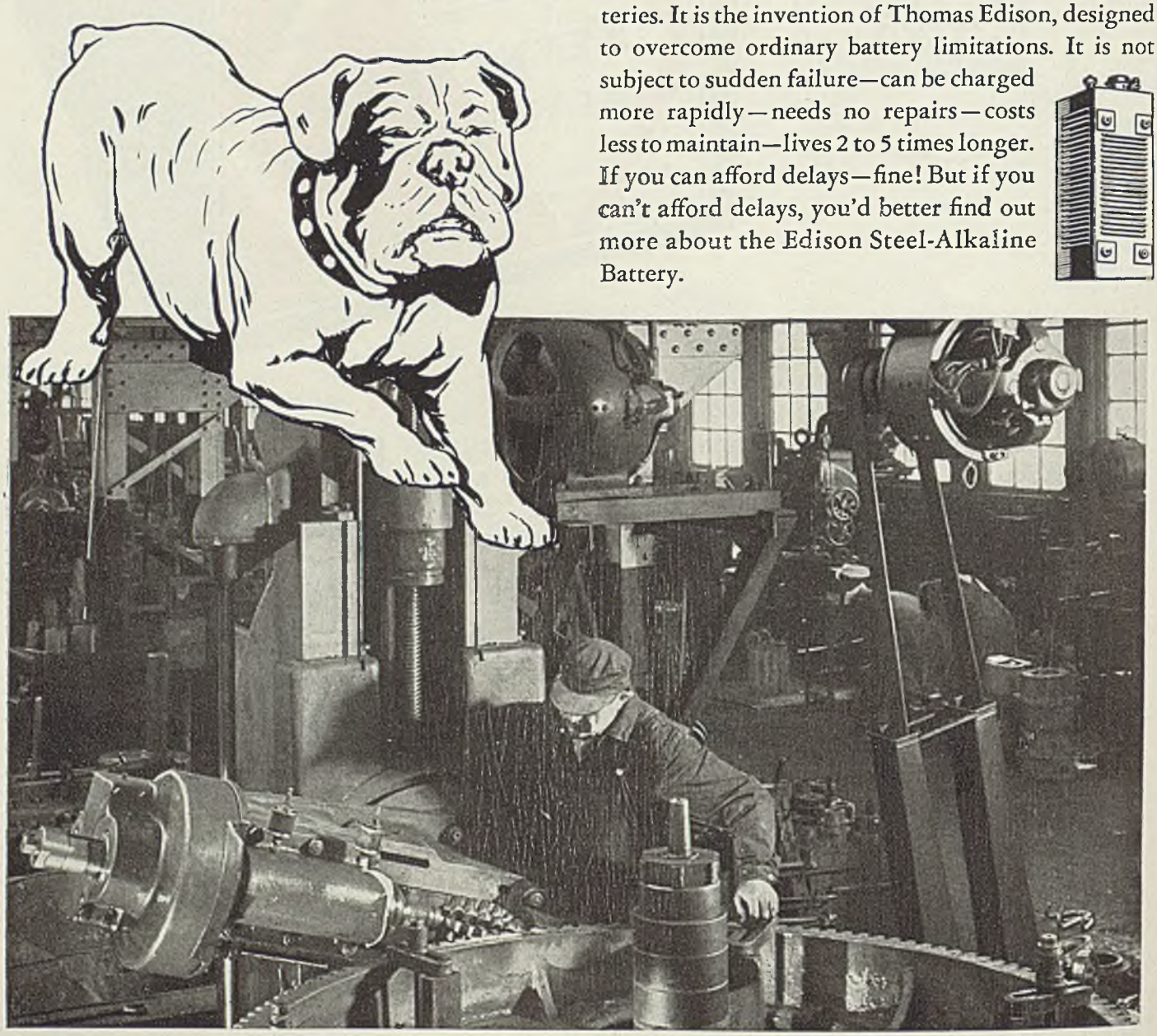
BETHLEHEM STEEL COMPANY

DELAY HAS A BULLDOG'S GRIP

Modern plants are geared for a rapid, smooth flow of work—but when delay takes hold it has a bulldog's grip. Failure of materials to arrive for one operation may hold up a dozen operations that follow. Material-handling trucks *must* be equipped with power-units which are not subject to sudden failure. Often a single delay can run into more overhead than the whole purchase price of the power unit.

That's the main reason in the majority of the industrial trucks you will find steel-alkaline batteries. The power is smooth—quiet—fumeless—dependable. One charging gives them energy for a whole shift's work—no time out for refueling.

But the steel-alkaline battery must not be confused with ordinary batteries. It is the invention of Thomas Edison, designed to overcome ordinary battery limitations. It is not subject to sudden failure—can be charged more rapidly—needs no repairs—costs less to maintain—lives 2 to 5 times longer. If you can afford delays—fine! But if you can't afford delays, you'd better find out more about the Edison Steel-Alkaline Battery.



EDISON STORAGE BATTERY

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

MATERIALS HANDLING

Haulaway Trailers Transport Large Part of Auto Production

BY A. H. ALLEN
Detroit Editor, STEEL

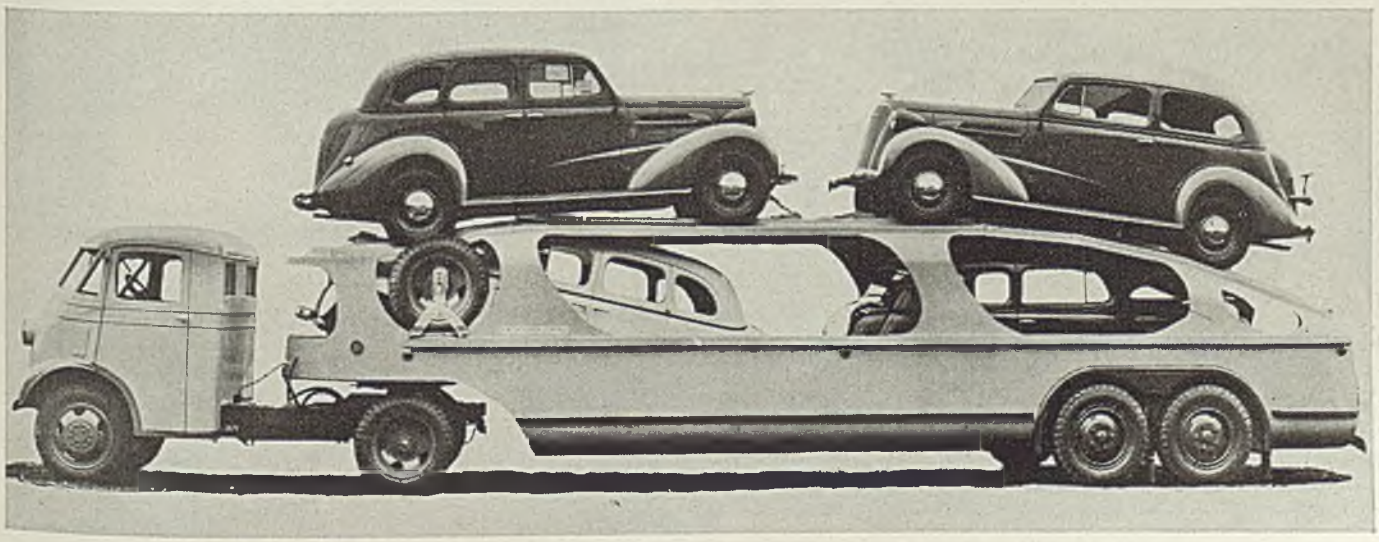
RECENT estimates have placed at 2,250,000 the number of new cars driven away from automobile assembly plants last year, a large percentage of which was moved on truck-trailer equipment.

This year the total undoubtedly will be higher. All of which means a brisk business has developed in the construction and maintenance of special trailers used for this hauling work. In the past few years it has been necessary to make alterations to these trailers each year as new model cars were introduced, because of changes in specifications. This year, however, in most cases trailers used for 1937 models will accommodate the 1938 models; nevertheless hundreds of new trailers will be needed, and builders are now in process of rushing them to completion.

One of the leading builders of this type of equipment, Mechanical Handling Systems Inc., Detroit, last year supplied several hundred of its streamlined haulaway trailers, each carrying four cars, and at present is busy assembling units ordered to handle 1938 shipments.

These trailers are built up by welding and riveting and are practically 100 per cent rolled steel. One popular design is a so-called "streamline" model, shown in an accompanying illustration, and is built with tandem wheels in the rear, total weight unloaded being 8000 pounds. Streamline contour is provided by the smooth exterior lines and by the curved plate sections which are placed over the crossbows and which furnish added

■ **Streamlining is now applied to haulaway trailers with pleasing effect, as shown here. The four-car trailer is 33 feet long, weighs 8000 pounds, is all-steel construction**



strength to the assembly as well as a decorative touch.

This type of trailer is built up on an adaptation of the assembly line principle, with the various subassemblies being fabricated and fed to a main assembly line where they are either riveted or welded to the structure.

Most of the structure is formed from sheet steel, although there are a few structural members. The five streamline plates on each side are cut from flat material, using templates for marking the proper shape, on small rotary shears. After being cut, they are rolled to the correct curvature on bending rolls and then pickled to insure a clean surface which will hold paint satisfactorily. These are the only parts of the assembly which require pickling treatment.

Use Brake and Shear

A press brake and a shear, shown in an accompanying illustration serve admirably for all cutting and bending operations on both rectangular and curved sections. The two horizontal sections extending along the sides are known as rub rails, and are formed on the brake from sheet stock. The lower rub rail is formed integrally with the curved bottom side sheet.

The axle assembly comprises pipe and castings and is fitted up completely as a subassembly before attaching to the trailer. An interesting innovation on the axle unit is a flat tire indicator, attached to each side, between the wheels. Essentially a small mercury switch, this unit signals by buzzer or light in the driver's compartment whenever a tire goes flat, since when one wheel drops down from a deflated tire, the switch is tilted and thus closes a circuit which flashes the signal. This is said to be the only means possible for a driver to know at once when a trailer tire is punctured while he in transit.

Interesting feature of the assembly is the use of both welding and riveting. Over 125 lineal feet of arc welding is required on each trailer, while there are close to 800 rivets of three types used to assemble the various sections, mainly the side sheets.

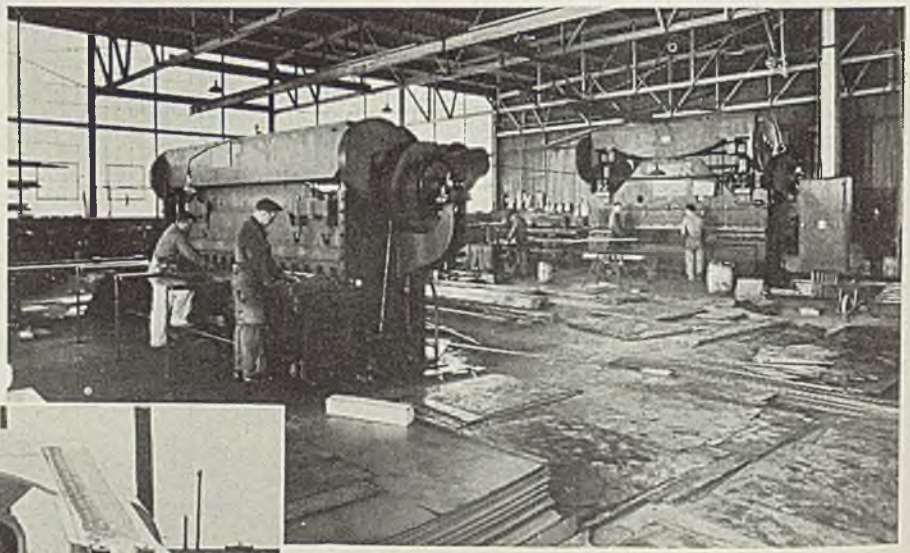
Bulk of the rivets used are the recently developed Huck rivets which can be drawn up cold from one side without any backup tool. Other rivets include larger sizes applied both hot and cold.

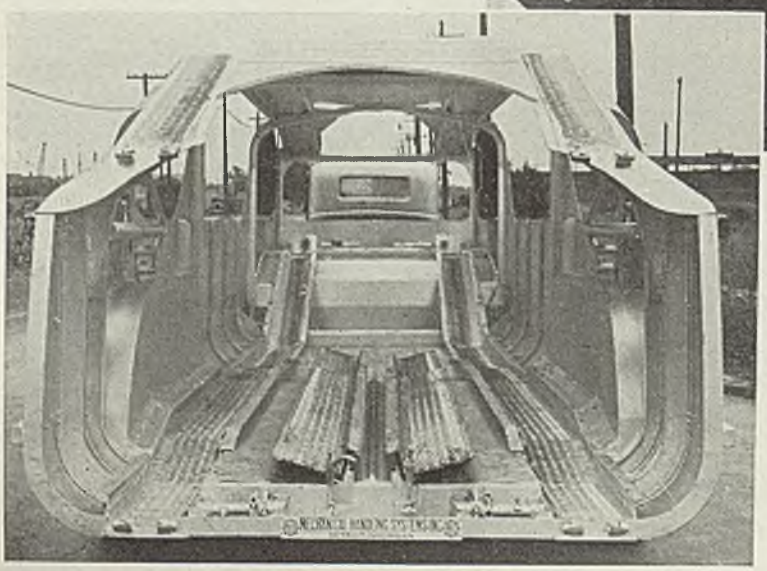
Riveting work is facilitated by having all of the equipment placed on a specially-designed, four-wheeled, structural steel carriage which carries a 15-foot swinging boom at its top on which rides a trolley carrying a cable and hook reeled up against a spring. The riveting gun is suspended from this hook and the spring is of sufficient strength to relieve the operator of most of the weight of the gun. On the carriage is carried the oil reservoir and compressor which supplies the hydraulic power to the riveting guns. Electric cables and hoselines are of sufficient length to permit carrying the gun to practically any location on the trailer without the necessity of moving the carriage.

Rivet Is Special Type

The Huck rivet has been described in STEEL (Dec. 23, 1935); it is a special type of rivet with a long threaded pin on one end for gripping in the special type of gun used in the work. In one stroke of the gun the rivet is pulled up tightly, the end swaged and pin broken off in tension. Entire cycle takes less than one second.

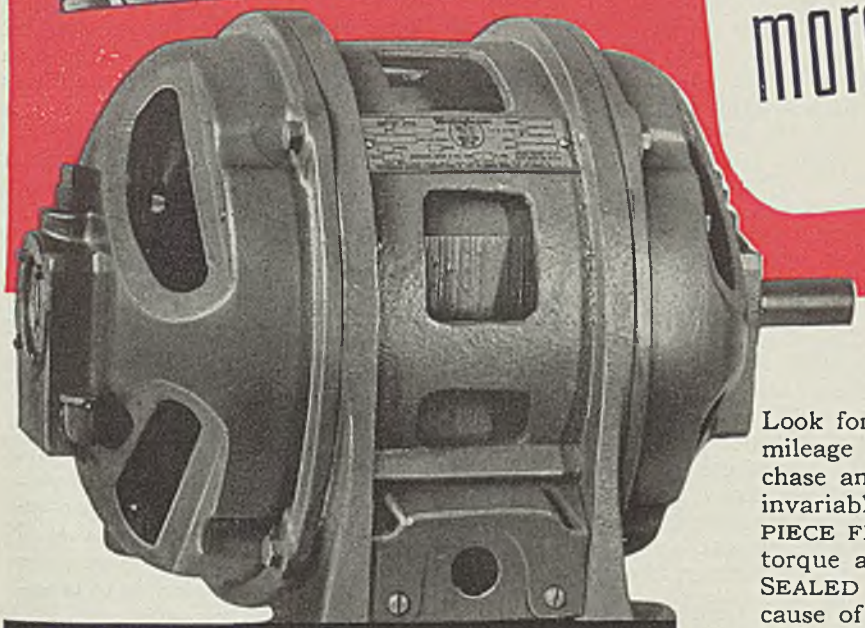
Most of the subassemblies are of





■ Interior view of trailer (left) showing toggle spring lifts for rear top section, loading skids in center and details of construction. In the illustration above, the shear in foreground and press brake in background are used to cut and bend the hundreds of pieces required for various subassemblies. Stock and cut parts are shown in the foreground

Westinghouse motors give more "mileage" too!



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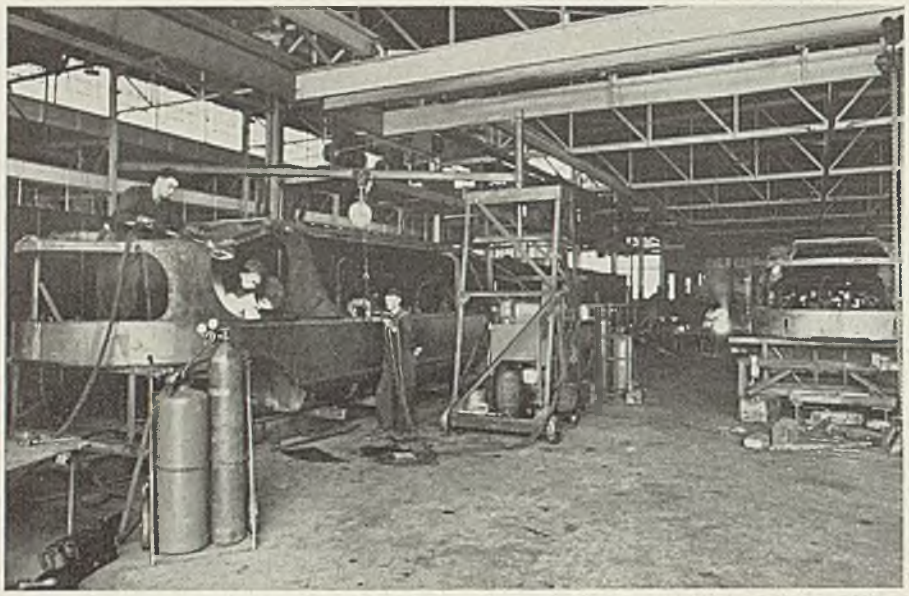


■ Special type of carriage with boom to carry riveting guns facilitates riveting operations. Gun for Huck rivets is shown on floor of carriage. Operators are welding forward streamline plate in position, while at extreme rear an operator is welding one of the subassemblies

welded construction, special jigs having been designed to facilitate quick and accurate fitting together of the component parts. With the exception of the rivets already mentioned, assembly of the various subparts into the final unit is by arc welding, and in this connection an unusual setup has been devised for welding generators. A large number of generators are used in the shop, and with the exception of three used for miscellaneous work around the plant they are placed on catwalks suspended from the roofbeams of the plant, about 15 feet off the floor of the shop. There are two of these catwalks, with welders set on each, the location being selected so that leads from the generators descend to control panels serving two separate bays of the shop.

Cut Maintenance Cost

The chief reason for placing the welders off the floor was an effort to cut down on maintenance costs which prior to the change amounted to some $28 per unit per year. Since the machines have been placed overhead, this maintenance figure has been cut to an estimated $1 per unit per year.

Control panel for each welder is placed at floor level and from this point there is 100 feet of cable, ample to permit an operator to move about on the job. Another innovation is in the location of grounds for the welders. Formerly it was the practice to ground the entire trailer upon which welders were working. While this was satisfactory as far as welding was concerned, it was found that riveters were experiencing arcing between the rivet and the gun, with destructive effect upon the anvils of the guns. Since these anvils are rather expensive, it was decided to make an effort to eliminate this arcing trouble, so ground cables were placed in the floor of the plant with a number of convenient outlets arranged so that all a welder had to do when starting to weld at a certain point was to attach his ground cable to the nearest outlet and to the piece he was welding and proceed as before. Of course, with this arrangement, the entire trailer is still grounded, but by attaching the ground connection near the point of welding, current takes the shortest path through the structure and there is now no difficulty with damaged anvils in riveting guns.

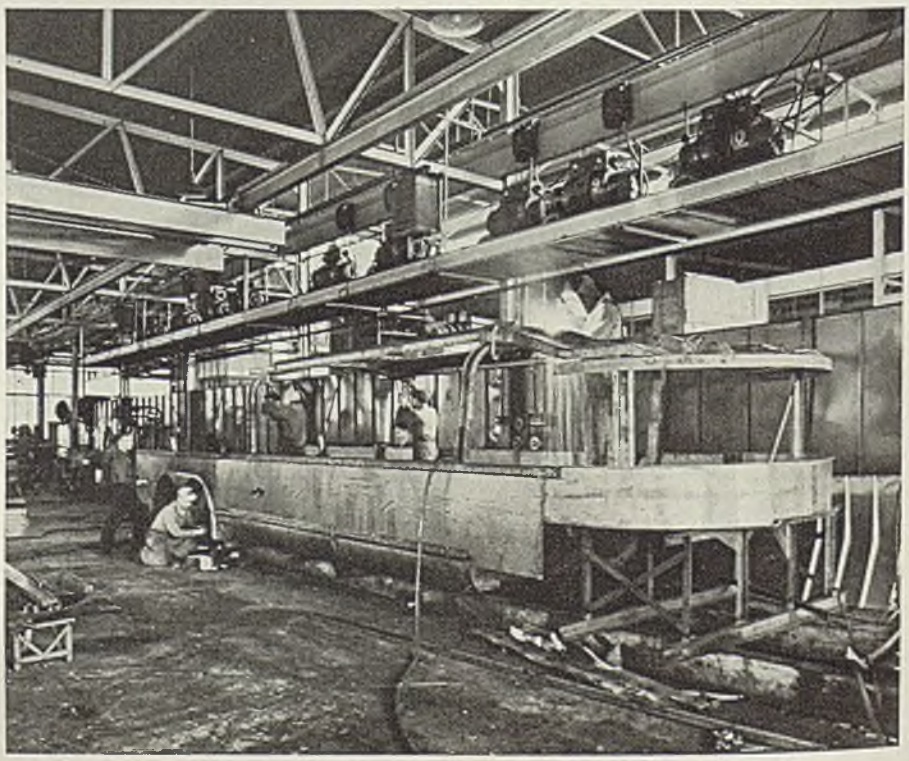
Cars Go On Track

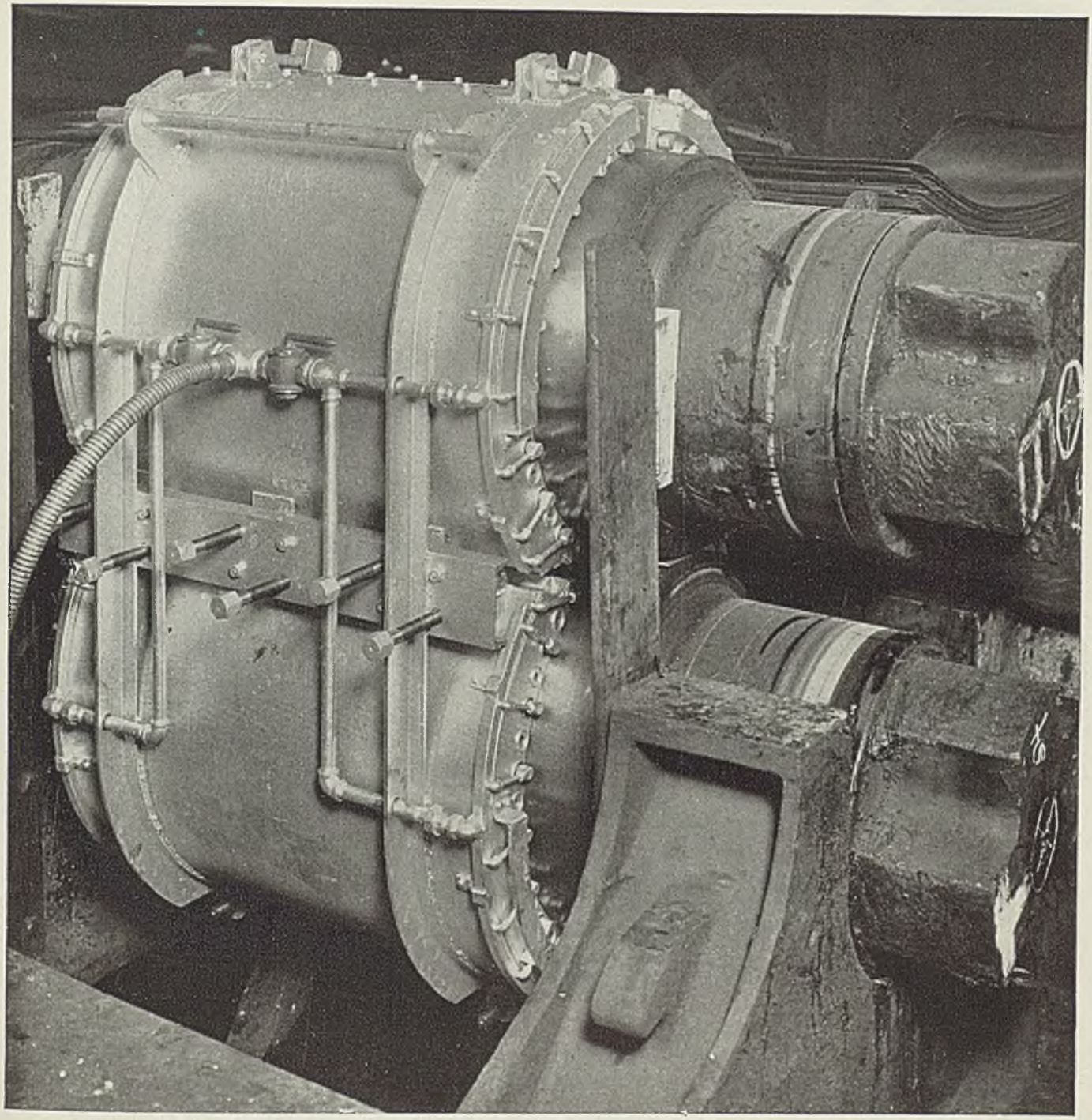
Reference to the illustration of the interior of the trailer will show the two toggle spring lifts which permit raising the rear section of the upper track on the trailer so that two cars can be driven into the lower compartment. When these cars are loaded the raised section is lowered into place, locked and cars driven onto the upper track. On the floor of the trailer are shown the four loading skids which hook onto the bracket castings at the rear and give a track up which the cars may be driven. Since it was necessary to have a strong material for the skids to support the weight of a car and at the same time a light-weight material, the skids are fabricated low-alloy high-tensile steel. Lower skids are 8 feet in length; upper skids 12 feet.

Over the skids and on the floor of both upper and lower decks will

(*Please turn to Page* 127)

■ Maintenance cost on welding machines is practically eliminated by placing them on catwalk overhead where they cannot be bumped or otherwise damaged. Operators are welding upper treads to crossbows





RADIATUBE, the new two-high roll-heater by *Kemp of Baltimore* cuts pre-heating costs, saves time for Eastern Rolling Mills.

Low-priced gas, premixed with air by the *Kemp Industrial Carburetor*, burns to complete combustion within a series of alloy-steel tubes that hug the rolls and are fired from alternate ends. Above, *RADIATUBE* is pre-heating 30x54 rolls at Eastern.

For complete details, address the **C. M. Kemp Manufacturing Co., 405 E. Oliver St., Baltimore, Md., or Oliver Bldg., Pittsburg, Pa.**

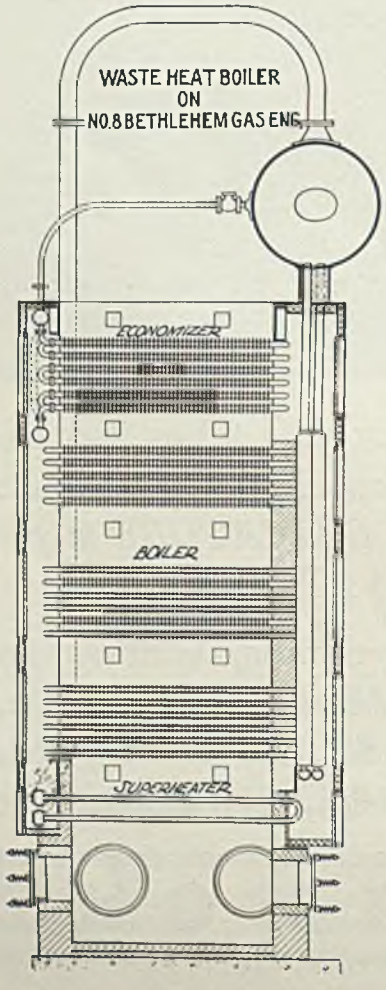
KEMP of BALTIMORE

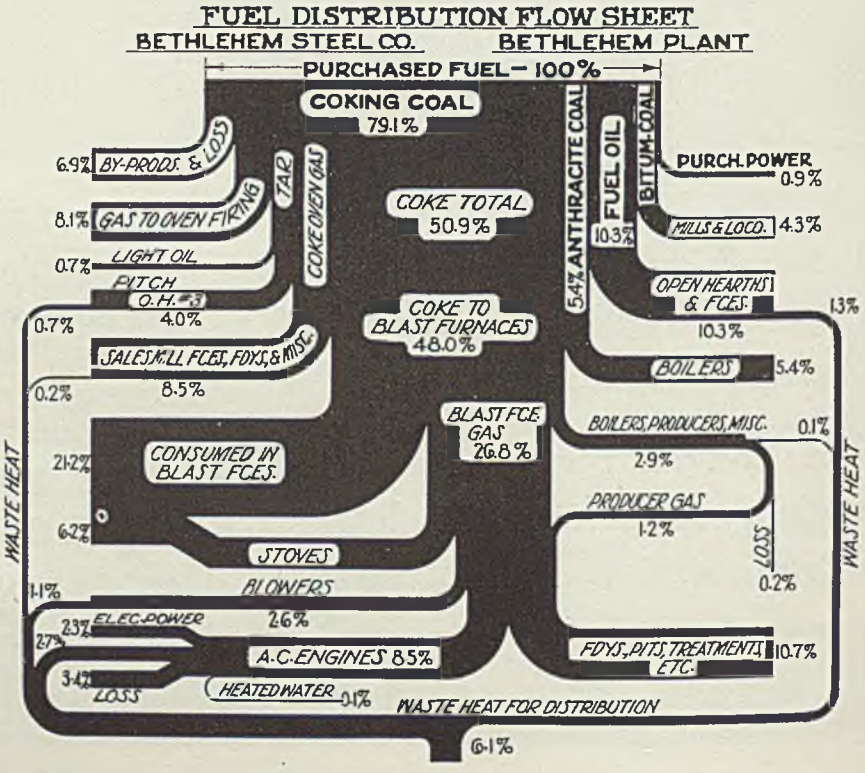
PROGRESS IN STEELMAKING

Development of Steam Generation From Gas Engine Exhaust

BY T. A. LEWIS
Combustion Engineer, Bethlehem Steel Co., Bethlehem, Pa.

EVER since heavy-duty gas engines found successful application as prime movers in the steel industry, no little amount of effort has been expended in developing a type of waste heat boiler for the efficient utilization of sensible heat in the exhaust gases. So far as it is known, the first designs of waste heat boilers for this purpose in the United States were made in 1918, but not until 1935 had the design developed to such a point where the unit was reliable nor had, coincidentally, gas engine performance improved to such an extent that the application was warranted. Before the year was over, Bethlehem Steel Co. had equipped one of its gas engines at the Bethlehem, Pa., plant with a waste-heat boiler unit which, except for slight delays in engine operations, has been in





Left is a diagrammatic sketch of a waste heat boiler on a gas engine, while below is a flow sheet showing distribution of fuel throughout the plant

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TABLE I

Comparison of Heating Surfaces

	F. T. Boiler F. T. Econ. Boiler	Econ.	F. T. Boiler W. T. Econ. Boiler	Econ.	2 Drum V. W.T.B. W. T. Econ. Boiler	Econ.	C.D.W.T. B. W. T. Econ. Boiler	Econ.	C.D.W.T. B. W. T. Econ. Boiler	Econ.	C.D.W.T. B. W. T. Econ. Boiler	Econ.
Tubes:												
Number	368	249	435	64	520	288	528	192	216	72	200	60
Size	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"
Length	19½'	13½'	17'	7'	14'	7½'	11'	11'	7'	7'	7'	7'
Total length	7176'	3362'	7495'	448'	7280'	2160'	5808'	2112'	1512'	504'	1400'	420'
Area (square feet):												
Dry side	3280	1540	3385	1344	3800	1131	3040	1107	4536	1512	4200	1260
Total	4820		4729		4931		4147		6048		5460	
Wet side	3746	1760	3850	205	3340	972	2660	970	692	231	641	192
Total	5506		4055		4312		3630		923		833	
Evap. lbs./hr./sq. ft.:												
1—Dry side	2.49		2.54		2.44		2.90		1.98		2.20	
2—Wet side	2.17		2.95		2.78		3.31		13.0		14.40	
Overall Dimensions:												
Length	43'—0"		38'—0"		31'—0"		16'—0"		11'—9"		10'—7"	
Width	9'—0"		10'—0"		9'—0"		10'—0"		8'—0"		7'—8"	
Height	18'—0"		16'—6"		23'—10"		23'—0"		21'—0"		20'—7"	
Floor area	387 ft.²		380 ft.²		279 ft.²		160 ft.²		94 ft.²		84 ft.²	
Gas Passage:	Two pass		Two pass		Two pass		Two pass		Single pass		Single pass	
Pressure drop	3.7" H_2O		6.0" H_2O		6.4" H_2O		9.0" H_2O		4.0" H_2O		8.0" H_2O	

continuous service. So successful was this installation that four complete units followed and, at the present time, three additional installations are under construction. These waste-heat boilers, which are equipped with economizers, are the first units of their kind to be used in this country to recover waste heat from the exhaust of large gas engines and utilize it efficiently in generating more steam for the steel plant.

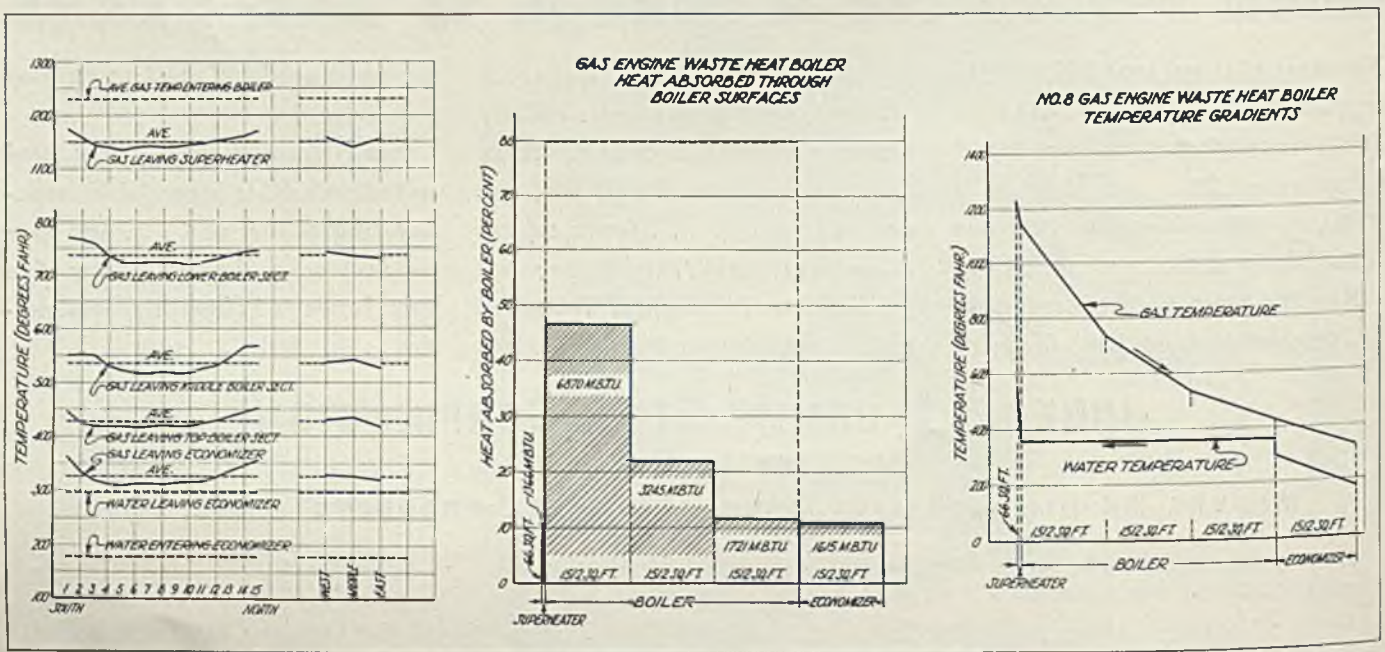
Despite the fact that the trend in mill drives is toward complete electrification, normal steel plant operations still require a large supply of steam. This and all other heat requirements, shown by means of the fuel distribution flow sheet, involve a large quantity of purchased fuel in the form of electric power, oil and coal. By referring to this chart, it will be seen that waste heat distribution represents 6.1 per cent of the total, an amount that influenced the application of waste heat boilers on these gas engines at the Bethlehem plant.

Application of a waste heat boiler to a gas engine is simpler, less costly, and more effective than to a metallurgical furnace, because it obviates the necessity for auxiliary equipment such as fans. No infiltration of air takes place as the boiler is on the pressure side, and clean gas and engine cylinder pulsations eliminate daily external cleaning of tubes. Use of internal combustion engines in Europe antedated their use in this country where the trend has been toward units of greater simplicity, at the expense of fuel economy.

The advantages of the turbine over the reciprocating engine, and its larger capacity per unit, led to a more general use of this type. This trend is still in evidence as attention is being directed to larger units.

During the development period of these internal combustion engines, much was learned by the pioneers who sought to improve the design, and likewise the operation. This development period is still in evidence for attention is being directed to larger size units. An illustration of this is furnished by the following data for the first waste

Left is a temperature traverse chart, center chart shows heat absorption through boiler surfaces and chart at right shows temperature gradients of water and gas



heat boiler on engine No. 8, installed in 1935:

Hours operated	7803
Per cent of time operated	89.2
Average K.W. generated/hr.	3480
Average boiler horsepower /hr.	398
Average pounds of steam /K.W. hr.	3.45

During this period the engine operation was handicapped by lack of gas due to curtailed plant operations. Under normal conditions this unit operates on a 96 per cent basis. The first two scavenged and supercharged gas engine blowers operated 98.5 per cent during their first 2 years of service; in their ninth year these are still as reliable as during the start of operation.

The improvement in the mechanical operation of the gas engine led to the development of a satisfactory type of waste heat boiler. The European practice was to use fire tube boilers and economizers. This contributed to lower installation costs, and was in line with boiler development of the time.

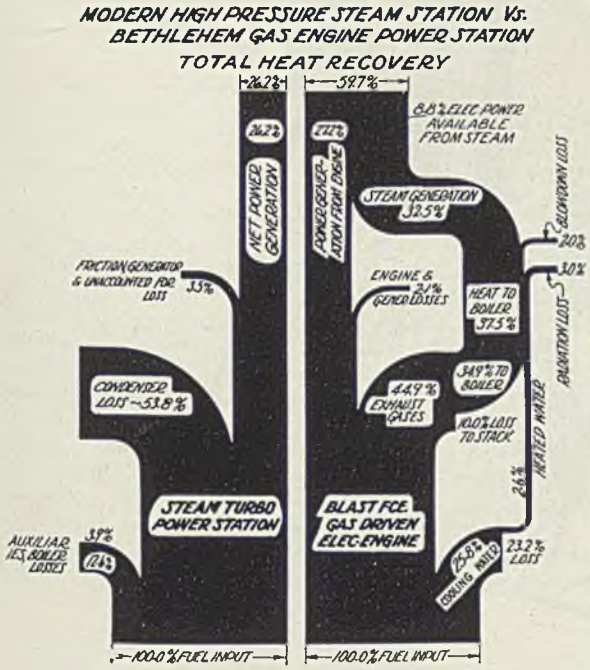
At Bethlehem it was first thought to install fire tubular boilers and economizers according to established practice. As clean flue gases contribute to satisfactory operation a final flue gas temperature of 350 degrees Fahr. and a feed water temperature of 200 degrees Fahr. were decided upon. By so doing the use of the fire tube economizer was eliminated. Following the results obtained, a comprehensive study was made of various types of boilers.

Due to the low calorific value of blast furnace gas, steel plants have been slow to utilize it for other than stove and boiler purposes. A 500-ton furnace will supply about 2,000,000 cubic feet of gas per hour above its own requirements. The steam load in steel plants with power units is very high, and the natural procedure is, therefore, to use this gas for boiler purposes. However, with increasing fuel prices the tendency is to use blast furnace gas in gas engines and metallurgical furnaces before using it under boilers. Waste heat boilers should be applied to all large gas engines and to metallurgical furnaces if the re-

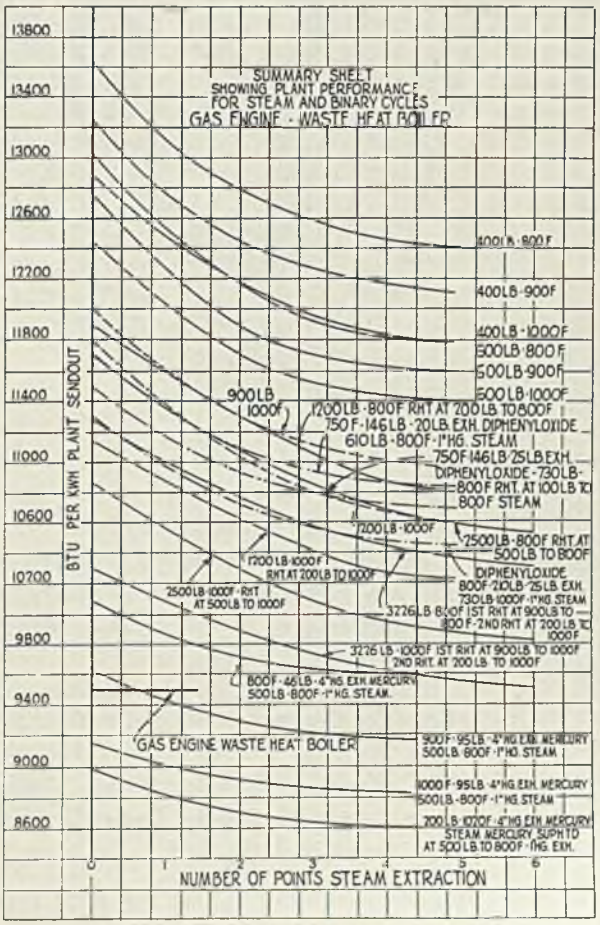
TABLE II

Heat Balance of 4000-Kilowatt Gas Engine and Boiler

	M BTU	Per cent
1—Net power generation	12,683	27.16
2—Steam generation	13,983	29.94
3—Loss to cooling water	12,040	25.78
4—Loss to boiler blowdown	913	1.95
5—Loss to sensible heat in stack gas	4,691	10.04
6—Loss to CO in stack gas	.....	0.00
7—Radiation and unaccounted for	2,398	5.13
	46,708	100.00
HEAT BALANCE OF BOILER		
1—Steam generation	13,983	70.51
2—Loss to blowdown	913	4.60
3—Loss to sensible heat in stack gas	4,691	23.66
4—Radiation and unaccounted for	243	1.23
	19,830	100.00
ENGINE HEAT BALANCE		
1—Net power generation	12,683	47.18
2—Loss to cooling water	12,040	44.80
3—Radiation, mechanical and electrical losses	2,155	8.02
	26,878	100.00



Graphic comparison between steam turbine and gas driven electric engine on heat recovery



Summary sheet showing plant performance for steam and binary cycles

TABLE III

Comparison of Waste Heat Boiler With Modern Steam Units

	Blast Furnace Gas Engine Unit Totals		Actual Operation Turbo Unit 275 lbs., 615° Temp. Totals		Theoretical Steam Unit 1250 lbs., 880° Temp. Totals	
General Plant Requirements:						
Total iron produced (tons)	.....	50,000	.....	50,000	.....	50,000
Power generated (KWH)	.....	14,000,000	.....	14,000,000	.....	14,000,000
Steam required for process (lbs.)	.....	62,600,000	.....	62,600,000	.....	62,600,000
Gas Engine Set-up:						
Total waste heat steam (lbs.)	.....	62,600,000	.....	.....	.....	.....
Blast fur. gas required (100 BTU/sq. ft.) per KW generated	126	1,764,000,000	.....	.....	.....	.....
Per ton of iron blown	13500	675,000,000	.....	.....	.....	.....
Turbo Set-up:						
Required for turbo Generators:						
Pounds steam/KWH	.....	.....	13	181,054,000	11.87	166,000,000
Cubic feet blast furnace gas/KWH	.....	.....	206	2,880,000,000	201	2,820,000,000
Per cent bled at 160 lbs. for plant process	.....	.....	.....	.....	38	63,000,000
Required for turbo blowers:						
Pounds steam/ton iron	.....	.....	1291	64,530,000	935	46,700,000
Cubic feet gas/ton iron	.....	.....	20570	1,027,000,000	16000	800,000,000
Total steam generated	.....	62,600,000	.....	308,184,000	.....	212,750,000
Steam generated for process	.....	.....	.....	62,600,000	.....	.....
Cubic feet gas required/pound steam	.....	.....	15.9	993,000,000	.....	.....
Per cent total heat input received by electric power and process steam unit	.....	59.7	.....	26.2	.....	45.0
Total blast furnace gas required	100%	2,439,000,000	201%	4,900,000,000	148.5%	3,620,000,000
Bituminous coal equivalent in tons	.....	8,060	.....	16,200	.....	12,000
Loss per year @ $5/ton of coal equivalent	.....	.....	.....	$489,800	.....	$236,400

turn might warrant the installation.

The amount of steam which can be generated in a waste heat boiler when supplied with a definite quantity of gas at a given temperature depends on the size of the boiler and the allowable draft loss. In practice, the theoretical limit of recovery is the heat in the gases between the temperature at which they leave the engine and the temperature of saturated steam at the desired operating pressure, or the temperature of the feed water if economizers are provided. It is not practicable, however, to build a boiler that even closely approaches this condition, but it is economically feasible to design a boiler with an efficiency up to 70 per cent if it is permissible to build up a draft loss of about 4 inches of water or higher through the boiler.

The flue gases enter the waste heat boiler at 1200 degrees Fahr. and leave at 350 degrees. Further recovery, in the form of hot water, can be made from this flue temperature, but local conditions determine whether such recovery is justifiable.

Much progress in power plant economy has been made during the past ten years. This has principally been accomplished by resorting to various combinations of regenerative feed water heating, steam reheating and extraction of heat from the flue gas by means of economizers and air preheaters. These systems have high steam pressures and temperatures. In addition there are the binary cycles, mercury-steam, diphenyloxide-steam, zinc-ammonium chloride, and aluminum bromide; of these the mercury-steam is probably the best known in this country.

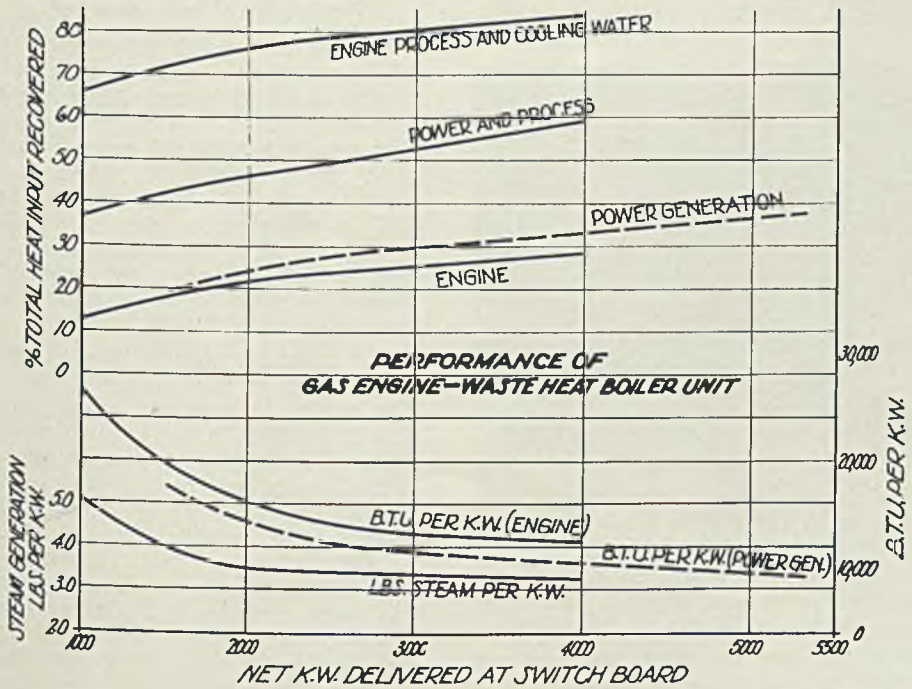
All these highly improved power schemes are excellent, but with their complications the simpler gas engine and waste heat boiler combination is more advantageous with a load of the type found in the steel industry.

As an illustration, a comparison has been made between the present operating gas engine units, equipped with waste heat boilers, and a relatively good turbine operating in a mid-western steel plant, and with a unit of unusually high efficiency such as can be obtained in a turbine with 1250 pounds steam pressure and 880 degrees temperature.

Summarizing, in steel plant operation, the Bethlehem gas engine that has been in operation for the past 20 years, but completely renovated, has been able to compete with the modern turbine units. Furthermore, application of waste heat boilers has reduced operating cost to the extent where such a combination is the only logical one. As the size of the gas engine increases, the advantage becomes still greater.

Compared with a turbine station, the gas engine-waste heat boiler system requires only half the amount of fuel, for the same power output, releasing the remaining half for metallurgical furnaces.

This chart shows graphically the performance of a waste heat boiler unit



SURFACE TREATMENT AND FINISHING OF METALS

What Does Future Hold for Cadmium In Electroplating Industry?

WHAT is the future of cadmium? This question has been bothering both producers and consumers for the past several years with no immediate answer in sight.

The situation today is in strong contrast to that prevailing some 25 years ago when two or three producers of the then practically unnoticed metal raised a fund to develop a market for it. Experiments developed the fact that cadmium constituted an excellent coating for steel and its use gradually increased. Its protective properties are almost identical with those of zinc and though it was, even then, more expensive than zinc, it had a great advantage in the fact that it presented a better appearance than zinc plated by current processes and resisted tarnish far better than zinc.

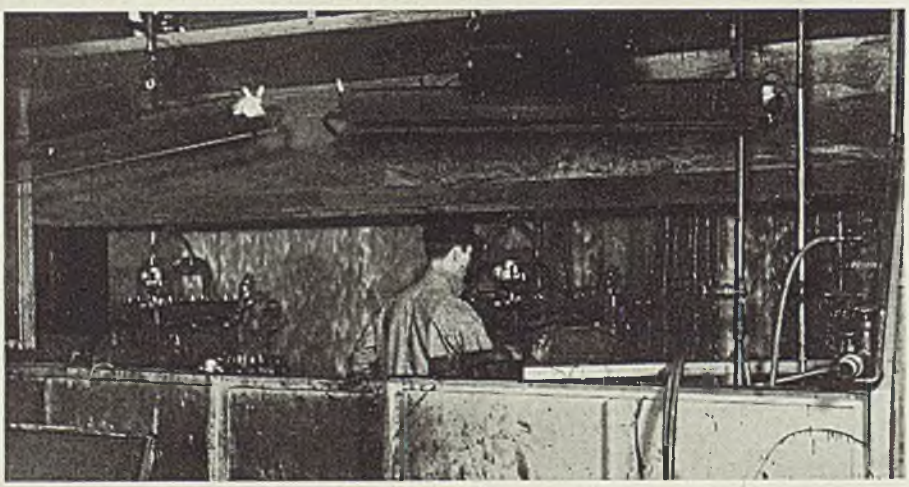
For many years the electroplating industry was almost the sole consumer of cadmium and the demand was not sufficient to cause any unusual fluctuations in price. The automobile industry, among others, adopted cadmium for parts requiring a rust-proof finish which would not tarnish. Such parts as tire rims, bolts and nuts on wheels and other visible parts were among those protected with this finish.

Production Limit Reached

Use of the metal grew until in 1919 production of cadmium reached a total of 100,000 pounds. This figure was eclipsed in 1927 when production reached 1,074,000 pounds and even more by 1930 when the amount was 2,777,000 pounds. In 1935 production reached 3,477,091 pounds and in 1936 3,633,495. Production in 1937 may exceed 4,000,000 pounds but metal men declare this to be the absolute limit.

The reason is simple. There is no such thing as a cadmium deposit. The metal is obtained principally as a by-product in the production of both distilled and electrolytic zinc. It is also derived from the flue dust of copper and lead smelters and through the purification of zinc sulphate solutions in the manufacture of lithopone. A process also has been developed for removing cadmium and other metals from zinc ore by adding a cheap chloride to the roasted concentrates and sub-

No Paint Wasted Here



■ Fireproof, safety spray booth is used at the Pontiac plant, Pontiac, Mich., for spraying completed engines. The power plants pass through the booth on a roller conveyor in front of which the spray operator stands. A curtain of water falls down the wall behind the conveyor line, catching, trapping and carrying away all flying paint which is then easily reclaimed

jecting the mixture to further roasting which volatilizes the cadmium and other contaminating metals as chlorides. Cadmium is removed by further treatment. Thus it becomes apparent that cadmium production is dependent upon demand for other metals.

Cadmium sold for $2.50 per pound 25 years ago, since production was practically negligible and consumption was equally unimportant. By 1932, the quoted price had dropped to 55 cents and sales were reported as low as 35 cents. Today cadmium is bought, not sold. Consumers are eager to pick up every available pound at prices ranging from $1.60 up to as high as $2 per pound. Domestic producers generally are quoted at $1.60 although some consumers are fortunate enough to be covered at 30 to 40 cents a pound less. Imported metal brings from $1.85 to $2.

As is well known this spectacular increase in production and prices is directly traceable to the adoption of cadmium-base bearings by the automobile industry. Ford went to steel-backed bearings about three years ago with a wearing surface 97 per cent cadmium and 3 per cent nickel. Pontiac developed a cadmium-silver bearing and Graham found cadmium-base bearings were particularly adaptable to its supercharged models. Others probably would have followed suit but for rising prices and shortage of supplies.

With the development of this new demand for cadmium, small lot purchasers like the electroplaters suddenly found themselves behind the eight ball. The demand for cadmium finishes had been created during the low price era and even though some purchasers were willing to pay the increased cost, the supply was too short to fill the demand. Something had to be done—and that quickly.

Zinc Processes Improved

Many former consumers of cadmium were forced to turn to zinc even though it did not come up to appearance requirements at the time. Quickly sensing the opportunity presented by this condition there was a rush among manufacturers of plating supplies to develop a satisfactory bright zinc process. Results at first were disappointing and even created prejudice against bright zinc processes, but improvement has been steady until today zinc can be deposited so that it rivals nickel in brilliance and resists tarnish as well as, if not better than, cadmium. Cost figures are so far below those of cadmium that competition appears out of the question.

For indoor use cadmium and zinc coatings of equal weight are about on a par with respect to corrosion protection on iron and steel. For outdoor industrial exposure heavier cadmium coatings than zinc must be used to realize equivalent corrosion protection. Cadmium is somewhat softer than zinc although both of these metals are too soft for use where wear resistance is much of a factor. With the appearance factor solved, cadmium appears to be well on the road toward losing the electroplating market to zinc. While this is not a serious matter to cadmium producers at the moment the future does not look so bright in view of recent developments.

Use in Bearings Waning

Ford today is the only user of cadmium bearings. Pontiac went back to tin-base bearings a couple of years ago and Graham is reported going to the same material for its 1938 models. Ford so far, apparently, has not found a satisfactory substitute for cadmium since bearings of this metal are particularly adapted to its high-speed V-eight motor. Characteristics of this motor, it is said, are such that babbitt will not stand up and copper-lead produces too much wear on the crankshaft.

Ford thus remains the dominant factor in the cadmium market. Monthly requirements are said to run close to 80,000 pounds which means that this single consumer is accounting for nearly one-third of total domestic production. If Ford should develop a substitute, it is doubted in metal circles whether plating requirements would take up the slack because of the inroads made by bright zinc processes.

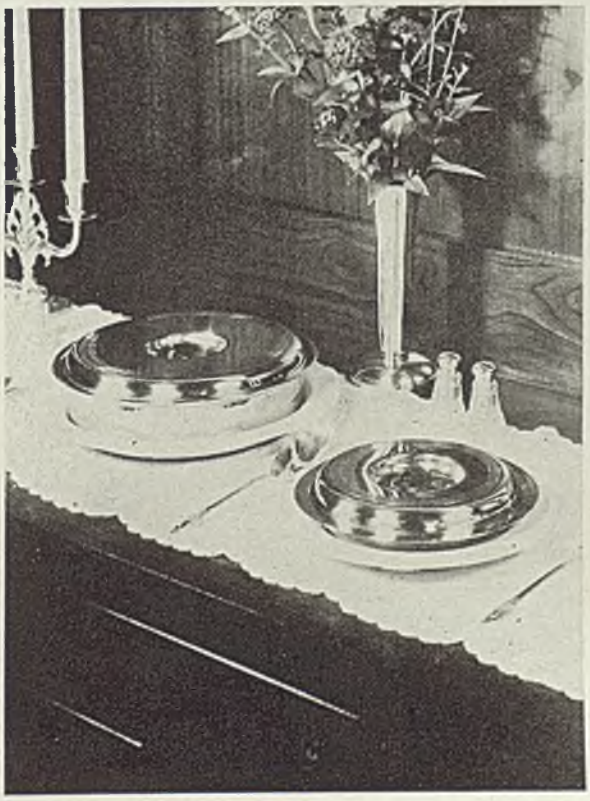
What the reaction in plating circles might be if cadmium dropped to its former low of 65 cents is difficult to say. Its former advantage of brightness and resistance to tarnish has been overcome completely. In fact tests indicate that bright zinc is even superior to cadmium in these respects and is more resistant to corrosion. The low cost of zinc seem to clinch the argument, for competition in that respect is out of the question for cadmium.

One factor may prove significant in the future of cadmium. Experiment has shown that a coating of 10 per cent cadmium and 90 per cent zinc resists corrosion in industrial atmospheres better than either coating alone. Whether or not the use of such a coating will increase to the point where it would compensate for the possible loss of the automotive bearing market is a matter for speculation.

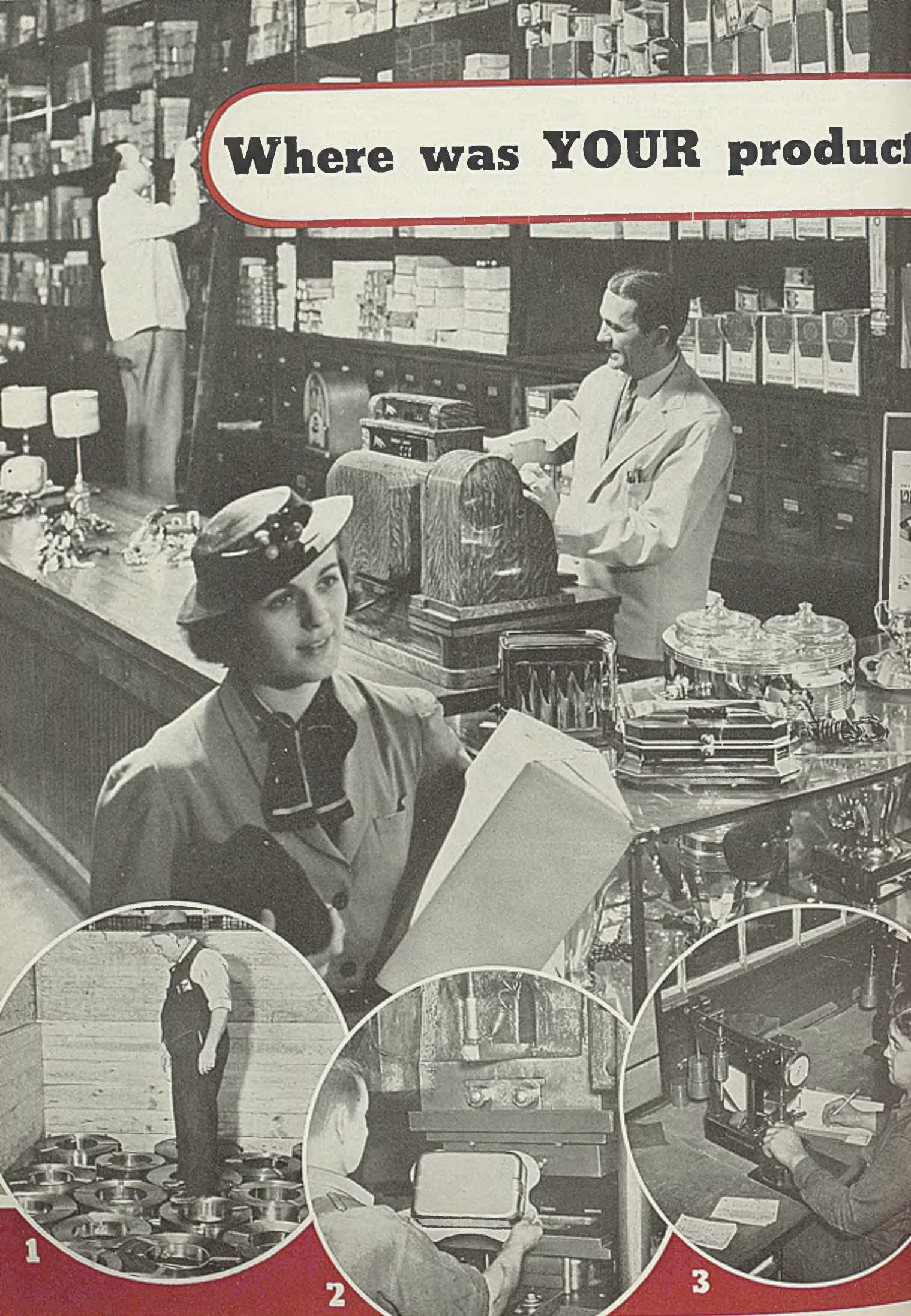
The most significant feature of the whole situation is that the "substitute" (bright zinc) coating was suddenly found to be superior or at least equal to the high cost "original" (cadmium) which forced its development (STEEL, 6/21/37, p. 66). If chemists could do this, it is interesting to speculate what they may develop next. What is the future of tungsten and other metals in the electroplating field? What effect will they have upon the metals used now?

Stainless Steel Combines Utility with Beauty

■ Stainless steel continues to invade new fields. Steelsmiths, Inc., Meriden, Conn. has introduced a line of stainless steel ware attractively designed to serve both as a cooking utensil and serving dish. Sizzling hot foods can be brought directly to the table from the oven and kept hot for appreciable lengths of time. Hot water and soap keeps these utensils bright and clean and service life is very long. Heat proof, plastic trays carrying designs which harmonize with the dishes are furnished with this ware



Where was YOUR product



1

2

3

when the Cash Register RANG

Did it go out with the Customer or back on the shelf?

COST, design, and appearance are the important factors that lead customers into buying some manufactured products and rejecting others.

Products fabricated from American Quality Cold Rolled Strip Steel have the smooth eye-appealing finish that helps move merchandise off the dealers' shelves and counters. It helps keep prices within the range of your customers' pocketbooks, too. For its cost is much lower than some of the more expensive metals. The ease with which it can be fabricated will reduce your rejections and wasted metal to a minimum.

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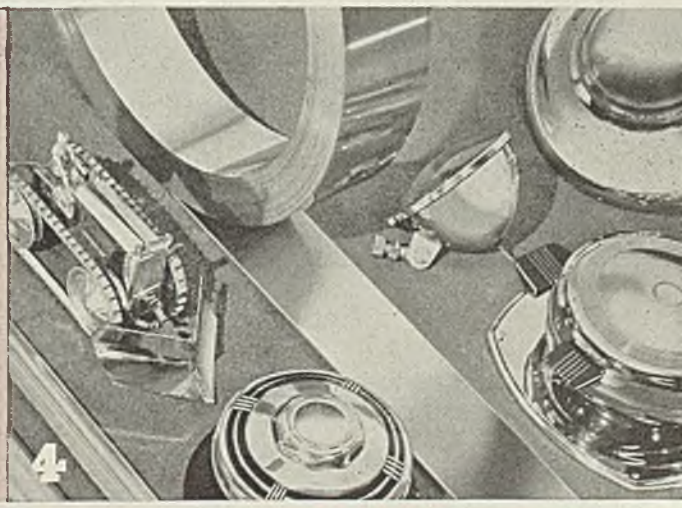
Export Distributors

1. Whether you order American Quality Cold Rolled Strip Steel a few coils at a time or in carload lots you are sure of getting the same high quality. Every coil of our Cold Rolled Strip Steel is subjected to rigid laboratory examinations to prove that its quality is all that we claim it to be.

2. Deep draws present no problems to our Cold Rolled Strip Steel. Here is a typical example of the way in which American Quality Cold Rolled Strip Steel simplifies deep drawing problems.

3. Temper, an important property of strip steel, is meaningless except when accurately controlled and defined. Sensitive Rockwell hardness determinations are therefore part of the rigid control applied to American Quality Cold Rolled Strip Steel.

4. The variety of products which lend themselves easily to fabrication from American Quality Cold Rolled Strip Steel is without limit. An investigation of your own products may point out how you can make them better and more economical by fabricating them wholly or in part from American Quality Cold Rolled Strip Steel.



UNITED STATES STEEL

WELDING, ETC.

BY ROBERT E. KINKEAD

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Fabricators' Troubles

■ Plate fabricators have observed with concern the definite trend in recent years in the direction of customers building their own equipment by welding.

Welding started into many industries like rubber, paper, chemical, etc., as a process used for the repair of existing machinery. In many cases now, plants in these industries maintain shops where their own welded fabrication is carried out. This development hasn't done the fabricators any great amount of good in a business way. To say that the fabricators could have prevented this development by being more alive to their changing markets is probably an overstatement.

During the depression "we'll make it ourselves" programs were popular with men who were intent on keeping their jobs. They did make it themselves, but in many cases it cost a great deal more than it would have if bought outside from a fabricator. It is also true that the menace of this move frightened the fabricator away from investing in personnel and machinery to do the work because he could never be sure of holding the customer against the efforts of the customer's own personnel to keep the work for themselves.

There is hope for the fabricating shop that traditionally operates on a jobbing basis, if it can select welded fabrication jobs that are common to a large number of customers and produce them on a manufacturing basis. By this means the cost may be reduced to the point at which "we'll make it ourselves" becomes an absurdity not tolerated by responsible management.

Doing this job is not particularly difficult but the step is a large one for the fabricating shop that has floated along for many years, bidding on customers' specifications in competition with other members of his trade. Proof of the soundness of the solution is found in the profitable operations of shops which have carried out such a program as this.

♦

Research in Welding

■ Ranking with the best professional work in any line, not excepting medicine, the publications of the welding research committee of the American Welding society are attracting widespread attention among engineers.

The work of W. Spraragen and G. E. Claussen published in the *Welding Journal* for September is typical. These able welding experts have collected and tabulated practically all the information in print on temperature distribution during welding, fusion welding of wrought iron, and the effect of total carbon and manganese on the mechanical properties and structure of welded joints in plain, low-carbon steel.

The value of such information depends on skill in interpretation, since in any such mass of information there is a great deal of error. However, the information is as valuable to a responsible engineer in welding as a medical library is to a doctor. Use of this information means that each new man starts where all of the others left off, rather than where they began.

The welding research committee is large and commands the advice and assistance of everyone in the industry. It has no ulterior motives and duplicates the work of no one else. Its work is purely professional. It is financed by membership dues and contributions of leading manufacturers.

♦

New Cutting Process

■ Newspaper accounts of a recently patented method of cutting, involving the use of liquid oxygen, indicate the rapid progress being made in this field. Claims for the new process involve cutting of thicker sections with a narrower cut than has heretofore been possible.

In many shops the economics of cutting have not received nearly as much attention as the economics of welding. When it is considered that, in the case of many structures, the cost of cutting exceeds the cost of welding, the importance of the subject cannot be overlooked. In the case of welded steel machinery and equipment, inaccurate cutting may increase the cost of welding 50 to 100 per cent and at the same time greatly reduce the quality of the welded structure. Modern cutting machines are a good investment and in combination with good workmanship produce economies which cannot be overlooked.

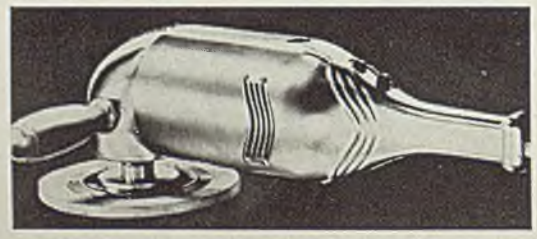
♦

Welding Properties

■ Publication of a list of approximately one thousand metals and alloys marketed under trade names in current issue of *Machine Design* focuses attention on lack of published information on welding properties of metals. Some of the metals and alloys in this list are already being welded. Others will be welded in the future.

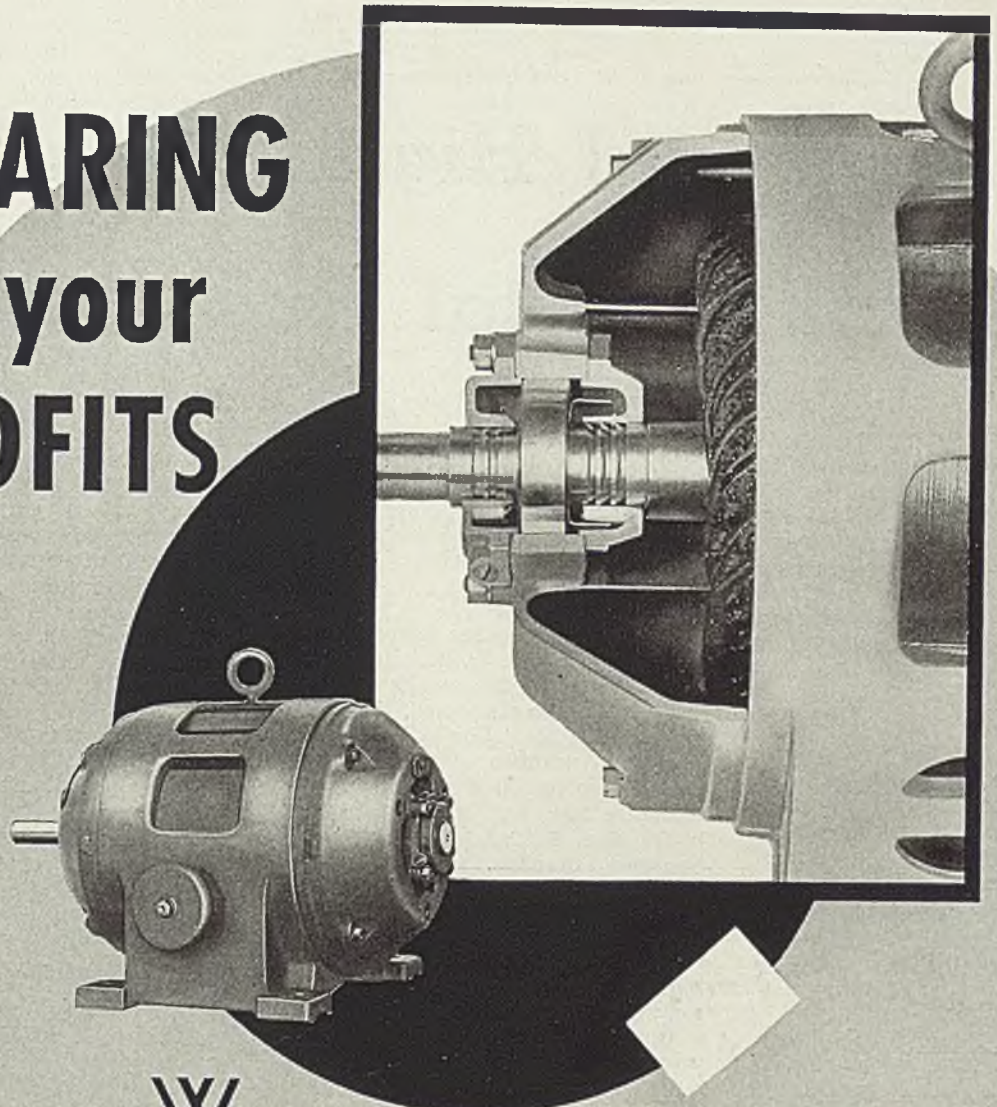
Descriptive literature giving information on how to weld various commercial metals is available but difficult to find and properly interpret. The problem is one of stating welding properties of a metal in a few concise terms that will be complete informative to the user regardless of the welding process he employs. Similar information has been developed on metals with reference to corrosion, fatigue and other properties. The development of a standard method of stating welding properties is a proper field of activity for the American Weldang Society.

Sander Is Streamlined



■ An example of the incorporation of style and beauty in tool design is this new 7-inch portable Skilsaw electric sander designed by Lawrence Blazey of Designers for Industry Inc., Cleveland

A BEARING on your PROFITS



What happens if grease leaks out of motor bearings? The answer is—it costs you money. Stop a moment and consider: (1) sooner or later you will have to replace the bearings for, if the bearing seal does not retain the grease, it will not keep out dust and grit and there will be bearing wear; and (2) while the motor is shut down for repairs, production will be choked or stopped completely!

But these expenses can be eliminated by installing Crocker-Wheeler ball-bearing motors. The patented, frictionless, bearing seal positively prevents grease leakage and the entrance of foreign matter. The grease itself forms the seal by means of a pumping action similar to that of a centrifugal pump. Many Crocker-Wheeler motors have gone 5, 7 and even 10 years without having the grease changed. Does this sound worth investigating? Write for bulletin 250.

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EXCELLENT ENGINEERING

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SALES OFFICES IN PRINCIPAL CITIES

Additional Highlights of National Metal Exposition

LAST week STEEL presented a number of highlights of the nineteenth National Metal exposition in Atlantic City, Oct. 18-22; this week it completes its resume of the show with a similar group of items. Registration through the week was approximately 11,000, a total considerably better than expected.

♦

Attendance at the exposition on its closing day was swelled by 1500 operating men from steel producing and metalworking plants in the Philadelphia area. These men came in 45 buses from Philadelphia, Coatesville, Reading, Allentown, Easton and Bethlehem in Pennsylvania; and Camden and Newark in New Jersey.

♦

Flexibility of flame cutting, both as to intricacy of contour and thickness of material, was demonstrated by the Air Reduction Sales Co., New York, in the simultaneous cutting of two railroad tender truck equalizers on a production basis. So heavy were the plates and parts cut that it was necessary to install special equipment to handle them. This equipment consisted of a structural steel framework supporting a traveling I-beam hand-operated hoist. Dominant in this company's exhibit was a modernistically designed rotating exhibit capped with a giant-size gas cylinder.

♦

To demonstrate the severe drawing to which the cold rolled sheet and strip produced on its continuous mill can be subjected, the Jones & Laughlin Steel Corp., Pittsburgh, showed a number of formed products. These included an all-steel automobile top, and automobile side panel and fenders and numerous household utensils.

♦

Men frequently are found within the steel plant who can wield a wicked brush when it comes to swabbing out molds but rare are those men on the crew who can step up to a canvas and paint a particular operation within the plant. Yet there is such a man to be found on the hammer crew at the Newark, N. J., plant of the Heller Bros. Co. His handiwork was displayed at the company's booth in the form of an 8 x 6-foot water color painting showing a crew of six men forging a heated bloom on a steam hammer. Standing out in the background is the post crane and two heating furnaces with the flame issuing from the doors. Many visitors entering the exhibition paused to view the painting. Comments were highly favorable too.

♦

The wide range of heat, acid and corrosion-resisting alloys produced by the General Alloys Co., Boston, was arranged attractively on tables and counters. A distinctive industrial plant atmosphere was provided by surrounding table sides and ends with blue printed drawings prominently displaying the company's name.

♦

Two moving displays attracted visitors to the exhibit maintained by the Carboloy Co. Inc., Detroit. One was a revolving 3-foot diameter disk mounted on the back wall to represent a cross section of a cylinder being turned in a lathe. This rotated against a giant size ce-

■ **Atlantic City's Auditorium afforded the finest setting the National Metal exposition has ever enjoyed. The exhibits occupied all arena floor space and the stage**

mented carbide tool. The other display was a cut-away section of a cemented carbide, diamond-impregnated dresser for all types of grinding wheels, which showed clearly the steel holder, the diamond-impregnated matrix and metal shank.

♦

Exposition visitors in great numbers were fascinated by one-eighth actual size models of a 3-stand 4-high cold reducing mill and a power press operated by the Youngstown Sheet & Tube Co., Youngstown, O. This installation, a replica of equipment in the company's plants and built by workmen in its own shops, reduced 27-gage steel strip to approximately 28-gage in a 5¼-inch width. Each mill stand weighed about 1470 pounds and each back-up roll 89 pounds. Strip reduced in the mill was passed into the press which formed souvenir ash trays.

♦

Magnetic Analysis Corp., Long Island City, N. Y., displayed in operation a new magnetic testing unit for inspecting ball races and closed rings. When properly set, the device indicates rejections for defects in structure and in hardness.

♦

Three cycles or thirty can literally be "picked" out of a circuit by welder control equipment which excited the curiosity of onlookers at the Westinghouse booth. Metal now can be "stitched" as easy and quickly as cloth on a sewing machine with the distance between the "stitches" determined by the number of cycles "picked" out of the circuit. Steel can be joined to steel, nonferrous metals to nonferrous metals, or one to the other by this "stitching" control.

♦

Efficiency of insulating fire brick was demonstrated by Armstrong Cork Products Co., Lancaster, Pa., through the use of two miniature gas-fired furnaces operated on identical air-gas mixtures and through similar cycles. One furnace was constructed of ordinary fire brick and the other of insulating fire brick. Operating results were charted on a potentiometer recorder.

♦

Demonstrations of flame cutting and flame hardening were conducted continuously by Linde Air Products Co., New York, one of several Union Carbide & Carbon Corp. units represented in the exposition. This equipment was installed on a platform enclosed by glass panels, this arrangement affording good visibility and keeping spectators from getting too close. Electro Metallurgical Corp., New York, exhibited a new ferroalloy named Silvaz. It is intended for use as a deoxidizer and for controlling grain size and was developed as a result of considerable study and experiment. It is named for its principal elements, silicon, vanadium, aluminum and zirconium. The various displays of the Union Carbide corporation's subsidiaries were grouped in a modernistic setting provided with attractive lighting effects.

♦

Wood came in for its part in the picture at the "Metal" show. Paramount Oilless Bearing Co., Inc., Worcester, Mass., showed bearings turned from hard maple which then is impregnated with a lubricating material. Wood will outwear babbitt or bronze in certain applications, it is said.

♦

An interesting operating exhibit, by the Pangborn Corp., Hagerstown, Md., was a new large rotary blast rocker barrel at work removing scale from heat treated forgings. An accessory was a loading device which received tote boxes filled with forgings and which elevated them and discharged their contents into the rocker barrel, thus reducing idle time.

♦

A silhouette of a forming press, with gears and slide in motion, formed the central theme in the exhibit of the Allegheny Steel Co., Brackenridge, Pa. Moving on an endless belt toward the press from the left were trademarks representing the various grades of stainless steels produced by the company; moving away from the press to the right on another endless belt were numerous items, such as cooking utensils, formed from these metals.

♦

Among operating exhibits of a spectacular nature was that of Ajax Electrothermic Corp., Trenton, N. J. Tubing and round and square bars were heated rapidly by electrical induction, using equipment of comparatively recent development and shown for the first time. Principal use of the method is heating stock prior to an upsetting or forging operation.

♦

Something novel in the way of placing its company name on its booth was employed by the Jessop Steel Co., Washington, Pa. Each letter in the name consisted of three parallel, ¼-inch diameter round, satin-finished stainless steel rods bent to proper shape. These rods were attached to the black panel board by means of polished stainless steel clips.

♦

Beryl in its rarer forms is simply the aquamarine of the jewelry trade but refined beryllium is a metal which makes copper strong as steel when added in small percentages. Beryllium copper tools were shown by several exhibitors at the show. Tools of this hard copper alloy are becoming more generally used in places where there is danger of gas explosions from sparks.

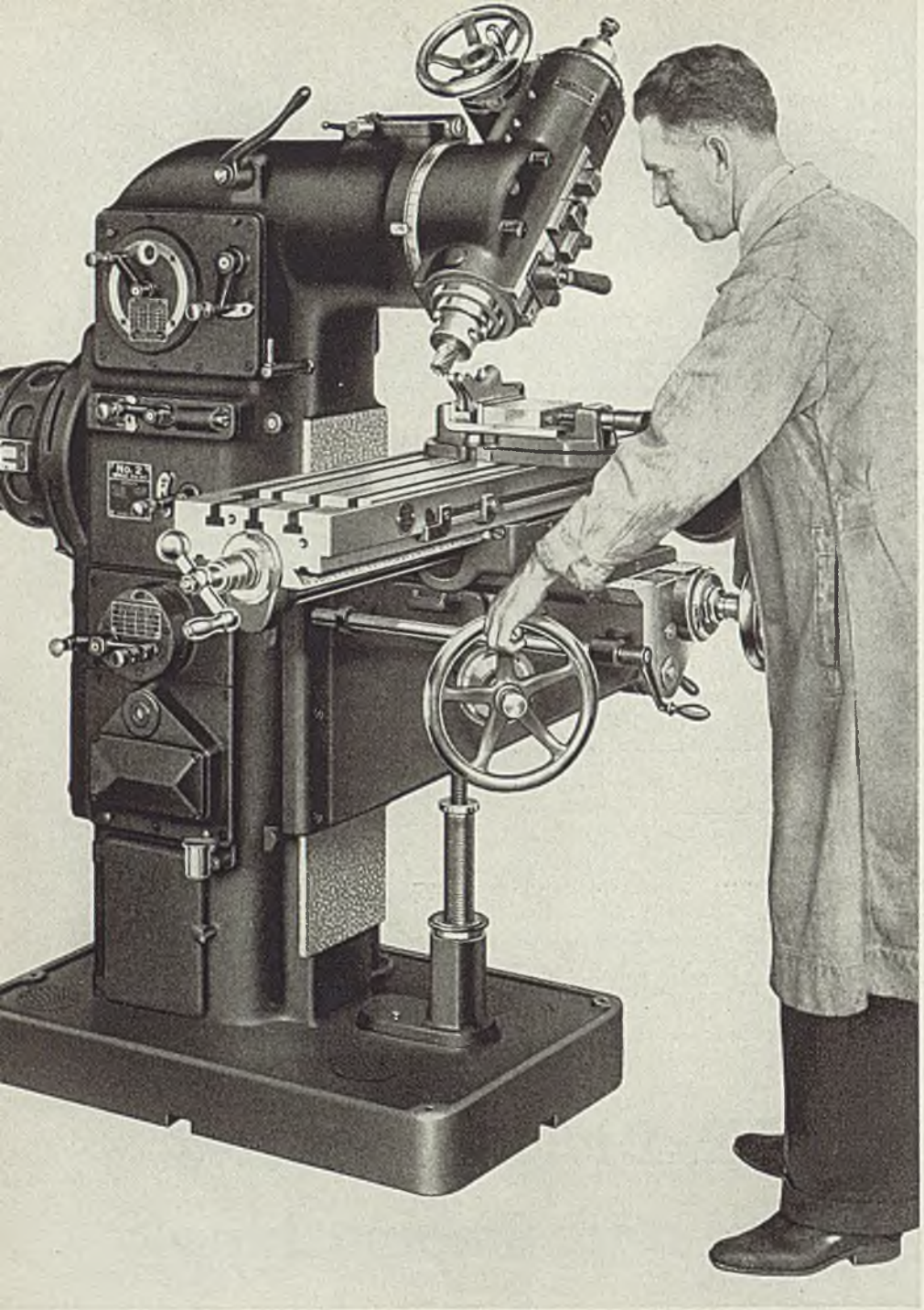
A.I.M.E. Division Studies Alloys and Steelmaking

TWO sessions conducted by the Iron and Steel division of the American Institute of Mining and Metallurgical Engineers in Atlantic City, Oct. 21, in connection with the nineteenth National Metal congress, proved particularly interesting to ferrous metallurgists and engineers. One session dealt with effects of alloying elements in steels for specific applications, and the other, sponsored by the division's open hearth committee, was devoted to open-hearth steel practice.

American metallurgists have been rather slow to take advantage of the economic possibilities of adding silicon to high-temperature steels, according to H. D. Newell, chief metallurgist, Babcock & Wilcox Tube Co., Beaver Falls, Pa. By "high temperature" steels he had in mind those specifically intended for service at elevated temperatures in steam plants, oil refineries, etc.

The author conducted a series of laboratory tests on various silicon additions to high temperature steel containing 2 per cent chromium and 0.50 molybdenum, the silicon ranging from 0.20 to 3 per cent. In addition, two melts of 5 per cent chromium and 0.50 molybdenum with 1.5 silicon were prepared. It was found that silicon additions gradually stiffen the metal, causing an increase in tensile strength, yield point and brinell hardness with a corresponding drop in ductile properties. Small variations in carbon were found to have a decided effect with the lower carbon alloy, exhibiting the better impact properties.

Properties of a 5 per cent chromium-molybdenum steel with 2.5 silicon are disappointing insofar as tube fabrication is concerned. Such an alloy has excellent scale resistance and may be hot worked satisfactorily but is extremely brittle in the cold state. While it might be



"LIGHT TYPES"

Increasingly Popular - - -

—No. 2 Universal
—No. 2 Plain
—No. 2 Vertical

Note swiveling spindle head on vertical machine—which permits setting the spindle in a vertical plane at any angle either side of O, from vertical to horizontal. Brown & Sharpe Mfg. Co., Providence, R. I.

B·S

BROWN & SHARPE

adaptable for certain heat resistant purposes it is too fragile for application in boilers or as refinery tubes which are subject to shock stresses. This is becoming apparent in the 1.50 silicon alloy, as evidenced by low impact values obtained in an experimental alloy containing 0.14 per cent carbon. It seemed indicated that carbon content in the 5 per cent chromium alloy should be 0.10 per cent or possibly 0.12 per cent maximum to avoid this condition.

Short time tests, though not reliable criteria for judging ability of the metal to resist stress for long periods of time at high temperatures, are interesting in developing information on the influence of various elements on mechanical properties, and they have some significance in indicating how a steel will behave under sudden stress such as might be encountered under sudden pressure increase or when hot spots develop in refinery tubes because of coking and irregular furnace conditions.

Show No Effect

Short-time tests on 2 per cent chromium steels, self annealed prior to test, showed no pronounced effect on short-time strength up to at least 1200 degrees Fahr. The alloys with higher silicon contents showed the lowest strength properties between about 950 and 1200 degrees Fahr. At 900 degrees the effect of silicon in stiffening the ferrite is noticeable and at this temperature the higher silicon alloys show a slight superiority over those of lower silicon content. At high temperatures, within the working or rolling range, silicon in amounts of 1 per cent or more seemed to cause softening.

In this connection it was observed that certain high silicon steels have excellent elongation through the working range but are easily guide marked or roll marked during the rolling of the tubes or other products. A decided tendency toward coarse grain structure was noted in alloy containing 2.96 per cent silicon and this was reflected in its impact properties.

While no data are available to indicate reliably the effect of silicon variation on creep strength of chromium containing steels, it seems that, generally speaking, silicon aids creep resistance of steel alloys up to about 950 degrees Fahr. The data seem to indicate that above that temperature silicon in increasing amounts depreciates creep resistance.

The most beneficial action of silicon, the author concluded, lies in its ability to improve resistance to scaling at high temperature. Until further data are available, silicon should be limited to about 1.50 per cent in steels containing 2 to 5 per cent chromium. Higher silicon results in loss of impact strength and tends to reduce ductility and should be avoided where shock stresses are likely to be encountered when the metal is cold.

Copper in small amounts improves the resistance of steel to dilute acid solution of a reducing character and also its resistance to atmospheric corrosion, said Mr. Newell. Based on experience, copper steels have been avoided in high temperature service. An exception, however, is in the use of copper-steel boiler tubes for nominal temperature conditions where corrosion from boiler waters of poor quality is to be combatted. In this case the copper bearing steels are not subjected to temperatures in excess of about 450 degrees Fahr. and they are not called on to resist the highly corrosive effect of oil products containing appreciable quantities of sulphur.

"X-Ray Study of Effects of Adding Carbon, Nickel or Manganese to Some Ternary Iron-Chromium-Silicon Alloys" was the title of a paper submitted by Eric R. Jette, school of mines, Columbia university, New York, and A. G. H. Andersen, department of development and research, Phelps Dodge Corp., Maspeth, N. Y. This paper represented further data on a study covered by a paper presented by these authors in 1936. The same authors presented at this meeting a paper entitled "Notes on Microstructure and Hardness of Alloys Consisting Essentially of Iron, Chromium and Silicon." It contained data supplemental to a report which they submitted several years ago.

The viscosimeter, as a means of controlling slag fluidities, has been in use in the plant of the Edgewater Steel Co., Oakmont, Pa., since 1935, said W. J. Reagan, of that company, in a paper describing the practice. The paper went into detail in connection with the use of the viscosimeter in connection with fully-killed, basic open-hearth steel ranging from 0.50 to 0.90 in carbon. In brief, he said, the method means more heats in grade, more uniform slag and a more uniform FeO content in the slag or, in combination, a more uniform practice.

Viscosimeter Discussed

Discussion revealed that the viscosimeter method is employed widely and with good results. One speaker advanced the contention that the best standard hole diameter is ¼-inch. When it is necessary to make a change, he said, he thought it better to increase the length of the hole rather than to reduce its diameter. An interesting question was asked by one speaker. He wanted to know whether the presence of sand in large amounts on sand cast spiegeleisen has an effect on viscosimeter tests. Nobody in attendance was able to comment on this factor.

P. F. Kinyoun, Bethlehem Steel Co., presented a paper covering the control of open-hearth furnaces and practices at that company's Lackawanna plant. By this control the human factor is minimized and the chances for mishaps and irregularities in operation are reduced.

George L. Danforth Jr., Open Hearth Combustion Co., Chicago, submitted a progress report on the use of venturi ports in open-hearth furnaces. Following the application of venturi port design for use with natural gas, it has been applied with other fuels.

Wire Producers Discuss Improvements in Processes

GALVANIZING practice, developments in cold heading, baking of rods and wire, and heat treatment of bolts, were among the subjects which members of the Wire association discussed in closing technical sessions of the organization's annual meeting at the Ambassador hotel, Atlantic City, N. J., Oct. 18-21. Activities of the association during sessions early in the week were reported in the Oct. 25 issue of STEEL, pages 19 and 74.

At the Tuesday afternoon session a comprehensive paper entitled "A Metallurgical Study of the Factors Affecting the Quality of Galvanizing" was presented by R. W. Sandelin, metallurgist, Atlantic Steel Co., Atlanta, Ga. This paper received first honorable mention of all papers prepared during the past year for the Wire association.

Spotting of galvanized coatings is more pronounced at high temperatures, the author asserted, and while dependent upon the nature of the steel, the size of the strip and the speed of the strip through the spelter, it is generally observed at temperatures above 830 to 840 degrees Fahr. Therefore, the speaker declared, one way of eliminating spots is lowering the temperature.

Spotting is more pronounced at

Everybody likes

U·S·S STAINLESS STEEL

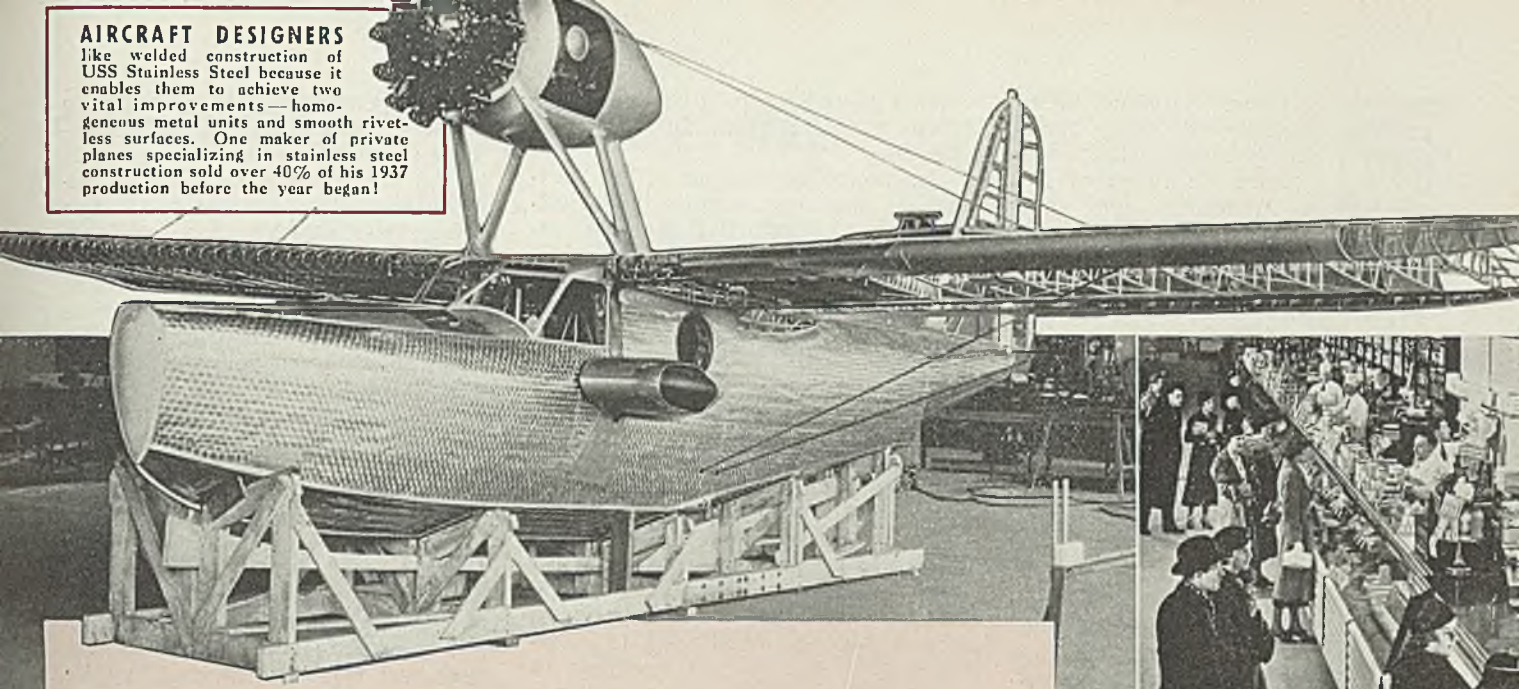
CANNERIES like USS Stainless Steel equipment because it costs them less per year-of-use. These virtually indestructible stainless canning pans are replacing tinned pans which cost 50c new, 35c each season for retinning, and then lasted only four or five years.

CAR BUYERS "... and I like stainless trimming on my car because I know it's the only trimming which will never tarnish, never peel, never show rusty scratches!" Women buyers know stainless steel — which explains why stainless trimming helps the salesman close the sale.

ARCHITECTS like USS Stainless Steel because it keeps their buildings looking new. In 1931, architects Howe and Lescaze specified glass, polished granite and USS Stainless Steel for almost every exposed part of Philadelphia's famed PSFS building. Now five years later, their work still attracts tenants, still looks "brand new".

SHEET METAL WORKERS like USS Stainless Steel because it helps them sell more jobs. This stainless kitchen in a Santa Monica penthouse was made and sold by Modern-Metals Mfg. Co. Starting from scratch twelve months ago, Modern-Metals has already built a successful business by specializing on stainless installations.

AIRCRAFT DESIGNERS like welded construction of USS Stainless Steel because it enables them to achieve two vital improvements—homogeneous metal units and smooth riveteless surfaces. One maker of private planes specializing in stainless steel construction sold over 40% of his 1937 production before the year began!



The Quick Facts about
U·S·S STAINLESS STEEL

(1) CHEMICAL INERTNESS—immune to weathering and normal atmospheric corrosion—immune to attack by food and beverage products—more corrosion-resistant to more corrosive chemicals than any other comparable metal—avoids contamination of contents—lengthens equipment life—always looks sparkling new.

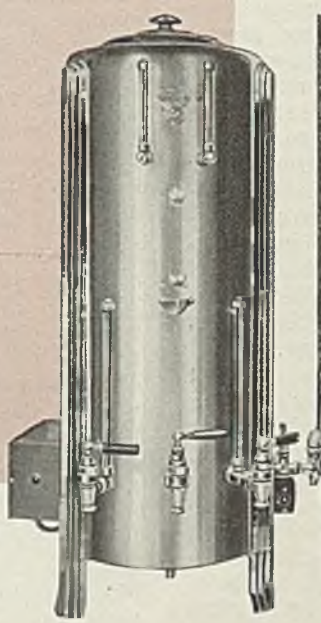
(2) MECHANICAL STRENGTH—tensile values from 85,000 to 170,000 lb. in.^{2}—one of the toughest and strongest metals known to science—owing to combination of high strength and corrosion-resistance, thin members can be assembled into new highly-efficient structures weighing less than equivalent structures of any other metals—saves weight—saves metal—increases safety.

(3) HEAT RESISTANCE—retains a large degree of mechanical strength and chemical inertness at temperatures disastrous to other metals—at 1500° F. USS 18-8 is still scale-free—at 1000°F. it will elongate only 1% in 10,000 hours under a stress of 17,000 lb. in.^{2}—useful for high temperature chemical equipment, oil burner tips, airplane motor parts, etc.

(4) BEAUTY—available in a wide range of glistening finishes—ranging from dull glowing satin to high polish—the only commercial metal which can maintain a silvery surface with no protective coating—the product that glitters may not be gold, but how it does sell!

(5) "USS"—those three initials identify stainless steel of the finest quality—made only in clean electric furnaces, exclusively devoted to high grade alloys, by men who make nothing else. A product of the world's largest producer of high grade steel.

RETAIL STORES like USS Stainless Steel be it suggests fresh modern merchandise and surroundings. In their big Pittsburgh m Donahoe's find that their new 125-foot co of USS Stainless Steel attracts customers, appetites and increases the average sale.



RAILROADS like lightweight stainless equipment because it costs less to run a also sells more tickets. The Burlington re christened their eighth stainless Zephyr. major railroads with stainless steel equi under construction or recently delivered i the Southern Pacific, the Santa Fe, the Worth & Denver, the Rock Island and the Re

SALESMANAGERS like to see USS Stainless Steel go into their products because it gives them a new and popular selling point. That's one reason why so many fast-selling products like the Toastmaster Coffee Maker are being redesigned in stainless steel.

U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago, and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
NATIONAL TUBE COMPANY, *Pittsburgh*

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

UNITED STATES STEEL

the shorter immersion time, he explained. Excessively long times, however, will produce a dull rough coating. Immersion times of less than 20 to 25 seconds will show maximum spotting effects, he contended. Time in the spelter ordinarily is governed by two factors, namely, length of travel in the molten zinc and the rate of speed through the spelter pan. The time factor is best arrived at, the speaker stated, by regulating the position at which the strip enters the spelter since high speeds are desirable from the standpoint of tonnage and the elimination of spots, the latter being due to retarded drainage of zinc from the strip.

The author observed that spotting occurred less in cold weather than when it was warm and that wind effects helped to eliminate spotting. As a result a large fan was installed to circulate air across the strip as it emerged from the spelter. The current of air thus created freezes the molten zinc on the strip and eliminates spots. The speaker cautioned, however, that such rapid cooling has a tendency to make the coating brittle so that it will flake off when the strip is bent.

Determines Cooling Rate

Continuing, Mr. Sandelin stated that the width and thickness of the strip determines the rate at which the strip will cool and form a spangle surface; the heavier strip having greater heat content will necessarily cool slower and increase the possibility for spotting. Heavy strip, he contended, will show greater increased spotting tendencies over thinner strip of the same type of steel, this being due to the retaining of high temperatures longer for the heavy strip providing increased time for diffusion and subsequent spotting. With longer immersion times the author noted that spotting occurs to a lesser extent with roughness due to streaks becoming more prominent.

He presented data to show that spotting steels retain their spotting tendencies regardless of whether or not they have been pickled in acid. However, the degree of spotting is unquestionably increased, he declared, by pickling in acid and seems to attain its maximum effect in a relatively short time since overpickling seems to have little or no additive effect.

In conclusion the author stated that spotting is a property associated with certain classes of steel and consists of the top layers of zinc diffusing into the steel base, leaving a dull gray zinc-iron alloy layer at the surface. Certain other classes of steels retard this diffusion to the extent that some thinner coatings result which have top layers of uncontaminated zinc which form a characteristic spangle upon freezing.

In discussing a paper at the Wednesday morning session on "Developments in Cold Heading at General Electric," A. R. Ryan, industrial heating engineer, General Electric Co., Schenectady, N. Y., cited three savings which future plans will effect. The first plan involves the use of heavier coils to feed the cold heading machines. About 15 minutes are required to end up an old coil and start a new one, he stated. Larger coils will enable the number of starting intervals to be decreased and in that way will enable a machine to turn out more screws in a given time with no additional attendant labor.

The speaker mentioned that experiments now are in progress to determine the possibility of using a tungsten carbide cold heading die. On first thought, he said, this may seem to have little chance for success due to the brittleness of the material but preliminary work indicates that success yet may be attained.

A further saving in material cost, as well as increased die life, is expected from the addition of a wire drawing equipment ahead of some of the cold heading machines. Such an equipment, the speaker contended, will permit the use of hot rolled wire of rather generous tolerances and will permit it to be drawn accurately just before it enters the header. Accuracy in wire size, the speaker pointed out, should provide better die life. Heading immediately after drawing is expected to eliminate aging effect and thereby provide a wire more easy to cold head.

New Development Announced

A new development in the baking of rods and wire was announced at a ferrous section meeting, Oct. 20, by K. B. Lewis, consulting wire mill engineer, New York. After tracing the history of rod baking, Mr. Lewis described the recently developed flash baker through which the air stream at 750 degrees Fahr. passes at a velocity 20 times as fast as in the modern baker.

The baker is an open-top chamber of the same size and shape as the lime tub and takes a pin of rods direct from the lime. The yoke rests on the edges of the chamber and the ends of the hollow cylinder formed by the coils of rods register with ducts through which heated atmosphere is discharged at high velocity. As the two air streams meet, the pressure forces the air through the massed coils.

At the sides of the chamber are located pickup ducts through which the spent air is returned to the combustion chamber. Here it is reheated, refreshed with new air to support combustion and is recirculated through the rods. As a result of the high temperature and velocity of the atmosphere the moisture is driven out of the lime with explosive violence.

A curtain of cold air is provided at the top of the chamber to minimize the loss of heat. The cold air is discharged at high velocity through narrow slots along the top edges of the chamber and this arrangement blankets off the hot gases at the bottom.

Mr. Lewis reported the baking time as ranging from 20 to 25 seconds up to 5 to 6 minutes for heavy coated stock. Fuel cost at one plant operating this type baker averages between 4 and 4½ cents per ton using 32-cent natural gas. This cost is being obtained in spite of the fact that the equipment cannot be used to maximum capacity. The installation of this single-pin baker permitted the company to shut down a 54-truck baker.

Corrosion Is Nil

A paper on "Nickel and Nickel Base Alloys in Wire and Rod Products," written by Carl Rolle, development and research division, International Nickel Co. Inc., New York, and presented by Gill Cox at the morning session on Oct. 21, declared that corrosion of monel, nickel and inconel metals is practically nil even in sulphurous industrial atmospheres. All three materials are useful in connection with the handling of acid goods. This is due to the excellent corrosion resistance and to the fact that nickel is nondestructive and nontoxic.

In discussing the hot working of nickel-base alloys, the speaker stated that the chief points to consider in the selection of fuels and furnaces are the use of low-sulphur fuels, avoidance of having combustion take place in direct contact with the material, and avoidance of highly oxidizing atmospheres.

T. C. Merriman in speaking on "Notes on the Annealing of Nickel Silver Wire in Coils" cautioned that while the underfired oil-burning type of furnace performs satisfactorily, it is essential to have the fuel oil low in sulphur. He also emphasized the desirability of slow heating at low temperature rather than work at high furnace temperatures.

Along with the idea of slow heating, the speaker declared, it is desirable to avoid heat shock as far as possible in annealing nickel silver. It is better to pull a load into the furnace at comparatively low temperature, he stated, and let it heat slowly for a while from the heat residual in the furnace before actively raising the furnace tem-

(*Please turn to Page* 82)

Welding Research Is Topic of A.W.S.

TWO of three sessions conducted by the American Welding society on Oct. 19 during its annual meeting in Atlantic City dealt with fundamental research. The third session was conducted jointly with the American Society of Mechanical Engineers and was devoted to problems of fabrication by welding.

Planing of excess weld metal on butt-welded structural plates, ¾-inch in thickness, adds to the unit fatigue strength of carbon steel joints, tests on the material as-welded indicating a reduction in such strength by stress concentration at the edge of the weld. This is the result of data compiled by W. M. Wilson, research professor, University of Illinois, and presented at the Tuesday morning session. In carbon steel plates the fatigue strength also appears greater when the automatic carbon arc method is used than when the hand-operated metallic arc welding process is employed. In the same series of tests, Prof. Wilson found strength of welds in silicon steel plates was limited by such strength of the filler metal while peening of beads and stress relieving by heat treatment had but slight effect on the fatigue strength of the welds.

Studies Effect of Heat

Walter H. Bruckner, naval research laboratory, Anacostia, D. C., station, gave a comprehensive review of literature pertaining to heat effect in welding, summarizing the conclusions made by various authors and citing 40 references on the subject. As to remedies for the heat effect, Mr. Bruckner stated adjustment of steel composition by reduction of carbon-content and increase of alloy has been nearly a unanimous conclusion from welding tests and experience. The carbon limit has frequently been fixed at 0.25 per cent, 0.18 per cent and as low as 0.14 per cent for fool-proof welding steel. However, definitely setting a maximum limit for carbon, below which a steel of easy weldability may be assured is difficult since a definite statement can not include all variations in alloy content of the many commercial steels.

Stress relief of the welded joint at temperatures of 1100 to 1250 degrees Fahr. to improve the safety of the joint has been frequently noted as a treatment for excessive hardness, but Mr. Bruckner said the existence of excessive hardness is generally coupled with fissures which are not remedied by stress relief.

Improved electrical design of large resistance welders should concern the welder manufacturer. Efforts should tend toward lower reactive losses with resultant higher operating power factors, according to A. S. Douglas and L. W. Clark, construction and electrical engineers, Detroit Edison Co.

The estimated total consumption of electrical energy for arc welding is now estimated well over 16,000,000 kilowatt hours annually. This estimate is based on use of 6,500,000 pounds of electrodes at an average of 2½ kilowatt hours per pound. The power company engineers also estimate 7,000,000 kilowatt hours for flash welding and 40,000,000 for resistance welding or a total of 63,000,000 kilowatt hours for the industry, these estimates being for 1936.

The usual method of power companies in providing satisfactory resistance welding service consists primarily in finding a low-cost point of service of ample capacity to keep voltage flickers within specified allowable limits. In industrial districts this is not difficult, but in some areas a power line extension for the welder load may be required, or a motor generator set to shield the power system from welder disturbances. A low reactance distribution system of reasonable cost is the ultimate problem of the user of electrical energy in welding. This may require an interlaced or concentric bus of special construction and the use of single-phase low resistance transformers.

Power Loads Compared

In the manufacture of welding apparatus faulty electrical design increases the cost of power service. Studies of the subject of power for welding indicates that the ratio of welder energy consumption to connected load is much less than for other types of load. Possible expenditures for serving the load, therefore, can not be made on the basis that expected earnings will justify capital expenditures in anywhere near the same proportion as for general power load. Reasonable accuracy may be expected from ordinary rotating induction watt-hour meters when measuring energy utilized by resistance welders.

Describing a new non-destructive method for testing welded seams, W. B. Kouwenhoven, professor of electrical engineering, Johns Hopkins university, and A. E. Vivell, electrical engineering instructor, Princeton university, magnetized the seam by a strong alternating magnetomotive force. Connected in opposition, two search coils are placed on the seam so that any strange field present cuts their windings. An oscillograph reveals the wave of electromotive force induced in the coils. Under proper conditions flaws in the weld produce distinct and unique changes in the shape of the valve, easily recognized and eliminating the defective part.

Necessity of machining the work before testing is eliminated, use of the alternating magnet field providing a method for studying welded seams with the bead in place. The change in the wave contour induced by the flaw gives a definite indication of weld quality, according to the engineer. Magnetic saturation is desirable with the frequency low enough to insure penetration of the magnetic flux for the best results in this test.

Girder Strength Increased

While the best angle of inclination remains to be determined, experiments on welded girders with inclined stiffeners proves that such stiffeners inclined in the direction of compresed stresses in the girder web materially increases the strength of the girder. A suitable method of design of such a new type girder is also wanting, according to Cyril D. Jensen, professor of civil engineering, Lehigh university, co-operating with William F. Lotz Jr., also of Lehigh, in further research on this subject, described in the Tuesday afternoon session. In a series of tests on girders with vertical and inclined welded stiffeners, buckling on the vertical were noted at about 44,500 pounds as compared with 60,000 pounds for the inclined. On two girders tested, pronounced buckling resulted at 46,000 and 63,000 pounds, respectively. No difficulty is experienced in the welded fabrication of inclined stiffener girders; in fact a reasonable tolerance in length of the stiffener is safe while this would be impossible with the tighter-fitting vertical brace. Messrs. Jensen and Lotz see the likelihood of varied applications of welded girders with inclined stiffeners in deck-girder bridge construction, through-girder bridges, in some instances, and girders which span openings in buildings carrying one or more columns.

Welding of copper, generally admitted to be a major problem in the art of cementing metals. was discussed by A. P. Young, Michigan College of Mining & Technology, in an admirably instructive paper on

the subject. Summarized, he finds that under the oxyacetylene process the efficiencies of plates are less than those of those completed by the carbon-arc welding process, probably because of the length of time the material is exposed to the welding temperatures. In gas welding, he recommends preheating for thicknesses greater than ⅛-inch for sufficient heat to overcome losses by conduction; also for faster welding operations. Especially when hard-rolled copper plates are welded, they should be clamped to prevent warping. To prevent lapping at the end of the weld, due to contraction during welding, edges of the plate on a butt weld should be so spaced that there is an increase in the spread between the edges of about 1/16 inch per foot of the plate length.

Weld metal should not be deposited without the use of a flux to prevent high porosity, unless a special welding rod is used requiring no such flux. Microscopic examination confirms this, for under these conditions unless ample flux is employed, porosity increases.

Welding Speeds Compared

Speed of welding is about six times as fast with the carbon-arc process as compared with gas-welding, according to Prof. Young; also the finished weld has better efficiency than gas-welded copper plates. If the speed is so regulated that full penetration is attained, preheating is not necessary, but too slow speed produces a wide, piled-up bead and undercutting. Yet too fast speed, reduces penetration and weakens the weld strength.

Heat required in welding reduces the strength of copper plate to that of soft copper, and, according to Prof. Young, 100 per cent welds are not likely. Speed of welding with the thickness of the plate are factors to control closely in welding copper under usual conditions.

Prof. Otto H. Henry, Brooklyn Polytechnic institute, considered static and impact tensile properties of the various welds at ordinary and low temperature. Tests on resistance butt, atomic hydrogen and bronze welds in 0.25 per cent carbon steel and gas arc welds in 18-8 alloy shows that static tensile properties do not vary much with temperature in the same way as impact tensile properties.

Result of investigations at Lehigh university, further research in the studies of welded top angle beam connections designed for end restraint, were outlined by Inge Lyse, research professor, and Glenn J. Gibson, former American Welding Society Research Fellow at Lehigh. They find that sustained and repeated loading did not have much effect on the welded connection, providing the top angle deflection is not excessive; also that previous design theory for such work is substantiated. Providing for 50 per cent restraint, the use of 3 x 3-inch top angles of various thicknesses will produce satisfactory beam connections. Practical beam spans of this size for top angle connections range from eight to 18 feet, such top angle connections being best adopted for lightweight wide flanged beams.

While highly developed, modern steel cutting apparatus still requires improvement in numerous instances, according to Prof. H. R. Bullock, mechanical engineering, Massachusetts Institute of Technology, reviewing studies in oxyacetylene cutting process. Desirable are improved efficiency and precision, both being possibly interdependent. Concluding that further improvements and refinements in cutting operations required improved cutting nozzles with possible mechanical refinements in the blowpipe, a study of the various nozzles was conducted by Prof. Bullock in two categories; the oxygen stream issuing from the nozzle and the actual cutting operation. Outlining the various methods utilized in this investigation, Prof. Bullock declared that despite the use of the highest camera speeds, definite conclusions as to the assumed problem are uncertain. Even higher camera speeds are being undertaken to register the velocity of disturbance. While still lacking conclusive data, Prof. Bullock offers the opinion that an apparent mechanical shock impulse in the nozzle, seemingly periodic, disturbs the velocity of the reaction between the oxygen and the metal being cut. The assumption is that in the resulting change of heat the disturbance is magnified greatly, becoming more so as the bottom of the cut is approached. Study of the internal flow in the nozzles is being continued.

Conduct Joint Session

A joint session of the American Welding society with the American Society of Mechanical Engineers held Tuesday afternoon was devoted to practical aspects of welding. J. M. Cooper, Philadelphia representative of Taylor-Winfield Corp., Warren, O., displayed slides illustrating many modern resistance welding machines and described the advantages of these units over their predecessors.

Much progress has been made in welding dissimilar metals, said Mr. Cooper. The problem of welding copper to copper, he said, has been simplified by using silver solder. Problems incidental to the welding of aluminum, stainless steels and other metals largely have been solved, although some problems in connection with welding of low alloy steels remain. Spot welding of galvanized sheets, he said, now is a common fabricating operation.

An interesting talk on gas cutting and welding was made by C. C. Brinton, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He emphasized that redesign is necessary when changing from castings to welded structures. Careful attention must be paid to layout prior to flame cutting as otherwise much time is lost. He estimated that when cutting plates the scrap remaining after cutting amounts to about 35 per cent of the weight of plates originally received.

It is difficult to control size to close tolerances due to the shrinkage from welding. This is a matter requiring close attention. He exhibited slides of jigs and fixtures which have been developed at the Westinghouse plant to facilitate welding and to minimize distortion.

Discussion indicated a continued diversity of opinion as to the value of thermal stress relief of welded structures. From his experience with heavy welded rolling mill gears, said A. E. Gibson, Wellman Engineering Co., Cleveland, he was inclined to believe that peening is sufficient and that thermal stress relief is unnecessary.

C. W. Obert, Union Carbide & Carbon Research Laboratories Inc., New York, also submited a paper on the practical aspects of welding. He devoted his remarks largely to increasing the life of wearing surfaces through hard facing.

Wire Producers Discuss Recent Developments

(*Concluded from Page 80*)

perature to that at which it is desired to let the load of metal soak.

Providing a proper drawing temperature following a full quench compensates for the hardness variation due to sectional differences in bolts. This fact was brought out at the closing session by Charles Fassinger, vice president, Oliver Iron & Steel Corp., Pittsburgh, in speaking on "Double Treating Track and Frog Bolts."

Tests show as a direct result of the double treatment procedure that at a specific tensile strength the ductility of the double treated bolt is much higher than that of the time quenched bolt. He pointed out that the reduction of area is approximately 50 per cent higher and elongation is about double.

Another favorable consequence mentioned by the speaker is that double treated bolts when measured by brinell tests are satisfactorily uniform in hardness throughout the entire length of the bolt, while time quenched bolts vary greatly between the shank and the threaded section.

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21 special quality sheets. Also all standard sheets such as plain back, galvanized, corrugated, etc. *Only Primes* are carried by Ryerson.

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Beams; Channels; Angles; Tees; Zees; Plates (17 kinds); Spring Steel; Tire Steel; Refined Iron; Boiler Tubes and Fittings; Bolts; Screws; Nuts; Washers; Rivets; Nails; etc.

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POWER DRIVES

Weighing Advantages of Belts, Chains and Variable Speed Units

EVERY drive, whether motor to shaft or machine or between a pair of shafts, requires some means of connection to transmit power from one to the other. The common means for doing this are by flat belts, V-belts, chains, gears, flexible couplings or speed reducers.

Flexible couplings are restricted to the connection of shafts in a straight line on a 1 to 1 ratio. Gears are limited to a fixed shaft spacing and to direction of rotation, except by addition of idler gears. Speed reducers usually are used for low speeds and relatively high reduction ratios in the lower horsepower range.

Until the introduction of silent chains, lineshafts were belt-driven and machine shafts were belt or gear-driven. Belt drives required long open-center connections to maintain tension and obtain the proper speed reduction with the necessary arc of contact on the smaller pulley. Losses in speed in this transmission have commonly been assumed to be much greater than they actually are. However, with insufficient attention and maintenance losses are increased.

Belts Have Advantages

Advantages of belt drives are: ease of installation and repair or maintenance, low belt replacement cost, absorption of shock, comparative long life, inexpensive guard or enclosure required, reuse after changes in arrangement, adaptability to ordinary speed reduction, requires only periodic attention, and will break or slip and run off on excessive overloads.

Chief objections are that the belt is not adapted to heavy loads at low speeds and is affected by moisture, oil, and hot, dry conditions, or by combinations of moisture or oil and dust. The objections of slippage, speed and centrifugal losses, and the necessity of maintaining high initial belt tension are overcome by the use of the pivoted motor base. This base also permits short centers and transmits full power at peak loads by automatic adjustment of tension and center distance.

Use Silent Chains

Silent and roller chains are being widely used on lineshaft and other shaft drives because of their positive ratio in transmission. On these the chain case serves as a guard, holds the oil for lubrication, also excludes dust and may be made fume proof, if necessary. Chain drives are highly efficient, positive, especially adaptable to heavy starting loads or to heavy loads at low speeds and may be used under atmospheric conditions where other drives cannot. Ease of installation and removal, long life with only periodic attention to change lubricant, short centers and high speed are features.

Ordinarily, roller chains are used at lower speeds than permissible with silent chains. For example, roller chains are seldom direct connected to motors rated above 1200 revolutions per minute, while silent chains are commonly driven by motors rated at 1800 revolutions per minute and, in the short pitch, by motors at 3600 revolutions per minute. Roller chains are frequently used for connecting two parallel lineshafts, thus providing positive speed ratios to both shafts. Roller chains also have extensive application to low speed and second-reduction drives. Use of shear-pin hubs protects either type of chains and the unit driven against damage from sudden stoppage.

Chains require perfect alignment and proper lubrication. Neglect of either may necessitate replacement of chain, sprocket and gear. Also, chains transmit more shock and vibration than do belts.

Chain drives have many applications in the connection of two or more shafts in machines due to their positive drive without the limitations of center distance and direction of rotation of a gear. By the use of special silent chain or by roller chain, either direction of rotation may be obtained as well as fixed speed ratios to all shafts.

V-belts, in general, may be used on any short-center drive within permissible speed ratios as the sheave, even on small arcs of contact, grips the belts and prevents excessive slippage. Moisture, dust and atmospheric conditions which do not affect rubber are permissible. Special oil-resisting belts may be obtained.

Less shock and pulsation are transmitted to motor and bearings by V-

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."

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YEARBOOK ISSUE of STEEL!

"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."

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"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."

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"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."

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"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."

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. . . 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.

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. . . 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.

belts than by other types of drives. Also, V-belts will be affected less by operating with slight misalignment; however, they should be aligned. Replacement cost is low as it requires only renewal of the belts. When revamping the drive to old machines with shock or pulsating loads, the weight of the flywheel sheaves may be applied or increased to provide additional momentum. In many cases the flywheel pulley may be grooved or belts run flat without grooving, thus eliminating the cost of a large sheave. V-belts have wide application where quiet operation and freedom from transmission of vibration are essential.

Ratio Is Constant

On the other hand, V-belts are endless and, unless the sheave is at the end of a shaft, partial dismantling is necessary to replace belts. Also, although speed transmission is not positive, the ratio is practically constant. In installation it is necessary to provide adjustment for tension, elongation and for changing belts.

Variable speed transmissions are ordinarily built as a part of the connection of motor to shaft or machine. Several types have the variable unit as the connector of input and output shafts. In some units of more recent design a variable diameter pulley on the drive or driven shaft provides for speed adjustment. These are made for multiple V-belt sheaves and for a special block belt. A few types of mechanical and hydraulic variable speed transmissions are designed to permit straight-line connection.

Many drive installations with fixed or step-adjustable speeds could use variable speed transmission to economic advantage. Such equipment would increase the adaptability of the drive to varied work and cutting speeds for various sizes of tools and different metals. With the increase in use of special alloys, machine tools operating on a variety of tasks, as in job work, need greater adaptability to change in working speeds. Ease in making these changes by control from working position, as is possible with many types of variable speed units, is a desirable feature if the advantages of selectibility are to be used at all times.

As drive connections increase in horsepower transmitted the application of some of these types of connecting units decrease; other types are fully adaptable to both large and small units. With the wide opportunity of choice in selecting a drive connection the plant engineer can use considerable discretion in weighing the advantages and disadvantages of one type against the other.

However, where all types are adaptable, trouble, if any, usually results from attempting to rate the drive too close to the requirements, improper installation, or improper maintenance and neglect of the proper servicing. The drive connection is important as a poorly-designed drive will impair production on a machine or from a group of machines.

♦

Examining Hoist Cables

■ The examination of any cable used in the lifting of relatively heavy loads is important, and it is wise to make such examinations periodically.

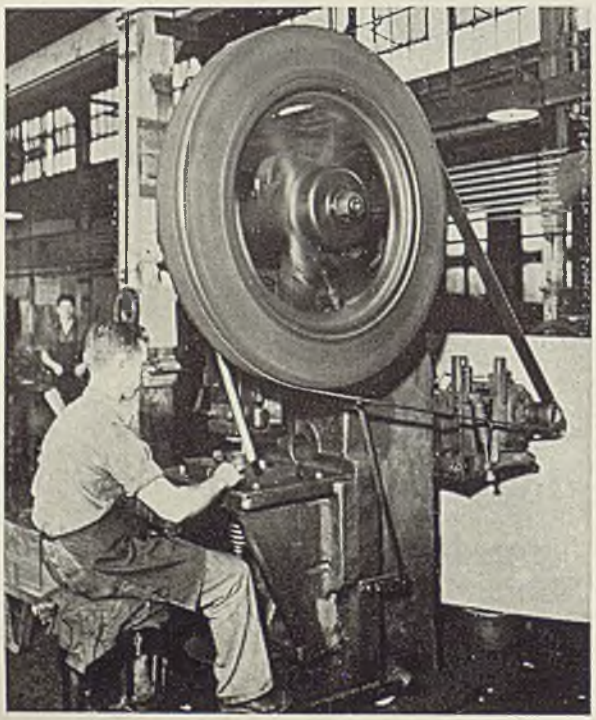
Causes of excessive wear or wire breaks in such cables can very often be analyzed, or traced, and the reason for the trouble found. Various reasons for excessive wear on lifting cables have been found, one of which is abrasive action. Hoist cables, in certain places where the air is quite heavily charged with abrasives, pick up some of the abrasive and it becomes embedded between the strands. This is especially true in the case of cables that have been heavily greased. It should always be remembered that an abrasive atmosphere and a heavily greased cable is a very bad combination. It is better to lubricate the cable more sparingly and more often where abrasive is present.

In some other instances it has been noted that the sheaves are too soft for the loads that are to be lifted by the cables running upon them. Where this is the case, the harder wires of the cables embed themselves to some extent in the softer groove of the sheaves. When any slight twisting action comes up the cable while in use, the wires of the cable will not register with the imprints they have formerly made in the sheaves, and an abrasive and cutting action is set up which is highly destructive to both sheave and cable. Examination of cables for excessive wear, therefore, may well include an examination to determine the condition of the sheave.

Ordinarily, cables are considered safe for their original load rating until they begin to show broken strands. Where broken strands are high in number, they are of course readily visible. Very often, however, one, two, or more strands of a cable may be broken and escape the attention of the operator, or may even be overlooked in a hasty examination. A very good method to find such broken strands quickly and easily, is to take a handful of waste and hold it around the cable to be examined. Pass it along forward and backward. Any broken strands in the cable are sure to catch one or more threads in the bunch of waste and these hanging threads will immediately reveal the existence and the location of breaks.

♦

Store spare motors, compensators, and other equipment with parts which may be damaged by condensation or moisture, in heated storerooms. Moisture collecting deteriorates the insulating materials and rusts finished surfaces. As a result, when such equipment is needed it may require considerable attention and repairs before use or soon may fail in service.



Drive connections, such as this from a 4½ to a 50-inch pulley, or 11½ to 1, would not be practicable without the use of a pivoted motor base to maintain tension under intermittent load. Photo courtesy Rockwood Mfg. Co., Indianapolis, Ind.

NEW EQUIPMENT

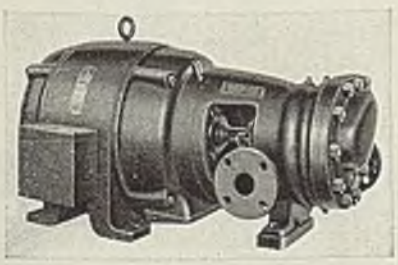
Molding Presses—

Standard Machinery Co., Mystic, Conn., has announced improvements in its self-contained molding presses so that they may be adapted to a wide range of pressures. By either of two simple adjustments, it is possible to reduce the total rated capacity of a Standard press. For continued maintenance of pressure, an adjustment, requiring but a few seconds to make, in the high pressure pump release valve changes the pressure delivered on the platen of the pump from its total capacity to any desired point down to approximately one-third its rated capacity. The same results may be accomplished by lowering the position of the "thrust" block. An indicator attached to the block and a pressure scale on the guide facilitate this operation. The Standard self-contained molding presses are made in 50, 100, 150, and 300-ton models.

♦

Built-Together Pump—

Fairbanks, Morse & Co., 900 South Wabash avenue, Chicago, has announced production of a two-stage, built-together pump—motor and pump built as a unit—for operating against heads up to 500 feet and for service with liquids low in viscosity and free from excessive foreign matter. Pump is of compact design and no special foundation is required. It is complete in itself and can be mounted in horizontal, vertical or angular position. Unit consists essentially of a two-stage, centrifugal pump, with enclosed bronze impellers, mounted directly on the shaft of an F-M splashproof motor. There are no flexible couplings or alignment problems. Two rugged ball bearings take all radial and unbalanced thrust loads. Impellers for the two stages are placed back to back, compensating thrust. Improved hydraulic design is attained by placing the first stage unit next to the motor and the second stage on the outside, simplifying the cross-over passage and placing the stuffing box under suction instead of pressure. A mounting leg under the pump end gives the unit added stability.



Fairbanks - Morse built - together pump has motor and pump built as a unit for horizontal, vertical or angular mounting

♦

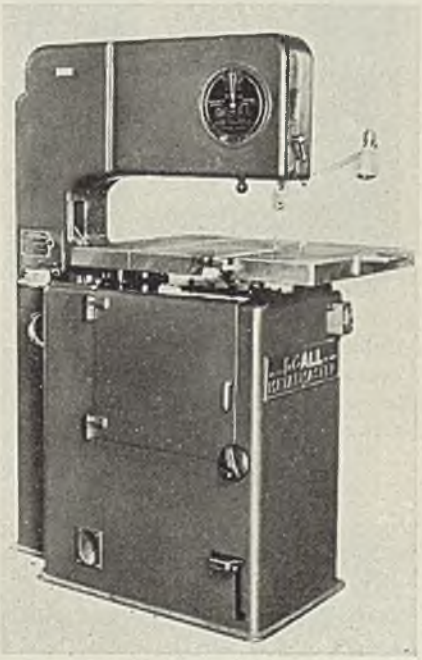
Diesel Engine—

Murphy Diesel Co., Milwaukee, is manufacturing a new diesel engine in two sizes—a four-cylinder model for uses requiring up to 100 horsepower continuously and a six cylinder model for uses requiring up to 150 horsepower continuously. Of symmetrical design and simplified construction, the engine has a single control wheel which acts as a throttle as well as to operate the simple gasoline starting mechanism, enabling the change to be made from gasoline to diesel operation at will. Governor, which is actuated by oil pressure, acts as an automatic cut-off for low lubricating oil supply, stopping the engine immediately if oil pressure fails for any reason, and a heat exchanger between the cooling water and lubricating oil serves to give quick warm-up to lubricant in cold weather and prevent over-heated oil in hot weather. Piston construction embodies an alloy metal insulating cup on the piston head which shields the body of the piston from the heat of combustion. An added feature is the solid injection fuel system.

♦

Contour Machine—

Continental Machine Specialties Inc., 1301 Washington avenue, S., Minneapolis, has announced a new Doall Metalmaster, three-in-one contour machine, with a 30-inch throat capacity. Designated as model MD, the new unit also has the built-in, automatic, instant butt welder for the saws and the job selector dial for selecting the correct speed to use in sawing or filing 48 different materials. This model has a new power work feed actuated by weights and levers. The weight or pull is adjustable with a hand wheel, and a mechanical toggle permits mechanically rotating the work to follow a contour. Work table has



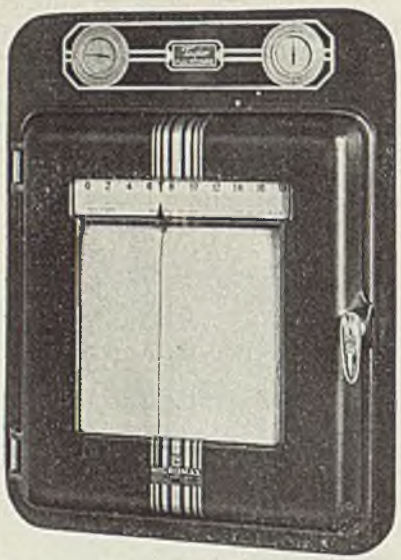
The new Doall Metalmaster model MD, three-in-one contour machine, has a throat depth of 30 inches

four-way tilt with a new type detachable disk cutting unit. Work thickness capacity is 8 inches although capacities up to 12 inches can be made on special order. Entire base of the machine is of arc welded steel construction.

♦

Potentiometer Controller—

Taylor Instrument Companies, Rochester, N. Y., has announced the Fulscope Micromax air-operated potentiometer controller for process control problems where smooth, proportional valve action is necessary and the potentiometer principle of temperature measurement is preferred. Air-operated control is completely adjustable and temperature measuring system is the Micromax recording and indicating potentiometer in which all functions affecting accuracy of temperature measurement are fully automatic—reference-junction compensation, positive balancing of potentiometer circuit, and current standardization. The new unit operates in conjunction with the Taylor Motosteel diaphragm valve. Where precision valve action or both precision valve action and compensation for changes in load may be necessary to prevent deviation from control point, the Ful-



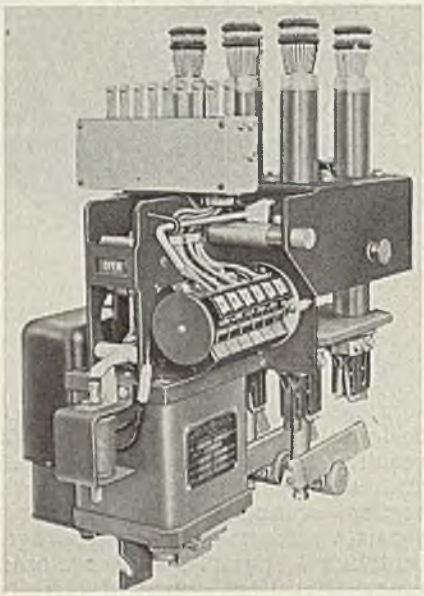
Fulscope Micromax is a new air-operated potentiometer controller in which all functions affecting temperature measurement are fully automatic

scope control can be supplemented with the Taylor Valv-Precisor or Dubl-Response control unit.

♦

Oil-Blast Circuit Breaker—

Delta-Star Electric Co., 2400 block, Fulton street, Chicago, has announced the BR-30E oil-blast circuit breaker built in 400 and 600 ampere capacities at 7.5 kilovolts, and in 800 amperes at 5 kilovolts. Rupturing capacity is 25,000 kilovolt-amperes. Primarily designed for use in type



Delta-Star BR-30E oil-blast circuit breaker has a rupturing capacity of 25,000 kilovolt-amperes

RA, vertical lift, Metal-Clad switchgear, the new unit is shown with tank and mechanism covers removed. It is complete with lifting ears, positive interlock bars, primary and secondary plug disconnectors. The solenoid mechanism and breaker head are an integral unit with internal operating linkage. Design permits permanent adjustment at all times. Unit is also built for manual operation.

♦

Dust Collector—

Claude B. Schneible Co., 3951 Lawrence avenue, Chicago, is introducing the Junior Multi-Wash dust collector in which dirty air, gasses or fumes are scrubbed five times by an impingement plate arrangement. Dust and fume-burdened air are drawn into the bottom of the tower of the dust collector. Heavier particles are immediately deposited in the sludge cone. Air is drawn upward through a turbulent spray of water, in its ascent passing over two sets of impingement plates which scrub the air, freeing it of the remainder of the dust, which is precipitated to the sludge cone at the bottom of the tower. Air is dewatered by an entrainment separator and discharged. Sludge in the cone is pumped to a Multi-Louver dewatering tank where the water is drawn off and recirculated.

♦

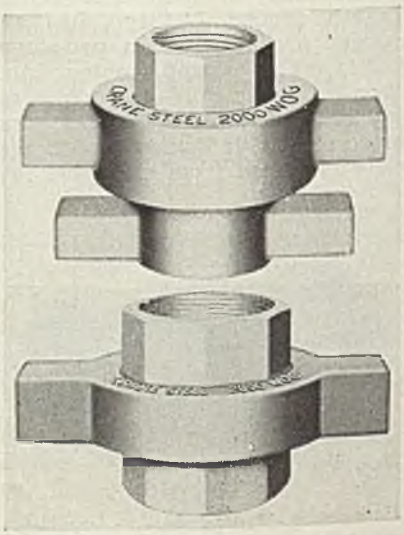
Gasoline Engines—

Le Roi Co., Milwaukee, has announced as its latest engine developments the D-201 and the D-382. These engines are of the removable, wet cylinder, sleeve type, and old sleeves can be replaced without the necessity for reboring and regrinding the cylinders. Cylinder sleeves are of close-grained cast iron, pressed into place with gaskets. Design feature is the valve seat inserts used on all of the exhaust valves to eliminate danger of valve seat burning, wear, warpage and pitting. Force feed lubrication is supplied by a gear-type oil pump, and the alloy steel crankshaft rotates in the newly-developed steel-backed, copper-bonded babbitt bearings. General design and valve-in-head construction are claimed to give the new engines high power, acceleration and torque characteristics. Accessibility to valves for tappet adjustment, replacements, or maintenance is also facilitated due to the overhead valve arrangement.

♦

Forged Steel Unions—

Crane Co., 836 South Michigan avenue, Chicago, has announced a new line of hammer lug unions comprising two types—forged steel screwed unions with one set of lugs, and forged steel screwed unions with two sets of lugs. Both of these unions have been designed for use in piping systems requiring frequent or quick dismantling and are particularly adaptable for service on hydraulic roll balancing systems in steel mills where quick breaking of union connection is often necessary. In either case a blow with a hammer upon the lug will immediately break the joint without the necessity of using a wrench. The single lug union is made with forged steel tailpieces and thread pieces in sizes 2, 2½, 3, and 4-inch —parts are of cast steel on the latter size—and have lugs on the union

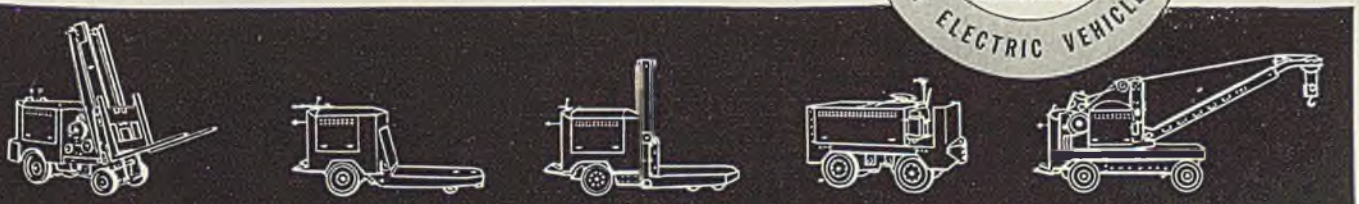


Hammer blow on lug of these unions will immediately break the joint

Odd Job Man

Most versatile of the Baker line, Baker Crane Trucks are daily saving time and money in the many odd jobs of handling steel. Change of lifting equipment only, from hook, as illustrated, to magnet, tongs, chain sling, rack or any special device permits the same crane to handle a wide variety of materials. You'll find its usefulness practically unlimited, its daily savings an important factor in cutting plant operation costs. ● Get all the facts on handling costs from the Baker Materials Handling Engineer. You'll find his data on time and cost savings detailed and accurate, his suggestions practical and helpful, in solving your own handling problems. There's no obligation, just write to BAKER INDUSTRIAL TRUCK DIVISION, *of the Baker Raulang Company.* 2167 West 25th St., Cleveland, Ohio.

OLDEST MANUFACTURER
Baker
TRADE-MARK REG. U. S. PAT. OFF.
OF ELECTRIC VEHICLES



POWER INDUSTRIAL TRUCKS FOR EVERY PURPOSE

ring. The double lug union is all forged steel, having lugs on both the union ring and the thread piece. It is made in ⅜, ½, and ¾-inch sizes.

♦

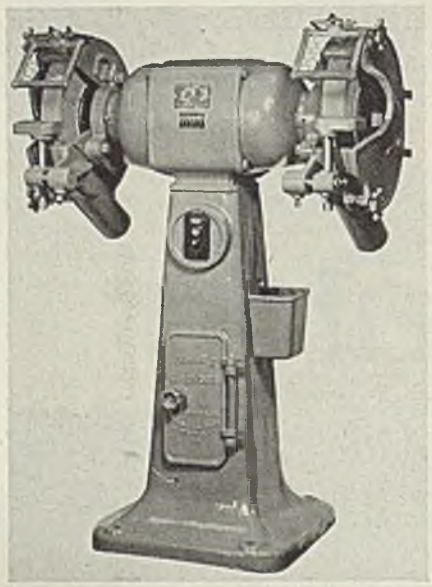
Pipe Tongs—

Gearench Mfg. Co., 313 Hughes Street, Houston, Tex., recently has designed Petol Bukup tongs to be used in connection with a pipe machine for bucking up and bucking off tool joints. Larger sizes may be used for breaking out drill collars, reamers, or similar heavy jobs. Capacity of each tong reduces cost of tools required for handling the many sizes of tool joints. Tong can be furnished with convenient hanger to assure ease in handling without hoist block. Handle is designed for length and rigidity to take care of load-indicator requirements. Either the fine pitch teeth inserts or knurled inserts eliminate deep cuts in the tool joint and tongs cannot be jammed or frozen to the work. Spring-clip, knock-out pins in the chain and hook make it possible to change from one size to another in a few seconds.

♦

Grinder—

James Clark Jr., Electric Co., Louisville, Ky., has added a 3-horsepower floor grinder to its line of industrial grinding equipment. The new grinder is adaptable for either production work or general tool grinding. Rotor shaft is mounted in heavy-duty, precision-type ball bearings, grease lubricated. Overall housings protect bearings against entrance of grit and dirt. Motor is totally enclosed and rated at 3 horsepower for constant duty at 1750 revolutions per minute. Maximum wheel wear and maximum clearance for work is assured by small diameter of the motor frame. A micrometer set attachment for grinding twist drills up to 1¼-inch diameter is available as extra equipment.



Three-horsepower floor grinder is latest addition to the Clark line

♦

Scrap Iron Grapple—

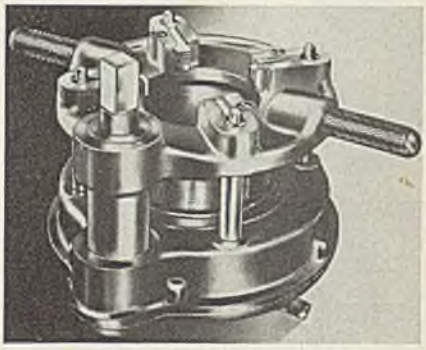
Owen Bucket Co., Breakwater avenue, Cleveland, is manufacturing the type RA scrap iron grapple for handling large quantities of scrap iron as well as pigs of non-magnetic Spiegel iron. In closing, the line which encounters the least resistance penetrates deeply into the material and anchors. The other three tines follow in the same order with a powerful gathering, closing action as of a giant hand. It is claimed small scrap, bushelings and stove plate are picked up in grabs so large that the grapple is far from closed and still there is no spillage after the grapple has compressed these materials between its tines. Properly operated, it is said to loosen larger pieces of matted material and pull them out individually when necessary. Arm-type, semiblade, or full blade tines are available and the grapples are manufactured in capacities of from 3 to 60 tons.

Owen scrap iron grapple is made with arm-type, semiblade or full blade tines

♦

Pipe Tool—

Beaver Pipe Tools Inc., Warren, O., has announced the No. 48-R pipe tool for threading 2½ to 4-inch pipe for those preferring the semiadjustable, taper-post type of pipe threader, using a separate set of dies for each size. The new unit is American thread, right-hand only, and not available in British thread or special thread pitches. Net weight is 58 pounds and it has fully-enclosed gears and four sets of dies, one each for 2½, 3, 3½, and 4-inch pipe. Extra wide die has a wide throat to center and hold the tool on the pipe. Driving pinion is straddle-mounted with a bearing both above and below the gear teeth on the pinion. Dies are held in position by a spring-backed ball, fully-enclosed. Proper position for cutting dies to a standard thread is marked by a shoulder on the tapered post.

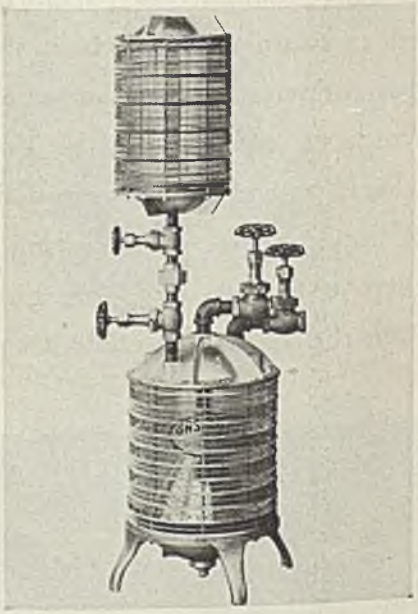


Beaver No. 48-R pipe tool is for threading 2½, 3, 3½ and 4-inch pipe, American thread, right-hand

♦

Automatic Fluxer—

Automatic Gasflux Co., Cleveland, has developed a new machine that automatically dispenses brazing flux. Gas line runs through this Gasfluxer and as gas passes through it is impregnated with a special flux. Flux then travels with the gas to the torch tip and is expelled in the flame. Special flux used has a low melting point and, dispensed in a minimum quantity, it creeps ahead of and is always under the brazing puddle. It is claimed to penetrate thoroughly and quickly, preparing metals so that a particularly tight weld is secured.



Gasfluxer is an automatic machine for dispensing brazing flux

■ To focus attention upon the thirty-eighth annual convention of the International Acetylene association, Nov. 10-12, in Birmingham, Ala., STEEL presents this special section reviewing progress and expanding applications of the oxyacetylene process in the metal producing and metalworking industries during the past year. The meeting, first to be held in the south, will chart the course for future achievements

The I.A.A. Convention in Birmingham

November 10, 11, and 12
3 Profitable Days

Plan now to attend

Technical Sessions

The program for the 38th Annual Convention of the International Acetylene Association includes papers and discussions on everything that is new and ready for you to use in connection with the oxy-acetylene welding, cutting and flame-treating processes. It is full of ideas you can take back to your own job to help improve your efficiency and increase profits. You will gain much valuable information from the subjects, "Speeding Manufacturing and Construction with Oxy-Acetylene Welding", "How and Why to Use Oxy-Acetylene Cutting", and "Maintenance and Operations Uses of the Oxy-Acetylene Process", scheduled for the technical sessions.

Welding and Cutting Round Tables

With well-informed chairmen and expert technical advisers to answer your questions, these meetings offer a real opportunity to learn more about the phases of welding and cutting in which you are interested. The plans for both evenings include a group of meetings, held concurrently, for open discussion of the subject in hand. No stenographic reports will be kept. The meetings will be entirely informal. You must be present to benefit from the free and frank Round Table Discussions.

Plant Inspection Trip

An interesting and unusual tour through the Tennessee Coal, Iron and Railroad Company's Ensley and Fairfield properties has been arranged to provide illustrations of many of the welding and cutting techniques discussed during the convention. The itinerary will include stops at the rail mill, mines, open hearth blast furnace, and the new sheet mill.

Everyone Welcome—An Educational Opportunity

Interested visitors and guests, as well as members and delegates, are cordially invited to attend every session of the 38th Annual I.A.A. Convention.

While admittance to all meetings is by official registration badge or ticket, there is no registration fee.

Write to the Secretary now for a copy of the complete program. You and your business will profit.

INTERNATIONAL ACETYLENE ASSOCIATION

Established 1898

30 East 42nd Street, New York, N. Y.

PROGRAM

Condensed Summary

Wednesday, November 10, 1937

12:15 P.M.—Opening Luncheon, Address of Welcome, Keynote Address, President's Address, and Presentation of Morehead Medal. *Peacock Ball Room, Tutwiler Hotel.*

2:30 P.M.—Technical Session. *Peacock Ball Room, Tutwiler Hotel.* General Topic: "Speeding Manufacture and Construction with Oxy-Acetylene Welding"—with papers on . . . Butt-Welding of Railroad Rails . . . Piping Design, Fabrication and Erection . . . Joining Copper Bus-Bars with Brazing Alloys . . . Bronze-Welding of Cast Iron Pipe . . . Multi-Lengthening Cast Iron Pipe by Welding.

8:15 P.M.—Engineering Round Table Discussion on Problems of Economics, Management and Design as related to welding and cutting. *Phillips High School Auditorium.*

Thursday, November 11, 1937

12:15 P.M.—Annual Luncheon and Business Meeting, Report of Oxy-Acetylene, Legislative, and other important Committees. *Peacock Ball Room, Tutwiler Hotel.*

2:30 P.M.—Technical Session. *Peacock Ball Room, Tutwiler Hotel.* General Topic: "How and Why to Use Oxy-Acetylene Cutting"—with papers on . . . Oxy-Acetylene Cutting in Fabrication . . . Management of Machine Cutting Operations . . . Cutting and Tempering of Structural Steels . . . Use of Shape-Cut Parts in Machine Design . . . Oxy-Acetylene Cutting as Applied to Repair and Conversion of Present Cargo Vessels to Tankers, and to Marine Work.

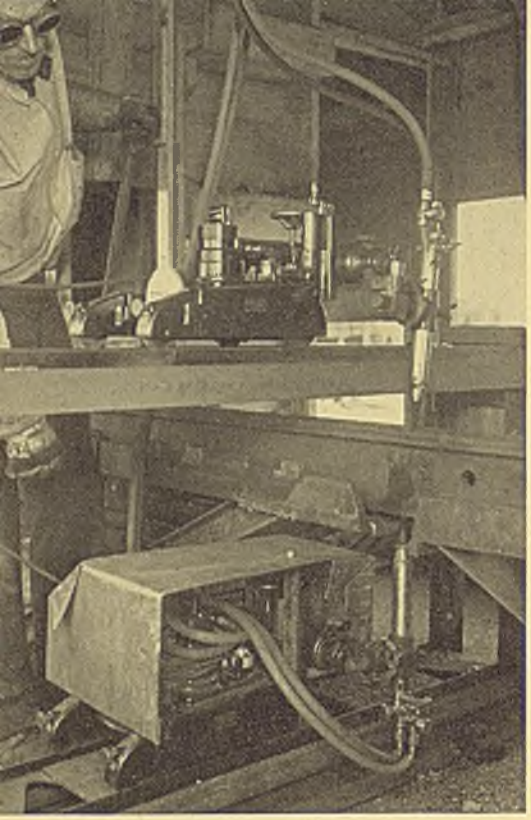
8:15 P.M.—Operating Round Table Discussion on Practical Problems of Welding and Cutting. *Phillips High School Auditorium.*

Friday, November 12, 1937

8:30 A.M.—Plant Inspection Trip.

3:00 P.M.—Technical Session. *Peacock Ball Room, Tutwiler Hotel.* General Topic: "Maintenance and Operations Uses of the Oxy-Acetylene Process"—with papers on . . . Selective Hardening of Ferrous Materials with the Oxy-Acetylene Flame . . . Flame Hardening . . . Important Uses of the Oxy-Acetylene Process in Steel Mill Operations . . . Reclamation of Textile Mill Parts . . . Welding Stainless and Alloy Steels.

38th ANNUAL CONVENTION
Tutwiler Hotel, Birmingham, Ala., November 10, 11, and 12



Cropping the battered ends of worn rails with the oxyacetylene torch accounted for considerable savings to railroads

New Development

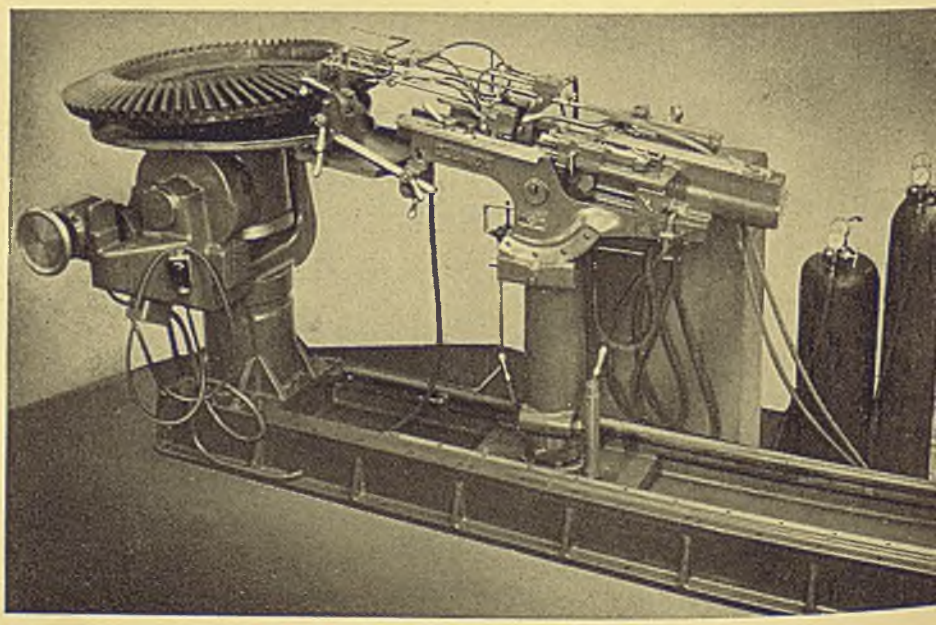
Acetylen

Abstracted from a report to be presented at the thirty-eighth annual convention of the International Acetylene association, Birmingham, November 10-12, this article presents a picture of progress in applications and uses of acetylene during the past year

THE economic vigor of an industry is shown not only by the way in which it suits its gait to the varying pulse of the business cycle, but also by its ability to develop new processes as outlets for its products to replace that portion of its substance lost by the constant attrition of competitive industries. The year 1937 tested the vigor of the oxyacetylene industry not only to the limit of its productive capacity; it tested its ability to supply technical developments in large measure to answer the insistent pressure of the industries it serves to make things faster, cheaper and better. In reviewing the state of the oxyacetylene industry in 1937, special emphasis will be laid on these newer technical developments of our industry as they present themselves on the unfolding picture of the year's progress, and as they evidence solutions to the problems of industrial production.

For industry in general, 1937 was a year of renovation, of expanding productive equipment, of scrapping obsolescent parts. The world armament race brought scrap from the steerage of freighter bottoms to the first class luxury liners and this enhanced value of scrap added impetus to the desire of industry to make room for expansion by sloughing off outmoded equipment. Extensive and highly organized scrapping programs thus became a feature of the year's activity. In the heavy industries, where obsolescent plants were plentiful and particularly in the railroads with thousands of worn out cars to be replaced, the oxyacetylene cutting torch gave a ready answer to the problem of rapidly converting millions of tons of scrap to salable size. Thousands of new cutting torches were lit throughout the country and placed in the hands of men with no previous training in our industry. The problem of training these operators in particular and of taking up the slack caused by the general lack of oxyacetylene operator apprenticeship during the depression years, was thrust squarely at our industry in intensified form by this scrapping activity. Operator training occupied a good portion of the year's service of our industry.

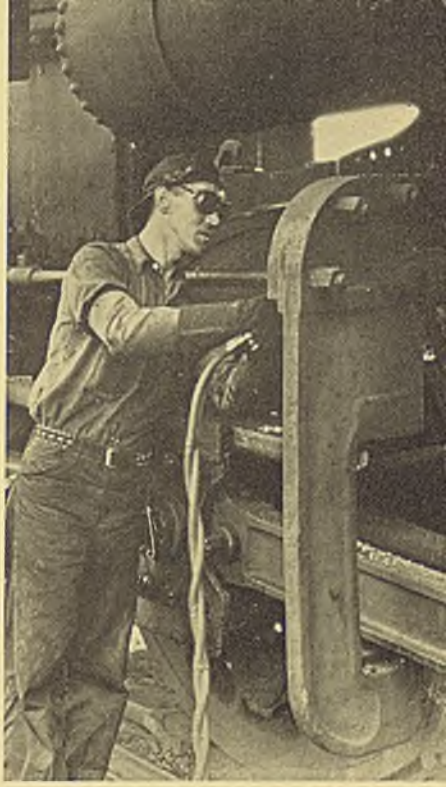
Another feature of the year 1937 was the increased acceptance of the oxyacetylene process as one which warranted a permanent investment in the form of pipe lines to distribute oxygen and in some cases acetylene from central locations to all consuming points. An ever increasing number of industrial plants have come to the reali-



Gear hardening with the torch and with multiflame heads has found increasing applications

Become Key To Progress

BY DR. G. V. SLOTTMAN
Air Reduction Sales Co., New York



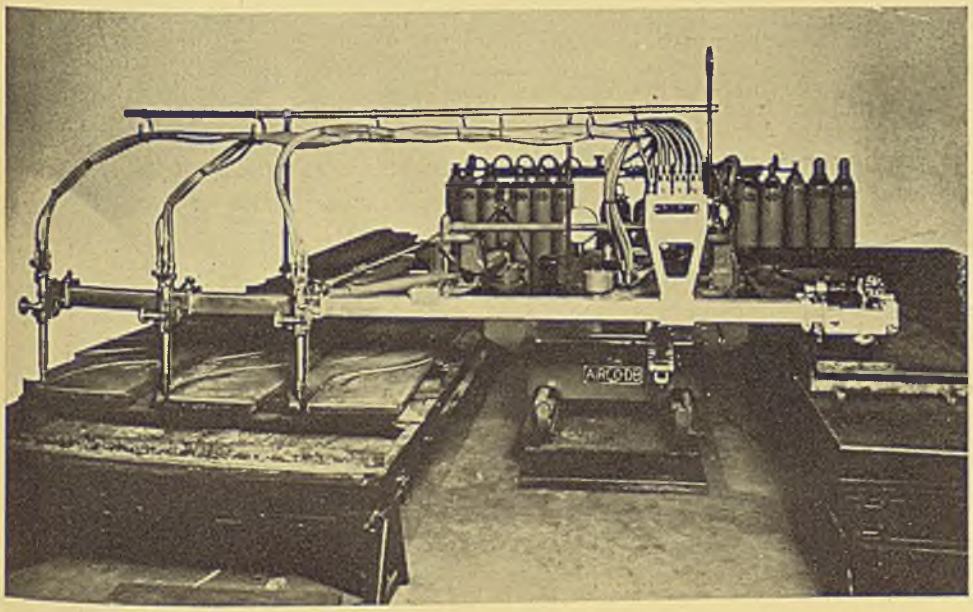
Well-designed jigs and fixtures facilitate welding operations

zation that with oxygen piped and conveniently available throughout a plant, many problems which yielded laboriously to the hacksaw or sledge, disappear entirely in the heat of the oxyacetylene flame. Oxygen, instead of being the proverbial plumber's tool to be gone after, stands ready to serve at the crack of a valve and tolerates no competitive process in speed or economy. The general availability of pipe line oxygen throughout industrial plants, and particularly in those departments where use is heavy, is coming to be the accepted form of oxygen distribution. The service of the oxyacetylene industry in fostering, planning and installing such piping systems has resulted in a wider use of its products, and has benefited industry in general by increasing the efficient and economic use of its processes.

The use of oxygen to condition steel stock for the finishing mills, and to replace the chipping hammer, is becoming widely accepted. Formerly regarded as, at best, a salvaging process, to reclaim stock too badly cracked to warrant chipping, deseaming is taking its place as a production tool of the steel industry. The advent of the high production continuous strip mills to be fed with large tonnages of conditioned slabs, and the increasing quality demands of steel consumers requiring finer conditioning of the stock, have brought the scarfing torch into the chipping yard. Larger sections, ingots, slabs and blooms are being generally skinned or spot scarfed with the oxyacetylene torch. The extension of the process to billet sections as small as two inch squares is in progress and promises to be as universally acceptable as the conditioning of larger stocks. To paraphrase the words of an executive of one of the country's largest steel producers, "The use of the oxyacetylene process for steel conditioning is without doubt the most significant development in the art of steel making within recent years".

Machine operation of scarfing torches marks a further development of the steel conditioning process. By mounting a number of scarfing torches on a traversing carriage, whole surfaces of blooms fourteen inches in width can be removed at linear speeds greater than two feet per second. The problems of surface condition in high quality steels, which have been solved in the past by mechanical skinning tools, are now being attacked from the basis of using stationary scarfing machines permanently located at the blooming or slabbing mills to completely desurface the hot slab or bloom as it passes to the finishing mills. The operation of steel conditioning with the oxyacetylene process represents one of the finest examples of the service of the oxyacetylene industry to the basic industries of this country.

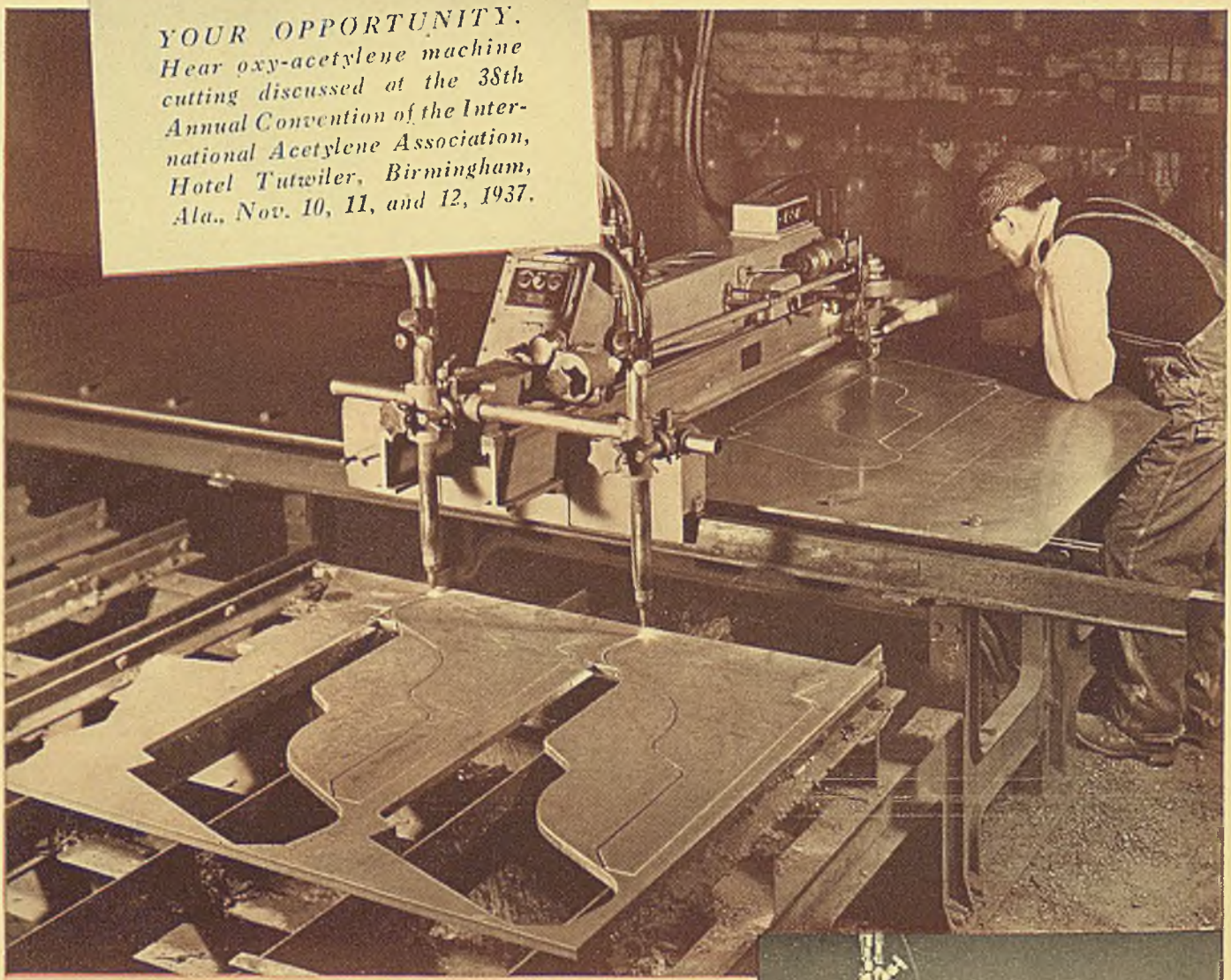
Railroad activity in car scrapping has already been commented on. As with the renovation of the rolling stock, improvement of the right-of-way was similarly studied. Wider application was made of the oxyacetylene process of rail joint hardening to resist batter, and the building up by welding of battered rail ends. A number of machines were developed with the purpose of making the rail end hardening process semiautomatic. Rail joint better-



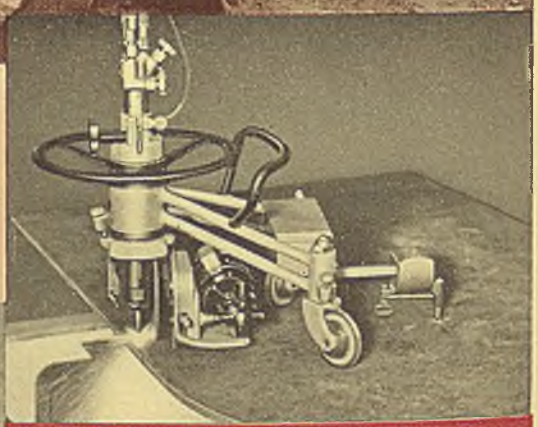
Marked increase has been noted in the use of machine gas cutting in a wide range of industries

Modern Applications

YOUR OPPORTUNITY. *Hear oxy-acetylene machine cutting discussed at the 38th Annual Convention of the International Acetylene Association, Hotel Tutwiler, Birmingham, Ala., Nov. 10, 11, and 12, 1937.*



Above. The Oxweld CM-12 Cutting Machine is unequalled for fully automatic, production shape cutting. Two or more cutting blowpipes can be used simultaneously for production shaping of similar parts. The blowpipes can be adjusted to any angle for bevel cutting. *Right.* The new Oxweld CM-16 portable cutting machine can cut steel plate up to 4 inches thick in straight lines or circles automatically; or when guided by hand, it can cut irregular shapes. The machine can be easily carried from job to job.



Far Left. This intricate reverse lever crank arm was readily and economically shaped from a 12-inch thick slab of steel by flame cutting in two planes. *Near Left.* With the easily made templet guiding the tracer, accurate cutting was achieved in shaping this 3-ton pitman. Note the smooth faces of the cut edges.

# of FLAME CUTTING

remove many Limitations in Fabricating Steel

STEEL shapes of any kind—simple flat pieces or complex shapes which require cutting in a number of planes—can be cut quickly and economically from plate or other rolled, cast or forged steel sections with Oxweld oxy-acetylene shape-cutting machines.

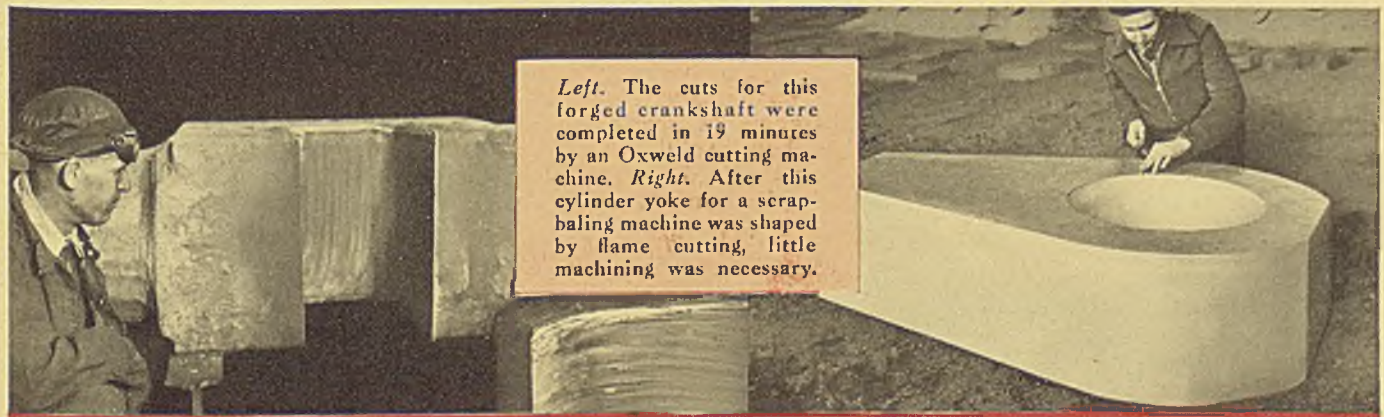
Facilitates all Phases of Production

Flame cutting simplifies manufacturing operations in many ways. Production is speeded up; costs are lowered. Parts and equipment are designed for their most effective and practical use. Expensive change-overs in machinery for the shaping of redesigned parts do not have to be considered; no such limitations exist when flame cutting is utilized. Design changes can be made either gradually or rapidly; only new drawings or templets are needed to produce shapes of changed outline and dimension. As a result, the user of flame cutting often gains many sales advantages for his products. Also, since flame cutting can be used for making many classes of replacement parts, he frequently can reduce parts inventories and the risk of parts obsolescence.

Complete Line of Oxweld Machines

There is an Oxweld flame cutting machine—portable or stationary, partly or fully automatic, of almost any capacity—for every cutting need. A representative from the nearest Linde office will gladly review with you the possibilities of improving cutting accuracy and of expanding and speeding up production in your plant with machine flame cutting. He will help you select the Oxweld machine best fitted to lower your manufacturing costs. Your request for this help will not obligate you. The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation, New York and principal cities.

The word "Oxweld" used herein is a registered trade-mark.



Left. The cuts for this forged crankshaft were completed in 19 minutes by an Oxweld cutting machine. *Right.* After this cylinder yoke for a scrap-baling machine was shaped by flame cutting, little machining was necessary.

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PRESTOLITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES FROM UCC LINDE UNION CARBIDE

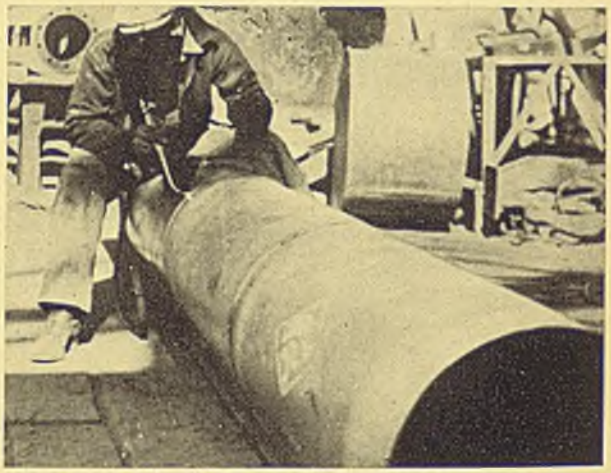
For greater strength and safety, airplane fuselages and frameworks are fabricated of chromium-molybdenum steel tubing by oxyacetylene welding. This is now a standard practice in airplane manufacturing plants

ment programs running into hundreds of miles of track were common to the larger roads.

Several large rail cropping programs made use of oxyacetylene cutting machines in place of friction saws for producing a smoothly cut rail section, back of the battered end, suitable for re-service in the line and at a considerable saving in time and money over the older process. Rail joint welding to eliminate joint maintenance entirely and to improve electrical conductivity for signal and power circuits continued to find growing application. Oxyacetylene bronze or steel welding of mine car and industrial crane rails has become common practice. Several long tunnel sections of railroad rail were oxyacetylene steel welded. Experimental work on railroad track in the open has also been continued, with promising results.

The introduction of multilayer or multipass oxyacetylene welding of heavy wall pipe for high-pressure, high-temperature steam and oil lines marked a new development in the pipe welding field. The grain refining and stress relieving effects of multiple passes laid down with the oxyacetylene torch have allowed of obtaining physicals, particularly in ductility and impact resistance, suitable to the most exacting service.

Continued use is being made of multiflame tips and semiautomatic multiflame welding holders, particularly in the production double lengthening of pipe in the mill. The problem of welding casing in the oil fields of the southwest and of producing welds in the higher carbon ranges which will stand drastic quenching without serious effects on the physicals was investigated with promising results. Mechanical welding of pipe and tubing using multiflame oxyacetylene welding tips was a very active field and the past year saw a large number of new applications of this process.

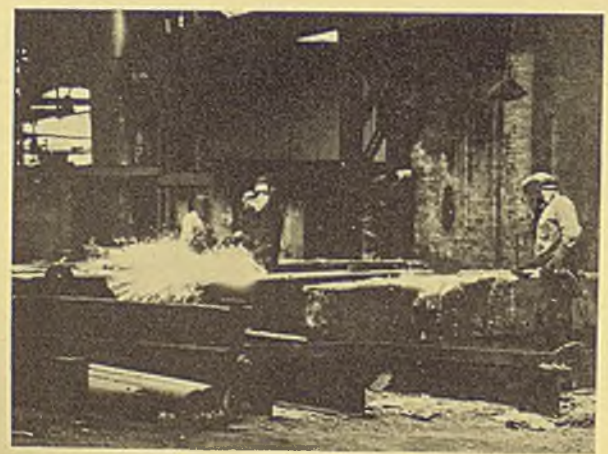


Progress in welded piping is illustrated by this large diameter pipe for water service at Grand Coulee dam

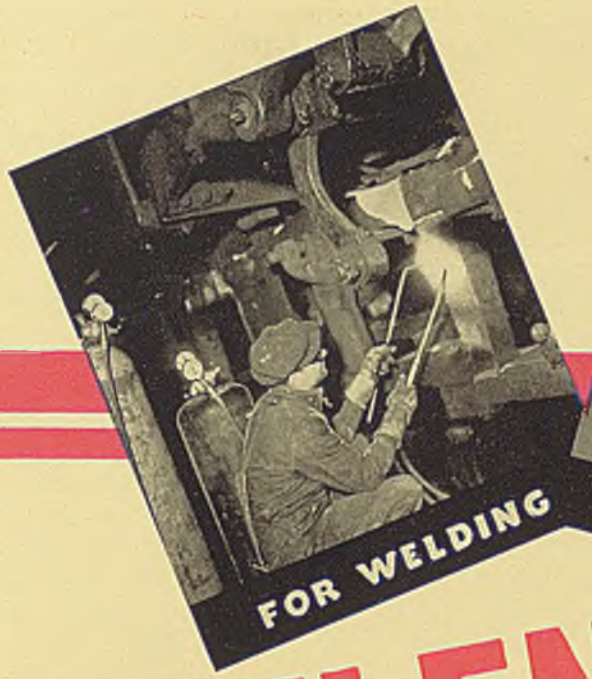
The widespread acceptance and specification of welded piping in governmental resettlement and private housing projects during the past year created a demand for trained pipe welding operators which was successfully met by the co-operation of many educational bodies. Municipalities co-operated in offering the facilities of their trade schools. In some localities, trade unions offered courses to their members. Much of this educational work, however, fell upon the members of the oxyacetylene industry as suppliers of equipment or welding gases and our performance in this phase represents one of the highlights of the year's activity.

In the nonferrous field, the wide acceptance by codifying bodies of hard solders of the silver solder type, applicable only with the oxyacetylene flame, has opened up virgin territory in replacing older methods of fabrication in general plumbing. Here again the problem of educating old crafts to new processes has fallen upon our industry. One of the most spectacular uses of silver solders, and one which will be discussed during the present convention, is in the assemblage of copper bus bars for collecting and distributing electric current in large central station and other power projects. Jointing of the bus bar members was formerly done with rivets. Vibration and the continual heating and cooling of the joints in service gradually increased the resistance of the joint, impairing its electrical efficiency and becoming a source of constant maintenance expense. Silver soldering these members, provides joints of exceptionally low electrical resistance, high physical strength, freedom from maintenance and allows of streamlining the bus bar assembly, improving its utility and appearance.

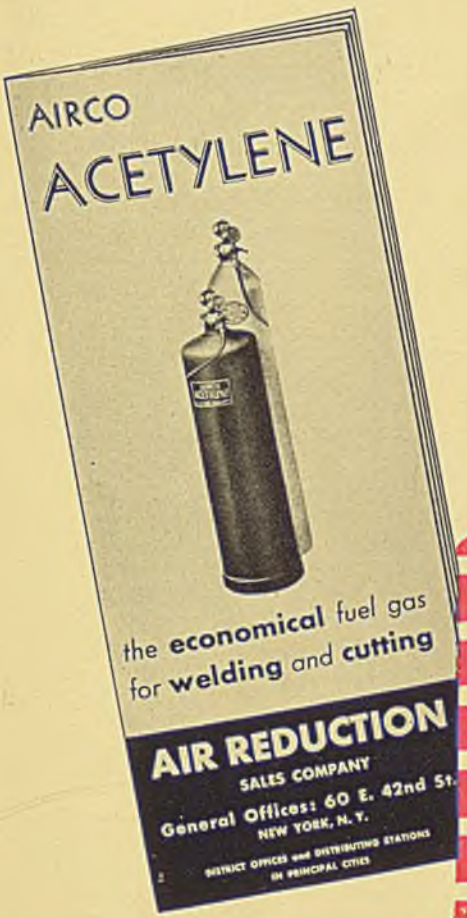
Bronze welding continues to be the accepted method of rebuilding worn parts and for heavy maintenance and repair work. As bronze welding requires only tinning of the base metal to form a permanent bond, it is possible to repair many broken parts in place using only light local preheating. Strong ductile welds are made, often superior in strength to the base metal, making possible the salvage of many expensive parts, and what is frequently more important, preventing long shutdowns of productive equipment. In this latter field, bronze



Deseaming ingots with the torch has become quite widely accepted in the steel industry



ACETYLENE *is the* SUPERIOR *fuel gas*



When it comes to the high temperature operations of gas welding and cutting, no other fuel gas equals, and no other fuel gas *can* equal, Acetylene for efficiency and economy.

Scientific law says this is so—for Acetylene is endowed by nature with certain properties, not possessed by any other fuel gas, which give it marked thermal advantages for high temperature applications.

It's an interesting story, and one which every user of the gas welding and cutting processes should know. It is told in easy-reading, non-technical terms in the little AIRCO Acetylene booklet. The coupon will bring you a copy. Mail it—today.

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Hundreds of Ways

HAYNES STELLITE WELDING ROD is economically applied to thousands of wearing surfaces to give them longer service life. The valve seats and disks shown here are typical examples.

AS GOOD AS 10 DISKS. A Haynes Stellited disk, of a 6-inch boiler feed valve operating at 1200 pounds pressure, will last 10 times as long as the one it replaces. On the disk at the left, Haynes Stellite has been applied. On the one at the right, the Haynes Stellite has been ground to accurate dimensions and the disk is ready for service.

HAYNES STELLITING MEANS MORE THAN LONGER LIFE

In addition to longer life and fewer replacements, Haynes Stelliting often makes other important savings. Consider these economies that resulted from hard-facing the following parts:

Ditcher teeth—Fuel consumption reduced 15 per cent.

Cement grinder rings—Efficiency increased 30 per cent.

Rail mill guides—Guide inventory reduced 80 per cent.

Hot shear blades—Cleaner cut and better edges produced.

Car wheel punches—Subsequent machining costs reduced 40 per cent.

Coal bits—Savings of 25 per cent made in power consumption.

Pulverizer hammers—More uniform sizing of coal obtained.

Coke pusher shoes—Longer life obtained from furnace floor.

Dies—Grinding costs reduced 89 per cent.

to Save MONEY

with Haynes Stellite Welding Rod

HOT or cold, a Haynes Stellited surface is one of the most resistant to abrasive wear that is known. It makes wearing parts last from 3 to 10 times as long as similar parts that have not been Haynes Stellited.

Haynes Stelliting Economies

The widespread use of Haynes Stellite welding rod by present-day industries is effecting major cost reductions in many ways. It gives longer service life to equipment. It saves parts replacements, with resulting savings in maintenance and production. It permits the use of cheaper base metals for wearing parts. It enables worn parts to be salvaged or reclaimed. It avoids sluggish operation and lowers power consumption. It produces a general increase in operating efficiency.

Performance Records

The accompanying photographs of hard-faced valves and seats show a few of the almost countless ways in which Haynes Stellite combats wear, minimizes maintenance and saves money. Five hundred other money-saving applications of Haynes Stellite, taken from actual performance records, are described in the book "Hard-Facing With Haynes Stellite Products." A new 104-page, 4th edition is now ready. Write the nearest office today and a copy of this book will be sent to you without obligation.

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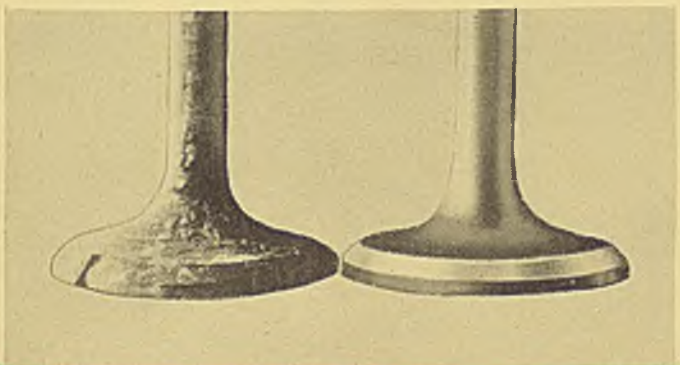
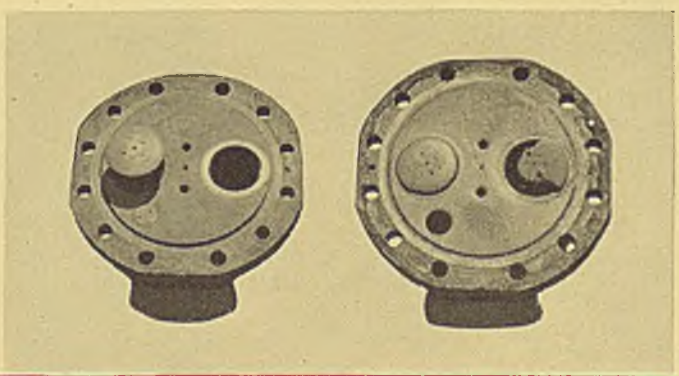


OUTLASTS SEVEN VALVES. Notice the effects of pitting and burning on the ordinary steel valve at the left after one month's service. Compare this with the excellent condition of the Haynes Stellited valve (right) after seven months' service in the same engine. (The Haynes Stellited valve was not reground and the picture is not retouched.)



LIFE RATIO 1 TO 2. The cylinder head on the left has a Haynes Stellited exhaust valve seat insert, and is still in good condition after 14 months of service. The head at the right was not protected with Haynes Stellite, and all wearing parts are badly burned after only two months service. (The cylinder heads are unretouched.)

welding repeatedly performs in spectacular fashion to the benefit of the heavy industries.

Increased use of fabricated parts and intensified activity in machine cutting development have marked the year's activity in the general manufacturing industries. A rapid transition in the status of oxyacetylene cutting from the roughing out tool to the accurately precise finishing tool is taking place. A wide variety of oxyacetylene cutting machines are available to the fabricating industries from the light portable straight line and circle cutting machines to production machines capable of cutting plates of unlimited length and in the greatest widths rolled, without movement of the work. Multiple torch operation on these machines allows of mass production of washers, flanges, car frames and similar parts.

Much attention has been given to the planning of fabricating problems, to the selection of suitable equipment from the variety of machines available, to the handling of material at the machines and to production scheduling to insure their efficient use. Portability and flexibility have always been considered among the prime advantages of cutting machines. This concept of a cutting machine, as being a portable tool to be brought to the work, has been changing in certain operations, particularly in riser cutting, to that of a tool permanently located on a production line working on the passing material. The mechanical features of cutting machines are being constantly studied and improved to increase their precision and to reduce vibration, lost motion and other sources of cut irregularity.

The cutting process itself and the effects of oxyacetylene cutting on the physicals of certain steels have been studied and the scope of the cutting field continuously expanded.

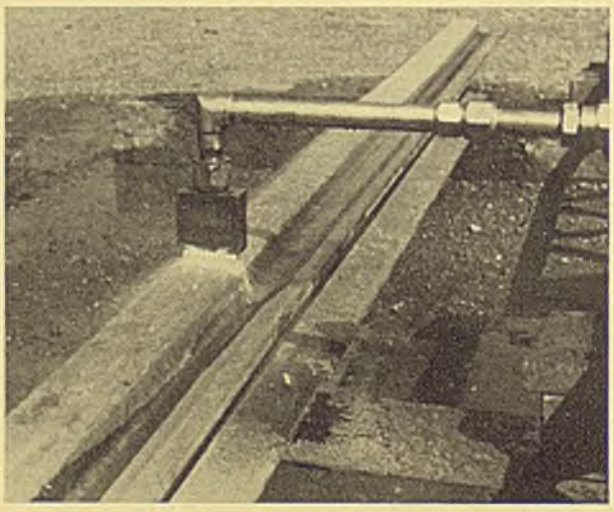
Similarly, with high carbon steels which show a tendency to check at the cut surface, the use of auxiliary preheating flames to preheat the line of cut has made it possible to cut such steels without preheating the entire piece. Methods have also been developed for machine cutting the stainless and Monel clad steels, which have proved of great value to the industries using these materials.

An interesting development of the past year has been the revival and wide-spread application of the old process of torch hardening. This process, variously known as flame, surface, selective or torch hardening utilizes the oxyacetylene flame as a heating medium in an operation metallurgically analogous to the widely used furnace hardening methods. Dating from the beginnings of the oxyacetylene industry and used in a limited manner in certain applications, the general utility of this process has been strangely restricted.

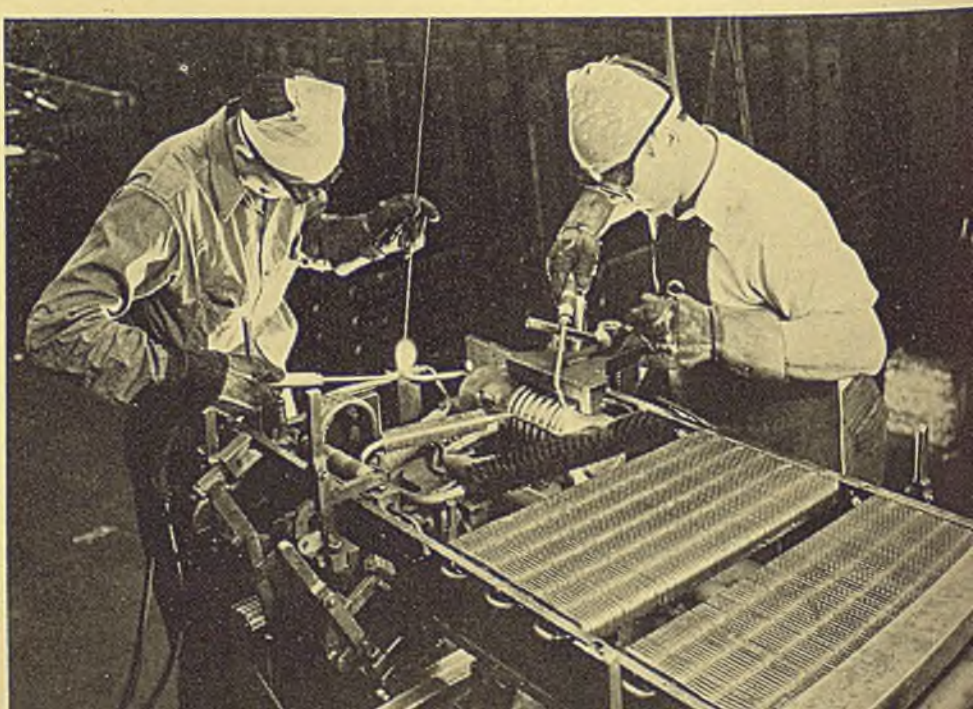
Starting with the contact surfaces of large gear teeth, this process has been gradually extended to cover a wide field of application including shieve wheels, cross head guides, cam shafts, ball races, sprocket wheels, shafts and other wearing parts common to machine design. The past year has seen an increasingly general recognition of the scope and utility of this process by machine manufacturers. An active development of suitable oxyacetylene equipment, particularly water cooled multiflame tips and torches, and machines for guiding these tips across the surfaces to be hardened as well as a thorough study of the hardening technique are in progress, which will make the flame hardening process steadily more serviceable to industry. The two papers on flame hardening which will be presented at this meeting indicate the general interest which has been aroused by this process.

Continued acceptance of welding and cutting by the various codifying bodies has been a feature of the past year. Of most general import perhaps, is the allowance of structural welding in the recently revised building code of the City of New York, particularly since this code serves as a model for many other municipalities throughout the country. A broad increase in the use of the oxyacetylene process for cutting and preparing welding surfaces in the field is to be expected as a result of the more general application of welding in

(*Please turn to Page* 120)



In many operations requiring hardening, flame treatment has solved difficult heat treating problems



Fabrication of refrigerator units by oxyacetylene welding represents a major advance in design for production

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PROTECTION is needed!

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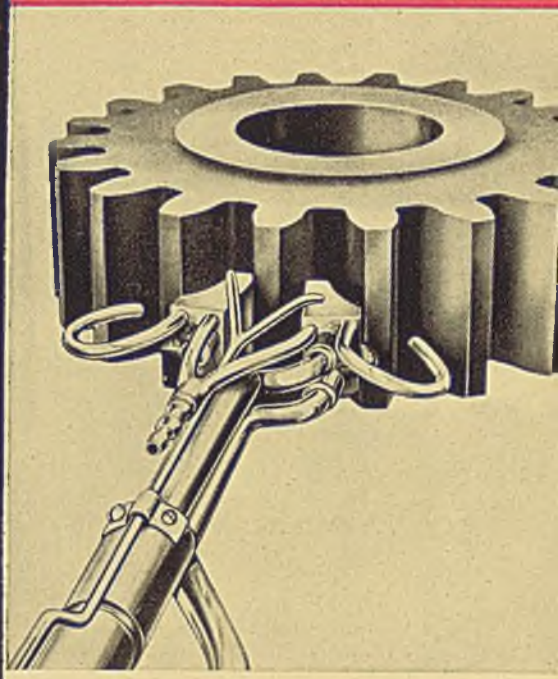
NOW you can have hardness exactly *where* you want it—on outside surfaces only. The simple National Flame Hardening process is the quick and easy way to get increased surface wear resistance and keep desired core strength and ductility. Quick, shallow-depth heating by an oxy-acetylene flame followed with a water quench creates this ideal result of exterior hardness and interior strength. This can be done with any hardenable steel—without changing physical properties, or causing distortion.

National Flame Hardening Advantages

1. Low Process Cost.
2. Hardening of entire unit is unnecessary.
3. Rapidity makes it a *production* process.
4. Use of simple carbon steel is often possible instead of expensive alloys.
5. Maximum surface hardness is not sacrificed to retain necessary core properties.
6. The process combines all the advantages of other methods, and in addition, is readily adapted to production work.

There are so many varied applications of the National Flame Hardening process that each requires special consideration. Burner designs, technique and equipment are adapted to each problem—the National Process will help you solve yours economically and efficiently.



Gear Wheel Hardening—Torch in working position.

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Round Table Talks Offer Opportunity For Discussion

FOR the first time in the South, at the Birmingham convention of the International Acetylene association, managers, engineers, foremen and welding operators will exchange ideas on important phases of oxyacetylene welding and cutting at a series of round table discussions. These meetings will be strictly informal and will offer an unusual opportunity to obtain authoritative, unbiased opinions on everyday problems concerned with oxyacetylene welding and cutting. Outstanding leaders, experts in their field, will be present to answer questions on management and on technical aspects of the oxyacetylene process. As no record will be kept of the discussions, it is expected that frank opinions will be expressed.

The program for the 38th annual convention of the International Acetylene association includes two evening sessions of round table discussions. Both will be held in Phillips high school. The first, or engineering session, will be held Nov. 10, and is for those who are, or who will be in the future, concerned with the planning and supervising of welding and cutting operations. This series of discussion groups will be of particular interest to managers, engineers, foremen and field supervisors, but is open to all those desiring to attend. Open discussion of economics, management and design relating to welding and cutting is invited.

The second, or operation session, will be held Nov. 11, and should be of interest to shop owners, welding and cutting operators, foremen, supervisors, and others planning, managing, and performing welding or cutting operations. Scheduled subjects will be treated from the practical angle. How to do certain jobs, what materials to use and all "down-to-earth" details of actual welding and cutting work will be considered.

Each session will consist of a series of concurrent meetings devoted to particular phases of oxyacetylene welding and cutting. Each meeting will be conducted informally by a chairman who will be assisted by guest technical advisors of national and international prominence. The advisors, each an authority on the subject under discussion in his group, will be present to answer all relevant questions as completely and impartially as possible.

Subjects to be discussed in group meetings at the first, or engineering session, will include, first, "Codes, Regulations and Operator Training." Discussion here will confine itself to the problem of economical management relating to teaching operators quickly and efficiently, the testing and qualification of operators, specifications and code requirements. The recent revisions in the boiler repair rules, issued in 1936 by the authority of the National Board of Boiler and Pressure Vessel Inspectors has definitely established the recognition of fusion welding for this type of repair. In addition, a series of interesting tests organized under the American Standard association to determine the shearing strength of steel anchor clips bronze-welded to cast iron pipe were recently completed. These investigations, together with the American Welding

J. I. Banash

JAMES I. BANASH, chairman of the Wednesday evening round table discussions, is a graduate of Massachusetts Institute of Technology. He is known as a nation-wide authority on safety measures concerning compressed gases. He is consulting engineer for the International Acetylene association, a past president of the National Safety council and was formerly head of the casualty department of Underwriters' Laboratories. He has been a member of the executive committee of the National Safety council since 1928, and since 1931 he has served as the National Safety council's representative on the National Fire Waste council

society investigations, published as "Specifications for the Design, Construction, Alteration, and Repair of Highway and Railway Bridges by Fusion Welding," have raised many questions in regard to regulations, design and management. Because of these many recognitions, it is expected that the group meetings relating to codes and regulations will be exceptionally well attended.

"Hard-Facing," is the subject of another meeting. Here, economies, the design of parts for hard-facing, the resurfacing of worn parts, the use of hard-facing in production operations and related subjects will be discussed pro and con. Because so many manufacturers of machine parts have standardized on hard-faced equipment in the past year, this economical process has assumed a position of primary importance in the field of industrial maintenance. Interest in the subject runs high, and a capacity crowd is expected.

To Discuss Cutting

The many and varied uses of oxy-acetylene cutting, especially machine cutting, are gaining much interest in fabrication plants. In addition, the versatility of the oxygen lance for penetrating almost any thickness of metal has proved to be of special interest. Thus, the session devoted to "Cutting and Use of the Oxygen Lance," in which such topics as management of machine-cutting operations, hand cutting, how to use the oxygen lance, costs, and similar subjects will be treated, is expected to arouse considerable enthusiasm.

For the benefit of those interested in the welding of nonferrous metals, one group meeting will be devoted to "Aluminum, Nickel, Copper, and Other Nonferrous Metals." Subjects under consideration will include how and when to weld nonferrous metals, production and welding, repair of broken parts, and the special techniques required for welding various materials. The importance of this phase of oxyacetylene welding has been growing steadily, and many new techniques have been developed in recent years. The technical advisors chosen for this group represent many of the leading nonferrous metal manufacturers.

Designing for the effective use of high-strength stainless and alloy steels, and consideration of how and where to use these products, are among the foremost considerations before engineers today. Welded construction and high-strength alloy steels go hand in hand in the fabrication of stronger and lighter equipment. Another group of the round table discussions will be devoted to these problems. This modern, up-to-date phase of welding and cutting arouses interest whenever mentioned, and it is to be expected that there will be a splendid attendance at this group meeting.

The ever-present problem of "Fire Prevention and Safety" will be discussed at another group meeting. Recent interest has centered about this subject, especially with regard to the safe handling of welding and cutting equipment, and the proper use of portable oxyacetylene cutting equipment. Safe locations and surroundings will be discussed as well as the causes of fires and how best to prevent them. Representatives of Underwriters' Laboratories Inc., Factory Mutual Laboratories, the National Safety council and other important regulatory bodies are expected to advise and suggest the proper procedures for best accomplishing fire prevention.

The many new methods of pipe welding introduced within the last few years have focused attention on this subject. In addition, overland pipe construction has had a year of marked activity. The all-bell-hole type of construction, multiflame welding, multilayer welding, and

welded power plant piping, design, and fabrication, will be among the topics under consideration at the group discussion on "Pipe Welding."

At the second session of the welding and cutting round table discussions, special consideration will be given to the practical aspects of each process. Here again, the most important subjects, "Pipe Welding"; "Cutting and Use of the Oxygen Lance"; "Stainless and Alloy Steels"; "Aluminum, Nickel, Copper and Other Nonferrous Metals"; and "Hard-Facing" will be repeated from a practical viewpoint. In addition, other specific phases of the oxy-acetylene process will be considered from the operating angle.

"Low Temperature Brazing and Use of the Air-Acetylene Flame" will constitute a group discussion of an almost entirely new subject. In the domestic and office building heating and air-conditioning field, tremendous impetus has been opened in the use of copper and brass tubing with solder-type fittings. Lower installation costs, speed of installation, the ease of making alterations and renovations in existing buildings, and the ultimate permanence and maintenance-free operation of such systems hold wide appeal. In addition, the widespread use of zinc die castings has opened up a considerable market for the repair welding shop operator. These subjects, together with the older topics of lead burning and armature soldering will form the basis for discussion in this group.

Sheet Metal Welding

"Sheet Metal and Steel Plate Welding" has become almost an industry in its own right. Production welding methods, the proper use of jigs and fixtures, prevention of distortion and similar topics are heard wherever welding operators are gathered. This subject is so important that the group discussing sheet metal and steel plate welding will surely be augmented by a number of engineers, designers, and managers of fabricating shops manufacturing sheet metal products by fusion welding.

Last but not least, the well-known subject of "Bronze-Welding" will be taken up in a discussion group. The bronze-welding process, which is used so widely for repairing broken castings and maintenance welding in large industrial plants, is always the center of interest wherever welding is done. When to use the process, how to get best results, when to preheat, and the proper materials to use are but a few of the timely subjects which will be discussed in this group.

W. S. Hays

W. S. HAYS, managing director of the American Welding society, is general chairman of the Thursday evening round table discussions. He is a graduate of Yale university. For many years Mr. Hays has maintained his own consulting engineering and association executive office. He is a past president of the American Trade Association Executives and also a former officer of the National Industrial Advertisers

Acetylene Industry Assumes Major Proportions

BY C. D'W. GIBSON

President, International Acetylene Association

An annual feature of the International Acetylene association meeting is the president's address, highlighting the work of the year in the industry. STEEL presents herewith an abstract of this year's message

LAST year Mr. Epperson gave us the definition that "an association was a body of people united in the interest of a common object." In 1892 not so very far from here, calcium carbide was discovered and the progeny of this interesting and valuable substance, (acetylene gas) became the object of our attention. Our association was formed in 1898 just a few years after the beginning of the industry. This association, of course, interested itself immediately in the care and development of this interesting and healthy child, and during the past forty-five years we can turn back the pages of our diary and recall experiences in the house lighting field, with miners' lamps, Bunsen burners, and the early oxyacetylene blow pipes. In more recent years, efficient applications of acetylene to automatic welding operations and semiautomatic flame cutting machines have taken our products over the thresholds of new industrial plants and have projected our interests in the drafting rooms of literally hundreds of industries. And now as we look at our progeny, a healthy man of 40, we find him investigating new fields. Life begins at 40 and carries with it a trace of earlier experiences.

Those of us who are accustomed to think of acetylene as a fuel gas for oxyacetylene welding and cutting operations, or for house lighting and miners' lamps, possibly fail to realize the exceedingly rapid growth that acetylene is making in the chemical industry, not only in this country but all over the world.

An astounding proportion of carbide is used in this country for making acetylene which, in turn, is utilized in the production of acetic acid,

C. D' W. Gibson

C D'W. GIBSON, president, International Acetylene association, is assistant vice president and general sales manager, Air Reduction Co. Inc., New York. A native of Schenectady, N. Y., Mr. Gibson attended Union college where he studied electrical engineering. He has been active in the oxyacetylene industry for eighteen years and prominent in the affairs of International Acetylene association for several years, having served as a member of both the executive committee and the program, publicity and arrangements committee, as vice president last year, and now president. Other societies in which Mr. Gibson is active include the American Iron and Steel Institute and the American Welding society

♦

ELMER H. SMITH, president, Commercial Gas Co., Minneapolis, is vice president of the International Acetylene association. A graduate of the University of Minnesota, he began his welding career as a representative of Davis-Bournonville Co. Since 1918 he has been identified with Smith Welding Equipment Corp. and since 1920 he has been president of Commercial Gas Co.

E. H. Smith

OUR GAS WELDING COSTS WERE 30% LESS LAST MONTH. HOW COME?

Here's Why:

"This Rego Economizer did the trick for us boss! It's a cinch for us welders 'cause all we do is hang the torch up like this and presto, the flame goes out. When I lift it off the Economizer and pass it over the pilot light the torch lights up with the same flame it had when I hung it up. Since we've had this gadget we don't burn gas except when we're actually welding."

TRY THE REGO ECONOMIZER IN YOUR SHOP FOR COMPARABLE SAVINGS

The BASTIAN-BLESSING Company

236 E. Ontario St., Chicago, Illinois

and there is every reason to believe that within the next decade the chemical use of acetylene, which is so rapidly creeping up on the industrial use, will far exceed it. Today 100 basic chemicals can be made as derivatives from acetylene gas. As of today, there are probably over 100,000 tons of carbide—approximately 900,000,000 cubic feet of acetylene—used in the manufacture of various chemicals and from these chemicals rayon, synthetic rubber, plastics, solvents, dyes, perfumes, safety glass, photographic films, and the like are being commercially produced. To the nontechnical man, this is legerdemain. It is done with mirrors. To the organization of many fine chemical companies, it is done with carbides.

Unfortunately, it is difficult to visualize the magnitude of the acetylene industry with all its ramifications, because the products are used in so many different ways by such a widely diversified group of industries in all parts of the world. When we are told that the automotive industry produced over four million cars last year, we immediately have a picture of the size of that industry. Similarly, the ingot production in tons is a visual measuring stick for the steel industry, oil production in barrels conveys a reasonably clear impression of the magnitude of that field. What can we say that would help us convey, more tangibly, the size of the acetylene industry and its collateral interest? The bureau of census of the department of commerce in Washington, from its latest available report on the compressed and liquified gas field, tells us that in 1935 1,133,824,000 cubic feet of acetylene were produced, and we are duly impressed with the astronomical size of that figure. Our oxyacetylene engineers tell us if all that acetylene were utilized in making the circumferential welds on 40-foot lengths of 12-inch pipe, the resulting pipe line would extend in length over 1,250,000 miles—more than enough to reach from here to the moon. Still we have failed to give a fair and recognizable picture of the size of our industry.

Let us look at it in another way. What does that figure mean to industries other than our own? This acetylene has to be dissolved into acetone and shipped throughout the United States, and if all of this acetylene were compressed in cylinders it would take 6,750,000 cylinders to handle it (allowing for a 45 day turnover). With the average weight of steel in these cylinders, here is an original shipment of new cylinders involving 385,000 tons of steel, or 19,000 carloads.

Industry Is Large Buyer

Now, if we go back to the original carbide required to produce our 1935 census figure, we find that the annual tonnage of carbide runs to 8000 carloads. The tonnage involved in the shipment of full cylinders to customers and the return of empties amount to another 45,000 cars, making a grand total annual shipping figure of 53,000 cars.

From our census figure, we can estimate that well over a quarter of a million dollars are annually expended on acetone purchased from the chemical industry. The annual power bill of the carbide manufacturers amounts to several millions of dollars, and these added to the miscellaneous items of supply purchased from the electrical industry and others give positive proof that our industry rates a prominent position as a purchaser.

These statistics apply to the acetylene industry alone, without giving any consideration to the size of its twin brother, the oxygen industry. Without going into the figures, you can visualize the importance of oxygen to American business when you consider that it requires a heavier steel cylinder per hundred cubic feet than acetylene, and that the production of oxygen is about twice that of acetylene. The twins combined form an oxyacetylene industry that is impressive in its scope.

The purchasing power and the influence of our industry can be developed far beyond the point which we have attained and you must appreciate that with the growth of this industry we must walk the bridge with watchful, trained and focused eyes and satisfy ourselves as to our soundings on the uncharted seas which we have yet to travel. Let us look at the bridge deck of this association. To the oxyacetylene committee must go the credit for a complete series of splendid reports that enable us to take advantage of the knowledge already gained, the experimental work under way in our field, and the credit for continually revising and bringing up to date our technical pamphlets on welding and cutting, pamphlets which include the most improved developments and the latest accepted practices. They have also prepared safety instruction booklets, and their report is recognized as a veritable text book for the industry and throughout this country. Under their guidance, subcommittees, co-operating with the Master Boilermakers association, the American Society for Metals and other affiliated technical associations, have done and are doing splendid work. The outstanding achievement of each and every one of our committees is deserving of the highest praise, and I feel sure

---

H. Sidney Smith

H SIDNEY SMITH, the recipient of this year's Morehead medal, is chairman of the executive committee of the International Acetylene association. He obtained his engineering education at the University of Nottingham, and was one of the first men to make calcium carbide in Europe on a commercial scale. Since coming to this country in 1911, he has been associated with various units of Union Carbide & Carbon Corp. Mr. Smith is distinguished by being the only man that has ever been president of both the British Acetylene association and the International Acetylene association

♦

H F. REINHARD, secretary, International Acetylene association, has served in that position for the past six years. Following his graduation from Purdue university, he was a chemist with the Indiana State Board of Health. From 1922 to 1931 he was associated with units of Union Carbide & Carbon Corp. He is well-known in the acetylene industry, having been active in the affairs of the International Acetylene association

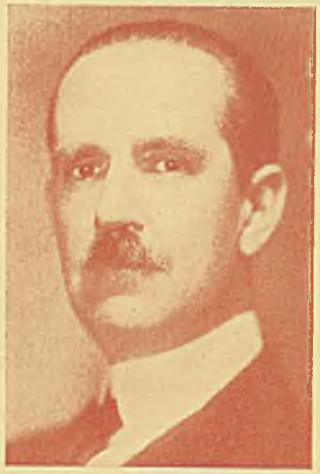
H. F. Reinhard

Henry Booth

HENRY BOOTH, sales manager, Shawinigan Products Corp., New York, is treasurer of the International Acetylene association. For many years he has been active in the International Acetylene association, and prior to his election as treasurer he served as chairman of the membership committee and also in other official capacities. Mr. Booth has been with the Shawinigan Products Corp. since 1920. Prior to that time he had been in the employ of Fairbanks-Morse Co. and also in the advertising business

♦

PHILIP KEARNY, president of the K-G Welding & Cutting Co., New York, is a member of the executive committee of the International Acetylene association. Mr. Kearny was elected director of International Acetylene association in 1932 and served as vice president in 1933. At the annual meeting held in Pittsburgh in 1934, Mr. Kearny was elected president of the association. In 1914 he was instrumental in founding the K-G Welding & Cutting Co., and later became president of this organization



Philip Kearny

I am voicing the sentiments of all our members in thanking them for a job well done.

Today our membership in the association has grown, and as impressive as the list of the names which make our membership, is the list of companies in all industries represented by those names. We have gone far past the question as to whether the association is receiving the wholehearted support of the industry. Like most things in life—we get out of the association just what we put in, no more and no less. We do not need members as much as we need ideas and it is marvelous to see the co-operation we are receiving from people outside of our industry who are today taking active part in the proceedings of these meetings.

As my term of office draws to a close, I want to thank our past president, and the officers of his administration, for turning over a ship that had such splendid momentum and was manned by such a well trained crew.

We are here primarily to discuss our business, and I know that the attention we give to the papers read during the three interesting days to follow and to the discussions at our round tables will prove to those interested that these meetings serve as a catalyst to the exchange of ideas, and that the International Acetylene association will continue to guide our industry along wide and progressive paths in the future.

Use New Ferrous Alloys To Weld Pressure Vessels

■ In fabrication of pressure vessels for many purposes, welding has continued to grow in favor, the material used being the familiar low-carbon steel, according to E. R. Fish, chief engineer, boiler division, Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

More Widely Used

Use of ferrous alloys in various combinations of chromium, nickel, molybdenum, titanium, and columbium for pressure vessels of many kinds and for high pressure piping has grown considerably because of the adaptability of these alloys to special uses wherein high tensile strength, resistance to corrosion and wear are advantageous, according to Mr. Fish. It was stated that fabricators of these materials recognized their welding qualities differ greatly from those of the low-carbon steels and have developed methods and treatments that assure sound welds with the proper physical characteristics, thus producing dependable work.

Many unfired pressure vessels for both high and low pressures have been made of these special alloys. Many pipe lines have been installed, made of carbon-molybdenum steel, to carry pressures on the order of 1200 to 1400 pounds per square inch. These special materials can be satisfactorily welded, but only after intelligent research and experiment have developed the proper welding procedure, according to Mr. Fish.

Quality of Welds Higher

■ New filler metal specifications recently released by the American Welding society indicate improved quality of weld metal may be expected from modern filler materials.

It is pointed out that 80,000 pounds per square inch ultimate with an elongation of 20 per cent in 2 inches is "good weld metal in any language." Other requirements such as free-bend, nick-breaks and density are equally high.

Recent monthly research report of the American Welding society devoted to "Corrosion Resistance of Welded Joints" showed the entire field had been combed for test results and service experiments dealing with the corrosion of welds in carbon and alloy steels and many of the nonferrous metals. In some cases the welds stood up better than the base metal.

Welding in the Oil Industry

In regard to welding's role in the petroleum industry, the society has editorialized:

"Quite early in its history, the petroleum industry became acquainted with welding as an emergency repair tool in preventing costly shutdowns in maintenance of tools and equipment and in the fabrication of its far-flung oil pipe lines, eliminating leaks and reducing maintenance cost.

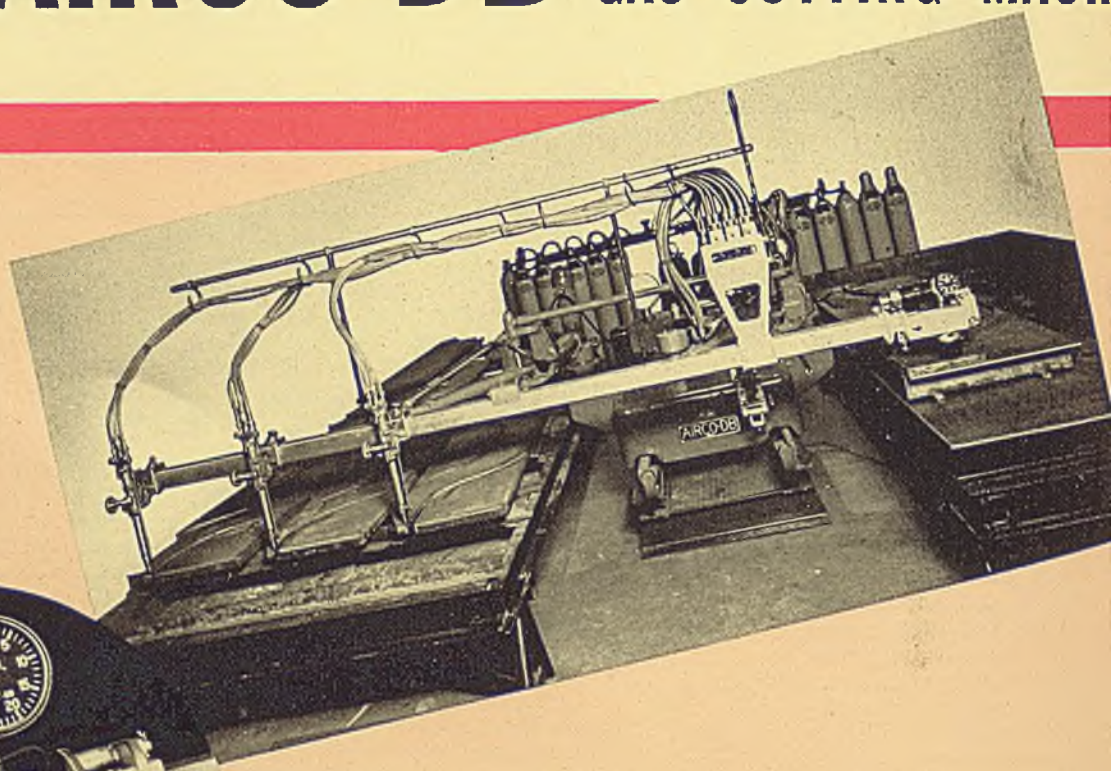
"The welded storage tanks, tank trucks and cars followed in due course. To meet demands for ever-increasing combinations of pressures and temperatures needed in increasing efficiency in oil cracking processes, improvement of quality and development of by-products, the oil industry turned to welding.

"Welded vessels four and five inches thick are taken as matters of course. In the march of progress the fact is well established that carbon steels must give way to alloy and clad steels and the advance guard of welded carbon-molybdenum and other alloy steels for high temperatures, cutting thickness of plate to less than half.

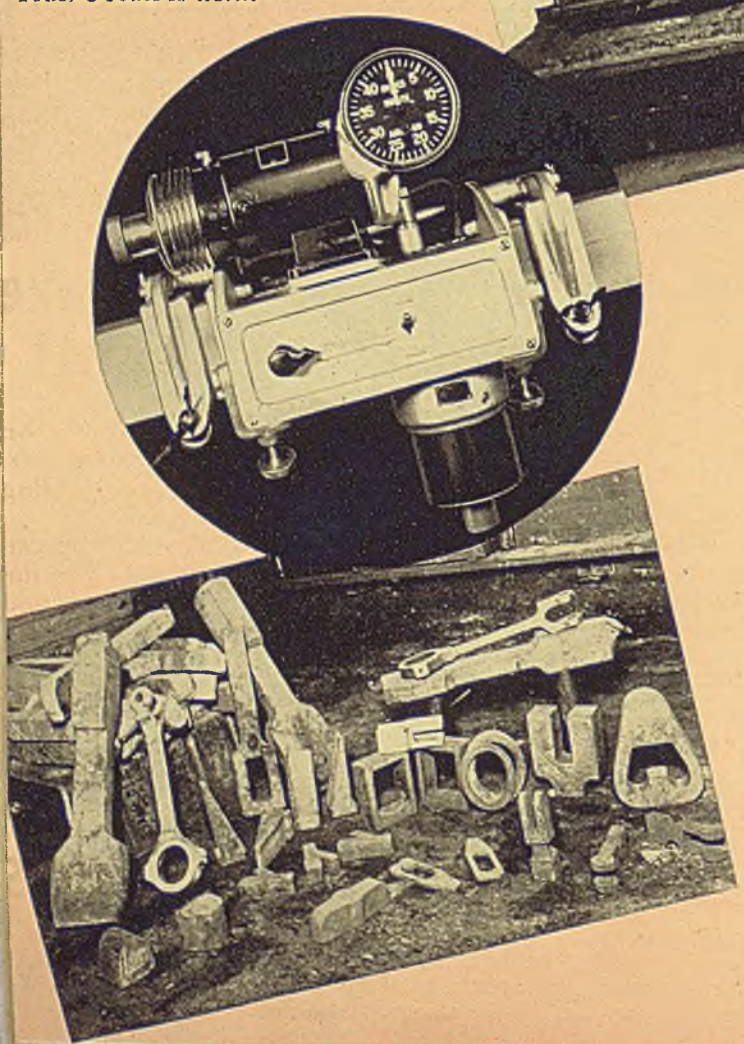
"The future will exact still greater requirements from the petroleum industry, and the welding industry will help meet those requirements."

HERE'S YOUR FORMULA FOR LOW-CO

Flame Cut with AIRCO-DB GAS CUTTING MACH



RIGHT: *AIRCO-DB No. 10 TRAVOGRAPH with Magnetic Tracer, Electrical and Multiple Torch Gas Control Unit. AIRCO manifolded Oxygen and Acetylene Cylinders in background.* BELOW: *Close-up of Motor Driven Magnetic Tracer with Tachometer and Quick Speed Changing Device. Motor-Driven mechanically guided tracer is also available. Lower picture shows typical TRAVOGRAPH work.*



The New AIRCO-DB TRAVOGRAP provide largest cutting area

With cutting areas up to 120 inches wide by 13 feet l these latest additions to the comprehensive AIRCO-DB make possible the simultaneous production of dupl parts in larger quantities with big savings in production c

Using the motor-driven magnetic tracer—*an exclu AIRCO feature*—plain or intricate shapes are automati reproduced from inexpensive templates, with speed accuracy.

Length of cutting area can be increased to any exten the use of additional track. Two sections make poss continuous operation, for plate stock can be set up in section while cutting is proceeding in the other.

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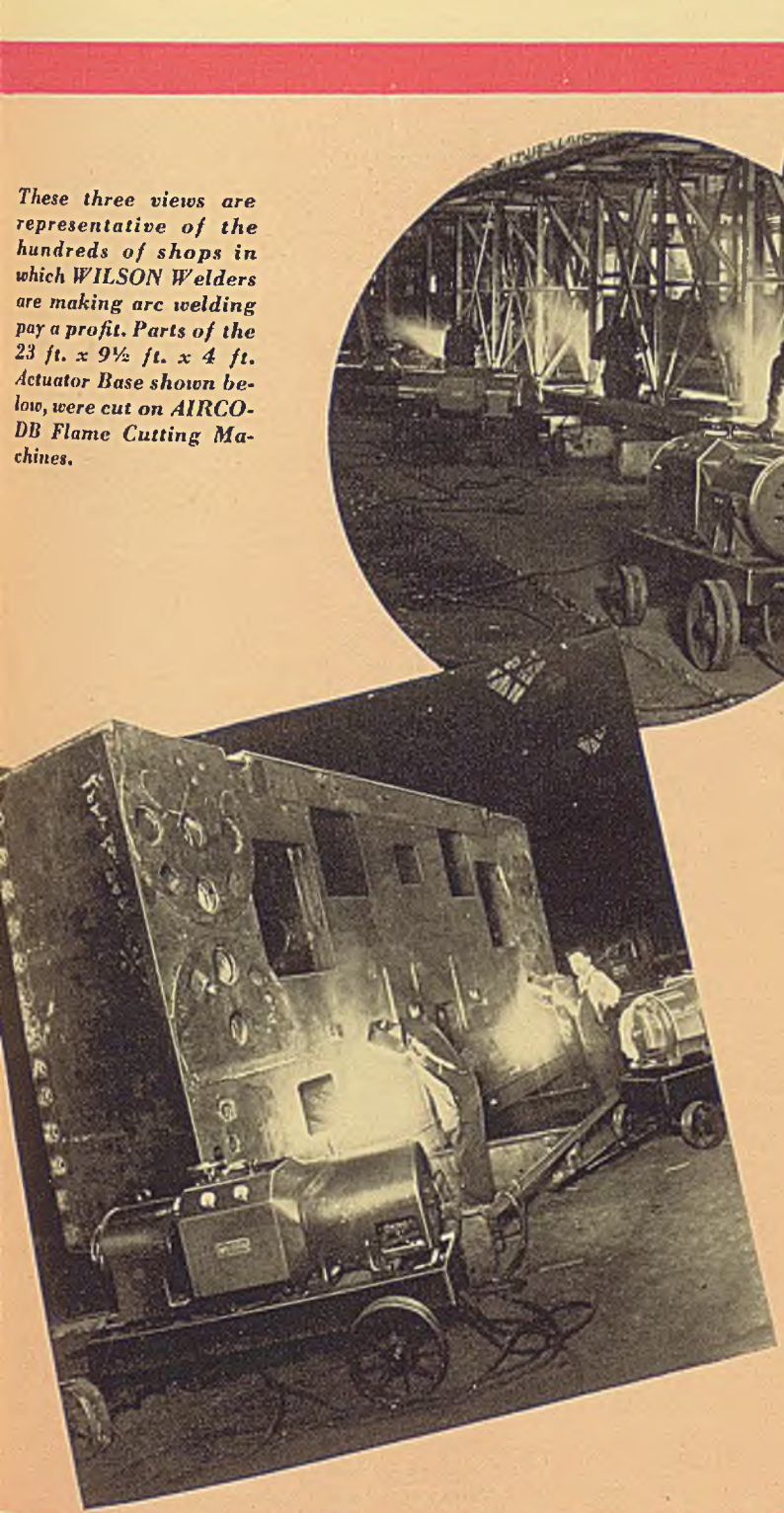
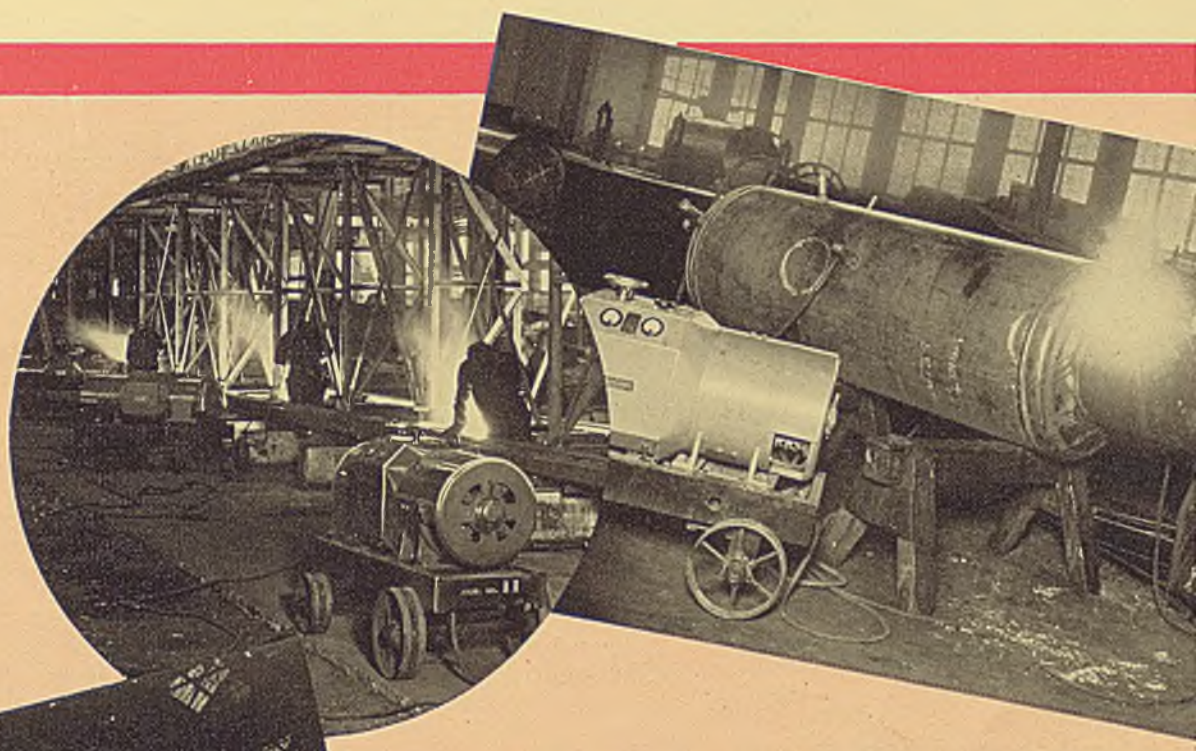
WILSON ELECTRIC ARC WELDE

These three views are representative of the hundreds of shops in which WILSON Welders are making arc welding pay a profit. Parts of the 23 ft. x 9½ ft. x 4 ft. Actuator Base shown below, were cut on AIRCO-DB Flame Cutting Machines.





WILSON ARC WELDERS ma arc welding pay a profit

More and more manufacturers are standardizing WILSON Arc Welders for the following very sound reas

The WILSON line includes types for every arc wel need.

WILSON machines provide voltage and current ad ments which make it possible to establish an arc of jus right character for the particular welding at hand . . . once established the basic WILSON design automati *"makes the arc behave."*

It is this inherent ability of WILSON machines to m tain a stable, uniform-heat-generating arc that makes w ing easier and assures both better results and lower c

Full details, including types and sizes are in the Wi Welder Bulletin—Write for a copy.

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N-WIDE SUPPLY SERVICE

Celebrities

Annual

"Vulcan", the largest iron man in the world. Weighing 200,000 pounds and standing 53 feet tall, he stands on Red Mountain and watches over Birmingham

THE thirty-eighth annual convention of the International Acetylene association to be held in Birmingham, November 10, 11, and 12, is fortunate in having on its program a number of outstanding leaders of industry. From the opening luncheon on Wednesday until after the last technical session Friday evening, members and guests will be offered a constant opportunity of hearing and discussing important phases of the oxyacetylene process.

The program includes meetings which will be of interest to everyone in the welding industry and to all who use welding and cutting. Three technical sessions are to be held in the afternoons; round table discussion groups, so popular last year, are scheduled for Wednesday and Thursday evenings; and an interesting inspection trip through the Tennessee Coal, Iron and Railroad Co.'s plants is planned for Friday morning.

At the opening luncheon in the Peacock ballroom, Tutwiler hotel, four principal events are planned. The address of welcome is to be given by J. L. Perry, president, Tennessee Coal, Iron & Railroad Co., Birmingham. Mr. Perry will be followed by Dr. James Shelby Thomas, president Chrysler Institute of Engineering, Detroit, who will deliver the keynote address. The subject of Dr. Thomas' talk is "New Frontiers for Smart People." At the conclusion of the keynote address, C. D'W. Gibson, president, International Acetylene association, will deliver the president's address.

The last feature on the opening luncheon program is the presentation of the Morehead medal by C. O. Epperson, director and past-president, International Acetylene association, and vice-president of the National Cylinder Gas Co., Chicago. The recipient of this unusual honor, which in the welding industry is as much of an honor as the Nobel prize in the pure sciences, is H. S. Smith, a director and chairman of the executive committee of the International Acetylene association. Mr. Smith is associated with The Prest-O-Lite Co. Inc., New York.

Tutwiler hotel, Birmingham, has been chosen as headquarters for the International Acetylene association's 38th annual convention

First Technical Session

After the opening luncheon, members will congregate again in the Peacock ballroom for the first technical session, on "Speeding Manufacture and Construction with Oxyacetylene Welding." This meeting, consisting of the presentation of important papers on the various phases of oxyacetylene welding, will be presided over by L. N. Shannon, vice-president, Stockham Pipe and Fitting Co., Birmingham. Inasmuch as pipe welding in all its phases has experienced a year of unusual development, this session offers many attractions. Several papers will be devoted to this subject. The other papers which have as their subjects, "Butt-Welding of Railroad Rails" and "Joining Copper Bus-Bars with Brazing Alloys," also hold much interest both from the technical and supervisory viewpoints.

The first session of the round

Will Highlight Meeting

"Iron Masters at Night" is the title of this furnace scene at Birmingham, where members of the International Acetylene association will gather

table discussions, features of the convention this year, will be held Wednesday evening. All members and others interested in the process will meet in the Phillips high school auditorium at 8 P.M. There they will be addressed by the general chairman of the engineering session of round table discussions, J. I. Banash, consulting engineer for the International Acetylene association, and a past-president of the National Safety council, Chicago. The general meeting will then be broken up into groups for discussion of specific subjects relating to economics, management and design in welding and cutting. Here open discussion is invited on the subjects, "Codes and Operator Training"; "Stainless and Alloy Steels"; "Aluminum, Nickel, Copper, and other Nonferrous Metals"; "Hard-Facing"; "Pipe Welding"; "Cutting and Use of the Oxygen Lance"; and "Fire Prevention and Safety." The chairman of each of these meetings will be assisted by a number of technical advisors.

On Thursday, with the convention in full swing, the annual luncheon and business meeting will be held in the Peacock ballroom, Tutwiler hotel. Under the chairmanship of C. D'W. Gibson, president, International Acetylene association, reports of officers and committees will be heard. After the report of the nominating committee, election of officers for the year 1938 will be held.

The second technical session on the subject, "How and Why to Use Oxyacetylene Cutting," will be held in the Peacock ballroom at 2:30 P.M. on Thursday. This meeting will be in charge of E. E. Michaels, chairman, Birmingham section, American Welding society and general manager, Chicago Bridge and Iron Co., Birmingham.

Among the most valuable advances in the oxyacetylene industry during the recent year have been developments in and increased utilization of machine cutting. During the past few months flame-cutting machines have been made available which are outstanding in their improved design and operation. Metal parts of almost any size or shape can be produced. Cuts can be made in any direction or at practically any bevel. Because of these many developments, it is expected that the interest in the second technical session will run high. Papers to be presented before this session will include "Management of Machine Cutting and Operations," "Oxyacetylene Cutting in Fabrication," "Cutting and Tempering of Structural Steels," "Use of Shape-Cut Parts in Machine Design," and "Oxyacetylene Cutting as Applied to Repair and Conversion of Present

(*Please turn to Page* 120)

Round table discussions will convene in the auditorium and class rooms of the Phillips high school, Birmingham

H. S. Smith Given Morehead Medal

THE James Turner Morehead medal for the year has been awarded to H. Sidney Smith for his vision, inspirational guidance and aggressive co-operation in the advancement of the acetylene industry. The medal will be presented to Mr. Smith during the opening session of the 38th annual convention of the International Acetylene association to be held at Tutwiler hotel in Birmingham, November 10.

The Morehead medal is awarded annually by the International Acetylene association to the person or persons who in the judgment of its officers and board of directors have done most to advance the industry of the art of producing or utilizing calcium carbide or its derivatives. The award was established in 1922 by John Motley Morehead in honor of his father, the late James Turner Morehead, who in 1892 sponsored the experiments which led to the discovery of the electric furnace method of producing calcium carbide.

Receives Two Medals

Past recipients of the Morehead Medal have included other such outstanding men in the acetylene industry as Edmond Fouche, the late Samuel Wylie Miller, the late Reverend Julius Arthur Nieuwland, and Dr. David Schenck Jacobus.

Mr. Smith has also recently been announced as the recipient of the Samuel Wylie Miller medal awarded by the American Welding society. He is a well-known figure in the acetylene industry both in America and abroad. He has served as president of both the British Acetylene association and the International Acetylene association, and he has been directly responsible for many important developments in acetylene utilization.

Mr. Smith was born in Newark, England, and was educated at Nottingham University, where he studied electrical engineering. After leaving college he was associated with the firm of Messrs. Robey & Co., and then for a time with the Brush Electrical Engineering Co., Ltd. In 1896 he joined the Acetylene Illuminating Co. Ltd., which was

H. Sidney Smith

experimenting with the manufacture of calcium carbide at Leeds Forge. He assisted in the preliminary experiments there, and in conjunction with S. G. Worth (the founder of the British Acetylene association) produced the first calcium carbide made in Great Britain on a commercial scale.

In 1901 he turned his efforts toward experimenting with the use of dissolved acetylene and oxyacetylene welding. As a result of his intensive work on dissolved acetylene, its use was sanctioned by the British Home Office.

He became general manager of the Acetylene Illuminating Co. Ltd., and also of the British Autogenous Welding Co. Ltd., and in 1910 he was elected president of the British Acetylene association. The next year he came to America and joined the Prest-O-Lite Co. Inc., in Indianapolis, becoming works manager in charge of all gas plants. In 1918 he became consulting engineer for Union Carbide Co.

In his long and active career with Union Carbide Co. and its associated companies, he has made many important contributions to the oxyacetylene industry, and has been the author of numerous technical articles on the uses of oxygen, acetylene, calcium carbide and oxyacetylene apparatus. One of the first instruction manuals on oxyacetylene welding and cutting was written by Mr. Smith, and he has been active in the technical training of many men who are now taking leading parts in the engineering aspects of the industry.

On the subject of industrial safety and fire prevention, his significant contributions are many, especially regarding matters involving the transportation and use of industrial gases and the use of the oxyacetylene process. He has worked actively with insurance and regulatory bodies in developing and applying rules and procedures to improve the safety standards of the industry. Mr. Smith's work has contributed vastly to the acceptance of the oxyacetylene and the compressed gas industries as being among the best regulated of American industries from the standpoint of safety and accident prevention.

Held Executive Positions

Elected president of the International Acetylene association in 1920 and president of the Compressed Gas Manufacturers association in 1928, Mr. Smith has also been for many years a director and a member of the Executive Committee of the American Welding society. He is also a member of the American Society of Mechanical Engineers, the American Society for Testing Materials, the National Fire Protection association, the National Safety council, the American Society of Safety Engineers, and a number of other engineering groups. In practically all of these associations, Mr. Smith has served in important executive capacities.

One of Mr. Smith's outstanding qualities has always been his ability and his willingness to pass along to younger men in the industry the ideas and lessons he has learned through his long association with the technical aspects of the business. The value of the service that Mr. Smith has rendered and is rendering to the industry in this regard can never be properly appraised. Therefore, it is appropriate that the citation on the 1936 Morehead Medal reads, "For his vision and inspirational guidance."

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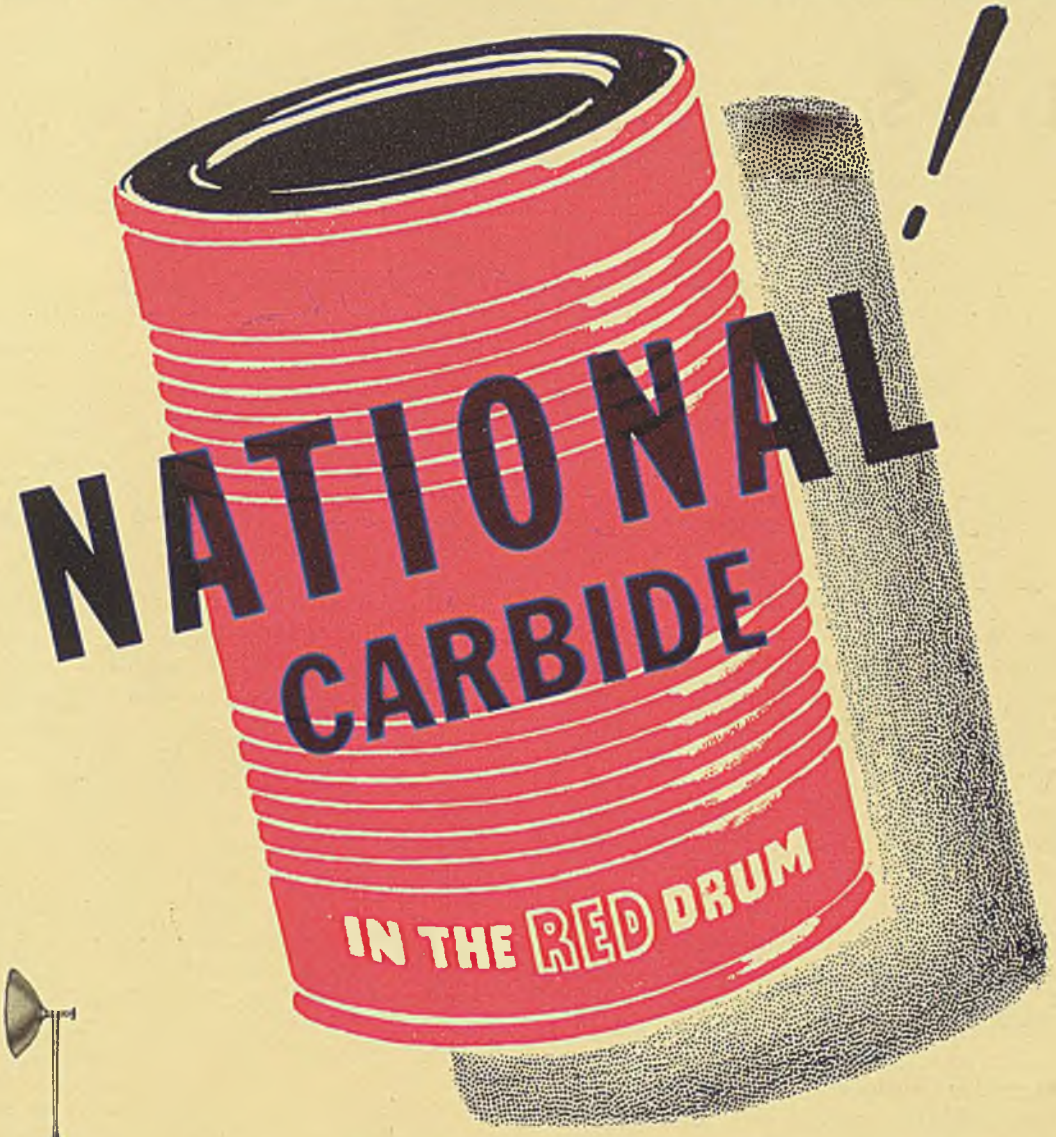

Gives *highest gas yield* because it is made from the best and purest raw materials obtainable and because its even size promotes gas generation. The air-tight *red drum* brings NATIONAL Carbide to you as fresh and dustfree as the day it was packed. Conspicuous wherever carbide is used, the *red drum* is the symbol of carbide economy. Write for the "STORY OF CARBIDE."

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Save Heat Treatment

Columbium-Bearing STAINLESS STEEL lowers Cost of Equipment for Handling Corrosive Materials

COLUMBIUM improves the welds and heat-affected areas adjacent to the welds in stainless steels. Columbium-bearing stainless steels can be used after they have been welded with columbium-bearing welding rod without subsequent and costly annealing. Welds are strong and fully as corrosion-resistant as the base metal. There is no increased susceptibility to intergranular corrosion in or adjacent to the weld.

Costs Less To Fabricate

With improved weldability comes easier and cheaper fabrication. Columbium-bearing stainless steels and columbium-bearing welding rod make possible the ready fabrication of stainless steel articles and equipment at costs low enough to encourage new and wider use of stainless steel. The accompanying photographs show the type of equipment for which columbium-bearing stainless steel is particularly advantageous.

Let Electromet Help You

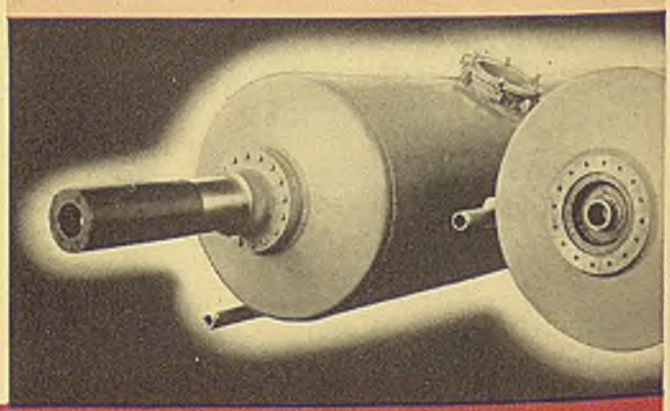
Electro Metallurgical Company is not a manufacturer of alloy steels, but for over thirty years, has produced ferro-alloys and metals that go into the making of stainless and other alloy steels and irons. During this time, Electromet has co-operated with the steel industry in developing new and better alloy steels for the specialized needs of industry.

If you make steel, Electromet metallurgists will gladly help you use Electromet ferro-alloys and metals to the best advantage. If you use steel, Electromet offers you unbiased data and assistance in selecting the right alloy steel for your purpose. This service is available without obligation.

The word "Electromet" used herein is a registered trade-mark.

AN OPPORTUNITY. Hear many timely and interesting discussions on welding and cutting alloy steels by attending the 38th Annual Convention of the International Acetylene Association, Hotel Tutwiler, Birmingham, Alabama, November 10, 11, and 12, 1937.

These steam-jacketed autoclaves for carbonating and grinding hot acid sludge are made of stainless steel. Stainless steel resists the severe corrosion, heat and abrasion involved in this service.



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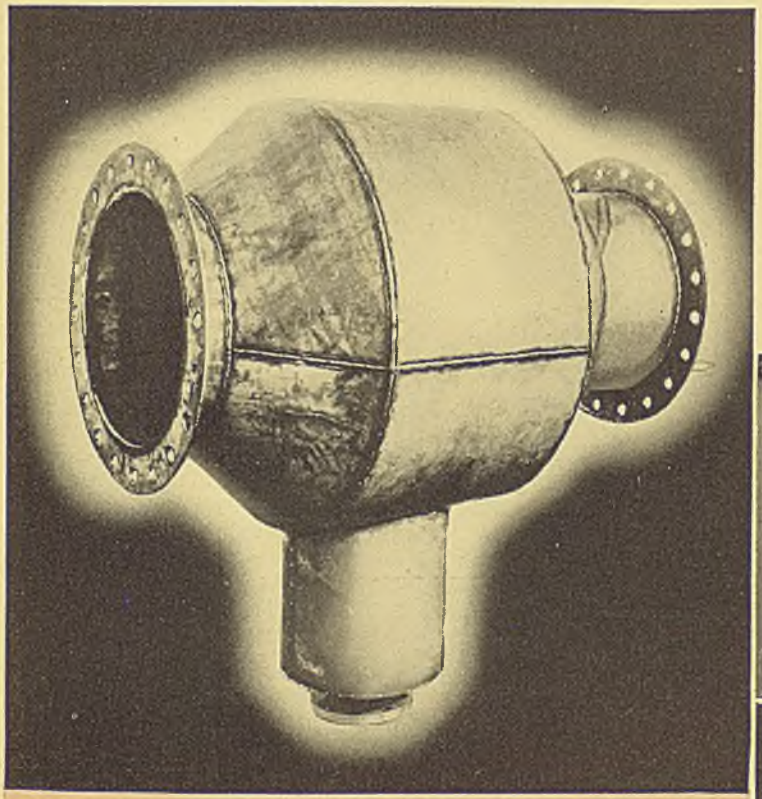
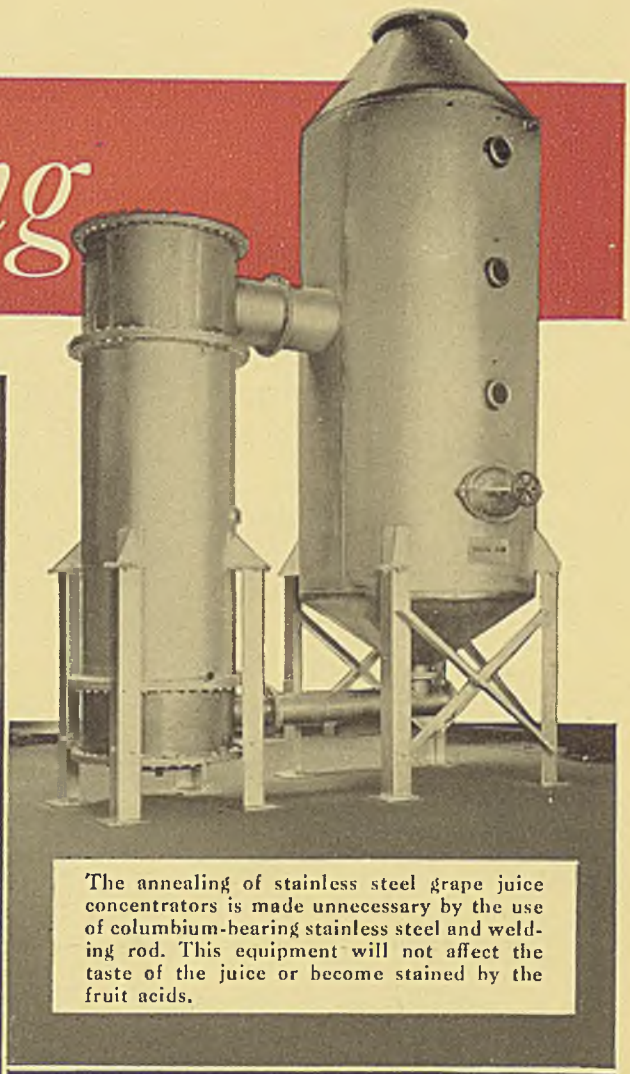
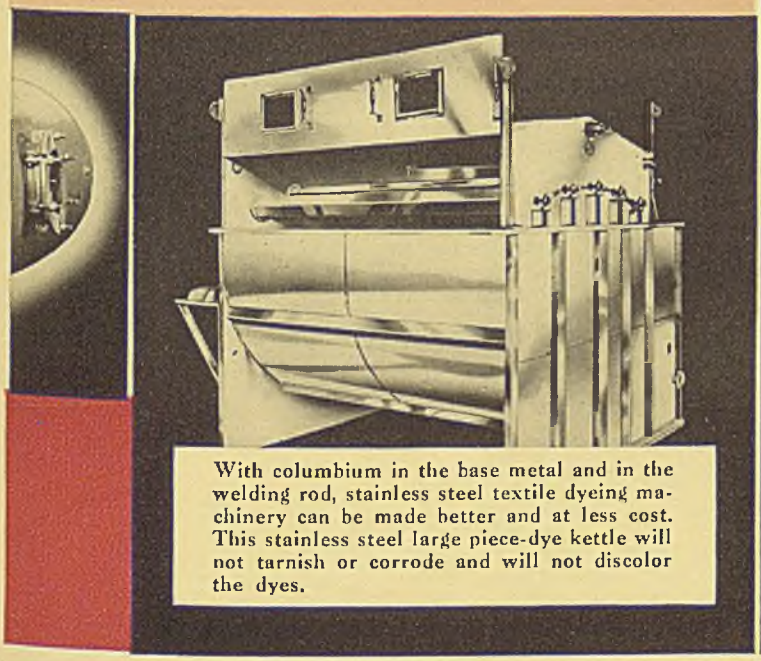
after Welding



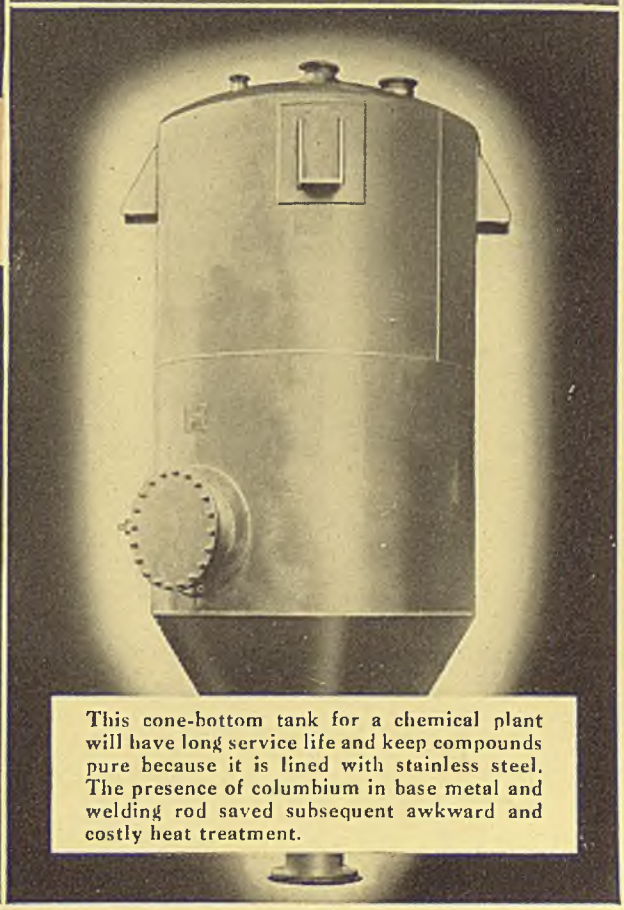
Columbium makes stainless steel fabrication cheaper and easier. In this all-welded separator for recovering nitric acid fumes, the welds have the strength, toughness and corrosion resistance of the stainless steel plate which they join.



The annealing of stainless steel grape juice concentrators is made unnecessary by the use of columbium-bearing stainless steel and welding rod. This equipment will not affect the taste of the juice or become stained by the fruit acids.



With columbium in the base metal and in the welding rod, stainless steel textile dyeing machinery can be made better and at less cost. This stainless steel large piece-dye kettle will not tarnish or corrode and will not discolor the dyes.



This cone-bottom tank for a chemical plant will have long service life and keep compounds pure because it is lined with stainless steel. The presence of columbium in base metal and welding rod saved subsequent awkward and costly heat treatment.

Acetylene Progress

(*Concluded from Page* 104)

building construction. Similarly, the tentative refrigeration code of the City of New York has recognized the superiority of welded and brazed joints in refrigeration service.

Attention has been called to the large increase in oxyacetylene operators, both welding and cutting, during the past year and the problem involved in maintaining a supply of trained craftsmen.

The members of our industry have individually campaigned for the safe as well as efficient handling of their gases and equipment through the distribution of literature and through the personal instruction of oxyacetylene operators by their service organizations. Your committee has had under consideration for the past two years a booklet, "Safe Practices in the Installation and Operation of Oxyacetylene Welding and Cutting Equipment", which is intended to incorporate the best features of existing literature on the subject.

In addition to the "Safe Practices" booklet, a number of pamphlets previously issued were revised prior to reprinting further editions. For example, the pamphlet on "Oxyacetylene Cutting" was expanded to include chapters on the "Effect of Flame Cutting on the Metal Being Cut," and a resume of the action of the Boiler Code Committee of the A.S.M.E. The chapter on the "Chemistry of Cutting" was improved and expanded and a number of illustrations added to the discussion of "The Scope of Flame Cutting". The pamphlet on Oxyacetylene Welding and Its Applications" was revised to include data on upward welding, alloy cast iron welding, multilayer welding, multiflame welding and welding of heavy pressure vessels.

In co-operation with the program committee, a series of leaflets were prepared for distribution at the round table discussions during the present convention. These pamphlets include:

"Codes and Operator Training".

"Stainless and Alloy Steels".

"Aluminum, Nickel, Copper and Other Non-Ferrous Metals".

"Hard-facing".

"Pipe Welding".

"Cutting and Use of the Oxygen Lance".

"Fire Prevention and Safety".

"Bronze Welding".

"Low Temperature Brazing and the Use of the Air-Acetylene Flame".

"Sheet Metal and Steel Plate Welding".

Program Story

(*Concluded from Page* 115)

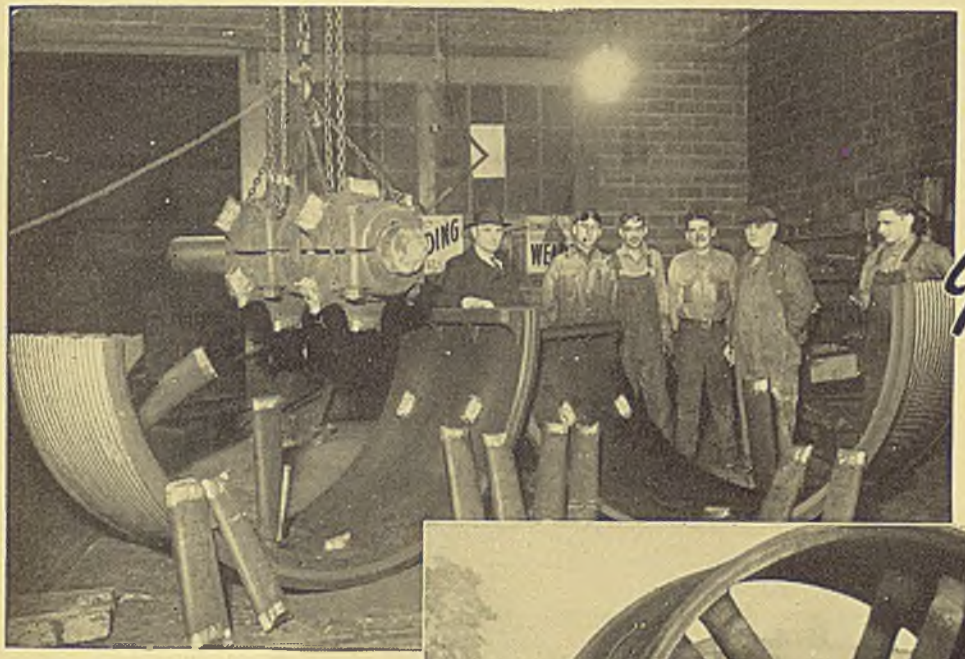
Cargo Vessels to Tankers, and to Marine Work."

The second session of the round table discussions will be held Thursday evening in Phillips high school auditorium. Similar in nature to the first evening's round table discussions, it will, however, be devoted more specifically to the practical and operating aspects of the oxyacetylene process. These meetings will be of fundamental interest to shop owners, welding and cutting operators, foremen and supervisors, as well as to those concerned with the planning and management of welding operations. The general chairman for this session is W. S. Hays, managing director, American Welding society, New York.

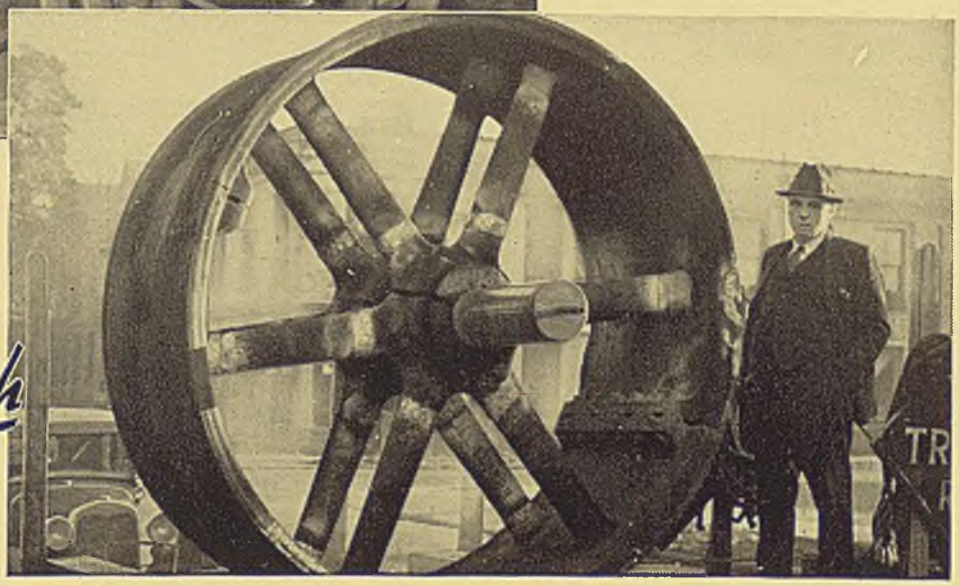
Subjects to be discussed in the group meeting at the second round table discussions session will be "Hard-Facing"; "Cutting and Use of the Oxygen Lance"; "Aluminum, Nickel, Copper and Other Nonferrous Metals"; "Pipe Welding"; "Bronze-Welding"; "Low Temperature Brazing and Use of the Air-Acetylene Flame"; "Sheet Metal and Steel Plate Welding"; "Stainless and Alloy Steels." These subjects will be treated from the practical, step-by-step angle. How each job is done, particular problems and how to solve them will be discussed. Because of the many specialized procedures which have grown up in recent years for treating certain metals during welding, and the importance of the use of these new procedures, this meeting will prove to be one of the most popular.

A unique plant inspection trip is planned for Friday morning. A special train will leave Birmingham at 8:30 A.M. from 1st Avenue and 14th Street, North, for the Ensley and Fairfield Plants of Tennessee Coal, Iron and Railroad Co. Stops will be made at the rail mill at Ensley; at Muscoda mines, at the Bessemer, open hearth and blast furnaces, and at the new sheet mill at Fairfield. Luncheon will be served at Fairfield.

Recent rapid advances in flame-treating of metals by means of the oxyacetylene process will feature the third Technical Session to be held at Tutwiler hotel, at 3:00 P.M. Friday; two papers on flame-treating will be presented at this meeting. The general topic of this session is, "Maintenance and Operation Uses of the Oxyacetylene Process." Other important papers will include a review of the important uses of the oxyacetylene process in steel mill operations, a summary of the reclamation of textile mill parts, and a general exposition on the welding of stainless and alloy steels.



In pieces October 6th



Back on the job October 12th

THANKS TO TOBIN BRONZE!

THE whole town of Austin, Pa., depends upon this pulley for food. It turns the wheels of The Bayless Pulp & Paper Company's mill and most everybody in Austin works for Bayless.

Recently, the shaft to this 84" pulley snapped between the two sets of wheel spokes, breaking all twelve spokes away from the hub and all but three away from the rim.

The plant was paralyzed . . . delivery of a new wheel would take from four to six weeks! Some one suggested welding. The idea seemed fantastic but the Bayless Company went to Hebeler Welding Company, of Buffalo.

The pulley was rushed to Buffalo, repaired with Tobin Bronze, sent back and re-installed —all within six days. Weeks of disastrous shut-down were averted and the cost of a new casting saved.

When difficult welding jobs appear, nothing equals Tobin Bronze! This time-tried Anaconda product carries the trade-mark "Tobin Bronze Reg. U.S. Pat. Off." on each rod. Look for this mark and be sure you're getting genuine Tobin Bronze.

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K. L. Landgrebe

A. E. Gibson

Official Program

Wednesday, Nov. 10

10:00 A. M.—HOTEL TUTWILER

Registration.

12:15 P. M.—HOTEL TUTWILER

Opening Luncheon

Chairman

C. D'W. GIBSON, president, International Acetylene association; vice president, Air Reduction Co. Inc., New York.

Address of Welcome, by J. L. Perry, president, Tennessee Coal, Iron & Railroad Co., Birmingham.

Keynote Address, by Dr. James Shelby Thomas, president, Chrysler Institute of Engineering, Detroit.

President's Address, by C. D'W. Gibson, vice president, Air Reduction Co. Inc., New York.

Presentation of Morehead Medal, C. O. Epperson, director and past president, International Acetylene association; vice president, National Cylinder Gas Co., Chicago.

Acceptance of Morehead Medal, 1936 recipient, H. S. Smith, chairman, executive committee, International Acetylene association.

2:30 P. M.—HOTEL TUTWILER

Technical Session

Chairman

LESTER N. SHANNON, vice president, Stockham Pipe & Fitting Co., Birmingham.

Butt-Welding of Railroad Rails, by R. R. Cummins, assistant general manager, Central of Georgia Railway, Savannah, Ga.

Piping Design, Fabrication and Erection, by O. B. McLaughlin, master mechanic, Freeport Sulphur Co., Port Sulphur, La.

Joining Copper Bus-Bars with Brazing Alloys, by R. A. Goeller, vice president, Hatzel and Buehler, New York.

Bronze-Welding of Cast Iron Pipe, by Dr. J. T. MacKenzie, metallurgist, American Cast Iron Pipe Co., Birmingham.

Multi-Lengthening Cast Iron Pipe by Welding, by C. L. Lane, works manager, Walworth Co., Attalla, Ala.

8:15 P. M.—PHILLIPS HIGH SCHOOL AUDITORIUM

Round Table Discussions Engineering Session

General Chairman

J. I. BANASH, consulting engineer, International Acetylene association; past president, National Safety council, Chicago.

Subjects

1—Codes and Operator Training.
2—Stainless and Alloy Steels.
3—Aluminum, Nickel, Copper and Other Nonferrous Metals.
4—Hard-Facing.
5—Pipe Welding.
6—Cutting and Use of the Oxygen Lance.
7—Fire Prevention and Safety.

Thursday, Nov. 11

12:15 P. M.—HOTEL TUTWILER

Annual Luncheon and Business Meeting

Chairman

C. D'W. GIBSON, president, International Acetylene association.

R. A. Goeller

C. L. Lane

R. F. Helmkamp

H. H. Moss

W. J. Sanneman

John T. Howat

R. L. Rolf

A. C. Leigh

Report of Oxyacetylene Committee, by Dr. G. V. Slottman.
Report of Consulting Engineer, by J. I. Banash.
Report of Legislative Committee, by H. S. Smith.
Report of Secretary, by H. F. Reinhard.
Report of Treasurer, by Henry Booth.
Report of Auditing Committee, by C. A. McCune.
Report of Membership Committee, by Henry Booth.
Report of Resolutions Committee, by F. E. Rogers.
Report of Nominating Committee.
Election of Officers.

2:30 P. M.—HOTEL TUTWILER

Technical Session

Chairman

E. E. MICHAELS, chairman, Birmingham section, American Welding society; general manager, Chicago Bridge & Iron Co., Birmingham.

Oxyacetylene Cutting in Fabrication, by A. E. Gibson, president, American Welding society; president, Wellman Engineering Co., Cleveland.
Management of Machine Cutting Operations, by R. F. Helmkamp, engineer, applied engineering department, Air Reduction Sales Co., New York.
Cutting and Tempering of Structural Steels, by H. H. Moss, development engineer, The Linde Air Products Co., New York.
Use of Shape-Cut Parts in Machine Design, speaker to be announced.
Oxyacetylene Cutting as Applied to Repair and Conversion of Present Cargo Vessels to Tankers and to Marine Work, by A. C. Leigh, marine engineer and naval architect, Ingalls Iron Works Co., Birmingham.

8:15 P. M.—PHILLIPS HIGH SCHOOL AUDITORIUM

Round Table Discussions
Operating Session

General Chairman

W. S. HAYS, managing director, American Welding society, New York.

Subjects

1—Hard-Facing.
2—Cutting and Use of the Oxygen Lance.
3—Aluminum, Nickel, Copper and Other Nonferrous Metals.
4—Pipe Welding.
5—Bronze Welding.
6—Low Temperature Brazing and Use of the Air-Acetylene Flame.
7—Sheet Metal and Steel Plate Welding.
8—Stainless and Alloy Steels.

Friday, Nov. 12

8:30 A. M.

Inspection Trip, Tennessee Coal, Iron & Railroad Co., Ensley and Fairfield, Ala.

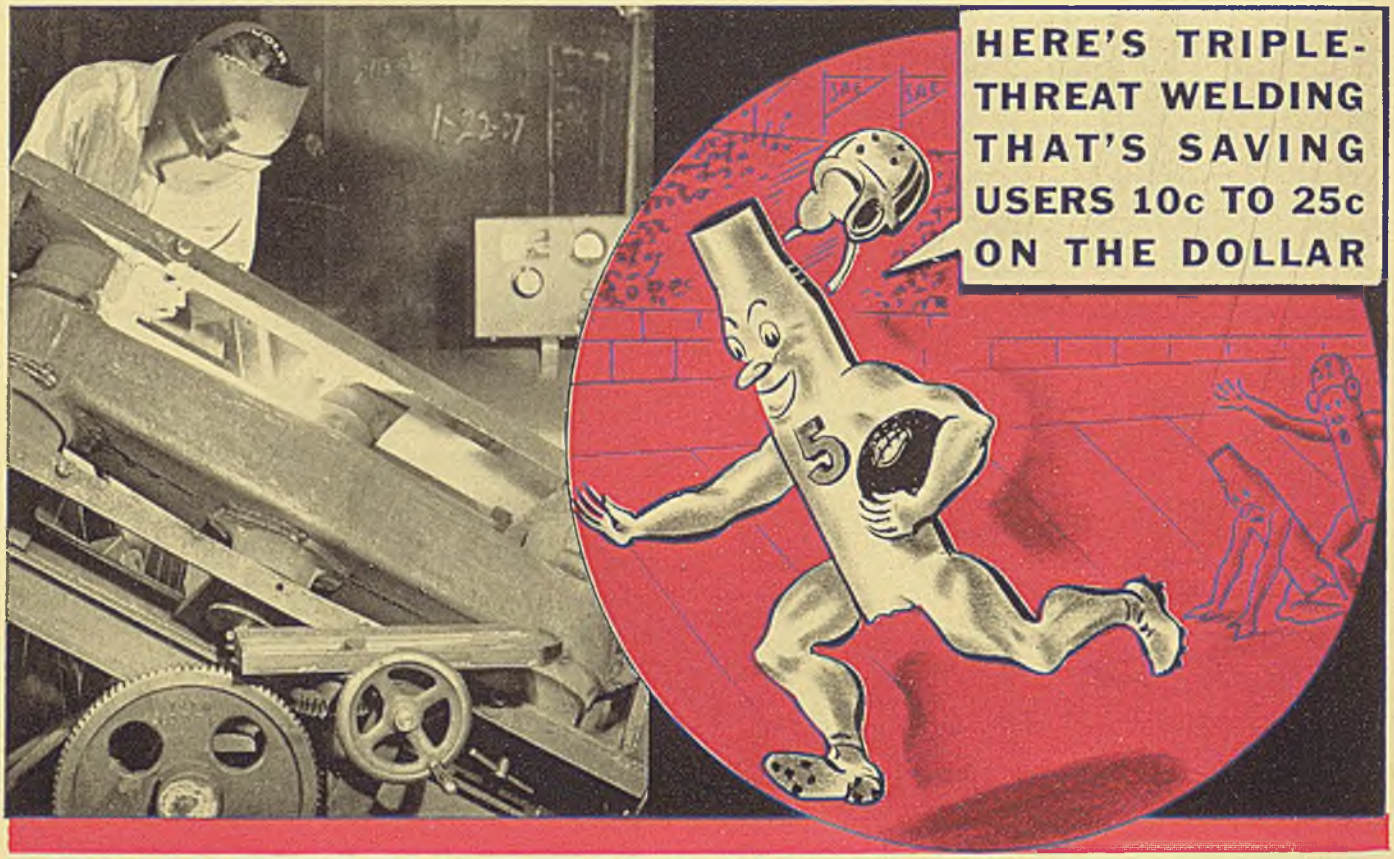
3:00 P. M.—HOTEL TUTWILER

Technical Session

Chairman

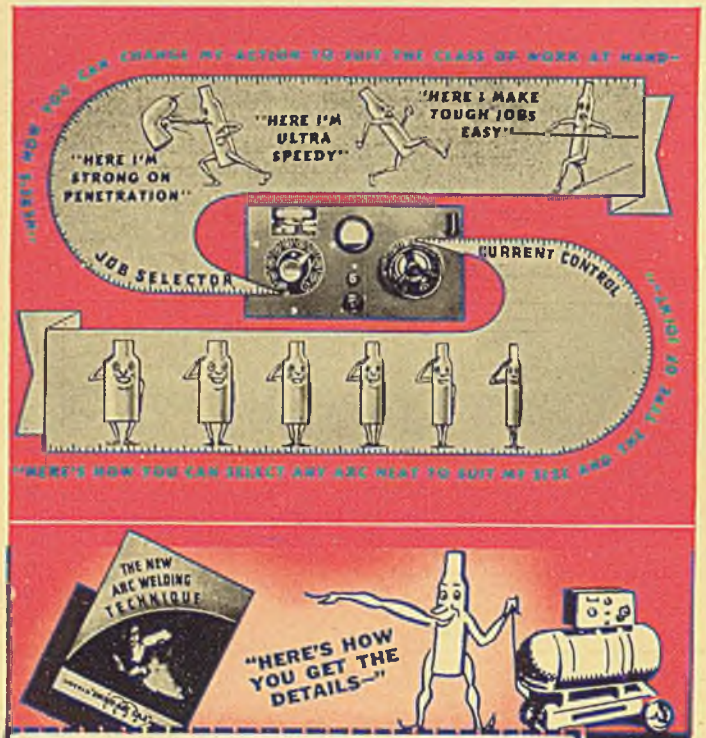
KARL L. LANDGREBE, vice president, Tennessee Coal, Iron & Railroad Co., Birmingham.

Selective Hardening of Ferrous Materials with the Oxyacetylene Flame, by R. L. Rolf, metallurgical engineer, Lakeside Steel Improvement Co., Cleveland.
Flame Hardening, by John T. Howat, superintendent, heat treating department, American Spiral Spring & Mfg. Co., Pittsburgh.
Important Uses of the Oxyacetylene Process in Steel Mill Operations, by W. J. Sannemann, service metallurgist, Tennessee Coal, Iron & Railroad Co., Birmingham.
Reclamation of Textile Mill Parts, by Hugh Comer, vice president, Avondale Mills, Sylacauga, Ala.
Welding Stainless and Alloy Steels, by T. R. Lichtenwalter, Republic Steel Corp., Massillon, O.



A welded design of pressed steel, combined with cast steel beat the strength of cast steel alone by 70% in the construction of this rocker beam for Athey Truss Wheel Co., Chicago, Ill.

"Use Me With The New 'Shield-Arc SAE' And You'll Lower Welding Costs These 3 Ways"...



"ONE—You get better welds 15% to 20% faster because its Job Selector gives you the right TYPE of welding arc to suit the job.

"TWO—You cover a wider range of application because of its Dual Continuous Control. In effect, you get two or three welders of different ratings when you buy an 'SAE.'

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LINCOLN "SHIELD-ARC SAE"

THE WELDER WITH DUAL *CONTINUOUS* CONTROL

Observe Steels at High Temperatures

STRENGTHS of steels at high temperatures, grain size, and the electrode salt bath method for hardening high speed steel, were principal topics discussed at two sessions of the American Society for Metals conducted on Oct. 18 during the National Metal congress in Atlantic City.

Results obtained from long-time rupture tests on eight steels at temperatures from 1000 to 1500 degrees Fahr. were presented in a paper by A. E. White and C. L. Clark, director and research engineer, respectively, department of engineering, University of Michigan, Ann Arbor, Mich., and R. L. Wilson, metallurgical engineer, Timken Steel and Tube division, Timken Roller Bearing Co., Canton, O. The time for fractures was varied from a few minutes to several hours, it was shown, and a definite relationship was found to exist for each analysis between stress and fracture time.

Tests revealed the rupture strength in some cases has a value nearly identical with the creep strength for a rate of 1 per cent per 100,000 hours. However, all things being equal, the rupture strength test would be preferred because it is simpler and less expensive, the authors pointed out.

It was also revealed that by increasing the resistance to general or intergranular oxidation the long-time rupture strength of the steel is increased and that intergranular oxidation not only decreases the long-time rupture strength of the steel, but also reduces the ductility.

Determine Ductile Properties

The chief merits of the rupture tests, according to the authors, were found to be that (1) they serve as a suitable basis for the design of high temperature apparatus in which some deformation of the parts is permissible and (2) they afford the best means available for determining the ductile properties of steels under the combined action of stress, time and heating.

Thomas D. Tifft, Sinclair Refining Co., New York City, pointed out that the observations recorded in the paper relative to intergranular oxidation occurring after an extended period at high temperature would indicate that present users of metals at these high temperatures can expect an aging effect which will in time cause the metal to lose its ductility and be liable to failure without any elongation and hence without warning. If this is true, Mr. Tifft said, users of alloy metals at fairly high stresses and fairly high temperatures should be on the lookout for this aging effect. The oil industry would like to know, he was sure, what the authors had to suggest as a practical means of insurance against the possibility of sudden and unexpected failure due to this aging effect.

E. S. Dixson, Port Arthur, Texas, in a written discussion sent to the meeting, thought the results shown in the paper were of much practical value to the refiner, adding that creep data published during the last few years had been of little value.

A somewhat similar view was expressed by A. B. Bagsar, chief metallurgist, Sun Oil Co., Marcus Hook, Pa. He stated that inasmuch as creep characteristics of steel vary considerably from heat to heat of the same approximate chemical analysis, and are also materially affected by variations in heat treatment or casting and finishing temperatures and other factors, the use of the proposed method of rupture tests as an acceptance test may prove to be very advantageous.

Has Further Possibilities

G. Watts, chief engineer, Standard Oil Co. of Indiana, said the paper appears to support the belief that the rupture strength test method has possibilities which may lead to its displacement of the creep test method as a means of determining working stresses for parts operating at high temperatures, particularly in those cases in which deformation is not the controlling consideration.

However, he said the occurrence of breaks in the logarithmic stress-time curves was somewhat disturbing and argued against placing too much reliance on extrapolation to long service periods from a series of tests which cover a period of not more than 1000 to 2000 hours. Additional tests should be made, he said, to ascertain whether the specimens which did not exhibit any break in the stress-time for fracture relationship in the tests covered by the report would have exhibited such breaks if tested for longer periods.

It would also be desirable, Mr. Watts believed, to know whether the specimens which did exhibit breaks in the stress-time for fracture relationship would have shown second breaks had the tests covered longer periods. He added that it should be noted that this shortcoming of the rupture strength test method is also a characteristic of the creep test methods.

Pointing out that there were no recommendations concerning the factor of safety to be used with the rupture strength of a material, Mr. Watts thought that some factor of safety should be established, and that consideration in this connection should be given to the relationship of the rupture strengths to creep strengths which have been used and are known to be safe.

The electrode salt bath for hardening high speed tool steel was discussed by Axel Hultgren, consulting metallurgist, Stockholm, Sweden, as utilized abroad. Internally heated salt bath furnaces, he said, have been used for the hardening of high speed tool steel for more than 30 years in Sweden and Germany and are today in fairly general use.

Furnace Thermally Insulated

In principle, the electrode salt bath furnace consists of a thermally insulated refractory container for the salt, sometimes having a lining of crucible steel, into which are introduced two or more electrodes of steel, alternating-current of low voltage being passed between the latter through the salt. The salt, he said, may be $BaCl_2$, with or without additions, or a preparatory mixture. The temperature may be measured by a thermocouple, an optical or a radiation pyrometer.

A method which may serve as a type of an acceptance test in indicating whether or not steels of the same general type and composition possess the same creep strength was described in a paper, entitled "A New Application for the Short-time High Temperature Tensile Test", presented by C. L. Clark and A. E. White, research engineer and director, respectively, department of engineering research, University of Michigan, Ann Arbor, Mich., and G. J. Guarnieri, graduate student, University of Michigan.

The paper presented results obtained from short-time high temperature tensile tests on five steels over a range of temperatures. The rate of load application and thus the rate of deformation as well as the time for fracture, it was pointed out, was varied, with the resulting tensile strength values correlated with the speed of testing. Results indicated a critical temperature existed which differed for each of the analyses considered. They further indicated that over a certain temperature range the creep characteristics are proportional to the magnitude of this critical temperature. In other words, the authors pointed out, the higher this temperature, the greater the creep resistance.

The relationship between this temperature and the creep characteristic does not hold over the complete temperature range; however, the au-

thors believed the procedure outlined had merit as a type of acceptability test. They said, though, that additional results would have to be accumulated before too definite claims could be made.

J. E. Dorn and O. E. Harder, research associate and assistant director, respectively, Battelle Memorial institute, Columbus, O., set up an hypothesis and on the basis of this suggested a possible mechanism for the relation of pre-heating of steels to austenitic grain growth. The authors postulated that aluminum killed steels contain a grain growth inhibitor, the solubility of which in ferrite and in austenite increases with the rise in temperature and that at the higher temperature range of ferrite the solubility is greater than at the low temperature range of austenite.

Test Commercial Steels

They tested this hypothesis by first heating commercial steels of 10 different analyses at temperatures below the critical range. In general, it was said, the steels which were saturated with the grain growth inhibitor at temperatures just below the critical showed a higher coarsening temperature than those which were heated to give a lower amount of inhibitor in solution.

Specimens which were heated directly from the saturation treatment and rapidly reheated were more inclined, the authors declared, to be fine grained than those which were slowly cooled from the saturation temperature and then reheated.

E. H. Dix Jr., Aluminum Co. of America, New Kensington, Pa., asserted the hypothesis presented in the paper would have been considerably strengthened if it could have been shown no other of the commonly accepted mechanisms could be used to explain the experimental observations presented. He added, however, the paper presented a rather simple and very logical explanation of a problem that had troubled metallurgists for years, namely, the problem as to how pretreatments affect the grain coarsening characteristics obtained on reheating.

R. L. Kenyon and Harry Tobin, American Rolling Mill Co., Middletown, O., pointed out the authors found aging for a considerable time was necessary to cause any inhibiting effect on grain growth and they interpreted this in terms of the effect of a grain inhibiting component which they call X, but which they inferred is probably alumina. The discussers asked if it were not possible that the long aging treatments resulted in the formation of large spheroids of carbides which did not go into solution in the relatively short time of one hour for which the authors heated the specimens subsequent to the aging treatment. They thought there was no doubt these carbides would serve as grain growth inhibitors.

Certain factors influencing austenitic grain size in high purity steels were the object of an investigation by G. Derge, Metals Research Laboratory, Carnegie Institute of Technology, A. R. Kommel, United Engineering & Foundry Co., Vandergrift, Pa., and R. F. Mehl, director of the metals research laboratory and head of the department of metallurgy, Carnegie Institute.

To determine the relative importance of aluminum in solid solution and finely dispersed Al_2O_3 in controlling the austenitic grain size of steels, high purity iron-aluminum samples were prepared by diffusing aluminum into hydrogen purified carbonyl iron. To obtain Fe-Al_2O_3 samples the iron-aluminum material were treated in hydrogen containing a small amount of oxygen. Additional samples were made by vacuum fusion of aluminum with purified and unpurified carbonyl iron. The same diffusion technique, it was pointed out, was used in preparing samples with silicon and SiO_2. An oxygen free hydrogen-hydrocarbon gas was used to carburize the irons.

The authors declared the experiments showed grain growth was inhibited by the refractory oxides, and the magnitude of the effect was sensitive to the dispersion of the oxide. Pack carburization of the same samples produced abnormal structures in all material, indicating abnormality was due to oxygen in the carburizing gas rather than to oxides in the metal.

Agrees With Results

Thomas G. Digges, metallurgist, national bureau of standards, Washington, declared that some work carried out by the bureau with high purity carbon alloys was in agreement with the results of the authors in that abnormal structures were produced in these alloys which were free of aluminum and alumina.

H. W. McQuaid corrected an impression which he believed the paper gave to the effect that he did not believe that grain growth is inhibited by finely dispersed non-metallic particles such as carbides, nitrides and refractory oxides. He said there was no doubt these play an important part in austenite growth.

In a paper on the "Austenitic Grain Size of Eutectoid Steel," Harry Tobin and Reid L. Kenyon, research assistant and research metallurgist, respectively, research laboratories, The American Rolling Mill Co., Middletown, O., declared it was difficult to determine the grain size in this case by ordinary methods due to difficulty in distinguishing between the different grains. Consequently, they developed a special technique, which they described and by which, they said, the austenitic grains in this range of steels could be clearly shown. They also brought out this technique gave a modification which made it possible to determine the size of the prior austenitic grains on a piece of material already heat treated.

Among various conclusions, the authors said the austenitic grain size of eutectoid steel could be determined by heating the specimen under mildly oxidizing conditions followed by careful polishing and etching in a 15 per cent solution of hydrochloric acid in ethyl alcohol. They further said on the eutectoid steel investigated, the austenitic grain size developed by a particular heat treatment was not influenced by the austenitic grain size resulting from previous treatments.

Grain Size Unaffected

The authors also pointed out the rate of heating through the critical temperature, within the limits of 1 to 800 degrees Fahr. per minute, did not affect the austenitic grain size on the steel tested. They further concluded that instead of having an inherent grain size, a steel has a characteristic austenitic grain growth behavior which is dependent for that steel on the time and temperature factors.

In discussion, J. K. Stone and J. R. Vilella, research laboratory, U. S. Steel Corp., Kearny, N. J., said the data which showed a high temperature normalize, with its attending coarsened austenite grains, would produce no different effect upon subsequent grain behavior than does a lower normalizing temperature, with its attending finer austenitic grains, was somewhat at variance with the majority of their own experiences with a limited number of steels.

They believed some effect of heating rate upon austenite grain size could have been obtained had the work been extended to include determination of austenite grain size within the coarsening range of steel.

O. E. Harder said steel studied by Mr. Tobin and Mr. Kenyon appeared to have a rather low coarsening temperature, thus suggesting it contained relatively little of the grain growth inhibiting material. He also thought the heat treatments selected by the authors to determine the effect of previous austenitic grain size did not appear to be the best ones possible to bring out certain differences. For example, he said, both specimens mentioned were air-cooled from the preliminary heat treating temperatures; whereas the work his organization had done indicated better contrasts are brought out if a comparison is made between quenched and slowly cooled materials.

Haulaway Trailers Move Finished Automobiles

(*Concluded from Page 60*)

be noticed a nonskid grating to give a firm grip on tires while cars are being loaded. This is an expanded steel mesh, welded to floor pans of the trailer and to the loading skids. Also at the rear may be seen two ratchet tiedowns which are used to lock loaded cars in position.

Spare tires for the trailer are conveniently carried on either side at the front on hinged brackets which may be swung down to bring the tire almost to the ground for removal.

Overall dimensions of the streamline trailer are: 8 feet wide, 7 feet 6 inches high unloaded, and 33 feet in length for the cab-over-engine type of tractor. For the standard type of tractor, length is reduced to 31 feet 6 inches. Hydraulic or electric brakes on the trailer wheels are available. Finished in three coats of paint, the units are supplied in practically any color scheme desired, including aluminum.

Detects Hidden Flaws

■ Method of inspecting machine parts for hidden flaws without injuring or changing them has been developed by the General Electric Co., Schenectady, N. Y. The method depends on the principle that any substantial change in the constitution or state of magnetizable material will be reflected in its magnetic characteristics.

A constant magnetic field is produced so that it penetrates through the entire thickness of a small area of the part to be inspected. The part is slowly revolved so as to change continuously the section within the field, until the whole part is magnetically explored. Imperfections such as voids or nonhomogeneous areas in the interior betray themselves by producing disturbances in the magnetic field at the surface of the part.

Magnetic search coils are mounted close to this external surface. Any sudden change in the magnetic linkage, created by a discontinuity in the metal of the part, produces a corresponding sudden electric voltage in the external measuring circuit. The imperfection is detected and the defective part is discarded.

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

Steel Sales—Union Drawn Steel Co., Massillon, O., has issued a folder on its district sales offices in 23 localities.

Lighting—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has issued a catalog section on its Millite lighting unit for industrial plants.

Insulating Material—Continental-Diamond Fibre Co., Newark, Del., has published a catalog on Micabond, a bonded mica insulating material.

Valves — Manning, Maxwell & Moore Inc., Hancock Valve division, Bridgeport, Conn., has issued an illustrated bulletin dealing with the new Hancock Duravalve.

Stamping — Chambersburg Engineering Co., Chambersburg, Pa., has issued bulletin 275 on the new Cecostamp, drop stamper for lightweight, sheet metal parts.

Arc Welding—Hobart Brothers, Troy, O., has issued a catalog dealing with its new 40-volt, simplified arc welder and the uses of motor horsepower control.

Regulators — Askania Regulator Co., 1603 South Michigan avenue, Chicago, has issued a bulletin on Askania automatic control for the steel industry.

Valves—Homestead Valve Mfg. Co., Coraopolis, Pa., has printed a folder dealing with use of the Hypressure Jenny for removing grease and dirt in maintenance work.

Fire Prevention—Linde Air Products Co., 205 East 42nd street, New York, has issued a booklet entitled "Preventing Welding and Cutting Fires."

Porcelain Enameling — Ferro Enamel Corp., Cleveland, has recently published "The A B C of Ferro's Responsibility," an interesting presentation of the company's services.

Metal Spraying—Metalspray Co., 113 Llewellyn street, Los Angeles, has announced its bulletin 800 describing some of the new applications in metal spraying.

Counterbores — Eclipse Counterbore Co., 7410 St. Aubin avenue, Detroit, has issued a pamphlet on the Eclipse line of counterbore and end mill products.

Rubber Belts—Manhattan Rubber Mfg. division, Raybestos-Manhattan Inc., Passiac, N. J., has issued a bulletin on Condor Compensated belts. Engineering data is included.

Metal Protection — Alox Corp., Niagara Falls, has mimeographed a 31-page booklet on corrosion prevention and covering the Alox products.

Steel Castings—Vanadium Corp. of America, New York, has published a 24-page bulletin on Vanadium steel castings, describing properties and applications.

Control Instruments—Bristol Co., Waterbury, Conn., has published a new bulletin describing temperature recorders and controllers for furnaces, kilns and industrial ovens.

Shapers — Gould & Eberhardt, Irvington, Newark, N. J., has published a catalog illustrating and describing its line of tool room and industrial shapers and attachments.

Nibbling Machines—W. J. Savage Co., Knoxville, Tenn., has printed a bulletin on its line of improved nibbling machines with direct-over-center drive, and totally-enclosed, one piece, revolving head.

Boiler Protection — Cochrane Corp., Philadelphia, has issued a folder describing and illustrating interesting installations of Cochrane Deaerators in a Youngstown steel mill.

Pumps—Weinman Pump & Mfg. Co., 290 Spruce street, Columubs, O., has announced bulletin 626 on low head, centrifugal pumps and bulletin 726-A on general service Unipumps.

Mold Duplicators—George Groton Machine Co., Racine, Wis., is distributing bulletin 1319-B on three sizes of machines for duplication of dies and molds and a number of interesting applications.

Furnaces—American Furnace Co., 2719 Delmar boulevard, St. Louis, Mo., has published bulletin 106-A on the Afco Duo-Blo unit for automatic or manual firing, bulletin 115-C on the Air-Stream unit, and bulletin 117 on the Afco Crescent furnace with waist-high shaker.

Hydraulic Power — Blackhawk Mfg. Co., Milwaukee, is distributing literature on Porto-Power, portable hydraulic power; hydraulic hand and service jacks; and Blackhawk Gripline wrenches.

Motors—Reliance Electric & Mfg. Co., Ivanhoe Road, Cleveland, has issued bulletin 122 on splashproof, type AA Reliance motors and bulletin 124 on explosionproof, alternating-current motors.

Aluminum — Aluminum Co. of America, Pittsburgh, has issued a completely revised edition of "Machining Aluminum," containing detailed data on the machining of aluminum and its alloys.

Electrodes—Page Steel & Wire division, American Chain & Cable Co., Monessen, Pa., has issued a booklet on stainless steel electrodes containing information on such steels and procedure for welding them.

Control Instruments—Wheelco Instruments Co., 1929 South Halsted street, Chicago, has issued bulletin 602 on the Wheelco Capacitrol temperature control and bulletin 650 on the Wheelco proportioning indicating controller.

Presses—Niagara Machine & Tool Works, 637 Northland avenue, Buffalo, N. Y., is mailing bulletin 58-G giving specifications and illustrations of the complete line of Niagara Master series A and standard series inclinable presses.

Annealing—Continental Industrial Engineers Inc., 201 North Wells street, Chicago, is distributing a bulletin entitled "Controlled Atmospheres for Copper," dealing with furnaces in the production of copper and copper alloys.

Insulation — Johns-Manville, 22 East 40th street, New York, has issued a 32-page catalog on Johns-Manville sheet, block and pipe insulations, also a new brochure entitled "Friction Materials for the Iron and Steel Engineer."

Stampings—Commercial Shearing & Stamping Co., Youngstown, O., has issued a large and completely illustrated catalog on tank heads, tank accessories, boiler heads and stampings of steel, stainless, monel, aluminum, copper and copper alloys and clad metals.

Hardening Baths — A. F. Holden Co., New Haven, Conn., has published a bulletin on Holden high-speed hardening baths, a new development for hardening high-speed steels. Another folder deals with the Holden Di-Ard, a bath for hardening tool steels, with a temperature range for hardening of 1350 to 1600 degrees Fahr.

Steel Decline Seems Nearing Bottom

Quiet Quarter Seen; Scrap Drops Again; Light Steels Lead

MARKET IN TABLOID

DEMAND . . . . *Slow, consumers using up stocks.*

PRICES . . . . *Scrap down sharply.*

PRODUCTION . . *Operations down 2 points to 51 per cent of capacity.*

SHIPMENTS . . . *Most buyers ask prompt delivery.*

CONDITIONS in the steel market appear to have reached a fairly balanced level, consumers buying only to fill in their stocks as current needs dictate, meanwhile operating largely from inventory.

Some hopeful factors appear, as resumption of buying for agricultural implement needs is expected as stocktaking season for that industry ends, and automobile builders' needs should become larger when new models are out and fall selling starts. Delay in demand from the latter source has had its effect on various steel products and also on pig iron demand by foundries allied to industry.

All indications seem to point to a quiet period over fourth quarter, with production keyed closely to consumption and volume of business depending on the situation in general business and the degree of confidence felt in the future.

It is too early to expect response by railroads to the higher rates granted by the interstate commerce commission and efforts to obtain a further increase may have some dampening effect on buying from that source. The unequal financial returns from the new rates, giving highest gains to roads largely interested in coal handling, results in some carriers receiving relatively little benefit.

Downward movement of the steel production rate last week was markedly less precipitate than in the previous period, indicating approach to the low point of the decline. Adjustment of production to demand appears to have been achieved in great measure. The national rate last week was 51 per cent of capacity, a drop of 2 points from the preceding week. Pittsburgh declined 8 points to 41 per cent, Chicago 2 points to 44, Eastern Pennsylvania 4 points to 43, Youngstown 1 point to 54, Wheeling 8 points to 62, Cleveland 6 points to 59, Buffalo 7 points to 51, New England 40 points to 25 and Detroit 5 points to 90. Cincinnati advanced its rate 4 points to 70 per cent and St. Louis and Birmingham were unchanged at 64 and 51.6 per cent, respectively.

It is apparent that the rapid fall in steelworks operations is not an index of current or future consumption of steel. Large inventories remaining from the heavy buying of first half, certainty of no price increase and general unsettlement of the business outlook conspired to cause consumers to rely on their steel stocks and delay further buying. Steel has been going into consumption at a much better rate than shipments of recent weeks would indicate. How soon depletion of stocks will force buying depends on continuance of demand for manufactured products.

Deepest cuts in production have been made by mills whose output is largely in heavier steel, structurals, rails, plates and similar products, while those with large capacity for sheets, strip and light steel are in better position and are able to continue at a higher rate. This division is caused by absence of railroad buying and restricted demand for building purposes on the one hand and more active business in automobiles and consumer goods, such as refrigerators, air conditioning and radios, on the other.

About 77,000 tons of plates, shapes, reinforcing bars and pipe will be required for an extension of Grand Coulee dam on which Dec. 10 has been set as tentative date for opening bids. Japanese interests are expected to award within a few days about 14,000 tons of plates for 45 tanks of 82,000 barrels capacity, to be fabricated in Japan.

Automobile production last week was practically even with the preceding, with 91,905 units, compared with 90,155 the week before. General Motors produced 45,225 cars, compared with 44,970, Chrysler 27,775 against 27,675, Ford 1375, compared with 765 and other builders a total of 15,780, compared with 18,495 the previous week.

Because of drastic adjustment of scrap quotations, especially severe in Eastern Pennsylvania, STEEL'S composite of steelmaking scrap declined last week by 91 cents, to $14.46, the level prevailing at the middle of August. The iron and steel composite was lowered 14 cents, to $39.33 by the weakness in scrap. Finished steel composite is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Oct. 30	Oct. 23	Oct. 16	One Month Ago Sept., 1937	Three Months Ago July, 1937	One Year Ago Oct., 1936	Five Years Ago Oct., 1932
Iron and Steel	$39.33	$39.47	$39.60	$40.16	$40.03	$34.67	$28.90
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.90	47.64
Steelworks Scrap ..	14.46	15.37	16.00	18.99	18.51	16.44	6.96

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

A COMPARISON OF PRICES

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

Finished Material

	Oct. 30, 1937	Sept. 1937	July 1937	Oct. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.05c
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, Philadelphia	2.74	2.74	2.74	2.36
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.11½
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.43½	2.43½	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.60
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20
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
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.50
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.05

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$32.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	32.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	32.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	40.00

Pig Iron

	Oct. 30, 1937	Sept. 1937	July 1937	Oct. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$20.8132
Basic, Valley	23.50	23.50	23.50	19.00
Basic, eastern del. East. Pa.	25.26	25.26	25.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.3132
No. 2 fdy., Chicago	24.00	24.00	24.00	19.50
Southern No. 2, Birmingham	20.38	20.38	20.38	15.50
Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
No. 2 X eastern, del. Phila.	26.135	26.135	26.135	21.68
Malleable, Valley	24.00	24.00	24.00	19.50
Malleable, Chicago	24.00	24.00	24.00	19.50
Lake Sup., charcoal, del. Chicago	30.04	30.04	30.04	25.7528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.6741
Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13

Scrap

Heavy melting steel, Pittsburgh	$15.00	$20.40	$19.40	$18.15
Heavy melt. steel, No. 2, E. Pa.	12.75	16.69	18.00	13.95
Heavy melting steel, Chicago	14.00	17.85	17.05	16.25
Rails for rolling, Chicago	16.75	20.35	20.30	16.95
Railroad, steel specialties, Chicago	18.75	20.50	20.20	17.75

Coke

Connellsville, furnace, ovens	$4.37	$4.45	$4.50	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.30	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

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

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, del.	3.84c
New York, del.	3.88c
St. Louis	3 78c
Granite City, Ill.	3.75c

Enameling Sheets

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

Tin and Terne Plate

Gary base, 10 cents higher

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

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

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

Straight Chromes

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

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63¼c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel

To Manufacturing Trade

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

Iron

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

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.60c
Gulf ports	2.90c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.84c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young.	2.45c
Gulf ports	2.80c

Wire Products

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

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

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

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c

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

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

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

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

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

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

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

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

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

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

Hot strip to 23½-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

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

Bolts and Nuts

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

Carriage and Machine

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

Plow Bolts

All sizes	65-5 off

Stove Bolts

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

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

Nuts

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

Hexagon Cap Screws

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

Square Head Set Screws

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

Rivets, Wrought Washers

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

Cut Nails

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

Welded Iron, Steel Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
⅛	59½	49
¼	62½	53
1—3	64½	55½

Iron

¼	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

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

Iron

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

Line Pipe

Steel

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

Butt Weld

Iron

	Blk.	Galv.
¼	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

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

Boiler Tubes

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

Lap Weld

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

Seamless

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

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

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

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

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

Forging Billets

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

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

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

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅝-inch incl.	47.00
Do., over ⅝ to ¾-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.25- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port

Sulphate of ammonia	$28.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. below 1.75 sil. Gross tons.

Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	.....	24.46	.....
Boston from Birmingham	26.37	.....	25.87	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	.....	.....
Brooklyn, N. Y., from Bmghm.	27.05	.....	.....	.....
Canton, O., from Cleveland	25.26	25.26	25.76	25.76
Chicago from Birmingham	24.22	.....	24.10	.....
Cincinnati from Hamilton, O.	24.07	25.01	24.51	.....
Cincinnati from Birmingham	23.69	.....	22.69	.....
Cleveland from Birmingham	24.12	.....	23.62	.....
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	25.26
Milwaukee from Chicago	25.00	25.00	24.50	25.00
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	.....	.....	.....
Newark, N. J., from Bethlehem	26.39	26.89	.....	.....
Philadelphia from Birmingham	25.38	.....	25.26	.....
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	.....
Pittsburgh district from Neville Island	∫ Neville, base plus 63c, 76c, ⌋ and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	25.75
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.29
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.95-3.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorous, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.
Oct. 23	12.00	13.12½	11.75	49.50	49.00	5.50	5.35
Oct. 25	12.00	13.12½	11.75	48.50	48.12½	5.50	5.35
Oct. 26	12.00	12.12½	11.75	48.50	48.12½	5.50	5.35
Oct. 27	12.00	12.12½	11.75	47.62½	47.25	5.50	5.35
Oct. 28	11.75	12.12½	11.27½	48.50	48.12½	5.50	5.35
Oct. 29	11.75	12.12½	11.27½	48.25	47.87½	5.50	5.35

	Zinc St. L.	Aluminum 99%	Antimony American Spot. N. Y.	Nickel Cathodes
Oct. 23	6.00	20.00	17.25	35.00
Oct. 25	5.75	20.00	17.25	35.00
Oct. 26	5.75	20.00	17.25	35.00
Oct. 27	5.75	20.00	17.25	35.00
Oct. 28	5.75	20.00	17.25	35.00
Oct. 29	5.75	20.00	17.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

*Yellow brass (high)	18.12½
*Copper, hot rolled	20.12½
Lead, cut to jobbers	9.00
Zinc, 100-lb. base	11.00

Tubes

*High, yellow brass	20.87½
*Seamless copper	20.87½

Rods

*High yellow brass	14.62½
*Copper, hot rolled	16.62½

Anodes

*Copper, untrimmed	17.37½

Wire

*Yellow brass (high)	18.37½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	6.12½-6.37½
*Cleveland	6.62½-6.87½
*Chicago	6.37½-6.62½
*St. Louis	6.37½-6.62½

Heavy Copper and Wire

*New York, No. 1	8.00-8.25
*Cleveland, No. 1	8.00-8.25
*Chicago, No. 1	8.00-8.25
*St. Louis	8.00-8.50

Composition Brass Borings

*New York	5.75-6.00

Light Copper

*New York	6.00-6.25
*Cleveland	6.00-6.25
*Chicago	6.00-6.25
*St. Louis	6.00-6.25

Light Brass

*Cleveland	3.00-3.25
*Chicago	4.00-4.25
*St. Louis	3.75-4.00

Lead

*New York	4.25-4.50
*Cleveland	4.25-4.50
*Chicago	4.00-4.25
St. Louis	4.00-4.50

Zinc

*New York	3.00-3.25
Cleveland	3.00-3.25
St. Louis	2.75-3.00

Aluminum

*Borings, Cleveland	8.00-8.25
*Mixed cast, Cleve.	10.75-11.00
*Clips, soft, Cleve.	12.75-13.00
*Mixed cast, St. L.	11.75-12.00

SECONDARY METALS

*Brass, ingot, 85-5-5-5, lcl.	12.25
*Stand. No. 12 alum.	18.00-18.50

WAREHOUSE IRON AND STEEL PRICES

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Birmingham	3.85c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c

REINFORCING BARS

Buffalo	3.10c
Birmingham	3.85c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleve., ¼-in., o'r	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Birmingham	3.80c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Birmingham	4.40c
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

NO. 24 GALV. SHEETS

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

BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅜ & Und.	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, 14 & Und.	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Birmingham	4.91c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

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

	Base
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Birmingham	50-10
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 28

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

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$29.76 6 0 0	$20.95	2 12 0
Basic bessemer	19.47 3 18 6	20.95	2 12 0
Hematite, Phos. .03-.05	35.96 7 5 0*	.....	.....
SEMIFINISHED STEEL			
Billets	$39.06 7 17 6	$43.20	5 7 6
Wire rods, No. 5 gage	53.69 10 16 6	49.22	6 2 6
FINISHED STEEL			
Standard rails	$50.22 10 2 6	$46.20	5 15 0
Merchant bars	2.43c 11 0 0	2.18c to 2.28c	6 0 0 to 6 5 0
Structural shapes	2.35c 10 12 6	1.96c	5 7 6
Plates, †¼ in. or 5 mm.	2.56c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.32c 15 0 0 4.14c 18 15 0	3.18c 4.01c	8 15 0†† 11 0 0
Sheets, gal., 24 gage, corr.	3.04c 13 15 0	2.37c	6 10 0
Bands and strips	4.31c 19 10 0	2.54c	7 0 0
Plain wire, base			
Galvanized wire, base	5.14c 23 5 0	3.18c	8 15 0
Wire nails, base	4.09c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	$ 6.20 1 5 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	$25.05	5 1 0 (a)	$17.12	505	$27.04	800	$25.31 63
Basic bessemer pig iron	24.80	5 0 0 (a)	.....	.....	.....	.....	27.93 (b) 69.50
Furnace coke	9.30	1 17 6	6.03	178	7.27	215	7.63 19
Billets	39.06	7 17 6	25.68	757.50	32.45	960	38.77 96.50
Standard rails	2.24c	10 2 6	1.62c	1,080	2.06c	1,375	2.38c 132
Merchant bars	2.53c	11 9 0	1.49c	995	1.65c	1,100	1.98c 110
Structural shapes	2.44c	11 0 6	1.46c	970	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.59c	11 14 3	1.86c	1,240	2.06c	1,375	2.29c 127
Sheets, black	3.48c	15 15 0§	2.25c	1,500‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.31c	19 10 0	3.38c	2,250	2.85c	1,900	6.66c 370
Plain wire	4.31c	19 10 0	2.28c	1,520	2.48c	1,650	3.11c 173
Bands and strips	2.70c	12 4 0	1.68c	1,120	2.33c	1,550	2.29c 127

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

**Gold pound sterling carries a premium of 65.5 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.	14.00
N. Eng. del. No. 1..	14.50-15.00
Buffalo, No. 1	14.50-15.50
Buffalo, No. 2	12.50-13.50
Chicago, No. 1.....	13.75-14.25
Cleveland, No. 1...	14.00-14.50
Cleveland, No. 2...	13.00-13.50
Detroit, No. 1.....	11.50-12.00
Eastern Pa., No. 1..	14.50-15.00
Eastern Pa., No. 2..	12.50-13.00
Federal, Ill.	12.50-13.00
Granite City, R. R.	15.00-15.50
Granite City, No. 2.	12.50-13.00
New York, No. 1..	†14.00
N. Y. dock No. 1 exp	13.00-13.50
Pitts., No. 1 (R. R.)	16.25-16.75
Pitts., No. 1 (dlr.)..	14.75-15.25
Pittsburgh, No. 2...	13.50-14.00
St. Louis, R. R.....	15.00-15.50
St. Louis, No. 2....	12.50-13.00
Toronto, dlrs. No. 1.	12.00
Toronto, No. 2	11.00
Valleys, No. 1	16.00-16.50

COMPRESSED SHEETS

Buffalo, dealers....	12.50-13.50
Chicago, factory...	13.00-13.50
Chicago, dealer	12.50-13.00
Cleveland	13.50-14.00
Detroit	12.50-13.00
E. Pa., new mat. ...	14.50-15.00
E. Pa., old mat.	11.00-11.50
Pittsburgh	14.75-15.25
St. Louis	10.00-10.50
Valleys	15.50-16.00

BUNDLED SHEETS

Buffalo	9.50-10.00
Cincinnati, del.	11.50-12.00
Cleveland	10.00-10.50
Pittsburgh	14.00-14.50
St. Louis	9.50-10.00
Toronto, dealers ...	8.00

SHEET CLIPPINGS, LOOSE

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

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	19.50-20.00
Chicago (3 ft.).....	17.50-18.00
Chicago (2 ft.).....	18.50-19.00
Cincinnati, del.	18.50-19.00
Detroit	16.50-17.00
Pitts., 3 ft. and less	19.25-19.75
St. Louis, 2 ft. & less	17.00-17.50

STEEL RAILS, SCRAP

Boston district	†14.00-14.50
Buffalo	16.00-16.50
Chicago	13.75-14.25
Cleveland	17.50-18.00
Pittsburgh	16.25-16.75
St. Louis	15.00-15.50

STOVE PLATE

Birmingham	9.50-10.00
Boston district	†8.50
Buffalo	12.00-12.50
Chicago	10.00-10.50
Cincinnati, dealers..	8.50- 9.00
Detroit, net	9.50-10.00
Eastern Pa.	13.00-13.50
New York, fdry.	†10.00-10.50
St. Louis	11.00-11.50
Toronto, deal'rs, net	10.00

SPRINGS

Buffalo	19.00-20.00
Chicago, coil	19.50-20.50
Chicago, leaf	18.00-18.50
Eastern Pa.	21.00-21.50
Pittsburgh	19.25-19.75
St. Louis	20.00-20.50

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	16.00-16.50

RAILROAD SPECIALTIES

Chicago	18.50-19.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	19.00-19.50
Cleveland, billet, bloom crops	22.00-22.50
Eastern Pa., crops..	20.50-21.00
Pittsburgh, billet, bloom crops	19.75-20.25
Pittsburgh, sheet bar crops	19.25-19.75

FROGS, SWITCHES

Chicago	13.75-14.25
St. Louis, cut	15.50-16.00

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	†10.00-10.25
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	15.00-15.50
Chicago, No. 1 net..	12.50-13.00
Cincinnati, No. 2 ...	12.50-13.00
Eastern Pa., No. 1..	15.50-16.00
St. Louis, No. 1....	10.00-10.50
St. Louis, No. 2....	15.00-15.50
Toronto, No. 1 dlr...	16.00

SPECIFICATION PIPE

Eastern Pa.	15.50-16.00
New York	†11.50-12.00

BUSHELING

Buffalo, No. 1	12.50-13.50
Chicago, No. 1.....	13.00-13.50
Cincin., No. 1, deal..	12.00-12.50
Cincinnati, No. 2 ...	7.00- 7.50
Cleveland, No. 2...	10.50-11.00
Detroit, No. 1, new.	12.00-12.50
Valleys, new, No. 1	14.75-15.25
Toronto, dealers....	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	9.00- 9.50
Chicago	9.50-10.00
Cincinnati, dealers..	8.50- 9.00
Cleveland	9.00- 9.50
Detroit	7.00- 7.50
Eastern Pa.	10.00-10.50
New York	†8.00- 8.50
Pittsburgh	10.25-10.75
St. Louis	8.00- 8.50
Toronto, dealers ...	8.00- 8.50
Valleys	12.00-12.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†7.00
Buffalo	9.00- 9.50
Cincinnati, dealers..	7.00- 7.50
Cleveland	11.50-12.00
Detroit	8.00- 8.50
Eastern Pa.	9.00- 9.50
New York	†6.00- 6.50
Pittsburgh	11.25-11.75
Toronto, dealers....	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00
Boston dist. chem...	†8.50
Bos. dist. for mills	†8.00
Buffalo	9.50-10.00
Chicago	9.50-10.00
Cincinnati, dealers..	7.00- 7.50
Cleveland	11.50-12.00
Detroit	8.00- 8.50
E. Pa., chemical....	14.00-14.50
New York	†6.50- 7.00
St. Louis	6.00- 6.50
Toronto, dealers....	9.00

PIPE AND FLUES

Cincinnati, dealers..	8.50- 9.00
Chicago, net	10.50-11.00

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	9.50-10.00
Cincinnati	8.50- 9.00
Eastern Pa.	13.00-13.50
New York	†10.00-10.50
St. Louis	11.00-11.25

FORGE FLASHINGS

Boston district	†9.75
Buffalo	13.00-13.50
Cleveland	14.50-15.00
Detroit	11.00-11.50
Pittsburgh	14.00-14.50

FORGE SCRAP

Boston district	†8.50
Chicago, heavy	18.50-19.00

ARCH BARS, TRANSOMS

St. Louis	17.00-17.50

AXLE TURNINGS

Boston district	†9.00
Buffalo	13.50-14.00
Chicago, elec. fur...	14.00-14.50
Eastern Pa.	13.50-14.00
St. Louis	11.00-11.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	19.00-20.00
Boston district ...	†19.00
Chicago, net	21.00-21.50
Eastern Pa.	22.00-22.50
St. Louis	19.50-20.00

SHAFTING

Boston district	†17.00
New York	†17.50-18.00
Eastern Pa.	21.50-22.00
St. Louis	16.00-16.50

CAR WHEELS

Birmingham	17.00-18.00
Boston dist., iron...	†12.50
Buffalo, steel	19.00-19.50
Chicago, iron	16.50-17.00
Chicago, rolled steel	16.50-17.00
Cincinnati, iron	16.50-17.00
Eastern Pa., iron...	18.00-18.50
Eastern Pa., steel..	20.50-21.00
Pittsburgh, iron	16.00-16.50
Pittsburgh, steel....	19.25-19.75
St. Louis, iron	17.00-17.50
St. Louis, steel....	19.00-19.50

NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.	†13.00
N. Eng. del. No. 2..	14.00-14.50
N. Eng. del. textile.	17.00
Buffalo, cupola	14.00-14.50
Buffalo, mach.	15.00-15.50
Chicago, agri. net..	11.50-12.00
Chicago, auto	12.50-13.00
Chicago, railr'd net	12.50-13.00
Chicago, mach. net	13.50-14.00
Cincin., mach. cup..	13.00-13.50
Cleveland, mach...	18.50-19.00
Eastern Pa., cupola	18.00-18.50
E. Pa., mixed yard.	14.50-15.00
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..	†11.50
N. Eng. del.	14.75
Buffalo, break.....	12.00-12.50
Cleveland, break. ..	16.00-17.00
Detroit, break.	11.50-12.00
Detroit, auto net...	13.00-13.50
Eastern Pa.	15.50-16.00
New York, break....	†12.00-12.50
Pittsburgh	13.50-14.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	18.00
Buffalo	16.00-16.50
Chicago, R. R.	16.00-16.50
Cincin., agri. del....	13.00-13.50
Cleveland, rail	17.00-17.50
Detroit, auto	13.00-13.50
Eastern Pa., R. R...	17.00-18.00
Pittsburgh, rail	15.50-16.00
St. Louis, R. R.	15.00-15.50

RAILS FOR ROLLING

5 feet and over

Birmingham	17.00-18.00
Boston	†12.50
Chicago	16.50-17.00
Eastern Pa.	19.00-19.50
New York	†15.50-16.00
St. Louis	17.00-17.50

LOCOMOTIVE TIRES

Chicago (cut)	18.50-19.00
St. Louis, No. 1....	17.00-17.50

LOW PHOS. PUNCHINGS

Buffalo	18.00-18.50
Chicago	17.50-18.00
Eastern Pa.	20.00-20.50
Pittsburgh (heavy)	19.00-19.50
Pittsburgh (light)..	19.50-20.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer.....	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	13.00-14.00
No. Afr. low phos. nom.	18.00-20.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60% nom.	15.00
Tungsten, Nov.-Dec. sh. ton, unit, duty pd.	nominal
N. F., fdy., 55%....	7.00
Chrome ore, 48% gross ton, c.i.f..	$25.50-26.50

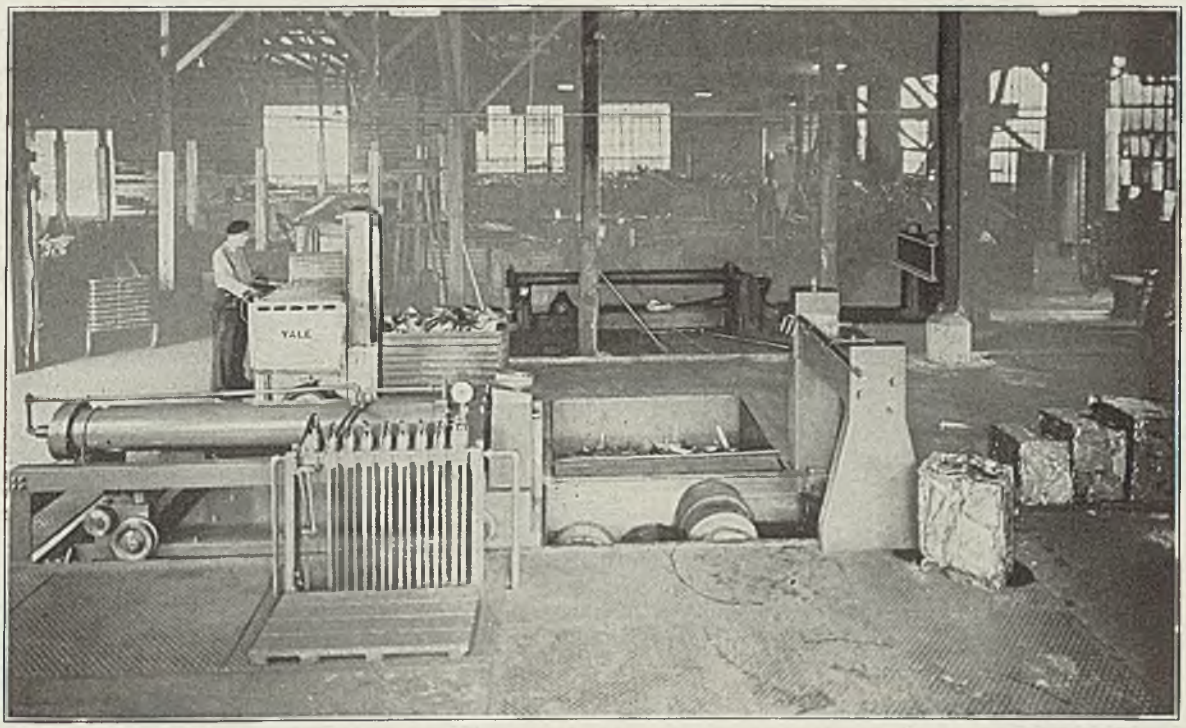
Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%..	non. 50.00
So. African, 50-52%	non. 50.00
Indian, 50-52%.....	Nominal

LOGEMANN

Metal Baling Presses



Steel mills, automobile manufacturers, stamping plants and scrap yards bale their sheet scrap in LOGEMANN scrap metal presses. Baled scrap pays substantial dividends . . . . saves space . . . . can be more economically handled and loaded . . . . is practically free from corrosion and saves much heat in remelting . . . . can be held for favorable price periods.

LOGEMANN scrap metal presses are built in many sizes and several types, to meet specific conditions. The illustration shows two LOGEMANN installations in a prominent automobile plant . . . . in the background a two-ram unit for ordinary scrap . . . . a triple-compression press with special large box in foreground for bulky scrap, drums and large forms.

The LOGEMANN line includes baling presses for all materials . . . . high pressure pumps . . . . hydraulic straighteners . . . . hydraulic presses and fittings. Write for descriptive bulletins.

LOGEMANN BROTHERS COMPANY

3126 W. Burleigh St. Milwaukee, Wis.

Sheets

Sheet Prices, Page 130

Pittsburgh—With October nearly ended, the month's sheet specifications are below the September volume, although elimination of the first week in September would make the figures more comparable. In the last few days tonnage has gained due to one automobile manufacturer's specifications, but no pronounced trend has developed and the situation is still spotty. Jobbers are ordering only lightly and trying to lower inventories. Automobile manufacturers have material on hand and from all indications are comfortably situated. Operations are estimated around 65 per cent; galvanized mills, around 67.

Cleveland — Inventories of miscellaneous consumers are ample, although they would be considered low on the volume of production reported a few months ago. Current buying, while showing a moderate increase, is still well below former estimates. Specifications from local stamping concerns is noticeably light. Little buying has been traced to consumers attempting to take advantage of present freight rates.

Chicago—There is no improvement in the demand for sheets. Resumption of production by Ford is expected to provide some stimulus to automotive sheet shipments though most interests are cautious regarding forward buying. While consumers generally are attempting to reduce stocks, some users still have fairly large inventories. Sheet mill backlogs are light and delivery of practically all grades can be made in two to three weeks or less.

Boston—Gain in sheet buying is spotty, with some sellers noting a slight increase in the number of small replacement orders for prompt delivery. Fabricators, including stamping shops and builders of household goods, are releasing shipments about in line with consumption and gradually lowering inventory as the end of the year approaches. Some jobbers note a slight pickup in demand.

New York—Sharp reduction in operations at many consumer plants is giving the sheet market a particularly depressing outlook. As a result of this curtailment, excess stocks at these plants appear more formidable and the trade looks for little real improvement over the remainder of this year. Deliveries continue easy, with hot-rolled generally available at around 10 days to two weeks, cold-rolled, two to three weeks and galvanized, three to four weeks.

Philadelphia — Orders for both hot and cold-rolled sheets from the automotive trade are proving disappointing, since the industry apparently prefers to gage public reception of new models before going ahead. One of the stove makers, recently strikebound, again is operating at capacity but is using material previously on hand or on order. Demand from miscellaneous sources is light and in practically all cases is geared to actual consumptive requirements.

Youngstown, O. — Lessened volume of demand for steel sheets is causing the smaller sheet mills to taper their activities somewhat. Some are operating on a shorter work-week, and still others are idle this week but with earmarked floor stocks of fair sizes awaiting shipping releases from auto partsmakers. Customers are cautiously placing pressing orders and asking prompt shipment.

St. Louis—With other finished steel products, the market for sheets continues quiet. Business consists chiefly of fill-in orders, and no class of users appears interested in distant requirements. The seasonal movement of galvanized material to the south is disappointing, attrib-

uted to the sharp decline in cotton and rice prices.

Cincinnati—Moderate sheet buying for automotive interests has failed to hold and order books last week resembled those of recent dull periods. Miscellaneous demand has been only fair, with uptrends in some seasonal lines, refrigerators and stoves, not pronounced.

Birmingham, Ala. — While specifications for some classifications of sheets, notably roofing, have not been up to expectations, mills continue to operate at capacity. Demand for galvanized sheets continues fair.

Strip

Strip Prices, Page 131

Pittsburgh — In common with most other products, only moderate demand is noted by strip steel producers. Consumers continue cautious and are unwilling to buy beyond actual requirements, even though inventories apparently are lower than earlier this year. Demand for automotive purposes continues irregular. Household appliance manufacturers continue active, however. Deliveries are prompt.

Cleveland — Producers of hot and cold-rolled strip report electrical equipment manufacturers are fairly active, although demand from this source is disappointing for most are intent on using up inventories and are specifying only for fill-in purposes. Specifications from local stamping concerns have shown some increase recently. Mills are generally operating on reduced schedules with backlogs seriously depleted.

Chicago — Strip demand continues slow. Business has received little stimulus from expansion in motor car assemblies but a further gain in shipments of automobile material is looked for this month. Consumers are reducing inventories and some users shortly are expected to make new commitments. Production has been curtailed with the depletion of mill backlogs and delivery can be effected on relatively short notice.

Boston — Narrow cold strip mills in most instances have made further adjustment in operating schedules, production being slightly lower, in line with spotty buying. Pressure for prompt delivery accompanies practically all orders, but mills are able to meet this requirement, backlogs having been cleared. There is little advance buying and business on books beyond December shipment is usually tonnage deferred for later shipment or subject to open releases. Users of strip stocked heavier than generally believed and many are still working off this stock. Hot strip demand is sluggish.

New York — New cold strip buying continues to reflect the cautious attitude of most fabricating consumers who are buying only for replacement to fill gaps in stocks. Such volume is usually for prompt shipment, which mills are able to meet, backlogs having been worked off some time ago.

Philadelphia — Continued quiet is reported in narrow strip, in both hot and cold-rolled specifications. Most consumers, carload buyers and others, are covered against needs for balance of fourth quarter. Prompt delivery is available from mills.

Youngstown, O. — Demand for wider hot-rolled strip steel continues to hold up rather better than narrower widths. It seems to be the other way around with cold-rolled, auto partsmakers and miscellaneous consumers taking more freely the narrow widths of cold-rolled. Mills need new business in both lines of strip, and some irregularity is appearing in operating rates.

Plates

Plate Prices, Page 130

Pittsburgh — Announcement of higher freight rates has failed to bring immediate buying by railroads. Other consuming sources continue quiet from the standpoint of specifications, although consumption among tank fabricators is fairly well maintained. Deliveries are prompt, with backlogs well depleted.

Cleveland—Sellers report a moderate increase in miscellaneous requirements for tank and boiler work, particularly the latter. Deliveries can be made within a week on standard sizes and in some instances mills have curtailed operations sharply. Some recent buying has been traced to efforts of consumers to take advantage of present freight rates, but this is small.

Chicago—Plate demand is fair from consumers other than railroad shops and freight car builders, but poor requirements of the latter are restricting shipments. Mill backlogs are small and little improvement in buying is looked for before renewal of equipment purchasing by the railroads. Tank fabricators are fairly busy but no large lots have been placed recently.

Boston—Plate buying is dull, miscellaneous requirements accounting for most shipments. Such orders are usually small, with car lot deliveries few. Boiler shops are beginning to lower backlogs, which were not heavy in most instances, and appear to be covered for immediate needs. Shipyard releases are steady, but most tonnage for that industry is potential rather than for current needs. With one or two exceptions, structural shops are taking few plates; recently placed tank work gives little work to district shops.

New York—A fair amount of oil refinery work is being figured but little actually placed, and with railroad and ship work negligible, platemakers find new tonnage light. There is also some good export inquiry but foreign buyers demand concessions, which most sellers are not willing to meet, with a result that little business is developing. N. L. Harrison & Son, Newark, N. J., general contractors, have awarded a 48-inch water main for Newark to a Leetsdale, Pa., mill, requiring approximately 1400 tons of plates. When the new freight rate becomes effective, the delivery price on plates will be 2.54c, an increase of 1 cent per 100 pounds.

More than 21,000 tons of plates and other steel products will be up for bids Nov. 16 for two battleships, with further requirements to come out later.

Philadelphia — Although a large share of incoming plate business is for less than carlots no deviation in base prices and small quantity extras is noted. Business is largely miscellaneous in character and insufficient in total to support operations. Some plate mills are down to three days a week or less and some are considering dropping another turn. Demand from abroad is slower and less attractive from a price standpoint. Offering prices for export are around 2.30c to 2.43c, f.a.s. New York, with the minimum offered by Scandinavian countries and the maximum by the Far East.

Birmingham, Ala. — Buying of plates has shown some improvement over the past two weeks and has contributed some to the district's production rate.

San Francisco — Interest is centered in the outcome of the award of 45 tanks of 82,000-barrel capacity for Japanese interests, calling for approximately 14,000 tons. It is expected that these tanks will be placed with three plate fabricators within the next day or two. Erection of

the tanks, it is reported, will be done by Japanese interests.

Seattle—Penstocks in the second unit of Coulee dam, bids about Dec. 10 at Denver, are estimated to require 8000 tons of plates to be furnished by the department. Bellingham, Wash. has called bids Nov. 12 for 3900 feet of 24-inch arc welded or cast iron industrial water supply pipe, which involves 200 tons of plates. Pittsburgh-Des Moines Steel Co. has been awarded a 32-foot diameter steel water storage tank for Toppenish, Wash., calling for about 100 tons of plates. Other projects calling for plates are being planned but are not yet out for figures.

Plate Contracts Placed

2500 tons, tanks, General American Tank Storage Terminal Co., Corpus Christi, Tex., to Wyatt Metal & Boiler Works, Dallas, Tex.

940 tons, 60-inch welded steel pipe for Sunset discharge pipeline, San Francisco, to Western Pipe & Steel Co., San Francisco.

100 tons, 200,000-gallon tank and tower, Toppenish, Wash., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plate Contracts Pending

21,474 tons, plates, shapes, sheets, strip and bars, mostly plates, bureau of supplies and accounts, navy department Washington; bids Nov. 16, schedules 1976, 1978 and 1980. Material is for battleships North Carolina and Washington to be built at the Brooklyn and Philadelphia navy yards, respectively.

13,950 tons, 45 tanks, 82,000-barrel capacity, for Japanese interests at San Francisco; bids opened and will be awarded within a few days.

8000 tons, penstocks for second unit Coulee dam, Wash.; bids at Denver about Dec. 10 for general contract.

500 tons, or more, seagoing hopper dredge, 2500 cubic yards capacity, chief army engineers, Washington; bids Dec. 14.

320 tons, high-tensile black welding quality, for navy, delivery Washington, Lukens Steel Co., low; bids Oct. 22.

250 tons, 500,000-barrel tank and tower, San Diego, Calif.; bids opened.

200 tons, 24-inch arc welded industrial supply pipe (alternate for cast iron) for Bellingham, Wash.; bids Nov. 12.

160 tons, welding quality, for navy, delivery Washington, Worth Steel Co. low on bulk bids, Oct. 22.

Bars

Bar Prices, Page 130

Pittsburgh — Hot-rolled bar producers report little improvement in new business. The October volume is lower than during September. Alloy bars, however, have been in better demand, due to automotive requirements, and according to some producers, bookings are comparable to September. While a small backlog exists for November shipment, hot-rolled sellers await restoration of confidence and resumption of railroad buying as two of the factors necessary for substantial improvement.

Cleveland — Local forging concerns are disappointed in current requirements from auto builders and are consequently specifying only for fill in purposes. Deliveries can be made within a week on all grades of bars. Mill operations generally have been substantially curtailed. Agricultural implement manufacturers are specifying freely for current needs, with little forward buying reported.

Chicago — Bar sales are unimproved but consumption is estimated to be heavier than shipments, the difference being accounted for by further reduction in stocks. Automotive demand still is moderate and less than had been anticipated in view of current motor car assemblies. Requirements of the farm equipment industry still are retarded by plant shutdowns for inventory but a good outlook prevails for the balance of the year.

Boston — Alloy and forging bars are fairly active in small lot shipments, but demand for carbon steel

material continues slack. Railroads are doing little buying. Indications are that small tool shops, makers of specialties and some forging shops have lowered stocks materially, but this has not yet been translated into a decided improvement in new tonnage. Producers of airplane parts are maintaining operations in most instances while machine tool builders are also releasing some business, mostly small lots through jobbers.

New York — Bar buying is steady, but still restricted to small orders. Specifications from tool builders are possibly the best, but even these constitute a relatively small volume. Continued absence of important buying by jobbers, railroads and bolt and nut manufacturers is still keenly felt by sellers.

Philadelphia — Demand largely is of a routine character and mostly for fill-in requirements. Deliveries are available in practically all directions in a week or less on standard specifications. Jobbers are well stocked. Prices continue steady.

Youngstown, O. — Mills are receiving instructions to ship promptly the large number of small orders for common steel bars, an indication that purchasers' inventories are inadequate for current consumption. Alloy steel bar needs of auto partsmakers also are becoming manifest more insistently.

Birmingham, Ala. — A sprinkling of new business in bars has appeared but in nothing like the anticipated quantity for this season. Indications are that a new buying period is shortly to materialize from manufacturers of agricultural implements.

Pipe

Pipe Prices, Page 131

Pittsburgh—Little change in light demand for tubular goods is noted. One producer reports October tonnage comparable to September, and another that the decline in demand appears to be flattening out. Seamless, mechanical and boiler tubes have performed best in the experience of some sellers. With the year drawing to a close, there is likelihood of less stocking in oil country casing and tubing.

Cleveland—Cast iron pipe foundries are operating at a much slower pace than 30 to 60 days ago, due primarily to lack of PWA activity in this field. A number of small municipalities have ambitious plans on paper awaiting aid from this source. Most foundries have ample stock. Bids on 100 tons of cast pipe for a water system extension, Yorkville, O., are to be readvertised Nov. 2.

City of Cleveland is planning a new main water line from Parma reservoir to Rocky River drive, requiring approximately 3000 tons of 30-36-inch steel pipe; bids are due some time this month on a portion of the project.

Chicago—Cast pipe buying is slow and new inquiries are confined to small lots. Formal distribution of 2610 tons by Chicago on which bids were taken recently is the only approaching order of size. Producers' backlogs are receding, with little prospect of an upturn in view of the season.

Boston—Cast pipe buying in small lots is fairly active with few tonnage inquiries out for bids. Some work in upper New England will go over until spring due to difficult laying operations. Lack of small building has hampered merchant steel pipe while demand for repairs and heating extensions has been below expectations.

Birmingham, Ala. — Demand for

pipe continues disappointing. Pipe plants have nothing on which to predicate hope for early resumption of better than 40 to 45 per cent production and available business is in scattered lots.

San Francisco—Cast iron pipe market is quiet and only two projects of size are up for figures. Approximately 5000 tons of pipe and fittings will be required for the extension of the Grand Coulee dam in Washington, bids upon which, tentatively, are expected to be opened Dec. 10.

Seattle—Demand for cast iron goods continues slow but with money soon available for approved PWA projects several cities in Washington and Oregon will proceed with plans for long-delayed water system improvements. Bellingham, Wash., has called bids Nov. 12 for 3900 feet of 24-inch cast iron or steel water supply pipe. If cast iron, it will total, including fittings, nearly 500 tons. Goldendale, Wash., has purchased a small tonnage of 6-inch steel pipe. Specifications show the proposed second Coulee dam unit will require 5000 tons of pipe and fittings.

Cast Pipe Placed

950 tons, navy department, eastern yards, to U. S. Pipe & Foundry Co., Burlington, N. J.; bids Sept. 3.

349 tons, 4 to 8-inch pipe, Tucson, Ariz., to Pacific States Cast Iron Pipe Co., Provo, Utah.

156 tons, 4 to 8-inch, Sacramento, Calif.; allocated as follows: 118 tons of 4 and 6-inch to United States Pipe & Foundry Co., Burlington, N. J. and 38 tons of 8-inch to American Cast Iron Pipe Co., Birmingham, Ala.

Unstated tonnage, 10,000 feet of 4 to 8-inch class C mains, Fond du Lac, Wis., to James B. Clow & Sons, Chicago.

Steel Pipe Placed

475 tons, 1¼ to 8-inch, seamless, Long Beach, Calif., to Oil Well Supply Co., Los Angeles.

Cast Pipe Pending

5000 tons, pipe and fittings, for extension of Grand Coulee dam in Washington; bids Dec. 10.

400 tons, 2 to 8-inch, Powell Valley Water District, Portland, Oreg.; bids opened.

338 tons, 16-inch, Class B pipe, San Diego, Calif.; bids opened.

Steel Pipe Pending

3000 tons, three miles of 30 to 36-inch, for new main water line, Cleveland, from Parma reservoir to Rocky River drive; bids out in near future.

Wire

Wire Prices, Page 131

Cleveland — Producers of merchant and manufacturers' wire report operations in some departments have been curtailed while in others deliveries are still comparatively well extended. However, most grades of wire can be shipped within a week to ten days. Most consumers are intent on using up present inventories before making further commitments. Nut and bolt and other consumers of manufacturing wire serving the auto trade are fairly active but production schedules are still disappointing.

Pittsburgh — October volume of new business is behind September total, but in the case of some producers, fairly comparable to the previous month. Manufacturers' continues moving slightly better than merchant. Jobbers' stocks are reported out of balance, being long on some items and short on others. Hand-to-mouth buying is the order of the day, and no speculative trends are shown. Definite export inquiry is reported in rods, barbed wire and nails, with rods recently booked at a few dollars under the domestic level. On the cost basis, wire pro-

ducers feel most of present prices are amply justified.

Boston — Wire mill operations have leveled off with the volume of incoming business and are somewhat more spotty. Demand is well spread, however. Wide variety of specialties produced in this district tends to sustain operations better than a casual survey would indicate. Orders are usually for small replacements, but in some directions such releases are slightly more numerous. Practically all specifications are for prompt delivery with little advance buying. Billet, rod and semifinished stocks are now ample for apparent immediate needs which is reflected in lower ingot production. The present low production of raw steel is expected to climb again shortly even should the current slack in finished wire goods continue.

Chicago — Steel wire demand shows little change and is being influenced only slightly by expansion in automotive assemblies. Consumers are cautious in ordering, practically all commitments being for early needs. Jobbers are fairly well stocked. Inventories of consumers have been reduced sharply the past several months but stocks in hands of some still are ample for present requirements. Production is lower, with backlogs scant.

New York — While a few cancellations have been made by wire consumers who overbought earlier, this development has been rare and has not attained serious proportions. Most buyers took shipments in full, but their policy of lowering inventory is reflected in current buying, which is of a fill-in character with slight gain in tonnage reaching mills.

Birmingham, Ala. — Some improvement, accumulating from widely scattered small orders, continues to be evident in demand for wire products. Operations in wire, nevertheless, are mostly on a hand to mouth basis.

Rails, Cars

Track Material Prices, Page 131

Railroads show no indication of renewing purchases of rails or rolling stock as a result of the recent permission to increase rates on basic commodities and programs are being held back for lack of funds. Request for further increase probably will not be acted on before the end of the year, making prospects for further volume buying this year more remote. Rail requirements usually are placed late in the year but seem likely to be deferred further under present circumstances.

Chilean State railways have placed 17,000 tons of rails with Bethlehem Steel Co., Bethlehem, Pa., and are also inquiring for six locomotives.

Rail Orders Placed

Chilean State railways, 17,000 tons rails, to Bethlehem Steel Co., Bethlehem, Pa

Locomotives Pending

Chilean State railways, six 2-8-2 locomotives.

Buses Booked

Twin Coach Co., Kent, O.: Nineteen 35-passenger for New Orleans Public Service Co., New Orleans; twelve 35-passenger for Dallas Railway & Terminal Co., Dallas, Tex.; twenty 35-passenger for St. Louis Public Service Co., St. Louis; six 31-passenger for Lakewood Rapid Transit Co., Lakewood, O.; five 25-passenger for Southern Indiana Gas & Electric Co., Evansville, Ind.; five 23-passenger for Columbus & Southern Ohio Electric Co., Columbus, O.; five 31-passenger for Pacific Electric Co., Los Angeles; three 31-passenger for Mississippi Light & Power Co., Jackson, Miss.

A. C. F. Motors Co., New York: Seven 35-passenger for Dallas Railway & Terminal Co., Dallas, Tex.; three 35-passenger for Memphis Street Railway Co., Memphis, Tenn.; three 41-pas-

senger for Queens-Nassau Transit Lines Inc., Woodside, N. Y.; two 36-passenger for Florida Motor Lines Corp., Jacksonville, Fla.

Shapes

Structural Shape Prices, Page 130

New York—Structural tonnage is lower, both contracts and new inquiry. Award of several thousand tons for apartment buildings about cleans up such active work. None of the 10,770 tons being bid for tunnels and shafts, board of water supply, next week will reach the structural shops this year. Most of the smaller shops in Northern New Jersey are well engaged on small miscellaneous structural contracts.

New orders for fabricated structural steel placed during September were approximately the same volume of August, according to the American Institute of Steel Construction, New York. Shipments for the month continued at the same high rate of the summer months. September bookings were 50.4 per cent of normal (the yearly average of 1928-1931) as against a monthly average of 62.5 per cent for the first nine months this year. Shipments during September averaged 66 per cent of normal, compared to 58.8 per cent for the nine months.

Pittsburgh—Inquiry includes numerous bridges, but most are under 500 tons, with the exception of the state of New York's span at Claverack, N. Y., requiring 800 tons. Awards have been light. It is thought the current downward trend of financial markets will hamper bond issues for public work.

Cleveland — Awards are confined to small tonnages and inquiries are almost at a standstill. It is estimated that a number of projects already on paper have been discarded, until the outlook for the next few months has become clearer. A number of projects on which bids have already been received retain the interest of local fabricators, particularly the expansioin program of the Pennsylvania railroad at its Sandusky, O., unloading dock. Prices are firm.

Chicago—Inquiry continues in lots of less than 1000 tons and such jobs hold at the restricted number of previous weeks. New projects consist principally of state bridges, with few major industrial jobs in early prospect. Mills with small backlogs are able to make prompt delivery.

Boston—Structural contracts are fewer and aggregate tonnage small. For Maine bridges, 365 tons have been placed with Pennsylvania fabricators. Bridge needs approximate 4000 tons, including 3080 tons for the Northampton, Mass., span, closing this week. Schools at Middleboro, Littleton and Mendon, Mass., now being figured, take several hundred tons.

Philadelphia — Principal interest centers around several state jobs up for bids this week, which are needed badly by fabricating shops to bolster present slim backlogs. The Lit Brothers and Woolworth store jobs, taking over 1000 tons, are still pending. Close figuring is reported on the few jobs coming out, but mill prices on plain shapes remain steady.

San Francisco—Pending work in-

Shape Awards Compared

	Tons
Week ended Oct. 30	8,061
Week ended Oct. 23	11,255
Week ended Oct. 16	32,454
This week, 1936	13,004
Weekly average, 1936	16,332
Weekly average, 1937	24,004
Weekly average, September	18,073
Total to date, 1936	976,043
Total to date, 1937	1,056,179

Includes awards of 100 tons or more.

Behind the Scenes with STEEL

Dotty

■ In order to reassure readers who have doubts as to their health after perusing this week's book back to this point, we wish to affirm, declare, state and swear that those are really black spots of type at the beginning of many items, and not the more nebulous type often seen before the eyes in moments of mental weakness. Throughout the book this week will be noticed new type in heads, captions and bylines, as well as a slightly changed format. All this is done to make our appearance worthy of our slogan—STEEL Is Modern!

♦

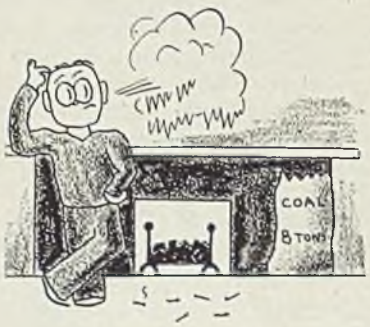
Hot Stuff

■ *The yellow sheets this week are given in salaam to International Acetylene boys, meeting down in Birmingham over Armistice day. Heated indeed will be their discussions, centering as they do around flame hardening, flame cutting, inflammations and flamingoes. Some interesting applications of this flaming subject are described by Lakeside's Rolf, beginning on page* 48.

♦

Cold Coal

■ The modern version of the wooden nutmeg salesman is a group of jobless men in Montreal. Fine family fortunes they are building up through the aid of a new discovery. In a vacant



lot they stumbled on an abandoned "mine" of iron slag, which is black stuff, four times as heavy as any anthracite coal. Now the boys are busy selling the iron slag to coal dealers. They tell us it gets quite cold in Montreal of a winter's night, too. Cmfwyp, the zinc line camera man, has once more gotten the jump on all wirephoto and news services by presenting herewith a forward looking view entitled "Shrdlu in Montreal; or, Where Oh Where Has My Blowtorch Gone?"

♦

Fen Male

■ Mister Whitey Maurath, the gentleman whose race horses run in the wrong direction, sends in the following letter, which he received in response to his offer of a prize to the finders of technical error in his race track picture:

"i see sooch a nize at in the Stil megzeen and i new rite away vot vas rong. Teckneecle airer yew call it.

Vy shud a men haf a vomans head on or is it a men? Mabee its a voman vid a mens pents Yes? Yew shud no—aint it?"

Whitey Sez this is the rong anser, but we will publish this segment anyhow, just to show advertisers and prospective advertisers what fine results can be had from insertions in America's Most Progressive Business Paper.

♦

Values Still

■ The other day one of our Eastern representatives went into the plant of a machintool builder in Philadelphia. During the course of the conversation, the machine tool man said he was one of the original machine tool advertisers in STEEL, walked to a file and pulled out some tearsheets, vintage 1902, to prove it. Said the old ads were quite effective—the first one sold him a machine two days after it appeared. Seems that advertising in STEEL was as valuable in 1902 as it is today, relatively speaking. Incidentally, that manufacturer still uses advertising space in STEEL to good advantage.

—SHRDLU

cludes 356 tons for crossings in Natrona and in Laramie county, Wyoming. Awards during the week aggregated 2478 tons, bringing the total this year to 135,512 tons, compared with 143,172 tons in 1936.

Seattle—Interest centers in the second Coulee dam project, which will require 25,000 tons of shapes, 12,000 tons of metal work and 4000 tons of cranes, bids about Dec. 10 at Denver, supplies to be bought by the bureau of reclamation. Ingalls Iron Works, Birmingham, Ala., has the award of 810 tons for the Sand Point Seattle, naval hangar. Business pending includes 450 tons of shapes and machinery for the Washington state Skagit river bridge, bids Nov. 2.

Shape Contracts Placed

1290 tons, extension, Willets Point boulevard station, Queens, N. Y., to Fort Pitt Bridge Works, Pittsburgh; through Meade Engineering Co., New York.

610 tons, 10-span I-beam bridge over railroads, Chautauqua county, New York, to Bethlehem Steel Corp., Bethlehem, Pa.; through Bero Engineering and Contracting Co., North Tonawanda, N. Y.

605 tons, trash racks, etc., Seminoe dam, Wyoming, to St. Louis Structural Steel Co., St. Louis.

535 tons, 17-story apartment, Central Park South, New York, to Belmont Iron Works, Eddystone, Pa.

525 tons, underpass, East Forty-sixth avenue, Denver, to Bethlehem Steel Corp., Bethlehem, Pa.; through Dutton-Kendall & Hunt, Denver, general contractors.

440 tons, institutional buildings, Selinsgrove, Pa., to Fort Pitt Bridge Works, Pittsburgh.

273 tons, sheet piling, United States engineer office, proposal 54, Los Angeles, to unnamed interest.

265 tons, state bridge, Richmond, Me., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

250 tons, International Harvester Co., Springfield, Ill., to Gage Structural Steel Co., Chicago.

240 tons, alterations, Interzone Corp., New York, to Ingalls Iron Works, Birmingham, Ala., George A. Fuller Co., New York, contractor.

230 tons, building, Delaware Trust Co., Wilmington, Del., to Bethlehem Steel Corp., Bethlehem, Pa.

225 tons, including 100 tons of joists, addition to packing plant, Montalvo, Calif., to Consolidated Steel Corp., Los Angeles.

220 tons, building, Celanese Corp., Amcello, Md., to Belmont Iron Works, Eddystone, Pa.

210 tons, viaduct, New York Central railroad, West Tenth to Charles street, New York, to Harris Structural Steel Co., New York; Duffy Construction Co., general contractor.

200 tons, postoffice, Evanston, Ill., to Bethlehem Steel Corp., Bethlehem, Pa.

190 tons, bridge NRS-2689, Colquitt-Cook counties, Georgia, to Taylor Iron Works & Supply Co., Macon, Ga.

183 tons, galvanized switch bus structures, Bonneville Dam, Oreg., to Bethlehem Steel Corp., San Francisco.

155 tons, bridge FAGM-36, Grant county, Kentucky, to Virginia Bridge & Iron Co., Roanoke, Va.

150 tons, Poiree dam trestles, Mississippi river locks, U. S. engineers' office, Keokuk, Iowa, to Worden-Allen Co., Milwaukee.

150 tons, addition, Aragon mills, Aragon,

Ga., to Ingalls Iron Works, Birmingham, Ala.
150 tons, state bridge No. 1480, Ft. Ashby, Mineral county, West Virginia, to Fort Pitt Bridge Works, Pittsburgh.
140 tons, beam span, Cumberland, W. Va., to Fort Pitt Bridge Works, Pittsburgh.
140 tons, 6-story apartment, Sixty-fifth street and Third avenue, New York, to Grand Iron Works, New York.
130 tons, route marker supports, state of New York, to American Bridge Co., Pittsburgh.
120 tons, passing places, navy pier, Chicago, to R. C. Mahon Co., Detroit.
115 tons, bridge, Kittery Point, Me., to American Bridge Co., Pittsburgh; Standard Engineering Co., Albany, N. Y., general contractor.
110 tons, state highway bridges, Ridgway, Colo., to Midwest Steel & Iron Co., Denver.
110 tons, building alterations, Lang Bakery Inc., Buffalo, to R. C. McManus Structural Steel Co., Buffalo.
100 tons, telephone exchange building, Olympia, Wash., to Poole & McGonigle, Portland, Oreg.
Unstated tonnage, rail support towers, Guntersville dam, Alabama, Tennessee Valley authority project, to Readwell Construction Co., Midland, Pa.; bids Sept. 30.
Unstated, control gates, hoists, etc., Alcova dam spillway, Wyoming, to Koppers Co., Fort Wayne, Ind.

Shape Contracts Pending

41,000 tons, including shapes, cranes and miscellaneous metal work, second unit Coulee dam; bids about Dec. 10 to bureau of reclamation, Denver, for general contract; bureau to purchase materials.
1835 tons, approach section, Lincoln tunnel, Weehawken, N. J.; Taylor-Fichter Structural Steel Co., New York, low; bids Oct. 26 Port of New York authority.
1060 tons, viaduct East 135th street, Bronx, N. Y.; Rusciano & Sons, Bronx, N. Y.
843 tons, municipal airport hangar, Baltimore; Kaufman Construction Co., Philadelphia, low on general contract.
800 tons, state highway bridge No. 8513, Claverack, N. Y.
775 tons, welding quality, black and galvanized I-beams, bureau of supplies and accounts, navy department, Washington; bids Nov. 5. Material is for battleships North Carolina and Washington to be built at Brooklyn and Philadelphia navy yards.
700 tons, bridge repairs, St. Louis-San Francisco railroad, St. Louis.
521 tons, bridge repairs, Union Pacific railroad, Los Angeles.
428 tons, 786 foot bureau of roads overspan, Mineral county, Montana; bids at Missoula, Nov. 5.
400 tons, Arlington Telephone building, Bell Telephone Co., Arlington, Va.
350 tons, Pulaski high school, Milwaukee; bids Dec. 1.
335 tons, state bridge, Lamar, Colo.
305 tons, Seminoe, Wyoming; bids in.
300 tons, underpass, Louisville, Ky., for city.
290 tons, state bridge over Powder river, project FAP-110-R-168-CR and FAGH-110, Powder River, Wyo.
285 tons, state bridge, Shubuta, Miss.
250 tons, state bridge, Cambria, Ill.
250 tons, mill building, Brownsville, Tex.
250 tons, seed houses, Santos, Brazil.
250 tons, state highway overpass, Winifrede Junction, W. Va.
225 tons, warehouse, John Deere Plow Co., Indianapolis.
210 tons, state highway bridge, Howard, O.
200 tons, coal washer, Maidsville, W. Va.
185 tons, contract bascule bridge, Mantolocking, N. J.; Eastern Engineering Co., Atlantic City, low on general contract.
180 tons, Canaseraga Central school; bids Nov. 5.
170 tons, cast house, No. 3 blast furnace, Republic Steel Corp., Youngstown, O.
150 tons, state highway bridge, Mt. Pleasant, Mich.
150 tons, building, Montgomery-Ward Co., Aberdeen, S. Dak.
140 tons, state bridge over Pecos river, Roswell, N. Mex.
140 tons, building, Chemical Construction Corp., Phoenix, N. J.
130 tons, highway bridge, Rock Island, Ill., for Rock Island county.
110 tons, mezzanine floor, Whitaker Paper Co., Pittsburgh.
100 tons, state highway bridge, project FAP-180-C, Roswell and Vaughn, N. Mex.
Unstated tonnage, armory, Philadelphia; bids Nov. 9.
Unstated tonnage, piling, for Erie canal dredging and improvements.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 131

Specifications are declining less rapidly but producers of bolts, nuts and rivets anticipate little improvement during November. Railroad demand is light and consumption in

Unit Steel Bids, Bronx-Whitestone, Suspension Bridge

Tenders, Oct. 13, to Triborough Bridge Authority

Material	Unit	A	B	C	D	Lowest Total
Cable wire, lbs.	8,350,000	$0.1725	$0.1825	$0.1825	$0.1775	$1,440,375
Suspender ropes, lin. ft.	67,000	1.15	1.65	1.30	1.50	77,050
Hand ropes, lin. ft.	15,600	0.40	0.66	0.50	0.45	6,240
Wrapping wire, lbs.	190,000	0.25	0.30	0.26	0.30	47,500
Cast and forged steel, lbs.	1,050,000	0.169	0.25	0.23	0.18	177,450
High tensile bolts, lbs.	34,200	0.156	0.20	0.55	0.15	5,130
Silicon steel, main bridge, lbs.	6,100,000	0.098	0.101	0.0975	0.1172	594,750
Carbon steel, main bridge, lbs.	10,400,000	0.0837	0.085	0.0845	0.111	870,480
Silicon steel, viaduct approaches, lbs.	3,800,000	0.0807	0.084	0.081	0.101	306,660
Carbon steel, viaduct appr'ches, lbs.	6,400,000	0.0678	0.07	0.068	0.095	433,920
Reinforcing steel, lbs.	150,000	0.0665	0.069	0.0775	0.07	9,975
Conduit for roadway lighting, lin. ft.	26,000	2.65	3.00	2.25	2.50	58,500

A—American Bridge Co., Pittsburgh, contract at $4,846,070.20; B—Mt. Vernon Bridge Co., Mt. Vernon, O., $5,080,701, second; C—Bethlehem Steel Co., Bethlehem, Pa., $5,085,610, third; D—John A. Roebling's Sons Co., Trenton, N. J., $5,602,805, fourth. Contract No. WB-5 covering cables and floor for the main bridge and approach viaducts.

the farm equipment industry has been curtailed by shutdowns at some plants for inventory. Automotive parts manufacturers gradually are increasing requirements but at a slower rate than was anticipated. Both jobbers and consumers are attempting to hold down inventories, and buying is regulated largely by early needs.

Reinforcing

Reinforcing Bar Prices, Page 131

New York—Bridges and sewers account for the bulk of activity while new inquiry for New Jersey highway projects is up slightly. Several additional mesh contracts for upstate New York have also been placed, but some tonnage will go over until next year. Prices continue easy and erratic.

Pittsburgh—Inquiry is good, including 340 tons of bars for the foundations for the Kelsey-Hayes Wheel Co. plant on Neville Island, and the Torrance state hospital in Westmoreland county, Pennsylvania. A number of projects under 200 tons have come out recently.

Cleveland — Reinforcing bar inquiries remain almost at a standstill, while awards are few and confined to small projects. Mills generally are inactive, with deliveries obtainable within a few days. Most fabricators have substantial stocks and show little interest in maintaining them at former high levels.

Chicago—Chicago sanitary district has taken bids on 700 tons for a sewer, the market otherwise is devoid of large inquiries. Awards also are confined to small lots and new business is insufficient to equal shipments. A decrease in deliveries is in prospect for the balance of the quarter.

Boston—With small-lot buying predominating, reinforcing steel contracts are not impressive. Approximately 1600 tons are pending, about half being for bridges. Highway mesh demand is slack. Bar prices continue soft.

Philadelphia — Eliminating state work, prospects for bar fabricators over the next two or three months are rather poor. A few private jobs are coming out despite general uncertainty, but these usually involve less than 100 tons.

Birmingham, Ala.—While backlogs are practically extinct with reference to reinforcing, mills are producing on spotty buying, but have business definitely in sight that should materalize soon, including nearly 3000 tons for the Baton Rouge, Mississippi river bridge.

San Francisco—Little improvement is noted in demand and bids on a number of private building projects have been rejected as having far exceeded the original estimates. Unnamed interests were awarded 700 tons for additions to Veterans project at Whipply, Ariz. Awards aggregated 1749 tons and brought the total for the year to 83,567 tons as compared with 207,753 tons for the corresponding period in 1936.

Seattle—Business is slow, but indications point to renewed activity, although perhaps not until next quarter. For the completion of Coulee dam, bids at Denver about Dec. 10, 25,000 tons of concrete bars will be required. This material will be purchased as needed by the bureau of reclamation.

Concrete Bars Compared

	Tons
Week ended Oct. 30	4,394
Week ended Oct. 23	2,796
Week ended Oct. 16	8,958
This week, 1936	2,803
Weekly average, 1936	6,005
Weekly average, 1937	6,218
Weekly average, September	8,084
Total to date, 1936	296,265
Total to date, 1937	273,593

Includes awards of 100 tons or more.

Reinforcing Steel Awards

700 tons, addition, Veterans Administration Facility building, Whipple, Ariz.

to unnamed interest.
615 tons, 6-story building, Malcolm A. Pratt psychopathic institute, city hospital, St. Louis, to Laclede Steel Co., St. Louis; Millstone Construction Co., St. Louis, general contractor.
390 tons, Richmond-Sunset sewage treatment plant, San Francisco, to unnamed interest.
375 tons, institutional buildings, Selinsgrove, Pa., to Bethlehem Steel Corp., Bethlehem, Pa.
275 tons, grade separation, Seven Mile road and John R street, Detroit, to Truscon Steel Co., Youngstown, O.
265 tons, procurement officer, treasury department, New York, to W. Ames & Co., Jersey City, N. J.
200 tons, power house, Pittsburgh & Lake Erie railroad, Pittsburgh, to Jones & Laughlin Steel Corp., through Pittsburgh-Des Moines Steel Co., Pittsburgh.
195 tons, navy department delivery Brooklyn, N. Y., for transhipment to Panama, to W. Ames & Co., Jersey City, N. J.
180 tons, approaches to Eggleston avenue viaduct, Columbia avenue boulevard development, Cincinnati, to West Virginia Rail Co., Huntington, W. Va.
179 tons, highway work in San Luis Obispo, Santa Barbara, Trinity and Eldorado county, California, to unnamed interests.
175 tons, bureau of reclamation, invitation A-42,377-A, Knob, Calif., to Bethlehem Steel Corp., Bethlehem, Pa.
175 tons, bureau of reclamation, invitation 3-42,378-A, Calexico, Calif., to Northwest Steel Rolling Mills, Seattle.
170 tons, dormitory, University of Iowa, Iowa City, Iowa, to Laclede Steel Co., St. Louis.
160 tons, Poland-Center-Waterloo highway SH 5151, Chautauqua county, New York, to Bethlehem Steel Corp., Bethlehem, Pa., through Reecon Inc., Buffalo.
140 tons, outlet works for San Gabriel dam No. 1, Los Angeles, to Consolidated Steel Corp., Los Angeles.
100 tons, vegetable shed, Louisville & Nashville railroad, Cincinnati, to Jones & Laughlin Steel Corp., Pittsburgh.
100 tons, procurement officer, treasury department, New York, to Capitol Steel Co., Brooklyn, N. Y.

Reinforcing Steel Pending

25,000 tons, second unit of Coulee dam, Washington; bids to bureau of reclamation at Denver about Dec. 10; material to be supplied by government.
1900 tons, sewer contract 3 of project 1, Queens, N. Y.; Elmhurst Contracting Co., Elmhurst, N. Y., low.
1125 tons, concrete and steel viaduct approach, Lincoln tunnel, Weehawken, N. J.; Porter & McLane, New York, and P. J. Carlin Co., New York, low on substructure.
1000 tons, highway bridge in Kentucky; Albert Lyons, Rogersville, Tenn., low bidder on general contract.
700 tons, Calumet intercepting sewer, contract No. 18-A, Chicago sanitary district.
500 tons, state procurement officer, treasury department, Boston; bids No. 3 and 4 in two inquiries.
340 tons, foundations for Kelsey-Hayes Wheel Co. plant, Neville Island, Pa.; general contractors' bids Nov. 1.
275 tons, viaduct, East 135th street, Bronx, N. Y.; Rusciano & Sons, Bronx, N. Y., low.
210 tons, Panama Canal inquiry 978-38-12, War department, U. S. army; W. Ames & Co., Jersey City, N. J., low bidders.
195 tons, navy department delivery,
175 tons, building, Armour & Co., West Fargo, S. Dak.
150 tons, bridge, Campbell's Island, East Moline, Ill.
150 tons, faculty building, Catholic university, Washington.
140 tons, railroad overcrossing, Mineral county, Montana; bids to bureau of roads, Missoula, Nov. 5.
125 tons, plant, J. I. Case Co., Sioux Falls, S. Dak.
109 tons, crossing at Livingston, Merced county, California; bids Nov. 3.
106 tons, Jughandle Creek bridge, Mendocino county, California; bids Nov. 10.
100 tons, building, Jewish community center, Washington.
100 tons, bridge over Mississippi river, Sparta-LaCrosse, Ill.
Unstated tonnage, Torrance state hospital, Torrance, Westmoreland county, Pennsylvania; general contractors' bids Nov. 3.

Pig Iron

Pig Iron Prices, Page 132

Pittsburgh—Pig iron producers await reversal of inactivity which has gripped the market recently. October definitely was below September in shipments. Quoting was done recently on an export inquiry, but no order has resulted yet. Thirty-four stacks are active, a steel producer having taken out one furnace during the week. Freight rate increases on raw materials, under the interstate commerce commission's recent ruling, will boost production costs. On iron ore the advantage of lake front furnaces will be widened over interior furnaces, as rates on the lower haul are boosted 6 cents a gross ton, while ore originating at mines in Michigan will be up 6 cents per gross ton on the upper haul.

Cleveland—Sellers are disappointed with current demand. The ratio between consumption and specifications of most foundries is decidedly in favor of the latter. Many are intent on using up inventories, particularly since it is generally assumed that sellers will announce prices unchanged for the first quarter about Dec. 1.

Chicago—Pig iron shipments are lighter and October deliveries were 10 per cent to 15 per cent below September. A further decrease is regarded likely this month. While pig iron consumption is bolstered somewhat by better automotive operations, the melt elsewhere is tending downward. Shutdowns by farm equipment interests during October also curtailed pig iron consumption but this industry is resuming operations at previous brisk rates. New pig iron business is dull and producers defer announcing first quarter prices. The market currently is

steady at $24, furnace, for No. 2 foundry and malleable.

Boston—Small-lot buying accounts for most pig iron activity, the aggregate volume being light. Foundry operations, after declining in recent weeks, appear to have leveled off in some instances, although the melt is contrary to seasonal trends.

New York—Pig iron sales remain spotty, with shipments continuing on a reduced scale as operations at foundries taper off. Many jobbing foundries are now down to an average of two and three days a week. Certain specialty plants are in better position, but the trend with them also is downward. Sellers expect little activity over the remainder of this year, particularly with consumers aiming to keep stocks down as the year-end inventory period approaches.

Philadelphia—Pig iron buying has almost completely stopped as consumers are fairly well covered for the remainder of the year and do not feel it necessary to buy far ahead. Shipments for the first 20 days of October were about equal to the same portion of September but have declined in the past 10 days. Few foreign inquiries are noted, due to the easier situation abroad. Slightly heavier movement of foreign iron to this country is noted, with prices maintained at the domestic level.

Buffalo—With a minor pickup noted this week pig iron shipments for October are expected to be slightly better than the same month last year and September this year

New business, however, continues to lag with orders limited to spot requirements. One blast furnace will be banked over the weekend. Orders are highly diversified with only a small part for the automotive trade.

Youngstown, O. — Sales of pig iron have been picking up in the last fortnight and merchant furnaces in the valleys are again beginning to accumulate more substantial backlogs. Yard stocks are small, most being earmarked. Foundries show more interest in purchases and shipments, indicating further revival in activities and also low inventories.

Cincinnati—Pig iron demand continues to sag. Shipments during October were considerably under those for September. The melt fails to show improvement and there is a tendency to reduce inventories, although prices appear firm. Buying except for spot shipment has virtually disappeared, many important foundries having covered quarter needs previously.

St. Louis—Aside from a few carloads for prompt shipment, pig iron buying is virtually at a standstill. Melters, both of foundry and basic iron, are using their inventories. Reaffirmation of steel prices is seen as indication blast furnaces will not change their quotations.

Shipments in October, while above a year ago, are reported to be slightly less than in September. Trend of the melt continues downward. Jobbing foundries are running out of backlogs, and new business is being sparingly placed. Automotive orders are disappointing, miscellaneous work furnishing bulk of new bookings.

Birmingham, Ala. — The pig iron market is firm even in the face of some recession in shipments. Seventeen furnaces are pouring.

Toronto, Ont.—Operations are at the peak level for the year. Merchant pig iron sales are at a high level with awards still in excess of 2500 tons weekly, of which more than two-thirds goes to Ontario melters. Spot sales account for practically all new business. Some melters are taking delivery on foundry iron to carry them through to the close of the year. Dominion Steel & Coal Corp., Sydney, N.S., is reporting exporting pig iron to Great Britain. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 134

Pittsburgh — No. 1 heavy melting steel is nominally lower, off 75 cents to a spread of $14.75 to $15.25, and other grades have weakened in this district, due to prolonged absence of activity. Railroad lists in the next few days are expected to provide a further clarification of quotations, but it is generally conceded that higher prices would be wholly unexpected in the face of declining steelworks operations.

Cleveland — Further reductions of 50 cents to $1 per ton on most grades of scrap have been made here and in the Youngstown district. Cast and low phosphorus grades and borings are unchanged. Bidding on important railroad lists next week is expected to give a better idea of the market. Steelworks buying is confined largely to taking distress tonnages occasionally.

Chicago — Scrap continues in the doldrums here, neither steelworks nor foundries being interested in new commitments. Prices consequently are nominal to a large extent, with heavy melting steel continuing at $13.75 to $14.25. Offerings are light, however, and few distress tonnages have accumulated.

Boston — Scrap buying for all deliveries is light, the dullest in

recent years. With 14,000 tons for export on cars near docks awaiting cargo space, shippers were covered against recent boat loadings with cargo space limited. Prices continue easy, but due to lack of buying, most grades are nominal.

New York — Buying of scrap for domestic and export account is dull with shipments to eastern consumers at a low point. Prices continue to sag in absence of demand. Heavy melting steel is nominal at $14. For export as low as $13 dock is being paid although some business is being done at $13.50. Some dealers predict further declines in active grades for export.

Philadelphia—The entire eastern Pennsylvania scrap market shows further decided weakness, with leading grades off as much as $2 per ton. This reflects the added decline in steelmaking operations and prospects for slow business during fourth quarter. Some mills continue to hold up scrap shipments and others are regulating the movement closely. Most mills are not interested in further buying. Scattered buying is reported on the basis of $15 maximum for No. 1 steel. One mill has bought a small tonnage of borings and turnings at $9.50. Foundries show little interest. One ship is due at Port Richmond Nov. 1 to load a cargo of No. 2 steel for export and another about two weeks later. This material was bought some time ago.

Buffalo—The stalemate in sales and an under-current of weakness still prevail in the iron and steel scrap market. While the principal consumers remain out of the market, the entire list was subject to price declines ranging from $1 to $1.50 a ton. The drop has carried No. 1 heavy melting steel down to $14.50 to $15.50 a ton with the customary $2 differential on No. 2, drop forge flashings, busheling and compressed sheets.

Detroit — Quotations on scrap are nominal and have dipped further about $1 per ton. There is practically no buying in steel mill grades, and a collapse of buying in foundry grades has depressed prices sharply.

Prospects are for continuation of decline in scrap prices, since dealers can discern no factors which might lead to an immediate resumption of buying. As yet dealers have not started to lay down tonnage, but may be forced to do so before long.

Cincinnati—The iron and steel scrap market is weaker, plenty of material for present demand being available at the bottom of the price spread. However, quotations remain nominally unchanged, thus suggesting a slowing down in the decline. Rails take some strength from comparative scarcity and holding by dealers. Mills are not interested in forward commitments.

St. Louis—There is a further reduction in iron and scrap prices ranging from 50 cents on heavy melting to $2 per ton on shafting, brake shoes and some other specialties. The latest decline is believed to have entered many items into bargain territory and some inquiries have emerged, though no sales of any size have been reported.

Dealers have pretty thoroughly cleaned up their back orders and are not disposed to operate on either side of the market until existing uncertainties have been clarified.

Seattle—The market shows little life, with export sales eliminated and domestic demand less than at any time during the last year. Mills have ample stocks and are not buying. Blockade and financial restrictions preclude shipments to the Orient. Quotations are nominal. Seattle is dismantling 8.9 miles of street railway track and will salvage 1135 tons of steel rails and accessories which will likely be offered for sale soon.

Toronto, Ont. — While steel mills are not pressing dealers for delivery of heavy melting steel and other lines, they are taking delivery as offered. Through the railroads the mills recently have been enabled to lay in substantial supplies of steel scrap, which take care of needs for some time. Foundries are in the market for cast scrap and stove plate and there has been steady movement of these materials. Prices are unchanged.

Warehouse

Warehouse Prices, Page 133

Cleveland — While the number of orders placed with local warehouse distributors during October has fallen below September, the aggregate volume shipped is estimated to be slightly more than the preceding month. The improvement is not isolated to one or two products, but includes structural and light finished material as well. No definite announcement has been made on the probability of extending prices in accordance with the mill statement two weeks ago.

Chicago—Sales show a slight gain in some directions compared with September. October as a whole, while failing to develop the expected upward trend was equal to

or slightly ahead of September. A gradual recession is thought not unlikely during the balance of the quarter.

Philadelphia—Buying from warehouse in October showed further recession from September but was about equal to October, 1936. Jobbers do not expect much further decline as it is believed some business will come in which is not profitable to mills in view of short rolling schedules. Orders are as numerous but in smaller lots.

Buffalo—Sales by warehouse distributors for October have receded to a level slightly below the previous month, but above last year. Specialties are moving best. Sheets are in fair demand but plate sales are slow.

Cincinnati—Orders from warehouse are unchanged in number but smaller. Volume for October is off from the previous month.

St. Louis—Sales from warehouse in October were smaller than in September. The total, however, compares favorably with a year ago. Seasonal improvement in movement of wire and wire products to the rural areas is noted. A bright spot in current business is the heavy demand for oil country goods, coming chiefly from new fields in Illinois. A fair volume of miscellaneous tonnage is being consumed by nearby coal mines. Prices on all standard commodities are unchanged.

Ore Leads Imports

Philadelphia—Imports during the week ended Oct. 23 were confined largely to chrome and manganese ore. Imports of the former totaled 3965 tons, of which 1865 tons were from Cuba and 1900 from South Africa. British India and Soviet Russia each accounted for 1500 tons of manganese ore. Other imports were 150 tons of wire rods, 11 tons of steel billets and 40 tons of steel forgings, all of which came from Sweden.

Ferroalloys

Ferroalloy Prices, Page 132

New York — Ferromanganese shipments continue to reflect the sharp decline in steelmaking operations. This month's movement will be well under that for September, and the trade is now inclined to look for a still further drop in November. Ferromanganese is unchanged at $102.50, duty paid, Atlantic and Gulf ports, at which most contract buyers have covered for their current quarter needs. Domestic spiegeleisen shipments also reflect the drop in steelmaking, with 19 to 21 per cent material quotable at $33, Palmerton, Pa., and 26 to 28 per cent, $39.

Tin Plate

Tin Plate Prices, Page 130

Pittsburgh — Tin plate operations have declined to around 75 per cent, as may be expected at this time of year when pressure customarily eases up after the packing season. Most consumers are comfortably supplied for their immediate needs and are unlikely to have heavy requirements in the near future. General line can manufacturers continue active, but the big season is over for beer, fruit and vegetable containers. Export shipments are well maintained.

New York — With consumers fairly well stocked and consumption down more than seasonally tin plate domestic specifications are light. The Florida canning season is getting under way and should lead to some improvement. A fairly good tonnage is moving abroad though export demand over the past fortnight has dropped. No revision in prices is expected when books are opened in November for next year.

Steel in Europe

Foreign Steel Prices, Page 133

London—(*By Cable*)—Because of shrinkage in demand for steel the International Steel Cartel at its recent meeting in Warsaw, Poland, reduced the monthly export tonnage by 75,000 tons, to 450,000 tons. Prices were maintained without change.

British steel markets are quiet as producers have orders to engage capacity through first quarter of 1938. The pig iron situation is easier, partly due to large imports, including considerable tonnage from America. Demand for semifinished steel continues active. The finished steel market is quiet and exports are dull.

The Continent reports reduced activity in exports and delivery periods are considerably shortened. Great Britain plans to accept larger tonnages from abroad.

Metallurgical Coke

Coke Prices, Page 131

Production of by-product and beehive coke appears now in better adjustment to actual consumption, seasonal heating requirements having helped to take up some of the slack, and the rest being accomplished through the closing out of excess ovens. Beehive output in the week ending Oct. 16 was 56,000 net tons, compared to 51,500 in the week ending Oct. 9 and 55,600 tons in the week ending Oct. 2. Present production is comparable to the output at this time one year ago.

By-product production in September was 4,426,375 tons, or 147,546 tons per day, according to U. S. bureau of mines. Compared with August, the daily rate increased 0.1 per cent, all of the increase occurring in merchant plants, which were estimated to have produced 1,102,265 tons, while furnace plants produced 3,324,110 tons. During the month one plant put into operation a new battery of 73 ovens. Stocks

of coke at by-product plants at the end of September totaled 2,298,304 tons, or 2.8 per cent in excess of August reserves.

Nonferrous Metals

Nonferrous Metal Prices, Page 132

New York — Nonferrous metals continued to seek lower levels last week. An effort is being made to stabilize the markets at levels which will obtain the confidence of consumers. Further price adjustments are expected since consumers have not yet shown active buying interest.

Copper — Custom smelters lowered electrolytic copper Thursday to 11.75c, Connecticut, while primary mine producers continued to quote 12.00c. Casting copper dropped more sharply to 11.27½c, f.o.b. refinery. Export copper appeared firmer at the close of the week around the 11-cent level.

Lead — Although lead demand held up fairly well, shipments have tapered and the first increase in stocks in 15 months is expected to be reported for October. Prices held at 5.50c, New York, and 5.35c, East St. Louis.

Zinc — Activity in zinc was dull despite a drop of $5 per ton on Monday to the basis of 5.75c, East St. Louis.

Tin — Prices fluctuated widely in line with the London market. Buying was sporadic with the stock market influencing the rate. Straits spot ranged from 47.62½c to 48.50c with 48.25c quoted as the close on Friday.

Antimony — Little interest was shown in antimony with American spot holding at 17.25c, New York, while Chinese spot eased $10 per ton to 17.75c, duty paid New York.

Financial Statements

(*Concluded from page* 24)

668, in the period in 1936. The third quarter net equaled $2,646,525 compared with $4,321,854 in the preceding quarter, and $2,063,603 in the September quarter last year.

SUPERIOR STEEL NETS $103,492 IN THIRD QUARTER

Superior Steel Corp., Pittsburgh, reports for the quarter ending Sept. 30 net profit of $103,492, or 91 cents a share, compared with $120,648 in the preceding quarter, and $118,010 in the third quarter last year. For the nine months this year net profit was $310,260, against $205,824 in the period in 1936.

PITTSBURGH STEEL'S PROFIT

Pittsburgh Steel Co. reports net profits of $257,160 for third quarter. Comparable figures for prior quarters are not available. Stockholders approved granting a stock purchase option to H. A. Roemer, president. The new board of directors consists of Charles E. Beeson, Albion Bindley, Frank F. Brooks, T. W. Friend, J. H. Hillman Jr., George T. Ladd, Henry J. Miller, George P. Rhodes, W. H. Rowe, Jr., W. C. Sutherland, E. A. Walker and Mr. Roemer.

KEYSTONE STEEL'S NET OFF SLIGHTLY

Keystone Steel & Wire Co., Peoria, Ill., reports profit of $985,745 for the nine months ending Sept. 30, against $1,010,060 in the same period last year. Third quarter net is $203,693, compared with $403,898 in the preceding quarter and $225,705 in the September quarter 1936.

COLORADO'S EARNINGS UP

Net profit of the Colorado Fuel & Iron Corp., Denver, for the three months ending Sept. 30, the first quarter of the company's fiscal year, was $442,080 against $338,658 in the corresponding quarter in 1936. The outstanding common stock was increased by 10,495 shares since June 30 last. These shares were given for the acquisition of the California Wire Cloth Co., Oakland, Calif.

Safety Council's Metals Section Elects Officers

■ R. A. Chaffin, Continental Steel Corp., Kokomo, Ind., was elected general chairman of the executive committee, metals section, National Safety council, at its recent meeting in Kansas City, Mo.

Other officers include: Vice chairman, Mell E. Trammell, Republic Steel Corp., Alabama City, Ala.; secretary and news letter editor, H. J. Griffith, Jones & Laughlin Steel Corp., Pittsburgh.

Committee chairmen are: Engineering, W. T. Filmer, the Youngstown Sheet & Tube Co., Youngstown, O.; health, Dr. R. C. Engel, Republic Steel Corp., Cleveland; membership, Fred Warr, Carnegie-Illinois Steel Corp., Pittsburgh; poster, H. H. Henry, Otis Steel Co., Cleveland; program, R. H. Ferguson, Republic Steel Corp., Cleveland; publicity, John O'Rourk, Bethlehem Steel Co., Sparrows Point, Md.; statistics, H. J. Spoerer, the Youngstown Sheet & Tube Co., East Chicago, Ind.; railway car builders, P. J. Brand, Pullman Standard Car Mfg. Co., Chicago; foundry, Irvin A. Brinkman, Mackintosh-Hemphill Co., Pittsburgh; contest, Robert L. Schmitt, Louisville Car Wheel & Railway Supply Co., Louisville, Ky.

Subsidiaries Become Blaw-Knox Divisions

■ William P. Witherow, president, Blaw-Knox Co., has announced action by the company's board of directors effecting a change in the corporate relationship of its domestic subsidiaries, effective Nov. 1.

The subsidiaries will be known as divisions of the Blaw-Knox Co. and the fabricating division located at Blawnox, Pa., will be known as the

Blaw-Knox division of the Blaw-Knox Co.

Officers of the former subsidiaries will retain their respective status and their duties will continue as under the former arrangement.

This action has been taken, states Mr. Witherow, to simplify and strengthen the corporate structure and to effect certain economies.

Subsidiaries include: Lewis Foundry & Machine Co., Pittsburgh; National Alloy Steel Co., Blawnox; Pittsburgh Rolls Corp., Pittsburgh; Union Steel Casting Co., Pittsburgh; Power Piping Corp., Pittsburgh.

Employes Honor Veritys On Fiftieth Anniversary

■ George M. Verity, founder and chairman, American Rolling Mill Co., and Mrs. Verity observed their fiftieth wedding anniversary Oct. 19. More than 400 men and women from the company's general office each placed a flower in a miniature "golden wedding garden" in Mr. Verity's office.

Delegations from each of the company's major plants also presented gifts and bouquets to Mr. and Mrs. Verity.

251 Lukens Workers Have Over 20 Years Service

■ Two hundred fifty-one employes of Lukens Steel Co., Coatesville, Pa., have worked for the company more than 20 years and form the Lukens Veterans guild. Their service aggregates 8015 years, an average of nearly 32 per man.

Six of the veterans have served a total of 327 years, each more than 50 years. Special recognition was given these men at the first fall meeting of the guild Oct. 19. They are: Charles L. Huston, first vice president, 62 years; H. B. Spackman, a director, 56 years; William H. Martin, a former heater now on the pension roll, 56 years; Samuel Forbes, flanging department foreman, 53 years; Daniel Toomey, watchman, 51 years; Curtis Brown, watchman, 50 years.

Test Bonding Value of Rusted Reinforcing Bars

Research to determine the effect of rust on the performance of a concrete reinforcing bar in service is to be incorporated in an extended series of bond tests about to be undertaken by the Concrete Reinforcing Steel institute, according to an announcement by the latter.

Results of these tests, it is expected, will discourage unwarranted rejections of reinforcing bars on the basis that a rusty piece, because it presents a poor surface appearance, must necessarily have impaired bond value.

Evidence given by tests conducted at the universities of Illinois and Wisconsin to determine the bond between concrete and steel indicate that the rusted bars have a far superior bond value than unrusted bars of ordinary mill surface. A report issued by the University of Illinois on this subject explained the superior bond property of rusted bars as "a natural consequence of the rougher surface."

Discuss Construction of Golden Gate Bridge

Johnathan Jones, chief engineer, fabricated steel construction, Bethlehem Steel Co., Bethlehem, Pa., and C. M. Jones Jr., assistant chief engineer, bridge department, John A. Roebling's Sons Co., Trenton, N. J., discussed the construction of the Golden Gate bridge, San Francisco, at a recent session of the Philadelphia section of the American Socety of Civil Engineers and the Engineers Club of Phladelphia.

Remarks were illustrated by sound motion pictures. Pictures illustrating Johnathan Jones' remarks covered the construction of the steel superstructure; those illustrating the remarks of C. M. Jones Jr. depicted the history of the suspension bridge construction in the United States during the past 100 years, and described spinning of the cables and the construction of the suspension system of the bridge.

Millions for Industrial Use of Farm Products

About $150,000,000 has been invested in new chemurgic industries launched since the organization of the National Farm Chemurgic council in May, 1935, according to C. B. Fritsche, managing director of the council, in addressing the recent annual convention of the Farm Equipment institute in Chicago.

This council was organized to advance the industrial use of American farm products through applied science and its aim is to devote 50,000,000 acres of farm land to the production of crops that may be employed in manufacturing industries. The largest expenditure for new industries so far is $100,000,000 which has been invested in new pulp, kraft paper and newsprint mills in southern states for the consumption of southern pine. Other projects include the use of southern sweet potatoes in the manufacture of starch for industrial consumption and the production of fuel alcohol from grains, starch and sugar.

Discussing the value of soy beans in the production of oil used in the manufacture of paint, varnish and linoleum, Mr. Fritsche stated that more than 300 food and industrial products now are made from the soy bean. Soy bean meal is an important item used in the manufacture of plastics.

Baltimore Ore Arrivals

Baltimore—Iron ore arrivals here in the period from Sept. 23 to Oct. 12 amounted to 91,492 tons. In addition, there were also substantial arrivals of manganese ore, and a few shipments of chrome ore.

Iron ore shipments comprised 10,-

500 tons from Daiquiri, Cuba, Sept. 23; 22,300 tons, from Cruz Grande, Chile, Sept. 26; 3504 tons from Whyalla, Australia, Oct. 1; 6183 tons, Narvik, Sweden, Oct. 2; 21,200 tons, Cruz Grande, Oct. 5; 10,500 tons, Daiquiri, Oct. 7; 11,000, Cruz Grande, Oct. 12; and 6305 tons, Lulea, Norway, Oct. 12.

Manganese ore arrivals comprised 6300 tons from Santiago, Cuba, Sept. 26; 7050 tons, Poti, Russia, Oct. 1; 4900 tons, Santiago, Oct. 2; 500 tons, Chile, Oct. 2; 1800 tons, Calcutta, Oct. 7; 2000 tons, Calcutta, Oct. 2; 9900 tons, Poti, Russia, Oct. 7; and 8950 tons, Takoradi, Gold Coast, West Africa.

Chrome ore shipments included 7300 tons from Lourenco Marquis, Portugese East Africa, Sept. 23; 2000 tons, Messina, Greece, Sept. 27; 750 tons, Aghia Marina, Greece, Sept. 30; and 5062 Lourenco, Marquis, Oct. 8.

Miscellaneous arrivals included 1701 tons of zinc concentrates from Callao, Sept. 25; 200 tons, pig iron; Bergen, Norway, Sept. 30; 30,007 bags zinc concentrates, Chile, Sept. 30; 2000 tons, zinc concentrates, Chile, Oct. 2; 5940 bags, dead burnt magnesite, Leningrad, Russia, Oct. 7; 400 cases, ferromanganese, Yokahoma, Japan, Oct. 9; and 3720 bags, magnesite, Dairen, Manchukuo, Oct. 11.

Equipment

New York—Machinery and equipment orders are less active, although several large additional contracts for heavy electrical equipment have been booked. Metalworking tools, however, are slower, the decline being well distributed. Few large lists are pending, but aggregate volume being estimated is fairly large. Purchases are slower to close, however. Several operating departments of airplane engine and partsmakers have asked additional appropriations. Deliveries have improved slightly, but backlogs are still heavy. Some dealers have booked foreign business for shipment well into next year.

Cleveland — Machine tool and equipment sales in October reflected the general uncertainty in the business situation. Aggregate business for the month was considerably below earlier expectations and in some cases as much as 50 per cent or more under September. Large orders are being held up pending crystallization of unsettled conditions. Miscellaneous equipment started moving in better volume last week, however, and export business continues an important factor in the market.

Chicago—Machinery and equipment sales reflect the uncertainty prevailing in general business and both orders and inquiries during October were off moderately from September. The recession in inquiries is insufficient to indicate an immediate sharp letdown in equipment buying but the tendency is downward. Small tool demand is holding fairly well but the larger items are attracting fewer sales and inquiries. Railroad inquiries for 1938 budget-making purposes are few and the carriers in general indicate equipment purchases will be small pending a clarification of the earnings outlook. Practically all lists from other tool users are small. Machinery builders in most instances have sufficient backlogs to support good operations during the remainder of the year.

Seattle—Sales are fair but record normal seasonal recession. Wire and electrical equipment continue in strong demand while pump machinery is moving actively. There is some call for road equipment as states and counties prepare for winter.

Construction and Enterprise

Michigan

DEARBORN, MICH.—Ford Motor Co. plans addition to power station at River Rouge plant, including installation of new 110,000-kilowatt turbogenerator unit and accessories, high pressure boilers, pumps and auxiliary equipment. Work will be carried out in conjunction with a $40,000,000 development program at plant during remainder of 1937 and in 1938, including large group of new buildings, with installation of electric furnaces, heavy duty motors and controls, regulators, electric hoists, electric cranes and other equipment. (Noted Oct. 25)

DETROIT — Barkley-Grow Aircraft Corp. has awarded contract to Joseph A. Krausmann Co., Detroit, for an addition and alterations to its factory. Estimated cost $18,000.

DETROIT—Detroit Rendering Co., 2500 Twenty-second street, will erect a $35,000 factory building on Sarsfield avenue. W. J. C. Kaufmann Co., Detroit, is contractor.

DETROIT — Spitzley-Rettenmier Sheet Metal Co. has been organized to manufacture, install, construct and maintain sheet metal; Ray L. Spitzley 1514 Twelfth street, is correspondent.

DETROIT—Detroit department of purchases and supplies will take new bids on furnishing sump and high pressure pumps for the high pressure tank at the Detroit sewage disposal plant, all previous bids having been rejected.

DETROIT—Michigan Steel Tube Products Co. has started a $100,000 building program which will add 45,000 square feet of additional floor space to present facilities. Contract has been placed with Austin Co., Cleveland, for erection of two buildings. A scale free, bright finished annealing furnace for normalized steel tubing will be installed.

HAMBURG, MICH.—Hamburg Mfg. Co. has been formed with $50,000 capital to manufacture screw machine products; W. Rex Johnston, 1425 Longfellow avenue, Detroit, correspondent.

MT. CLEMENS, MICH.—Mt. Clemens Metal Products Co. is erecting an addi-

tion to its plant. W. J. C. Kauffman, Detroit, is contractor.

PLAINWELL, MICH.—S. A. Elam Co. is taking figures for the construction of a factory addition.

Ohio

CINCINNATI—Rainbow Lithographing Co., 4142 Davis Lane, plans three-story 40 x 90 foot steel factory addition, costing over $40,000. Carlton, Frankenberger & Batson, 4122 Davis Lane, architects.

CLEVELAND—Pittsburgh Plate Glass Co., 3849 Hamilton avenue, will erect a $40,000 addition to its warehouse and office building.

CLEVELAND—Ohio Steel & Supply Co., 5120 Sweeney avenue, has leased additional space doubling its present capacity. New equipment will be installed at a cost of about $15,000. R. L. Cole is president.

CLEVELAND—Brewing Corp. of America, 9400 Quincy avenue, has let contract to Sam W. Emerson Co. for erection of a new building and additions to others, at a total cost of about $200,000. Ernest McGeorge is architect. (Noted Sept. 27)

CLEVELAND—Morse Rogers Steel Co., 1515 Fairfield avenue has leased 14,000 square feet of additional space at 1500 Fairfield avenue, to be used for the manufacture of tubular steel furniture and as a warehouse. Edgar D. Rogers is president.

CLEVELAND—Arrow Electrodes Co., a new firm manufacturing electrodes and welding accessories, has leased a building containing 10,000 square feet at 5509 Hough avenue. L. Clayton Ross is president and O. W. Esslinger, engineer and general manager.

Illinois

CHICAGO—Automatic Spring Coiling Co., 3982 West Barry avenue, has let contract for one-story, 100 x 175 foot factory, to Holton Seelye & Co., 32 West Randolph street. (Noted Oct. 11)

CHICAGO—Pullman Standard Car Mfg. Co., 79 East Adams street, has let general contract for erection of two-story engineering building to E. W. Sproul Construction Co., 2001 West Pershing road. Cost over $40,000.

CHICAGO—Glidden Co., 5165 West Moffat street, has awarded general contract for three-story boiler house addition to J. Shedden & Co., 20 North Wacker drive. N. Ronneberg Inc., 10 South LaSalle street is architect. (Noted Oct. 18)

CHICAGO—Scully Steel Products Co., 1319 Wabansia avenue, has let general contract for erection of one-story, 115 x 175 foot warehouse to M. J. Boyle & Co., 1742 North Mozart street. Cost $50,000. H. G. Boston, 4145 North Laramie street, is engineer.

Connecticut

COLCHESTER, CONN.—Town will take bids early in November for waterworks system, including storage distribution and 18 x 50-foot filter plant, costing approximately $90,000. G. L. Bilderbeck Inc., 76 Starr Hill road, Groton, Conn., engineer. (Noted Sept. 20)

MERIDEN, CONN.—L. Hamilton, architect, 22 Church street, is taking bids for erection of two-story 45 x 100-foot factory on South Vine street, for Cuno Engineering Corp., 80 South Vine street. Cost $42,000.

WATERBURY, CONN.—Lombard Bros., 1844 East Main street, have plans completed by H. T. Butler, 150 Walnut avenue, for erection of steel warehouse building. Cost $40,000.

Massachusetts

WINCHESTER, MASS.—J. H. Winns Sons, Washington street, will soon let contract for two-story, 45 x 60 foot plant, costing approximately $40,000. W. Blank, 120 Milk street, Boston, is architect.

New York

BUFFALO—Morrison Steel Products Inc., 127 Kehr street, has let contract to W. Zacher, 34 Wright street, for erection of factory addition, costing $40,000. (Noted Sept. 20)

BUFFALO—City plans purchase of new electrical pumping equipment for water supply extension, for which a bond issue of $375,000 has been authorized.

MASPETH, N. Y.—I. Furst, 24 Woodward avenue, has had plans drawn by S. Goldsmith, 84 Livingston street, for constructing a factory building to cost $320,000.

TONAWANDA, N. Y.—General Motors Corp., Chevrolet division, Detroit, plans erecting a castings plant on River road here, cost of which will exceed $40,000. A. Kahn Inc., New Center building, Detroit, is architect.

UTICA, N. Y.—Central New York Power Corp., Utica Gas and Electric building, plans improving power and lighting facilities here and in surrounding districts. Cost over $916,000.

WATKINS GLEN, N. Y.—New York State Electric & Gas Corp., Watkins Glen, has filed petition with Public Service Corp. of New York, Albany, N. Y., for permission to construct electric plants in several towns and villages. Estimated cost $100,000.

Pennsylvania

PITTSBURGH—Coca Cola Bottling Co. is having plans prepared by Roberts & Co., Bona Allen building, Atlanta, Ga., architects, for a bottling plant on Center and Negley avenues, Pittsburgh.

TAMAQUA, PA.—Reevesdale Coal Co., care of J. T. McAloose, McAdoo, Pa., plans modern coal breaker at coal mining operations near here. Will purchase and install transmission, conveying and coal handling machinery and equipment. Cost $35,000.

Indiana

INDIANAPOLIS—Articles of incorporation have been filed with the Indiana secretary of state by K. & H. Tool & Die Inc., 1720 Mishawaka avenue, South Bend, Ind., formed to manufacture machinery, jigs, fixtures, etc. Incorporators are Richard P. Krause, F. Kathryn Krause, James R. Huckins and Cora R. Huckins.

District of Columbia

WASHINGTON—Panama Canal, general purchasing officer, will take bids Nov. 5, schedule 3297, for concrete mixers, structural steel, metal roofing, steel windows and doors, metal lockers, woodworking machine, pipe fittings and steel plates, to be delivered to Cristobal or Balboa, Canal Zone.

Kentucky

HENDERSON, KY.—Board of city commissioners will soon take bids for municipal light plant improvements, including installation of new boiler, feed water pumps, and circulating pumps. Cost $33,000.

LOUISVILLE, KY.—Louisville Gas & Electric Co. plans transmission and distributing lines for rural electrification, totaling about 41 miles, with outdoor power substations and service facilities. Will spend approximately $60,000.

Georgia

BRUNSWICK, GA.—Capt. M. L. Gilbert, president, Gil-Boat Mfg. Co., Holland, Mich., has purchased a site here

for erection of a plant, for building all-welded steel boats.

CAIRO, GA. — Grady County Rural Electric Co-operative, care of E. P. McLean, Moultrie, Ga., consulting engineer, has plans under way and will take bids early in November for primary and secondary lines for rural electrification in part of Grady and Decatur counties, totaling about 75 miles with outdoor power substations and service facilities. Fund of $75,000 secured through federal aid.

ROSSVILLE, GA.—Lamede Inc. plans construction of a $50,000 chemical plant.

Mississippi

GREENVILLE, MISS.—Greenville Seating Co., Mrs. Nora L. Phillips, will construct a plant for manufacture of steel framed seating equipment for schools and theatres. Heavy machinery for cutting and forming sheet steel and making iron castings to form framework for chairs will be installed.

Louisiana

DeRIDDER, LA.—Chicago Bridge & Iron Co., 37 West Van Buren street, Chicago, will erect a creosote treating plant and post and piling plant for Long Bell Lumber Co. here. The plant will have capacity for 2,000,000 feet of treated products per month.

Tennessee

KNOXVILLE, TENN.—City, George R. Dempster, city manager, will call for bids about Dec. 1 for constructing municipal power distribution system. Plans have been approved by PWA.

Missouri

JOPLIN, MO.—American Lumber & Wood Treating Co. has awarded contract to the Chicago Bridge & Iron Co. for construction of a one-story steel and corrugated iron wood treating plant, 42 x 80 feet, to cost about $250,000, including seven steel tanks, one 250,000-gallon, three 50,000-gallon and three 30,000-gallon, and two steel retorts and several smaller buildings.

KANSAS CITY, MO.—7-Up Co., E. G. Peacher, manager, 215 East Twenty-seventh street, has leased a building at Eighteenth and Burlington avenues, and will install $75,000 worth of machinery and equipment.

Arkansas

GUION, ARK.—Edgar Baker and associates, Batesville, Ark., will start work soon on erection of lime plant, consisting of two kilns with capacity for 40 tons daily.

Wisconsin

DENMARK, WIS.—Denmark Brewing Co. plans construction of a new bottling plant and installation of new bottling equipment. Harry W. Williams, Northern building, Green Bay, Wis., is architect.

LA CROSSE, WIS. — Wisconsin state teachers college plans building a steam-electric power plant, costing over $100,000.

MENASHA, WIS. — Hafemeister Machine Co. has been incorporated to conduct a general foundry and machine business, by Edgar E. Becker, Walter F. Casperson and Louis H. Hafemeister.

MERRILL, WIS.—Merrill Woolen Mills Co. plans construction of a two-story factory addition.

MILWAUKEE—Midland Iron & Steel Corp. has been incorporated by Carl and M. E. Walter.

MILWAUKEE—Milwaukee Independent Brewery, Henry Bills, president, 2701 South Thirteenth street, contemplates remodeling and enlargement operations estimated to cost $100,000.

MILWAUKEE — Electro-Forg-O-Mat Corp. has been incorporated by Carl S. Zaiser, 1859 North Sixty-eighth street, president of Ampco Metals Inc., to manufacture forgings and castings. Associates are Herman Hahle and Joseph C. Brauer.

RACINE, WIS.—Architect E. A. Klinger, 614 Fourteenth street, has been chosen by county board of supervisors to design proposed new $25,000 generating plant to serve county institutional buildings.

RACINE, WIS.—J. I. Case Co., maker of tractors, farm implements, etc., plans construction of a new heat-treating shop, 130 x 500 feet, designed by Frank J. Hoffman, architect, 201 Sixth street. L. R. Clausen is president.

RACINE, WIS.—Hamilton-Beach Co., manufacturer of electric motors, appliances and soda fountain equipment, has awarded contract to Nelson & Co. for construction of a third story addition to the plating and polishing plant. Frank J. Hoffman is architect.

RHINELANDER, WIS.—Robbins Flooring Co., Rhinelander, has awarded general contract to C. R. Meyer & Sons Co., Oshkosh, Wis., for construction of a factory building and dry kilns at Newberry, Mich. G. Arntzen, Escanaba, Mich., is architect.

RIPON, WIS.—Barlow & Seelig Mfg. Co., maker of washing machines and other domestic appliances, expects to start work soon on manufacturing additions costing about $80,000. Architects Auler & Jensen, Oshkosh, Wis., are in charge of project.

Minnesota

KANDIYOHI, MINN.—Village council will take bids Nov. 8 for construction of a waterworks system, including water main, pump house and a 30,000-gallon steel water tank on an 80-foot tower. Ealy G. Briggs, 1955 University avenue, St. Paul, is engineer.

ST PAUL—United States government, war department, Lt. Col. Philip B. Fleming, district engineer, 615 Commerce building, will take bids until Nov. 10 for two electrically-driven traveling tainter gate hoists.

ST. PAUL—Minnesota Mining & Mfg. Co., 791 Forest street, manufacturer of abrasive materials, plans installation of motors and controls, conveyors and other equipment in new plant addition. Cost close to $400,000. Toltz, King & Day Inc., Pioneer building, is architect and engineer. (Noted Sept. 13)

Texas

DOUGLASVILLE, TEX.—M-B-C Electric Co-operative Inc., James H. Simms, receives bids Nov. 8 for constructing 187 miles of rural electric transmission lines in Morris, Cass and Bowie counties. William G. Morrison, engineer, 912 Professional building, Waco, Tex.

Kansas

POMONA, KANS.—City voted favorably on $25,000 bond issue to finance construction of waterworks system, including well and tank costing $35,000. Paulette & Wilson, 311 Farmers Union building, Salina, Kans., consulting engineers.

TECUMSEH, KANS.—Kaw Valley Co-operative Electric Co., Benjamin L. Pressgrove in charge, has plans under way and will take bids soon for primary and secondary lines for rural electrification totaling about 370 miles, with outdoor power substations and service facilities. Fund of $395,000 arranged through federal aid.

WINFIELD, KANS.—City, H. H. Haulen, clerk, is taking bids to Nov. 11 on construction of sewage disposal plant of 900,000-gallon per day capacity, and incinerator. Cost is about $100,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas

City, Mo., consulting engineer. (Noted Sept. 13)

North Dakota

MINOT, N. DAK.—Ward County Farmers Union is making a preliminary survey and will make application to REA soon for funds to finance construction of an electric transmission line between Foxholm and Palermo, N. Dak., to cost between $40,000 and $50,000.

South Dakota

SIOUX FALLS, S. DAK. — Dakota Equipment Co. has been incorporated with capital stock of $50,000 to distribute and service road building machinery and industrial equipment, by

G. E. Fischer, A. J. Mittlestead and R. W. Townsend.

Iowa

CEDAR FALLS, IOWA—Iowa state commerce commission has granted permission to the county board of supervisors to construct an extension of rural electric lines into Butler county. C. H. Streeter is engineer.

COUNCIL BLUFFS, IOWA—Iowa State Commerce commission has granted permission to the Nebraska Power Co., Seventeenth and Harney streets, Omaha, Nebr., to construct rural transmission lines in Pottawattamie county. Clarence Minard is company engineer.

DAVENPORT, IOWA — Eastern Iowa Light & Power Co-operative has been allotted $270,000 additional REA funds for construction of 375 miles of rural transmission lines in five counties. John P. Hand, 1933 Main street, is engineer.

GRAFTON, IOWA — City, Otto Bueschele, city clerk, is preparing plans for construction of a waterworks plant to cost $20,000. Ralph W. Gearhart, Cedar Rapids, Iowa, is engineer.

Nebraska

DODGE, NEBR.—Nebraska State Railway commission has granted permission to the Nebraska Power Co., J. E. Davidson, president, Seventeenth and Harney streets, Omaha, Nebr., to construct short rural transmission lines in Dodge and Saunders counties. Clarence Minard is company engineer.

FREMONT, NEBR.—Town has plans maturing for extension and improvements in municipal electric power plant, including installation of considerable additional equipment. Cost estimated at $225,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

MASCOT, NEBR. — Nebraska State Railway commission has granted permission to the Western Public Service Co., Scottsbluff, Nebr., to construct rural power lines in Gering and Harlan counties.

OMAHA, NEBR.—Omaha Packing Co. has awarded contract to Cooper Construction Co. for construction of a two-story packing plant addition, to cost about $100,000. Egan, Brubaker & Egan, Chicago, are architects.

ORD, NEBR. — North Loup Public Power & Irrigation district, J. P. Barta, secretary, will take bids Nov. 3 for construction of 40 miles of transmission lines and two substations, part of a $2,000,000 irrigation and power project. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

Pacific Coast

LOS ANGELES—Metropolitan water district, F. E. Weymouth, engineer, 306 West Third street, will take bids Nov. 8 for 808,400 lineal feet of woven wire fencing and 211 gates. Specification 245.

STOCKTON, CALIF.—Continental Can Co. is erecting a large can manufacturing plant here. J. F. Egenolf, district manager of manufacturing, will head the new branch, under M. S. Huffman, Pacific coast manager for the company.

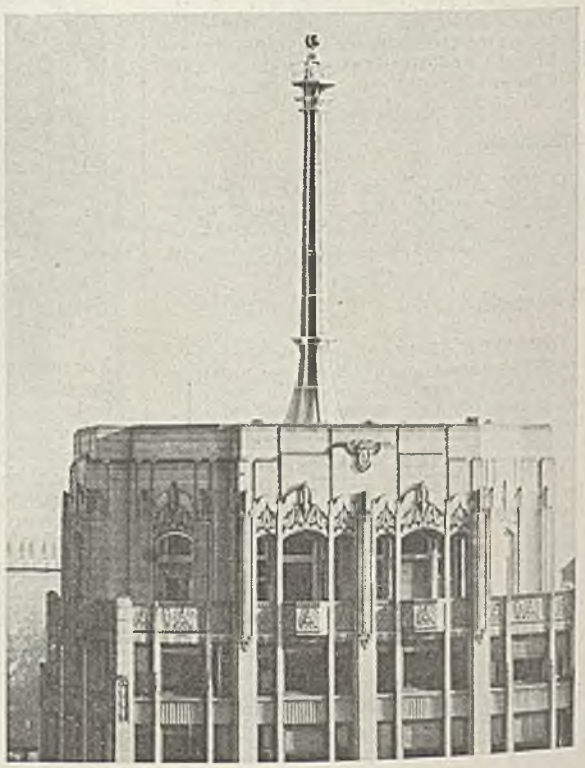
COULEE, WASH.—MWAK Co., contractor for the first Coulee dam unit is selling $1,000,000 of used equipment as fast as it is released, including trucks, shovels, caterpillars, tools, etc. Under the contract the government takes over stationary equipment. H. A. Hamlin is in charge of sales.

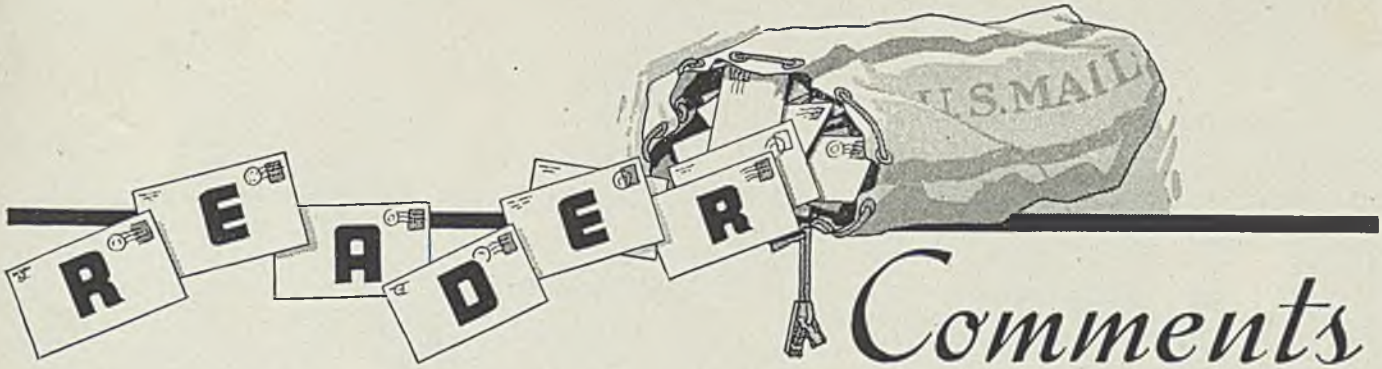
Canada

OTTAWA, ONT.—W. E. Noffke, architect, 46 Elgin street, is taking bids for construction of addition to present plant and supplying and installing new machinery for Capitol Brewing Co. Ltd., 840 Wellington street. Estimated cost $50,000.

Steel Tower Supports Airplane Beacon

■ Crowning the new 13-story office building of the Northwestern Mutual Fire Association in Seattle is this 70-foot steel tower, supporting an airplane beacon. The tower is fabricated of eight ⅛-inch steel plate fins radiating from an extra heavy 6-inch steel pipe. On the fins' edges are two 3 x 3½ x ⅜-inch angles. The whole structure is erected on a steel I-beam base. All connections in the tower are welded. It was designed by Architect Henry Bittman, fabricated by the Standard Steel Fabricating & Boiler Works Inc., and erected by the H. W. Pohlman Co., all of Seattle





Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Makes a Correction

To the Editor:

On page 82 of the Nov. 1 issue of STEEL, third column, third paragraph, you quote me as saying, "From his experience with heavy welded rolling mill gears——" (This refers to a report of the American Welding society's meeting in Atlantic City, Oct. 19.)

This is not correct. What I did say was that my experience led me to believe that thermal stress relief was not necessary with welded gear reduction cases. This is quite another matter, and I would not recommend eliminating thermal stress relief in gears, because gear rims should be made of the higher carbon or low alloy steels and the welds joining the rim to the arms or web would naturally be deficient in ductility due to the air hardening characteristics of these higher strength steels. In gear reduction cases, low carbon steel is universally used.

A. E. GIBSON

President, Wellman Engineering Co., Cleveland.

Trade Papers in Schools

To the Editor:

W. D. Keefe, sales manager of the refrigeration division of Fedders Mfg. Co., Buffalo, addressing the New York state teachers' association recently on what industry expects from vocational apprentices. made some pertinent observations along the line of industrial thinking. I have excerpted a few paragraphs. in view of personnel problems of today. Mr. Keefe said:

"American industry expects the vocational student to look upon industry as a post-graduate course that leads to a career, not simply a piece-work job.

"The first rung upward in the ladder is achieved when the apprentice demonstrates his ability to manage men, as well as machinery. Believe it or not, the biggest job in industry is to find the right man. That is why the opportunities are unlimited. The eyes of industry are focused on the vocational student. They are in a sense, recognized by industry because they have ambitions along technical lines.

"To give you just one idea of how industries try to help their men improve themselves, they invite their employes to accept copies of trade papers, so they can get a broader aspect on their work by reading the current developments. These trade papers naturally have many explicit, understandable and up-to-the-minute articles on new shop methods, new materials, new production economies and the latest type of production machinery. There again, life in industry offers a post-graduate course in their vocational advancement. The apprentice imbued with the desire to forge ahead, mentally, with advancing ideas will win recognition because of what he knows, as well as what he does.

"We often have heard the complaint that if a man had been born 20 years sooner, his opportunities would have been greater. I do not subscribe to this statement! The creation of new products and industries are creating unlimited opportunities today and tomorrow for technically skilled men who are smart enough to ride to success with the progress of American industries."

HORACE A. LANEY

Buffalo.

Building Still Laggard

To the Editor:

The one big blind spot in the business picture now is to be found in the laggard construction industry. Excessive costs have been blamed for this condition. And partly that is the case. But more basic is the fact that the national income has not yet reached the level which could support a high volume of private construction. Especially is this true if due weight is given to the increasing drafts upon the public purse, federal and local, and the concomitant mounting burdens of taxation.

Under these conditions it is idle to talk about housing shortages. Where they exist they will be filled privately only when incomes permit and not sooner. If increasing proportions of personal incomes are to go for the support of government it is idle to talk about a building boom, even should one be desired, for much of the wreckage from the last one has still to be cleared away.

L. SETH SCHNITMAN

Consulting Economist, New York.

FAIRBANKS MORSE Diesels

DIESEL ENGINES
PUMPS
ELECTRICAL MACHINERY
FAIRBANKS SCALES
RAILROAD EQUIPMENT
WATER SYSTEMS

REFRIGERATORS
RADIOS
WASHERS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS