STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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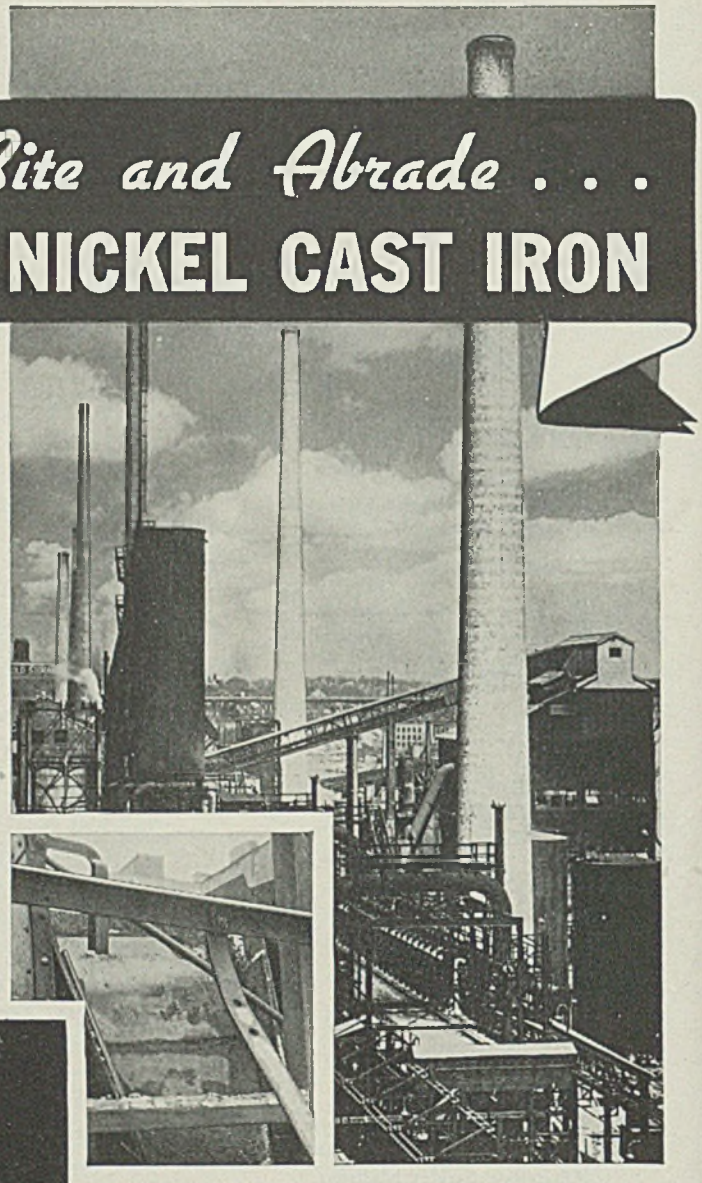
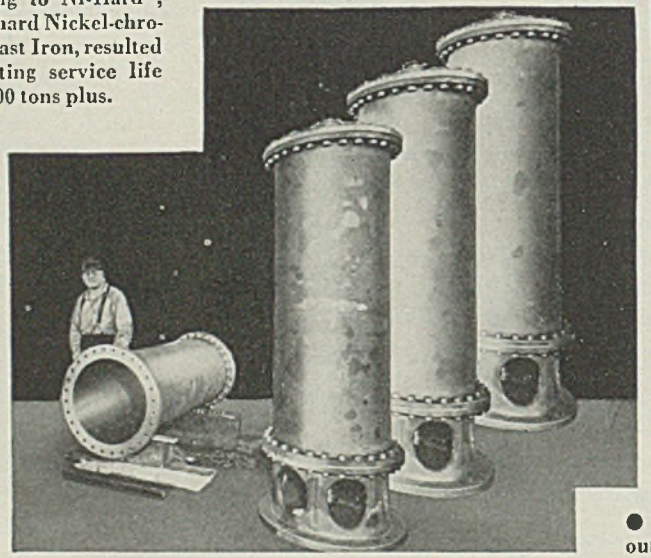
Where substances Bite and Abrade . . .
ECONOMY *dictates* NICKEL CAST IRON

INDUSTRY'S search for more enduring metals is inevitably leading to more widespread use of the alloys containing Nickel. For by fortifying the simple irons and steels with additions of Nickel, materials are being produced that offer stiff opposition to metals' deadliest foes—wear, corrosion, stress, shock, heat, etc. Pictured here are several examples where the use of Nickel alloys have substantially increased the life of equipment and resulted in marked economies.

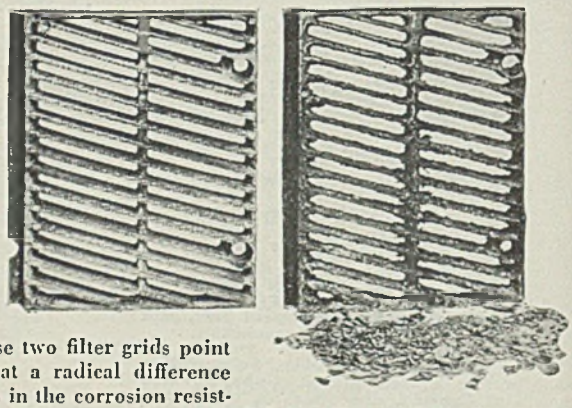
* * *



● Every year the Rochester Gas & Electric Company handles thousands of tons of coke. The chutes and slides through which it flows are subjected to incessant abrasion. Tripper plates (see inset at right) were formerly made of both grey iron and special steel, with maximum life of 33,500 tons and 18,000 tons respectively. Switching to Ni-Hard*, a super-hard Nickel-chromium Cast Iron, resulted in boosting service life to 250,000 tons plus.



● If cylinders are to prove economical in service they must not only be wear resistant but unusually strong. Those pictured above were designed for use at a California reservoir. They operate under high oil pressure and the specifications called for a tensile strength of 50,000 p.s.i. By using Ni-Tensyliron*, a high strength cast iron composition containing Nickel, tensile strength was stepped higher than the specifications—to 60,000-80,000 p.s.i. with a Brinell hardness of 265-285.



● These two filter grids point out what a radical difference there is in the corrosion resistance of different metals. At the left is a filter grid from a rotary salt drier. It is made of Ni-Resist*, a special cast iron containing Nickel, copper and chromium. At the right, a grid of plain cast iron has seen the same type of service in the same plant. The former was 18 months old when this picture was taken, and after 5 years is still in service; the latter was 4 months old when photographed before scrapping. The Nickel Cast Irons can effect similar economies in *your* plant. We invite consultation on their use in your equipment.

*Reg. U. S. Pat. Off. by The International Nickel Co., Inc. Canadian Patents Nos. 281,986; 324,552; 278,180.

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

As the Editor Views the News

AMONG industrial employers, as among executives and professional men in any line of activity, will be found wide divergence of opinion as to what is right and wrong in the present labor situation. Hundreds of thoughtful employers take the attitude that until recently the cards were stacked against the proponents of professional unionism, that in the past employers received most of the favors of government and that consequently, in the present controversy, the unionizers should be accorded certain advantages to compensate for past injustices. Opinions of similar character are entertained by a substantial portion of the American public.

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In line with this thinking, a certain well known industrialist, in a recent private conversation, said: "As employers, we have had our inning. Now it is time for labor to go to bat." One may admire the spirit of fair play indicated by this remark without agreeing to the soundness of its implications. If granting professional unionism broad liberties to atone for past errors means exempting union agitators and organizers from observance of the laws, then the philosophy is not only unsound but destructive. Today, because of license vouchsafed to unionists, general respect for law is at a dangerously low point.

Danger in Anarchy

• • •

CIO representatives boast that four departments of the federal government are their allies. Many state and local governments are aiding strikers. The one-sided Wagner act, brazenly drafted for the sole purpose of helping unionization, is at the disposal of CIO. With these powerful aids, unionists enjoy advantages far exceeding those alleged to have accrued to employers in the past. Yet they are not satisfied. Instead they seek additional favor by openly violating (p. 12) scores of fundamental laws. This is not fair play. It is not fair to the thousands of loyal employes who want to work and do not want to join a union. Judge Grosscup's words of 1894, prompted by the Pullman strike (p. 33), still apply: "The law as it is must first be vindicated before we turn aside to inquire how law or practice as it ought to be can be effectually brought about."

Vindicate Old Laws First

• • •

That mechanical failures in automobiles are so rare as to be almost negligible is due to many factors, but the key to the high degree of reliability is metallurgical control. It is the instrument by which the work of iron and steel producers, fabricators, partsmakers and automobile manufacturers is co-ordinated to achieve uniformity of quality. While metallurgical control has attained a high standard of effectiveness, metallurgists are far from satisfied. Refinements are being introduced steadily (p. 36) and changes in specifications, materials and practice are constantly developing new concepts of the potentialities of metallurgical control. Progress in this field of activity means much to producers and users of ferrous and nonferrous metals. It tends to broaden the application of these materials.

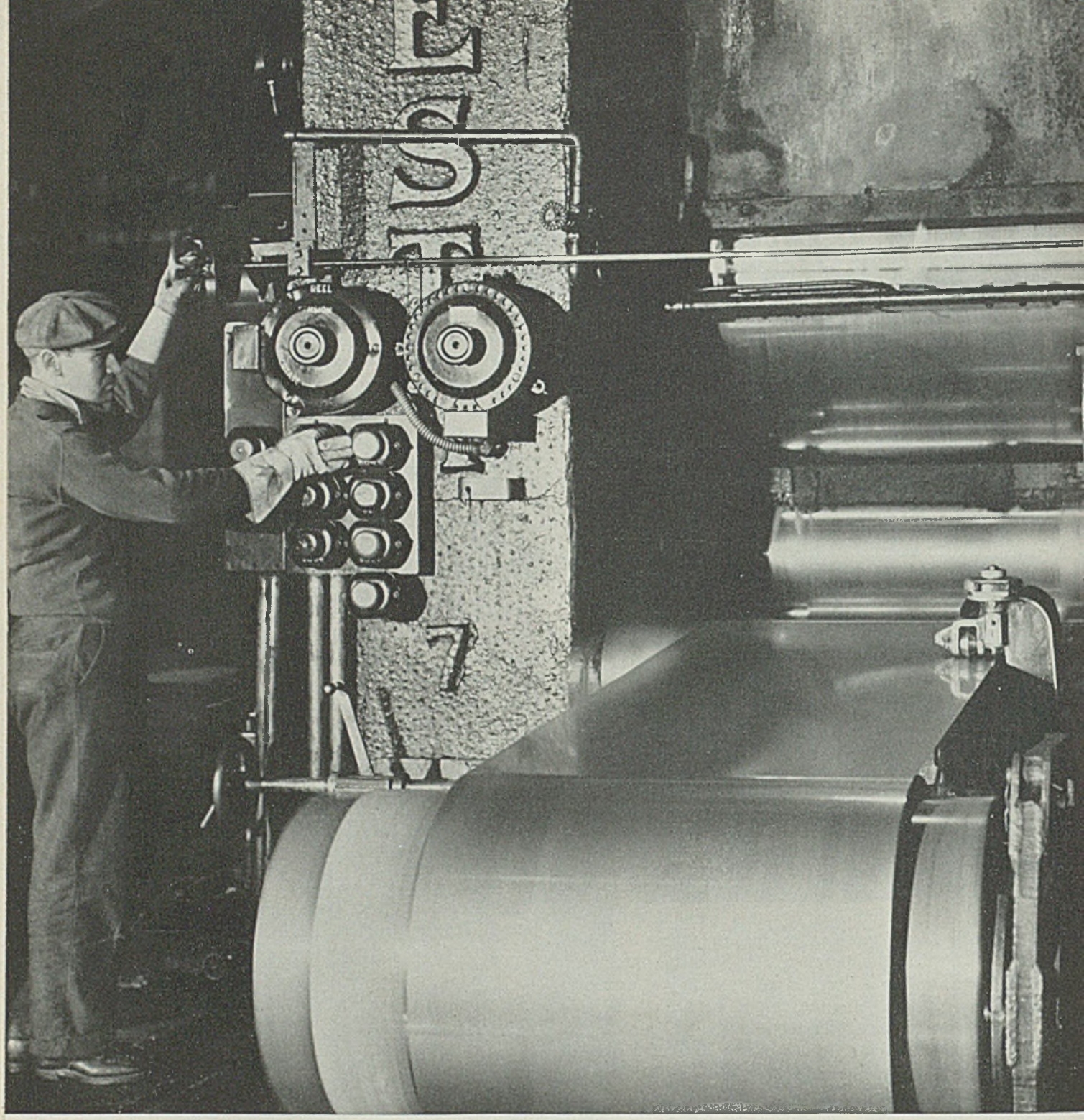
Control via Metallurgy

• • •

Few manufacturers encounter the variety of material handling problems that are present in a modern automobile assembly plant (p. 47), yet almost every operator of a metalworking establishment will find that one or more of the ideas employed for handling parts in an assembly plant are adapted to his own requirements. The alert observer who can spot a good idea and put it to effective use to his own account usually is rewarded by savings in production costs. . . . When a manufacturer moves from one building to another—and particularly when he goes into one designed for operations other than metalworking—he may encounter difficulties in mounting shafting and other driving mechanism of his machines. The staff of a midwestern metalworking establishment (p. 60) solved this problem in a novel manner.

Capitalizing Good Ideas

E. L. Shaner



You'll Save By Using Inland Sheets

● Today's preference for Inland Cold Rolled Sheets follows from records of smooth, cost-saving production experience in many hundreds of plants. Inland field men and metallurgists are often able to solve difficult problems for manufacturers by determining the exact surface and other characteristics best suited to a given process or finished product.

Their co-operation is a regular part of Inland service—personalized to fit the needs of the individual customer.

Why Wages, Hours Are Not an Issue; Earnings in Steel Among Highest

WAGE increases in the iron and steel industry since business started to come back have placed hourly rates and weekly earnings among the highest of 27 manufacturing classifications. The number of hours worked is little more than the equivalent of eight per day, five days a week.

The American Iron and Steel institute periodically publishes this industry's payroll statistics. Its most recent compilation (STEEL, June 7, p. 27) shows that employment and payroll disbursements—just before the strike—were the highest ever attained. But it is only by comparison with other basic industries—comparisons which the Steel institute does not draw—that the full significance of the figures becomes apparent.

The National Industrial Conference board regularly compiles data from 27 industries, including iron and steel, and these impartial records afford accurate bases for comparisons.

The average hourly rate for all wage earners in iron and steel in April, according to the board's current report, was 85.4 cents, or 24.3 per cent higher than the general average of 68.7 cents in 27 manufacturing industries.

Weekly earnings in iron and steel in April—The first full month for the wage increase which became effective March 16—average $35.36, or 25.6 per cent above the general average of $28.12 for 27 industries.

The average hours per week per wage earner in iron and steel was 41.4, and the average for 27 industries was 40.9.

Further examination of the board's tabulations show that iron and steel stood second from the top of the list of 27 industries for average weekly earnings.

The automobile industry was first with $37.86, compared with steel's $35.36. Then in order came news and magazine printing, petroleum refining, machines and machine tools. The latter's $32.29 was on a parity with earnings in the rubber tire industry.

In the list of industries having the highest average hourly earnings steel is fourth from the top, with 85.4 cents. Rubber tires leads with 96.3 cents—though in weekly earnings this industry ties with machines and machine tools for fifth.

Hourly earnings in petroleum refining and automobiles also average higher than in steel; 93.6 cents for refining, and 89.3 for automobiles.

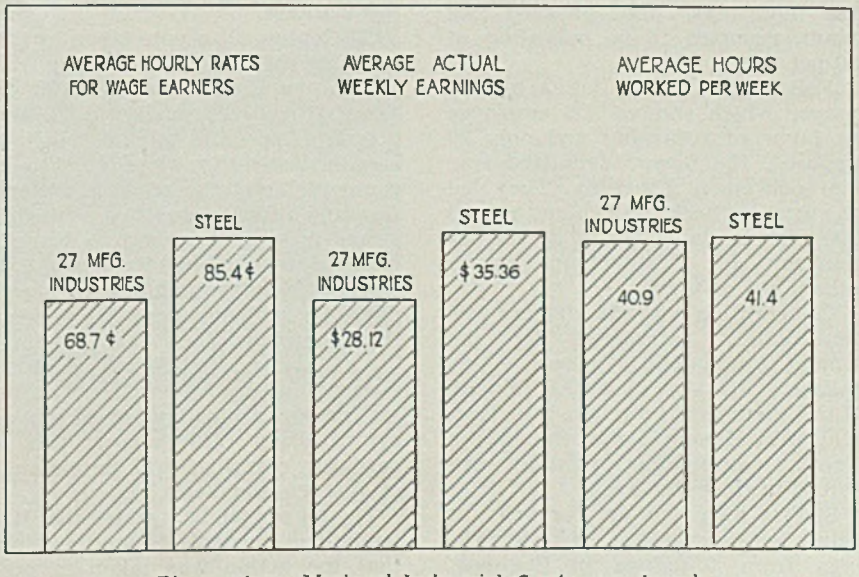
Steel ranks fourth in the list of highest hourly earnings for unskilled workers, at 67 cents, again being outranked by rubber tires, automobiles and petroleum refining. The average for 27 industries is 56.5 cents.

It is fifth in hourly earnings for skilled and semiskilled workers, with 88.6 cents, compared with the average of 76.7 cents for 27 industries.

The highest hourly earnings, however, do not mean the largest weekly earnings. In such comparisons steel moves up in the list of top pay industries.

In weekly earnings for unskilled

Relative Position of Steel Wages and Hours



Figures from National Industrial Conference board

labor, steel ranks third. Such earnings amount to $27.54, compared with $27.71 for rubber tires and $30.27 for automobiles, and an average of $23.35 for 27 industries.

In weekly earnings for skilled and semiskilled labor, steel again stands third in the list, with $36.77. Here it is outranked only by book and jobs printing, and newspaper and magazine printing. Automobiles fall into fourth place and petroleum refining in fifth place. The general average for 27 industries is $31.68. These and other comparisons are set forth in the accompanying table.

Wages and hours are not an issue in the steel strike. So far, however, the loss in wage earnings averages about $88 per worker. This is figured on the basis of two and one-half weeks' idleness at the average weekly earnings in the industry just before the walk-out. SWOC's sole demand is for a contract designating it as the official bargaining agent for the men. To date this has cost those men $6,000,000.

AVERAGE EARNINGS OF ALL WAGE EARNERS

	Hourly, Cents		Weekly
Rubber Tires	96.3	Automobiles	$37.86
Petroleum Refining	93.6	**Iron and Steel**	**35.36**
Automobiles	89.3	News, Magazine Printing	34.55
Iron and Steel	**85.4**	Petroleum Refining	33.42
Agricultural Implements	78.1	Machines and Machine Tools	32.29
Average of 27 industries	68.7	Average of 27 industries	28.12

AVERAGE HOURLY EARNINGS

	Unskilled		Skilled and Semiskilled
Rubber Tires	79.9	Rubber Tires	$1.026
Automobiles	74.2	News, Magazine Printing	1.002
Petroleum Refining	73.5	Petroleum Refining	.976
Iron and Steel	**67.0**	Automobiles	.921
Agricultural Implements	64.3	**Iron, Steel**	**.886**
Average of 27 industries	56.5	Average of 27 industries	.767

AVERAGE WEEKLY EARNINGS

	Unskilled		Skilled and Semiskilled
Automobiles	$30.27	Book, Job Printing	$39.93
Rubber Tires	27.71	News, Magazine Printing	39.86
Iron and Steel	**27.54**	**Iron and Steel**	**36.77**
Agricultural Implements	26.56	Automobiles	36.56
Machine and Machine Tools	25.68	Petroleum Refining	34.41
Average of 27 industries	23.35	Average of 27 industries	31.68

Juncture with Steel Strikers Averted, But Auto Plants Are Closed

MONROE, Mich., late last week resembled an armed camp—as a result of the determination of Republic Steel Corp.'s loyal employes to continue at work, after they had been escorted into the Newton Steel plant by 300 police.

Civilian vigilantes and members of the American Legion patrolled the highways, and guarded the plant, reported to be operating at 50 per cent.

Following a ballot taken by the mayor which showed 856 employes in favor of returning and only 20 opposed, the mayor deputized special policemen Thursday. They led the workers back to the plant, routed 200 pickets, jailed some of the organizers for "protection," drove others out of town.

Co-operation with the strikers was immediately threatened by the United Automobile Workers. A retaliatory invasion by 13,000 Pontiac UAW members, however, was forestalled by Homer Martin, though the Pontiac automobile plants were forced to close Friday.

Strikes also tied up Chevrolet at Flint, because of the lack of castings from foundries in Saginaw. Forty-one thousand General Motors employes were idle as a result. In Detroit it was reliably reported that the entire automobile industry is planning a complete shutdown if labor unrest does not abate.

The "back-to-work" movement among idle steel employes has been gaining momentum, and only threats of violence appear to be restraining workers.

At Canton, O., a vote taken by the chamber of commerce among Republic employes revealed 3633 in favor of returning, and only 216 opposed. Approximately 800 ballots cast in this election were found to be counterfeit and discarded. A citizens law and order committee with 500 members was organized to investigate many complaints made by workers that they had been threatened by strikers even when away from the plant.

At Cleveland, Republic's permit to operate an airport was revoked by the mayor at instigation of strike sympathizers. The airport was a base for carrying food into plants at Warren and Niles, O.

The mayor publicly stated that Republic had not violated any law, but that the action was taken to prevent possible violence. The mayor had a taste of picketing methods when he visited the airport. Pickets, failing to recognize him, seized his automobile and almost turned it over.

Despite a promise by strike leaders that the airport would not be molested while being evacuated, strike sympathizers stoned automobiles and buildings.

At Washington the senate post office committee last Friday heard two witnesses on the resolution providing for an investigation of the post office department's refusal to deliver parcel post packages to Republic plants. It then adjourned to resume this week.

Attending a conference at Columbus, O., called by Gov. Martin L. Davey were J. A. Voss, director of industrial relations for Republic; J. C. Argetsinger, general counsel for Youngstown Sheet & Tube, and R. M. Welsh, assistant to Sheet & Tube's president Frank Purnell. On the union side were Philip Murray, SWOC chairman, John Owens, Ohio CIO director, and Lee Pressman, CIO general counsel. Late Friday the governor stated that he hoped to keep the representatives in Columbus "until an agreement is

reached even if it takes several days".

Efforts to obtain some expression from the President at his press conference last week failed. He stated he knew nothing about it except what he had read. It is known that the postal question had been discussed with him several times, but no indication of this was given to newsmen.

Earlier in the week local unions had telegraphed the President asking him to settle the strike. The message was turned over to the national labor relations board which maintained a hands-off policy. "No formal action has been instituted before the board . . ." a statement explained.

When a hearing on the suit brought by Robert W. Northrup against Republic, to restrain Republic's alleged purchases of arms and ammunition, started in common pleas court at Cleveland several hundred strike sympathizers were on hand. Northrup, the company contends, is an organizer for the CIO, bought ten shares of Republic stock May 25 solely to qualify for the suit. While Northrup was not in court, his lawyer, Edward Lamb, CIO general counsel for Ohio, demanded that T. M. Girdler, Republic chairman, appear in answer to a subpoena. The case was continued until June 12.

David Watkins, organizer in the Johnstown, Pa., area for SWOC, asserted that union members at the Bethlehem Steel Co.'s Cambria, Pa., plant would go on strike in sympathy with the strike of workers on the Conemaugh & Blacklick railroad, a transportation unit of the Cambria plant. It was stated that the railroad workers' strike was called because contracts with two brotherhoods had not been signed.

Strike developments at Chicago last week generally constituted rebuffs to the CIO but resulted in no tangible progress toward breaking the impasse between strike-bound steel plants and the union.

Republic neatly out-maneuvered a city edict that housing of workers violated municipal regulations and continued to operate. Van A. Bittner, Chicago director of the SWOC, demanded that Inland set a date for bargaining negotiations and the signing of a contract and was promptly told that the company would bargain at any time but that it would sign no contract. The state's attorneys office continued its investigation of the riot at the Republic plant two weeks ago. In the meantime the death toll resulting from the battle with city police rose to eight.

Fines ranging from $100 to $1000 and accompanying sentences of 10 to 240 days were meted out in circuit court to 39 individuals for their part in a sit-down strike last February at the North Chicago plant of Fansteel Metallurgical Corp. Somewhat novel, so far as retaliation against sit-downers is concerned, prosecution of the Fansteel strikers enmeshed two of the leading CIO organizers of the Chicago district.

Sleep in Pullmans

Expectations of the union that Republic would be forced to close its South Chicago plant because housing of the workers within the mill was in violation of the city's health and building regulations were short-lived when the company moved Pullman cars into the plant to provide sleeping accommodations for the majority of the employes. At the same time Republic filed application for a permit to remodel a warehouse into living quarters for the men.

No further disturbances have occurred at the site of the only strike fatalities in the Chicago district, and groups of workers have left the plant and re-entered without molestation. The guard of city police at the plant gates has also been reduced.

SWOC went off on another tack in its attempt to obtain a contract from Inland. Addressing the national labor relations board, Bittner accused the company of engaging in unfair labor practices because "it refused to enter into collective bargaining negotiations looking toward a signed agreement with the Steel Workers' Organizing committee . . ."

Actually, what Inland's J. H. Walsh, works manager, had told Bittner was as follows: "I am sure you will recall that at our last conference I made it entirely clear that we would meet with the Steel Workers' Organizing committee at any time for purposes of collective bar-

Frankly Terroristic

CIO's ultimatum to employes who remain at work in Republic Steel Corp. plants makes this statement:

"The strike is being supported financially by all steel workers in the United States. 300,000 workers will donate one day's pay each month to see us win."

Other statements:

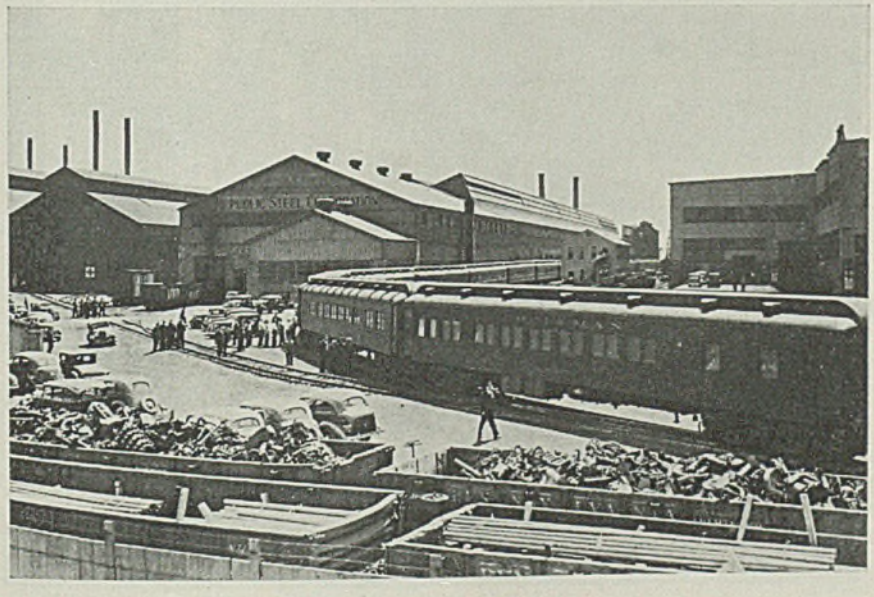
"Our pickets are well fed and happy. Relief is being arranged for their families. Four departments of the United States government are fighting on our side . . . .

"You are still welcome out here with us. Extra precautions will be taken throughout the next 12 hours to guarantee your safety in leaving the plant. After that time your safety will be your own responsibility."

A donation such as that referred to would mean more than $1,500,000 a month—yet "relief is being arranged for their families."

The tone of the ultimatum—to quote the *New York Herald Tribune*—is "frankly terroristic."

Pullman Cars House Loyal Steel Workers



WHEN Chicago city officials, acting on CIO complaints, declared Republic Steel Corp.'s housing facilities for its loyal employes at the South Chicago plant were not in accordance with ordinances, the company ran in a string of Pullman cars to be used for living quarters while it started to remodel a warehouse. Wide World photo

gaining but that we did not propose to make a signed contract with that committee and that the national labor relations act does not require the signing of a contract. That is still our position."

The union claims to have enrolled about 9000 of Inland's 13,500 workers, but its offer to prove this contention is by a check of its own books and membership cards against the company's payroll. An investigation of the SWOC charges was promised by the Chicago regional director of the labor board.

SWOC WINS ELECTION AT PITTSBURGH STEEL CO.

Pittsburgh Steel Co. employes in Allenport and Monessen, Pa., plants last Thursday voted 5287 for and 645 against the Steel Workers Organizing committee as their collective bargaining representative. At Monessen the vote was 3536 to 490; at Allenport 1751 to 155.

Twenty-eight ballots were thrown out for various reasons. Of 2052 employes at the Allenport plant eligible to vote, 1934 cast ballots.

In an election at the Acme Steel Co., Chicago, last week 1113 votes were cast in favor of the Amalgamated Association of Iron, Steel and Tin Workers against 877 in favor of the Acme Steelworkers Security league. This was to determine the sole collective bargaining agency for all company's employes.

SHEET, BAR WAGE PACT NEGOTIATIONS UNDER WAY

Annual wage conferences between the Amalgamated Association of Iron, Steel and Tin Workers and the Western Sheet and Tin Plate Manufacturers, and the Amalgamated with the Western Bar Iron association were in progress last week. Present agreements expire June 30.

Conferences between the Amalgamated and the Western Sheet association were started June 8 in Atlantic City, N. J., but adjourned for two weeks. Adjournment was necessary because hotel reservations expired and Amalgamated officials had an appointment in Chicago where a similar conference with the Western Bar Iron association opened.

Amalgamated is demanding wage increases and vacations with pay from both associations.

WAGE-HOUR BILL A MENACE, SAYS O'LEARY

The Black-Connery wage-hour bill is based on economic principles which have been proved false by experience and upon social controls which would endanger both economic and social progress, John W. O'Leary, Chicago, told a joint congressional committee in Washington last Friday. Mr. O'Leary is president of the Machinery and Allied Products institute. He said:

"There is far greater danger to the general welfare of the American people in conferring upon any board such broad powers as are contemplated in this act than there are in unregulated hours and wages."

WEIRTON STEEL OFFERS VACATION OR EXTRA PAY

Weirton Steel Co., Weirton, W. Va., has announced an optional plan of vacations with pay for wage earners for 1937.

Its purpose is to provide the equivalent in vacation pay to employes working on an hourly, piece rate, or tonnage basis, who prefer to work rather than to take time off for vacations. Employes eligible for vacations who wish to take the allotted time off, may elect to do so and will receive vacation pay.

Employes with a continuous service record of one year and less than five years will receive vacation of two days of eight hours each; for five years' service and less than 10 years' service, the vacation will be six days; for 10 years' service and less than 15 years' service, the vacation will be eight days; for 15 years' service and over the vacation will be 10 days.

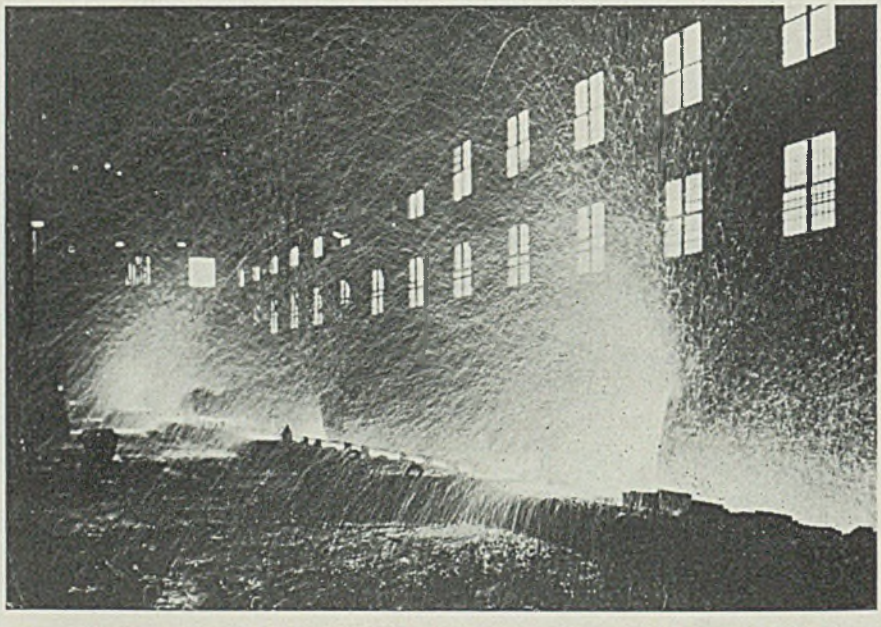
Materials Are Available For Product Redesign

With warm air heating and air conditioning having the "green light", manufacturers of equipment for this field are faced with an almost complete revamping of products to meet the new conditions of appearance and service. So stated F. H. Ramage, sales promotion manager, Republic Steel Corp., Cleveland, in addressing the midyear meeting of the National Warm Air Heating and Air Conditioning association in Cleveland, June 8-10.

Mr. Ramage spoke on the subject of "Product Development — the Means for Stimulating Sales and Enlarging Profits." The heating industry need not hesitate in developing new products, he said, for steels and alloys for practically every conceivable need are available, including those which will resist high temperatures and pressures without scaling or failure and those which will resist varying degrees of rust and corrosion.

The warm air furnace of today must have modern eye appeal, he continued. The new units must compare with other household appliances. Modern sheet metal fabrication should be employed with spot welding used where advisable. Baked-on enamel paint provides a permanent and pleasing finish and decorative trim adds to the styling. Stainless steel offers advantages for the latter. Mr. Ramage emphasized that the value of employing color in adding merchandising appeal should not be underestimated.

Pyrotechnics in Steel



SAWING a red-hot rail in Carnegie-Illinois Steel Corp.'s Gary works. The peripheral speed of the hot saw is at the rate 3 miles per minute. The temperature of the rails is 1850 degrees Fahr., and time required for sawing 7/10 of one second. The result, a pyrotechnic display

Bulk of Labor Is "Reasonable"

SPEAKING before the annual meeting of the Gray Iron Founders' society in Cleveland last Friday, Whiting Williams, Cleveland, expressed the belief that agreements made recently by industries with the CIO are being taken more seriously by industrialists and the general public than the facts warrant.

Mr. Williams divided industrial workers into three groups: First, 20 per cent who are pro-union, made up of young men of relatively short service who are inclined to be radical; second, 20 per cent consisting chiefly of older men long in service who are pro-company; and third, 60 per cent who are neither pro-union or pro-company but pro-job. This latter group he said, will take a reasonable point of view.

Must Seek New Fields

In an address, "Publicity for Sales Promotion to Increase the Use and Sale of Gray Iron Castings," L. J. Wischerath, advertising manager, Buffalo Foundry & Machine Co., Buffalo, stated that only when a foundry or group of foundries develops new fields of service will the demand for gray iron castings increase. Foundrymen should acquaint prospective users with the properties available in gray cast iron today, in contrast with the properties discussed in some text books on engineering materials.

He discussed the recent advertising program conducted by society and expressed the opinion that a continuance of this program will bring highest satisfaction.

Two important new factors vitally affect the depreciation problem according to Prof. P. T. Norton Jr., Virginia Polytechnic institute, who spoke on "Rethinking Depreciation and Obsolescence." The first is recent legislation, particularly the corporation surplus tax which makes it necessary to calculate depreciation and obsolescence more carefully than ever before, if corporations are to be maintained economically sound. The second, is the constant rise in standards of perfection of products and service which in turn places greater demands on plant and equipment.

Prof. Norton stated that it is not possible to set standard depreciation rates or to prescribe in detail a standard system for calculating depreciation charges for a group of manufacturers whose plants are operating under different conditions. He stressed the fact that depreciation is a production cost, paid in advance.

W. J. Donald, managing director, National Electrical Manufacturers' association, spoke at the afternoon meeting on "The Use of the National Trade Association in the Light of Pending Federal Legislation."

New Capacity

WEIRTON STEEL ADDS BESSEMER CONVERTER

WEIRTON STEEL CO., Weirton, W. Va., subsidiary of National Steel Corp., Pittsburgh, has increased its ingot capacity 10 per cent by installation of a 25-ton bessemer converter at its main plant at Weirton. This addition will increase output of finished steel, which has been at capacity for several months.

This is the first addition to bessemer steelmaking capacity in this country since 1930 when Jones & Laughlin Steel Corp., Pittsburgh, added two 25-ton bessemer converters for steel production at its South Side works, Pittsburgh. Previous to that no bessemer converters for steel production had been built since 1922. In that year Steel & Tube Co. of America, Chicago, built two 15-ton converters. This company was taken over in July, 1923, by Youngstown Sheet & Tube Co., Youngstown, O.

However, in the period between 1922 and 1930 A. M. Byers Co., Ambridge, Pa., installed two 10-ton converters, not for steelmaking, but to convert cupola iron into metal suited to its puddling process. Between 1930 and 1937 National Tube Co., put into service at its McKeesport, Pa., plant three 25-ton bessemer converters for duplexing steel for the open hearth. Neither of these installations was to add to bessemer steel production.

BY-PRODUCT COKE CAPACITY INCREASED

Algoma Steel Corp. Ltd., has placed a contract with the Wilputte Coke Ovens Corp., New York, for a battery of 53 by-product coke ovens for its steel plant at Sault Ste. Marie, Ont. Capacity is estimated at 250,000 tons of coke annually. The Algoma works has 160 by-product coke ovens at present, 110 being Koppers and 50 Wilputte, with annual capacity of 720,000 tons of coke.

This construction is a further development in enlarging cokemaking capacity at steel plants, which lagged through the depression. From 1932 when Illinois Steel Co. completed 138 ovens at Gary, Ind., four years elapsed in which no steelworks ovens were completed. This year Ford Motor Co. completed 122 Koppers ovens with 770,000 tons annual capacity and Inland Steel Co., completed 59 Koppers ovens at its Indiana Harbor, Ind., works with capacity of 300,000 tons annually. Great Lakes Steel Corp., subsidiary of National Steel Corp., is building 130 Semet Solvay ovens with 675,000 tons annual capacity at its plant near Detroit. This makes a total of 364 ovens completed or under construction this year, with annual capacity close to 1,200,000 tons of coke.

Steel Corp. Shipments Show Small Loss

Shipments of finished steel by the United States Steel Corp. in May were 1,304,039 tons, a decline of 39,605 tons from the total of 2,343,644 tons shipped in April. This is the second month a loss has been shown. Compared with shipments of 984,079 tons in May, 1936, the gain was 319,942 tons.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)

(Tons)

	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	1,133,724	676,315	583,137	385,500
Mar.	1,414,399	783,552	668,056	588,209
April	1,343,644	979,907	591,728	643,009
May	1,304,039	984,097	598,915	745,063
June	.....	886,065	578,108	985,337
July	.....	590,851	547,794	369,938
Aug.	.....	923,703	624,497	378,023
Sept.	.....	961,803	614,933	370,306
Oct.	.....	1,007,417	686,741	343,962
Nov.	.....	882,643	681,820	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'rly adj.	.....	.....	†23,750	†19,907
Total	.....	§10,825,132	7,347,549	5,905,966

*Addition. †Deduction. §Subject to adjustment.

For five months shipments aggregated 6,345,724 tons, compared with 4,145,285 tons in the same period of 1936, an increase of 53 per cent.

In view of frequent requests concerning figures for 1929, the Steel Corp. has compiled figures comparable with those reported on shipments since 1930. The 1929 figures follow:

1929	Tons
January	1,239,119
February	1,257,448
March	1,445,156
April	1,463,771
May	1,539,738
June	1,385,506
July	1,338,944
August	1,360,523
September	1,145,244
October	1,210,116
November	1,006,231
December	844,846
Less: Yearly adjustment	12,287
Total	15,234,355

Republic Steel Corp., Cleveland, has begun work on a new $50,000 office building at Gadsden, Ala., which will house the accounting and operating departments for the corporation in that district.

May Ingot Output Near All-time High

STEEL ingot production in the first five months this year—24,580,871 gross tons—exceeds by 447,552 tons the output in the comparable period in 1929.

For the first time on record, production in each of three consecutive months—March, April, May—was more than 5,000,000 tons.

Prior to this year, a monthly total of 5,000,000 tons or more was attained in only two periods, March and April, 1929.

Production in May totaled 5,135,559 tons, compared with 5,071,875 tons in April. The operating rate was 88.82 per cent of capacity in May and 90.27 per cent in April, an additional working day in May accounting for the apparent discrepancy. The May output has been exceeded only twice in the history of the industry, in March this year when 5,216,666 tons were made, and in May, 1929, when the all-time record of 5,286,246 tons was set.

Production in May was 27.6 per cent greater than in May, 1936, and the cumulative total for five months this year is 42.1 per cent larger than in the same period of 1936.

In 1929 ingot output tapered from May to the end of the year. All indications now are that the summer lull this year will be relatively light, backlogs and current orders holding up exceptionally well. Barring prolonged labor difficulties, steel output this year may set an all-time record.

District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
Pittsburgh ..	92	— 3	65	32
Chicago	63	None	69	41
Eastern Pa...	64½	— 6½	44½	32
Youngstown .	30	+ 1	76	42
Wheeling ...	95	— 1	68	48
Cleveland ...	46	None	82	51
Buffalo	89	+ 1	84	35
Birmingham .	83	None	69	30½
New England	45	None	78	60
Detroit	95	— 5	100	94
Cincinnati ..	93	— 3	80	†
St. Louis ...	85	— 6	†	†
Average ..	74	— 1	68	39

†Not reported.

Production

STEEL ingot production declined 1 point last week to 74 per cent. Heavier schedules at plants in the Youngstown district unaffected by strikes failed to offset losses at Pittsburgh, eastern Pennsylvania and elsewhere. Details follow:

Pittsburgh—Down 3 points to 92 per cent. The leading interest continues operating at around 95 per cent and the leading independent at 87 per cent. One blast furnace operated by an independent steel company is down for repairs.

Central eastern seaboard—Off 6½ points to 64½ per cent. A further reduction is indicated as the summer season approaches.

Cleveland-Lorain—Held at 46 per cent, with Otis Steel Co. and National Tube Co., Lorain, operating on practically unchanged schedules.

Youngstown—Operations at plants unaffected by the strike averaged 30 per cent, up 1 point. Carnegie-Illinois Steel Corp. was producing in 24 open hearths and Sharon Steel Corp. 5. Republic Steel Corp. operations at Warren, O., are estimated at about 50 per cent. Sharon will resume with a blast furnace at its Lowellville plant this week making 12 active.

Birmingham—Ingot operations remained at 83 per cent, for the sixth consecutive week.

Chicago—Unchanged at 63 per cent, with plants of Inland Steel Co. and Youngstown Sheet & Tube Co. still idle. Blast furnace operations also are unchanged, 27 of 39 stacks being active.

Wheeling—Down 1 point to 95 per cent.

Detroit—One of the district's furnaces was down all last week for rebuilding, bringing the rate down to 95 per cent. This week again will see all open hearths active.

Cincinnati—Down 3 points to 93 per cent, with 22 open hearths active. One open hearth was taken off last week for repairs.

New England—Unchanged at 45 per cent. Completion of repairs and resumption of four to five open hearths this week will lift operations to about 82 per cent.

Buffalo—Gained 1 point to 89 per cent, with 38 open hearths and 11 blast furnaces in production.

St. Louis—Off 6 points to 85 per cent.

Steel Ingot Statistics

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

	—Open Hearth—		—Bessemer—		—— Total ——		Weekly production, all companies,	Number of weeks in
1937	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	gross tons	month
Jan.....	4,433,145	84.20	291,794	54.30	4,724,939	81.43	1,066,578	4.43
Feb.....	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March.....	4,812,879	91.42	403,787	75.14	5,216,666	89.91	1,177,577	4.43
April.....	4,681,677	91.83	390,198	74.98	5,071,875	90.27	1,182,255	4.29
May	4,767,269	90.55	386,290	71.88	5,153,559	88.82	1,163,332	4.43
5 mos....	9,448,953	.....	1,803,738	.....	24,580,871	.....	1,139,058	21.58
1936								
Jan.....	2,843,415	54.76	196,389	32.21	3,039,804	52.39	686,186	4.43
Feb.....	2,754,446	56.76	202,445	35.55	2,956,891	54.53	714,225	4.14
March.....	3,148,813	60.64	185,040	30.33	3,333,853	57.46	752,563	4.43
April.....	3,627,830	72.14	304,775	51.62	3,932,605	69.99	914,593	4.29
May.....	3,735,283	71.93	302,092	49.55	4,037,375	69.58	911,371	4.43
5 mos....	16,109,787	.....	1,190,741	.....	17,300,528	.....	796,520	21.72
June	3,640,672	72.40	334,897	56.72	3,975,569	70.75	926,706	4.29
July.....	3,587,764	69.25	326,606	53.69	3,914,370	67.61	885,604	4.42
Aug.....	3,833,727	73.83	350,560	57.50	4,184,287	72.11	944,534	4.43
Sept.....	3,848,340	76.71	303,048	51.45	4,151,388	74.05	969,950	4.28
Oct.....	4,216,536	81.20	317,710	52.11	4,534,246	78.15	1,023,532	4.43
Nov.....	3,993,472	79.42	329,553	55.82	4,323,025	76.94	1,007,698	4.29
Dec.....	4,119,025	79.50	305,342	50.20	4,424,367	76.42	1,000,988	4.42
Total....	43,349,323	70.74	3,458,457	48.07	46,807,780	68.36	895,329	52.28

Percentages of capacity for 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,882 gross tons; bessemer, 6,325,000 tons: for 1936, on weekly capacities of 1,172,160 gross tons open-hearth ingots, 137,624 tons bessemer, 1,309,784 tons total, based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth ingots 61,280,509 gross tons, bessemer 7,195,000 gross tons.

Stainless Steel Diesel Trains for Rock Island

Six lightweight stainless steel trains will be placed in service this summer on lines of the Chicago, Rock Island & Pacific. The order was placed with Edward G. Budd Mfg. Co., Philadelphia, in November and they are nearing completion. Four of the trains are of three cars each and two are of four cars. They are powered by diesel-electric locomotives and have daily capacity of 2000 passengers. They will be placed on daylight runs between Chicago and Peoria, Ill.; Chicago and Des Moines, Iowa; Kansas City and St. Paul; Kansas City and Denver.

Financial

WHEELING STEEL TO REFINANCE, ERASE ARREARS

DIRECTORS of Wheeling Steel Corp., Wheeling, W. Va., have announced a recapitalization plan designed to wipe out the $23.50 back dividends on the 6 per cent preferred and provide funds for other corporate purposes. Stockholders will vote July 14 on the plan, which provides for creation of a $5 cumulative convertible prior preferred. Authorized common shares would be tripled and one of the new preferred shares plus one-half share of common would be given to holders for each share of old preferred. Plan further contemplates that new prior preferred will carry right of conversion into common during the next ten years on a sliding scale downward from 1½ to 1¼ shares.

DIVIDENDS DECLARED

Directors of Youngstown Sheet & Tube Co., Youngstown, O., declared a regular quarterly dividend of 75 cents a share on common stock, payable July 1 to stockholders of record June 14.

American Ship Building Co., Cleveland, has declared an extra dividend of $1 a share on common stock payable June 26 to record June 18, a dividend of 50 cents on common payable Aug. 2 to record July 15 and an annual dividend of $7 a share on preferred, payable June 26 to record June 18.

Arthur G. McKee & Co., Cleveland, declared a regular quarterly dividend of 25 cents and an extra of 75 cents on B stock, payable July 1 to stock of record June 20. Total declarations this year equal $2.25 per share.

Granite City Steel Co., Granite City, Ill., declared a regular quarterly dividend of 25 cents a share, payable June 30 to record June 16.

W. H. Davey Steel Co., Cleveland, declared the regular quarterly dividend of 20 cents a share, payable June 28 to stock of record June 18 and an extra dividend of 60 cents.

Interlake Steamship Co., Cleveland, will pay 50 cents for the second quarter, same as in the first three months. This is double the amount paid a year ago.

Meetings

BULK OF SPACE IN METAL SHOW ALREADY RESERVED

NINETY-ONE per cent of the exhibit space for the nineteenth annual National Metal exposition, to be held in the Auditorium, Atlantic City, N. J., Oct. 18-22, has been contracted for, according to W. H. Eisenman, managing director of the show and secretary of the American Society for Metals which is sponsoring the show. The number of industrial companies acquiring this space totals 189. Only 31 exhibit spaces remain to be sold.

The Atlantic City Auditorium provides 154,348 square feet of space on one floor unencumbered by pillars or posts. Accommodations for meetings of the National Metal congress are available on the second floor.

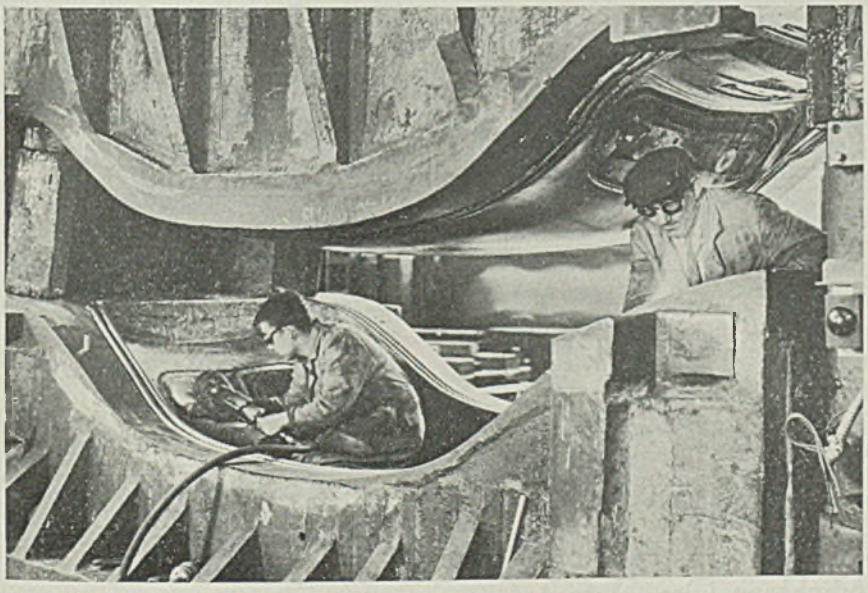
Co-operating with the American Society for Metals in the congress will be the Iron and Steel and Institute of Metals divisions of the American Institute of Mining and Metallurgical Engineers, American Welding society, American Society of Mechanical Engineers, and the Wire association.

AGRICULTURAL ENGINEERS TO HEAR ADDRESS BY FLANDERS

Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., and past president, American Society of Mechanical Engineers, will address the thirty-first annual meeting of the American Society of Agricultural Engineers at the University of Illinois, Urbana, Ill., June 21-24. "Responsibilities of the Agricultural Engineer in Economic and Social Development" will be the title of his address.

Two papers of interest to the steel industry are to be presented at a session of the farm structures division. One is "New Developments in Roofing Nails," by James B. Maze, W. H. Maze & Co., Peru, Ill., and the other is "Progress of the Fence Testing Project," by H. W. Riley, Cornell university, Ithaca, N. Y.

Industrial Dentists



DENTAL work on an elephantine scale is typified by this view of workmen inside the jaws of a 1500-ton press which stamps out solid steel tops for DeSoto. Portable high-speed grinders are being used to smooth off rough spots in the huge dies which measure 12½ feet across. Dies for this work are the most costly of any used in the automobile industry and require many hours of careful finishing to prevent wrinkling or tearing of the sheet steel

Wire Association Meets in Pittsburgh

The pendulum is swinging too far over for labor, asserted Frederick A. Westphal, superintendent of wire mills, Sheffield Steel Corp., Kansas City, Mo., in addressing a regional meeting of the Wire association in Pittsburgh recently. Mr. Westphal, who is vice president of the association, said further that some workers are intimidating others to force them into organizations they do not wish to join.

Labor will awaken soon and discover it has been stupidly misled, he stated.

Approximately 160 association members and guests attended, among these being a number who had been invited to inspect Firth-Sterling Steel Co.'s new sintered carbide plant, McKeesport, Pa.

Two technical papers were presented, C. L. Harvey, chief metallurgist, Lamson & Sessions Co., Kent, O., discussed cold heading wire, and B. L. McCarthy, chief metallurgist, Wickwire Spencer Steel Co., Buffalo spoke on the metallurgy of steel wire.

Pig Iron Leads In April Imports

IMPORTS of steel and iron products into the United States in April, excluding scrap, aggregated 56,484 gross tons, valued at $2,709,526, compared with 49,898 tons, valued at $2,420,133 in March, 1937, and 40,828 tons, valued at $1,700,619 in April, 1936, according to the metals and minerals division, department of commerce.

Pig iron was the chief item imported, from the standpoint of tonnage, a total of 11,464 tons, British India sending 7791 tons and the Netherlands 2960. Structural shapes ranked second with 10,716 tons mainly from Belgium and France. Bars were third with 6891 tons. Ferromanganese imports totaled 3379 tons.

Belgium supplied the largest tonnage of imports in April, 19,522 tons, excluding scrap; 8118 tons being structural shapes, 4762 tons bars, 2080 tons hoops and bands, and 1385 tons sheets, skelp and sawplate. Germany was second with a total of 10,118 tons, including 4775 tons of pipe, 1658 tons of nails, tacks and staples and 1302 tons of barbed wire. British India furnished 7791 tons, all pig iron, France 4600 tons, mostly shapes and bars, and Sweden 4081 tons, mostly wire, wire rods and bars.

Imports for four months of 1937 totaled 186,181 tons, valued at $8,517,255, compared with 169,027 tons, valued at $6,825,193, imported in the comparable period of 1936. In the four months Belgium led with 63,199 tons, Germany was second with 25,838 tons, British India third with 23,600 tons, Sweden 14,588 tons, Netherlands 14,386 tons and France 14,324 tons.

Scrap imports in April totaled 11,713 tons, compared with 1907 tons in March and 8549 tons in April, 1936. Scrap receipts for four months aggregated 18,512 tons, compared with 30,817 tons in the corresponding period of 1936, practically all from Canada in both years.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1937		1936	
	Imports	Exports	Imports	Exports
Jan.	43,063	201,692	50,489	241,564
Feb.	41,628	290,987	43,358	213,802
March	51,805	570,584	56,720	264,337
April	68,197	671,746	49,277	301,987
4 Mos.	204,693	1,735,009	199,844	1,016,764
May	.....	.....	59,391	314,950
June	.....	.....	59,910	294,951
July	.....	.....	47,490	296,738
Aug.	.....	.....	60,697	295,341
Sept.	.....	.....	59,993	235,571
Oct.	.....	.....	64,509	261,882
Nov.	.....	.....	61,970	203,297
Dec.	.....	.....	52,584	244,156
Total	.....	.....	666,838	3,162,694

ORIGIN OF APRIL IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	31,121	100	.....	2,835
Mexico	492	.....	.....	.....
Canada	90	318	.....	279
Cuba	55,000	.....	3,150	.....
Chile	110,350	.....	.....	.....
Germany	.....	100	.....	.....
Netherlands	.....	2,960	.....	.....
Sweden	.....	200	.....	.....
British India	.....	7,791	780	.....
France	.....	.....	5	105
Soviet Russia	.....	.....	22,281	.....
Gold Coast	.....	.....	16,515	.....
South Africa	.....	.....	119	.....
Japan	.....	.....	.....	81
Czechoslovakia	.....	.....	.....	79
Total	197,053	11,469	42,850	3,379

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	1,385	8,095	4,762	2,080
France	157	2,289	1,208	627
Germany	41	309	227	605
Sweden	6	.....	540	.....
Unit. Kingdom	12	.....	137	54
Canada	2	.....	1	.....
Austria	.....	.....	3	.....
Czechoslovakia	.....	.....	13	.....
Total	1,603	10,693	6,891	3,426

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

	April 1937	March 1937	Jan. thru Apr. '37
Pig iron	11,469	10,720	45,963
Sponge iron	.....	59	1,455
Ferromanganese (1)	3,379	4,108	11,407
Spiegeleisen	1,240	2,720	5,850
Ferrochrome (2)	34	56	159
Ferrosilicon (3)	192	42	467
Other ferroalloys (4)	.....	.....	52
Steel ingots, blooms	.....	14	124
Billets	220	220	676
Concrete rein. bars	586	1,183	2,639
Hollow bar, drill steel	254	255	872
Bars, solid or hollow	6,891	5,413	20,888
Iron slabs	.....	1	1
Iron bars	410	157	832
Wire rods	1,751	1,631	5,982
Boiler other plate	137	11	176
Sheets, skelp, saw pl.	1,603	1,591	5,635
Die blocks or blanks	18	22	53
Tin plate, taggers' tin and terneplate	12	16	71
Structural shapes	10,716	8,650	34,047
Sashes, frames (5)	.....	.....	.....
Sheet piling	.....	341	854
Rails, fastenings	765	847	3,269
Cast-iron pipe, ftgs.	221	303	928
Mall. iron pipe fittings	71	26	160
Welded pipe	2,053	1,422	3,861
Other pipe	4,378	2,041	8,462
Cotton ties	.....	.....	349
Hoops and bands	3,426	2,586	10,560
Barbed wire	1,746	1,297	5,548
Iron and steel wire	581	595	1,954
Teleg. and tele. wire	.....	2	8
Flat wire and strips	300	332	1,139
Wire rope and strand	396	334	1,151
Other wire	252	410	1,219
Nails, tacks, staples	2,686	1,991	7,552
Bolts, nuts, rivets	23	92	230
Horse, mule shoes	35	6	87
Castings, forgings	639	404	1,498
Total gross tons	56,484	49,898	186,181
Iron and steel scrap	11,713	1,907	18,512
GRAND TOTAL	68,197	51,805	204,693

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content; (5) formerly included with "Structural shapes".

Michigan Ore Output Up; Taxes Lower

Iron ore production in Michigan increased to 9,126,184 tons in 1936, compared to 5,173,143 tons mined in 1935, according to the state department of conservation. Shipments in 1936 were 10,502,036 tons, against 7,241,544 tons in the preceding year.

Mines were worked an average of 238 days in 1936 and employed 4929 men. Average daily wage was $4.87 and average yearly earnings $1160.18. Miners produced an average of 8.39 tons per day.

State and local taxes on active mines totaled $1,521,684. This amounted to 16.67 cents per ton of ore mined last year. In 1932 when production was only 2,496,672 tons and high taxes of the pre-depression period still prevailed, the average per ton was $1.09.

Bill Bars Exports For War Use

A BILL was introduced in the house last week by Representative Crawford (R.) Michigan "to prohibit the exportation of pig iron, scrap iron, and scrap steel except under license from the secretary of commerce."

The bill provides that it shall be unlawful to export these commodities without the written permission of the secretary of commerce.

"Such permit," the bill states, "shall be granted by the secretary only upon application therefor in writing and after proof satisfactory to him that such pig iron, scrap iron, or scrap steel is not to be used in the manufacture of implements of war or for military purposes."

It is further provided in the bill that "the secretary shall have access to, upon his request, any and all communications and contracts existing in connection with any and all shipments of pig iron, scrap iron, and scrap steel for which an export permit is sought."

The bill is to become effective immediately upon its approval by the President. It has been referred to the house committee on interstate and foreign commerce.

Record Cargo of Ore

The largest cargo of iron ore ever handled on the Great Lakes, 15,031 gross tons, arrived last Wednesday at Fairport, O., in the Interlake Steamship Co.'s freighter HARRY COULBY. The COULBY, third largest craft on the lakes, has 607-foot keel, 65-foot beam and 33-foot depth.

The largest cargo of ore previously shipped from the head of the lakes to Lake Erie was 14,617 gross tons, also brought down by the COULBY in 1929.

Experiment with Mile-Long Rails Proving a Success

AFTER a year and a half in service, none of the 269 welds has broken in the mile-long rails installed by the Bessemer & Lake Erie railroad at River Valley, Pa., and the movement of this long stretch of track has been very slight.

Carrying more than 18,000,000 tons of freight since the installation in November, 1935; and during extremes of heat and cold ranging from 104 degrees Fahr. to —15 degrees the running surface of the rails in the area covered by the welds has shown no indication of breaking down, according to F. R. Layng, chief engineer of the railroad.

The United States has not experimented widely with long stretches of welded rail. The Bessemer & Lake Erie hopes to determine whether or not the thermit method of welding will prove satisfactory; what movements take place in long stretches of rails; what stresses are encountered in this type of construction; whether the GEO type of plate fastening is successful in controlling the stresses of expansion and contraction due to changes in temperature; and whether or not this type of construction offers economies in track maintenance. By welding, the ordinary joints are eliminated, removing the cause of rail-end batter.

At one time railroad men believed short rails were imperative to allow for expansion and contraction. Then it was found that long rails did not contract or expand much more than did 39-foot lengths, considerable depending on the amount of holding power in the fastenings.

Little Movement Recorded

Mr. Layng said recently before the New York Railroad club that "so far no longitudinal movements of special interest have been recorded in the one-mile stretch, except at the extreme ends of the installation. Here the rail moves in harmony with changes in temperature—the maximum longitudinal movement covering a range of 1 inch at the south end, while ¾-inch is the range at the north end. As a whole, the track has remained in excellent line and surface, and no lining or surfacing has yet been necessary."

The one-mile stretch in the Bessemer & Lake Erie experiment includes tangent track, curves and a grade which is downward with the current of traffic. Work was started Oct. 7, 1935; welding began Oct. 10 and was completed Oct. 29, and the rails entered service on Nov. 9, 1935. Upon new red-oak ties, with GEO plates previously attached, workmen placed the 39-foot lengths of rail, 131 pound, A.R.E.A. section.

"About ¼-inch section of the lower half of the web and base of the ends of each rail was cut away with a torch to provide a ½-inch gap (except at the head) when the rails were clamped together," said Mr. Layng. "Head of the rail and upper part of the web were then cleaned thoroughly to remove all scale and rust."

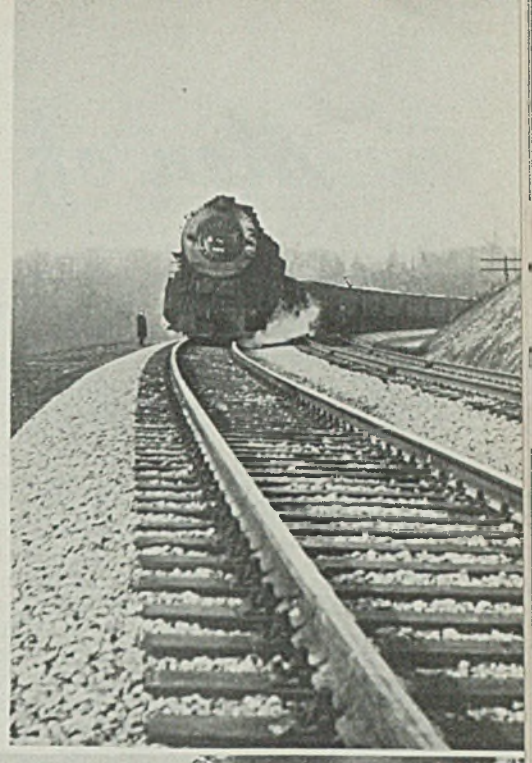
Thermit butt pressure welding, which is a combination pressure butt weld of the rail heads and a fusion weld of the base and web, was used. Two sets of clamps and crucibles were used simultaneously.

Molds made of a mixture of sand, clay and gluten, in metal flasks, were prepared on a push car just behind the welding operations. These molds are so designed that the thermit metal fills the gap cut out of the web and base of the rails, and forms a collar around the base and web of the rail, while the light slag floats on the liquid steel and surrounds the head of the rail.

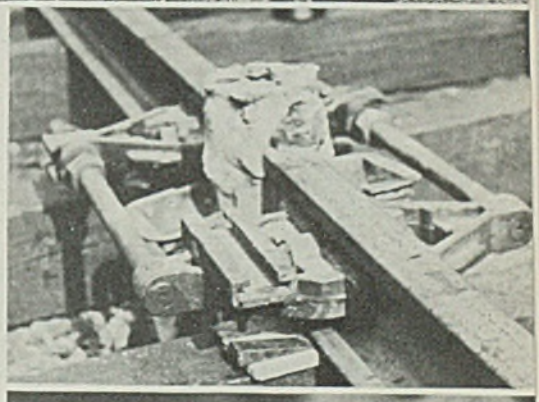
The molds were applied at the joints and held in place by clamps and thumb screws. The flasks were removed about 10 minutes after the welds were made, and the mold and slag adhering to the rail knocked off, allowing the weld to cool. When the molds were removed, the welds in the head of the rails were dressed with a hand hammer to weld down the lip that might have formed and restore the grain structure.

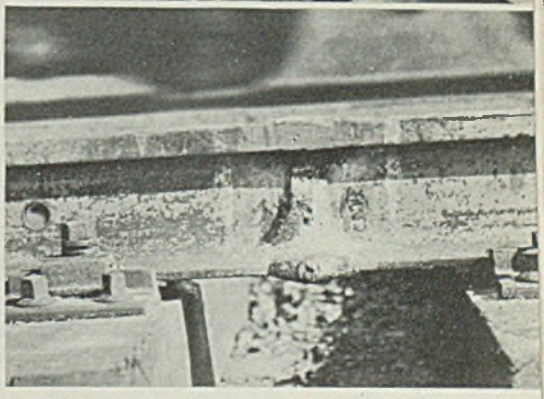
Elapsed time for making one weld,

(*Please turn to Page* 104)



PART of the section is a curve. Right, placing molds; joints were prepared and welded in groups of four. Below, weld with form removed after pouring, and completed joint partially surfaced





Men of Industry

GEORGE W. BUTLER has been appointed manager of conduit sales for Steel & Tubes Inc., Cleveland, subsidiary of Republic Steel Corp. He had been assistant midwest district sales manager in Chicago the past four years, prior to which he spent 3 years in the company's Wichita, Kans., and Kansas City, Mo., offices.

Henry R. Coward, associated with the Kansas City sales staff of Steel & Tubes the past four years, succeeds Mr. Butler as assistant midwest district sales manager in Chicago. Howard H. Loving will be Steel & Tubes new representative in Kansas City. He spent two years in the Chicago office and was its representative in Dallas, Tex., for the past year.

♦ ♦ ♦

J. Cleveland McKenna has been elected a director of Vanadium Alloy Steel Co., Latrobe, Pa., to succeed Daniel C. Stewart, resigned.

♦ ♦ ♦

C. J. Weigel, 626 East Thirty-fifth street, Brooklyn, N. Y., has been appointed sales manager in the New York district for Braeburn Alloy Steel Corp., Braeburn, Pa.

♦ ♦ ♦

Charles W. E. Clarke has rejoined the staff of United Engineers & Constructors Inc., Philadelphia, as consulting engineer.

♦ ♦ ♦

Ralph F. Peo, vice president and general manager, Houde Engineering Corp., Buffalo, has been elected a vice president of the Houdaille-Hershey Corp., parent organization.

♦ ♦ ♦

R. Clements Reichel has been appointed general sales manager, General Body Corp., Detroit, manufacturer of welded-steel passenger trailers.

♦ ♦ ♦

Dr. Earl G. Sturdevant, since 1931 development manager, United States Rubber Products Inc., New York, electrical wire and cable department, has been named consulting engineer for that department.

♦ ♦ ♦

H. B. Spackman has resigned as general sales manager, steel products division, United States Gypsum Co., Chicago, to become affiliated with Lyon Metal Products, Aurora, Ill., as general sales manager.

♦ ♦ ♦

R. R. LaPelle, formerly associated with Salem Engineering Co., has become associated with Philadelphia Drying Machinery Co., Philadelphia, as a member of its industrial furnace division.

♦ ♦ ♦

Malcolm F. McConnell, general superintendent, Homestead works of Carnegie-Illinois Steel Corp., has received the honorary degree of doctor of science from his alma mater, the University of Pittsburgh.

♦ ♦ ♦

R. E. Zimmerman, vice president in charge of metallurgy and research, United States Steel Corp., New York, sailed from New York last Thursday for a visit to Germany, France and England, to be gone four weeks.

♦ ♦ ♦

C. C. Caudill, general manager of the Portsmouth, O., works of Wheeling Steel Corp., Wheeling, W. Va., for the past 12 years, has been transferred to the Wheeling works. George W. Moore, of Portsmouth, will succeed Mr. Caudill.

♦ ♦ ♦

Charles R. Underhill has been elected president, Brown Fence & Wire Co., Cleveland. He succeeds the late Frank Spitz. M. B. Sackheim has been elevated from treasurer to vice president and Charles O. Hodge, secretary, has taken on the additional duties of treasurer.

♦ ♦ ♦

S. G. Pierson, vice president and treasurer, Colorado Fuel & Iron Corp., Denver, has relinquished his duties as treasurer but will continue in an advisory capacity regarding financial problems. H. C. Crout, heretofore assistant treasurer, has become treasurer.

♦ ♦ ♦

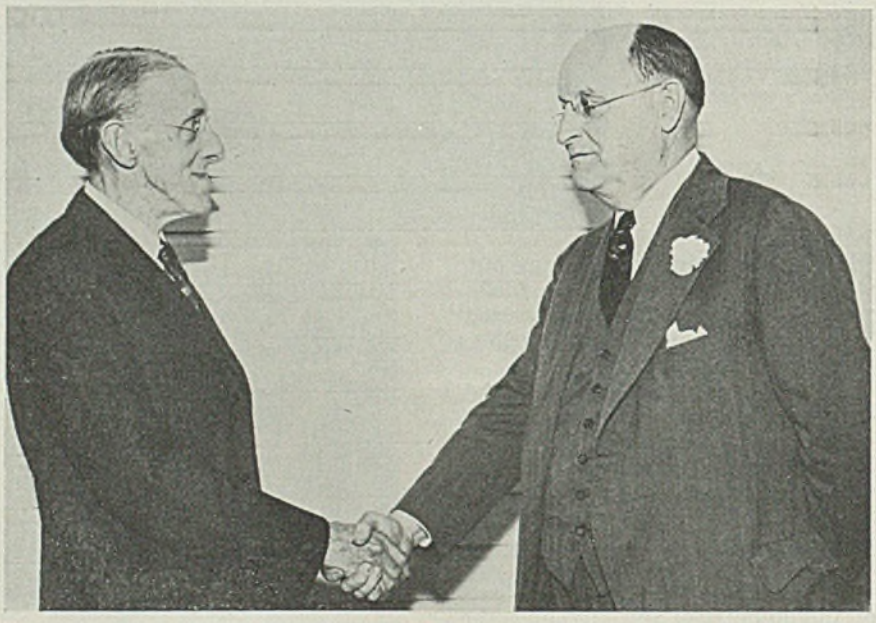
Benjamin F. Fairless, president, Carnegie-Illinois Steel Corp., Pittsburgh, received the honorary degree of doctor of science at the annual commencement exercises of Kent State university, Kent, O., June 11. He is a graduate of Ohio Northern university.

♦ ♦ ♦

K. L. Hansen, Harnischfeger Corp., Milwaukee, has been elected chairman, Milwaukee section, American Welding society. Harold Falk, Falk Corp., Milwaukee, has been elected vice chairman of the Milwaukee section and J. J. Chyle, A. O. Smith Corp., has been named secretary-treasurer.

♦ ♦ ♦

L. E. Peck, for the past four years sales manager of United States Tool Co., Ampere, N. J., has become manager of the press department, Thomas Spacing Machine Co., Pitts-



C. F. Blackmer, president, American Steel & Wire Company, (right) congratulating W. R. Pendry, superintendent of the company's coke plant in Cleveland. The occasion was a recent dinner celebrating the reopening of the plant, now in full operation after a four-year shutdown.

Mr. Blackmer is one of the oldest employes of the company in point of service. He started in the wire business in 1898 with the Washburn & Moen Mfg. Co., which became part of the American company in 1899.

Mr. Pendry worked on the construction of the first Koppers by-product coke ovens that were constructed in the United States, at Joliet, Ill. He has been with the American company since 1905. He built the Cleveland coke works in 1916, and it operated continuously until 1933. The plant has been modernized at a cost of approximately $500,000.

burgh. Prior to his connection with United States Tool, Mr. Peck was for many years associated with J. N. La Pointe Co.

♦ ♦ ♦

C. P. Geen has been named manager of lubrication research, a division of the newly organized research sales staff recently inaugurated by E. F. Houghton & Co., Philadelphia, manufacturer of industrial oils and leathers. G. W. Esau has become manager of metal working research, another division, and working with Mr. Esau are O. M. Gibson and E. L. Ward.

♦ ♦ ♦

George A. Rempe, formerly vice president, has been elected president, Rempe Co., Chicago. Other officers are Lester W. Rempe, vice president and treasurer, and C. Rempe Denvir secretary. J. O. Schultz, associated with the company the past year, has been appointed general manager. George T. White has been named general superintendent in charge of production.

♦ ♦ ♦

Robert J. Tully, assistant general superintendent for Carnegie-Illinois Steel Corp., in the Youngstown, O., district, has resigned effective July 1, after 42 years' service with the corporation. He started his career in the New Castle, Pa., works and for a number of years was general superintendent. He was assistant general superintendent of Clairton plants from June, 1931, until last February when he was transferred to Youngstown.

♦ ♦ ♦

Ralph B. Nettleton and George H. Wright have become eastern sales manager and western sales manager, respectively, Covered Wagon Co., Mt. Clemens, Mich., maker of trailer coaches. Both men previously were assistant directors of sales. The following field representatives have been added to the staff: James L. Brown, who will act as assistant to J. E. Roberts, vice president in charge of sales; Lawrence S. DeVos, district manager of the Atlantic district, and Alex G. Cruikshank, district manager for New York, Pennsylvania and eastern Ohio.

♦ ♦ ♦

J. J. Mortimer has been appointed superintendent of the blooming and plate mills at Gary works, Carnegie-Illinois Steel Corp. He has been at the corporation's South works since 1905, serving as superintendent of the 96-inch plate mill and the 44-inch slab mill since 1936. He worked in a number of positions from 1905 to 1911 when he was appointed piler foreman of the universal mill. In 1917 he was made mill foreman, a year later became foreman of the No. 2 90-inch plate

J. J. Mortimer

mill. In 1922 he became assistant superintendent of the No. 1 90 and 132-inch plate mills and the No. 2 90-inch plate mill; in 1930 was made assistant superintendent of rolling mills and in 1933 became superintendent of the universal mill, the 96-inch plate mill and the 44-inch slab mill.

♦ ♦ ♦

John S. Haug, consulting gas engineer, United Engineers & Constructors Inc., Philadelphia, has been awarded the Edward Longstreth medal "in consideration of the invention and development of an improved type of mechanically clinkered water gas generator," by the Franklin Institute of the State of Pennsylvania, Philadelphia. Other awards made by the institute are: Louis Edward Levy medal to Inge Lyse, professor of engineering materials, Lehigh university, Bethlehem, Pa., for his series of papers on "A Study of the Quality, the Design and the Economy of Concrete;" the George R. Henderson medal to Dr. Rupen Eksergian, E. G. Budd Mfg. Co., Philadelphia, "in consideration of his contributions to Railway Engineering and his accomplishment in the field of railway locomotive and car design."

William B. Mayo

For 19 years associated as engineer and chief engineer for Ford Motor Co., has been named consulting engineer for Hupp Motor Car Corp., Detroit, as announced in STEEL, May 17, page 32. Mr. Mayo developed the large combination gas-steam engines installed in Ford's Highland Park plant in 1913, and later was in charge of the Ford aviation division, retiring in 1932. He will now work closely with Frank E. Watts, Hupp vice president in charge of engineering

Died:

WILLIS L. TINKER, 53, secretary, Lake Superior Iron Ore association, Cleveland, in Hudson, O., June 5. He became associated with the association in 1906, and since 1911 served as secretary. He was a member, American Institute of Mining and Metallurgical Engineers.

♦ ♦ ♦

M. J. Collins, 76, general purchasing agent for the Santa Fe railroad, at his home in Chicago, June 6.

♦ ♦ ♦

W. J. T. Davis, 70, assistant secretary, Truscon Steel Co., subsidiary of Republic Steel Corp., in Youngstown, O., June 1.

♦ ♦ ♦

Albert L. Treusch, 52, former chief clerk and paymaster, Jones & Laughlin Steel Corp., Pittsburgh, in Pittsburgh, June 7. He had been an employe of Jones & Laughlin 35 years.

♦ ♦ ♦

Charles J. Kirk, aged 78, leading Lawrence county industrialist, died at his home in New Castle, Pa., May 30. He was the founder, Universal Sanitary Mfg. Co., New Castle.

♦ ♦ ♦

George A. Payne, 56, treasurer, Wood Shovel & Tool Co. and American Pullmatch Co., Piqua, O., in Piqua, June 8. He formerly was associated with Otis Steel Co., Cleveland, as treasurer.

♦ ♦ ♦

Leon W. Friedman, 66, for the past 30 years, industrial editor, *Birmingham News*, Birmingham, Ala., and correspondent for STEEL and *Daily Metal Trade*, in that city, May 31. He was widely known among iron and steel executives in that district.

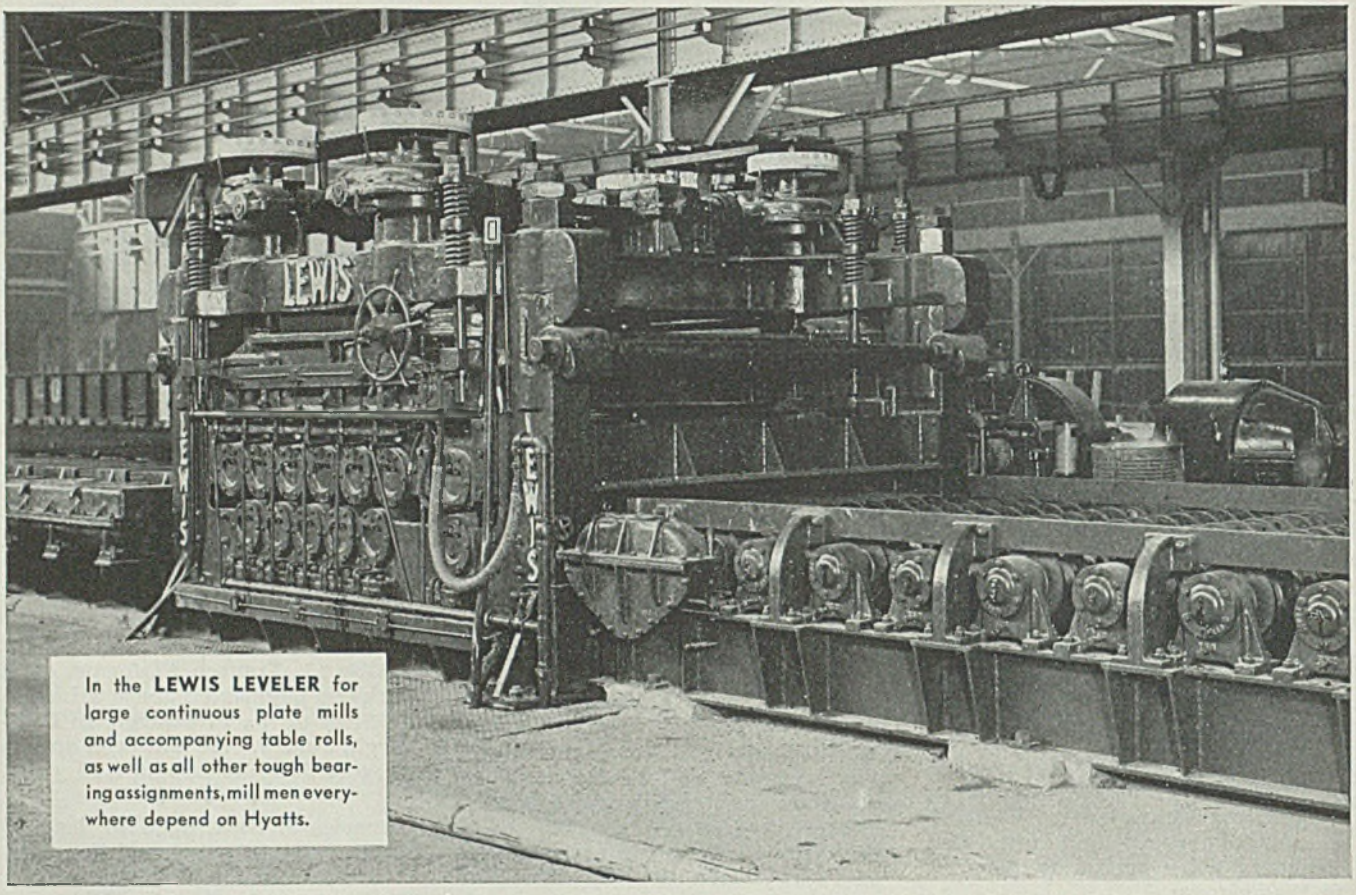
♦ ♦ ♦

N. D. Mook, 42, associated with Trundle Engineering Co., Cleveland, from 1926 to 1932 as consulting engineer, and for the past five years chief maintenance engineer for the Cleveland board of education, in that city, June 8.

♦ ♦ ♦

Herman Lutter, 80, one of the founders of the former Lutter & Gies Co., Milwaukee, now part of the Milwaukee Press & Machine Co., in that city, May 28. He was widely known as an expert designer and manufacturer of production equipment.

Where *Wear* is a problem...



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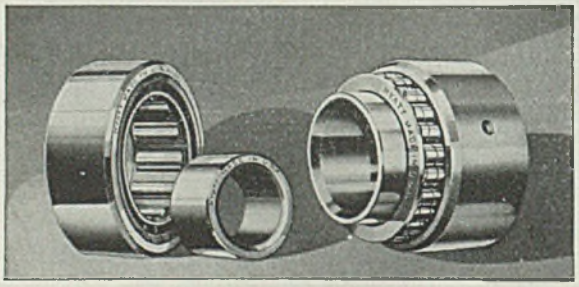

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MIRRORS OF MOTORDOM

DETROIT

ONLY a few years ago coil springs made their bow on independent front wheel suspensions and their adoption was featured by most of the leading car builders with the exception of Ford. Millions were spent for new equipment to form and heat treat the coils and talk was that the leaf spring was on the way out. Independent springing was said to provide a softer, smoother ride and it appeared only a question of time before it would spread to include rear wheels.

But there are many knotty engineering problems in adapting independent suspension in the rear and up to now they apparently have not been worked out successfully. However, Buick will make the change for 1938 and will feature this new type of springing in the rear. The last leaf spring checked through the spring division of the Buick forge plant some 60 days ago and all equipment for processing this type of spring, including punch presses, drill presses, arbor presses, furnaces and quenching equipment, has been torn out to make room for furnaces and machinery to handle the new design.

Engineering Problems Simplified

Engineering of independent suspension in the rear for Buick has been simplified by the fact that a torque-tube drive is used, a development of the days when Buick had cantilever springs and retained when the change was made to semi-elliptic springs. It is said a minimum of rear-end redesign has been required, thanks to the torque-tube drive instead of a drive through the rear springs used on other cars. Centerless ground silicomanganese steel rods are used for the coils; on the front coils the rod diameter is about ⅞-inch, for the rear coils a slightly smaller diameter and a slightly longer spring is indicated. Manufacturing details for Buick front springs were described in STEEL for Dec. 31, 1934. Silicomanganese steel also is used for leaf springs.

Removal of equipment for manufacture of leaf springs means Buick, Olds and Pontiac have had to place rear spring work on the outside; this includes requirements for the balance of 1937 models and for new Olds and Pontiac models. Buick will require about 20,000 coil springs per month for peak production on 1938 models.

BY A. H. ALLEN
Detroit Editor, STEEL

Buick First to Have Four "Knees"

Independent suspension on all four wheels thus will be achieved by Buick, to which will go the credit for being the first American car so equipped. The system is used on numerous European cars, but they are much lighter and far less powerful than American designs. Probably Buick is pointing the way for other General Motors cars, and it is not a bad guess that before many more years a number of other cars will appear with four "knees" instead of the present two.

As far as costs go, it is understood the coil spring itself represents about half the cost of a leaf spring, but by the time the balance of the suspension system is figured in there is an added cost which only cars in the Buick price class could absorb. The chief advantage claimed for the coil springs is an improved ride. Leaf spring manufacturers even question this edge.

It appears the 1938 Buick bodies will be considerably wider through the rear seat, extending possibly flush with the rear fenders and giving several inches more seat room. This will mean an added burden on sheet metal engineers in connection with drawing out the wheel housing which naturally will be considerably deeper. Wheel housings are not drawn out uniformly because of the restrictions of body design, and are approaching the upper limits of the drawability. The new Buick bodies are reported to be all-steel, removing the last of the composite bodies from the Fisher line.

FACES of 1938 models will bear evidence of "beauty parlor" treatments in the effort to create a definite distinction from 1937 models. In many cases this will be the extent of changes for next year. In fact some specifications on tonnages now coming into steel company order departments, originally thought to be for filling out 1937 needs, have proved to be releases for new models.

Radiators will have changed slants; grilles will be revised in design. Chevrolet closed within the last 10 days on a revised grille design. Chrysler is inquiring for a new type of grille, die cast, in eight sections, instead of the single-piece grille now used. Replacement cost on some of these die-cast grilles runs as high as $35, a considerable sum for a driver who is unfortunate enough to have accidentally damaged a grille. By making the part in sections, it will be possible to replace any one which is broken at an appreciable saving in cost.

Manufacturing Cost Lower

The sectional grille is being proposed for Chrysler and DeSoto models. Manufacturing cost is reputed to be less than for the one-piece design due to fewer and less costly rejections, easier handling, cleaning and plating. Assembly cost is slightly higher, but the advantages of the sectional design indicate it will probably be adopted for other die cast radiators.

Die castings, by the way, are showing a steady climb as far as automotive uses go. For example, one estimate on new die castings for 1938 Chrysler lines indicates an increase of from 20 to 25 per cent over present usage. Ornaments, trim, handles, carburetors and numerous small parts are instances where die castings are getting the call, and

MIRRORS OF MOTORDOM

an aggressive exploration of new uses being conducted by those interested in the die casting industry is continually leading to new outlets.

In connection with beautifying and brightening front ends, Chrysler is proposing to return to chrome plating for headlamp support brackets and other front end trim which is now painted. Improvements in chrome plating have overcome many of the pitting and corrosion difficulties.

MILITANT actions of undisciplined labor groups who think a UAW button gives them *carte blanche* to take over the reins of industry and police departments alike, are fast leading either to some wholesale bloodshed or an effective chastisement. If the situation were not so critical, it would be laughable. Consider, for example, some of the excuses offered for wholesale unauthorized walkouts which have fallen like rain over plants in this district:

An "inside" version of the Chrysler walkout a week ago last Friday, affecting 9000, placed the blame on a few nonunion girls who "stuck out their tongues and made faces" at UAW members.

At Packard, night shift UAW members "fired" and ejected their superintendent because he would not change the wage rate on a certain job, and when the day shift reported, UAW members refused to work because their own colleagues had ejected the night superintendent.

At a plant near Detroit, UAW members struck because there weren't enough electric fans installed to keep them cool while they worked.

At another plant, UAW members walked out because the management fired for inefficiency a union member who had been hired originally only two weeks previously.

At Budd Wheel Co. here last week, in the midst of negotiations on wage rates and other matters, a few hotheaded UAW members took over a union meeting in the absence of international officers and ordered a strike; 1500 were out of work Tuesday and Wednesday. Prospects for settlement of the trouble were hazy. The shutdown forced closing of the Dodge truck division from lack of wheels and panels. Other Chrysler divisions dependent on Budd for stampings had a sufficient float to keep going for a week or more.

UAW members at the Consumers Power Co. in Saginaw pulled main switches again early Wednesday, shutting off power to plants in Flint, Saginaw, Bay City and a host of other Saginaw Valley communities, throwing 60,000 out of work. And all because of "premature and inaccurate" release of details of an agreement being worked out in Washington for all union members of the company. This was the second time the UAW had cut off power in this district.

In Lansing last Monday, UAW members, worked up to a frenzy by organizers, called a general strike and roved through the town closing up all stores, blocking traffic and completely paralyzing the city, all because six pickets on a building wrecking job were jailed for breaking a Michigan antipicketing law. Here strikers made the mistake of invading the campus of Michigan State college where they were promptly tossed in a river by infuriated students and run out of town. Olds, Reo, Fisher Body and Motor Wheel plants all were closed for the day.

Twelve thousand employes of two Ternstedt plants in Detroit were without work Tuesday when the UAW called a strike, complaining the management has refused to carry out promises to adjust wages and abolish piecework.

Detroit businessmen have become practically inured to these labor difficulties. They are no longer news, as a matter of fact, the only news being when a plant is able to operate without labor squabbles. Concluding some pertinent observations on the labor situation in this district, one observer pointedly remarked, "And all the while these strikes pile up one on the other the Great One sits in Washington unmindful, concerned only with haranguing the Supreme Court over taking a vacation."

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	518,977
April	477,059	527,625	553,415
4 Mos.	1,575,624	1,644,622	1,855,724
May	381,809	408,518	†542,300
June	372,085	469,368	.....
July	35,297	451,206	.....
Aug.	245,075	275,934	.....
Sept.	92,728	139,820	.....
Oct.	280,316	230,049	.....
Nov.	408,550	405,799	.....
Dec.	418,317	519,121	.....
Year	4,119,811	4,616,437	.....

Calculated by *Cram's Reports*
Week ended:

May 15	140,396
May 22	131,306
May 29	131,421
June 5	*101,779
June 12	115,900

	Week ending June 12	June 5
General Motors	44,520	*34,472
Ford	29,240	29,240
Chrysler	27,300	*22,250
All others	14,840	*15,817

*Revised. †Estimated.

CONTINUED outbreak of the rash of unauthorized strikes makes any attempt to estimate production from week to week a rather difficult job. Labor troubles during the week ended June 5 whittled the total production down to an estimated 101,779 and last week the total is estimated to have increased to 115,900.

Gradual tapering off in 1937 model runs is to be expected at this season and it would not take much more irritation on the part of labor to persuade managements to shut up shop completely until workers are more inclined to concentrate on their jobs than on whether the man at the next machine is union or nonunion.

As a matter of fact, the Chrysler management was reported to have been on the verge of such a step last Monday, being completely fed up with UAW tactics since the signing of their agreement with the union.

Friday the UAW presented a new series of demands on General Motors, seeking broad revisions in its contract with GM. After several days of dickering among committee members the UAW presented demands for wage increases, corporation-wide seniority, 35-hour week, increased rates for night shifts and numerous other minor points which go far beyond the present contract. Naturally the UAW is asking for a mile and probably will be placated with an inch. How far the corporation will go remains to be seen.

WILLYS likely will have a line of commercial cars for display at the New York show, since space has been reserved in this section.

(*Please turn to Page* 32)

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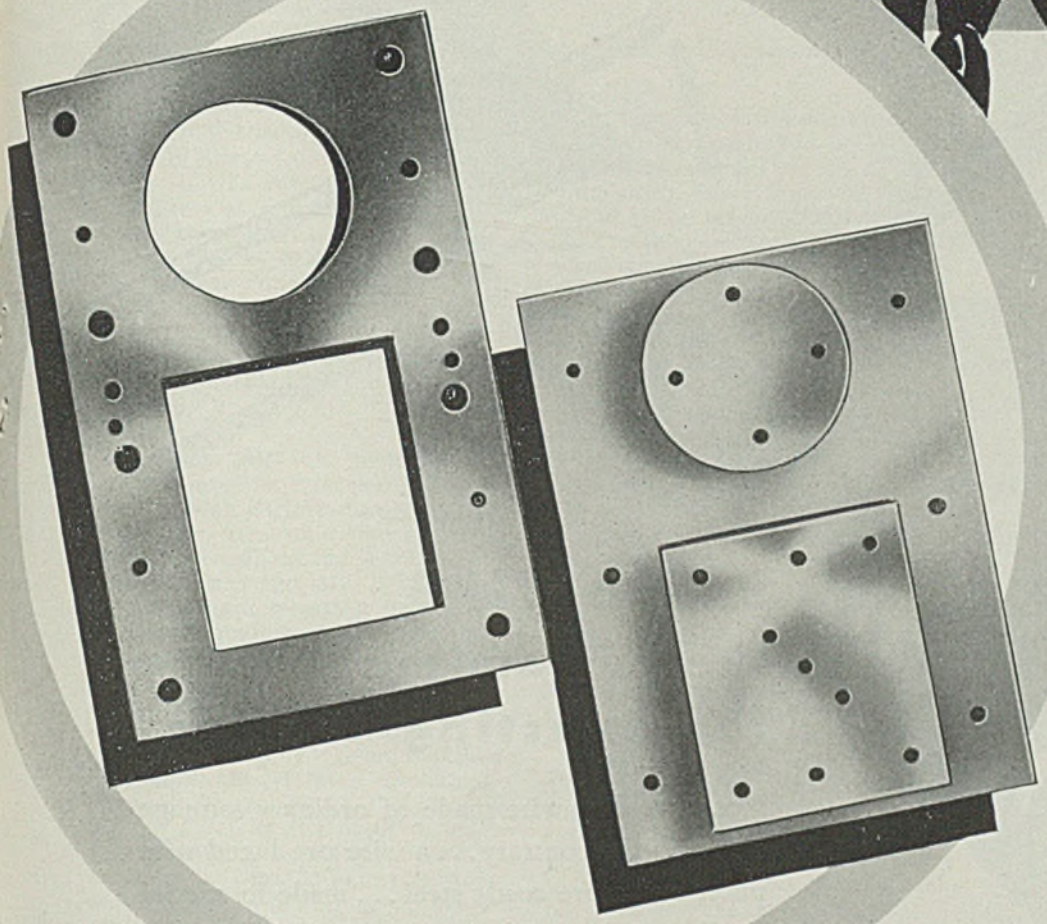

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WINDOWS OF WASHINGTON

BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

CURRENT hearings of the joint congressional committee on the Black-Connery labor bill have brought some interesting personalities to Washington, both as observers and witnesses.

One of these told a story to the writer of this column that may be of interest to employers generally. In this connection it should be said that the writer has been observing Washington conditions, from the standpoint of industry, for nearly 30 years. But after this recital he is wondering if there is something to the labor side that the industrialists of the country are not thinking about.

We will call this man Mr. X. He graduated as a mechanical engineer from an eastern university and served in the American army in Europe throughout the World war.

Some years ago, Mr. X had been employed as a salesman by a large machinery manufacturer. He wanted to get back with the company again. But important changes had been made in the machinery produced by that organization since he had left its employ. Being a skilled machinist, as well as a mechanical engineer, he conceived the idea of getting a job in the plant to learn at first hand just what changes had been made. Dressed as a mechanic, and without revealing his previous affiliation, he succeeded in getting such a job at $18 a week, and worked for several months.

Sales Ability Brought Advance

One day, three visitors walked through the plant, stopping at various places. They stopped at his bench and began to ask him about the machinery. He thought they were prospective customers. All his instincts as a salesman rose to the occasion and he gave them a fine sales talk, pointing out in detail all the good points of the machine.

But it so happened that one of these "visitors" was the president of the corporation. He was greatly impressed by the "sales talk" which Mr. X had delivered so enthusiastically. Without more ado, he had Mr. X transferred from his work bench to the office. Mr. X is now in charge of one of the larger territorial divisions of the company.

The experience he had at the work bench had, however, given him a special interest in the labor question. That was why he took advantage of a visit to Washington to learn something at first hand of the government's relation to that problem. He insists that too often the mechanic does not get a fair deal and that is the reason for the apparent ease with which the CIO gets into so many plants for organizing purposes.

Need Better Understanding

The mechanic, for instance, says Mr. X, is "docked" when he is sick, late, or makes even a trifling mistake. No such discipline is enforced against white collar employes in the company offices.

On Christmas and New Year's day, the office employe usually gets a present of some kind; the mechanic loses a day's work because he is on a daily wage or a "per piece" schedule. "So it goes down the line."

Mr. X is of the opinion that too many industrial leaders actually do not know the conditions under which their own men work. He insists that most workmen are genuinely amenable when they are properly approached. While Mr. X is not at all in sympathy with the CIO, or with union organizations generally, he believes workmen join unions chiefly in the hope of bettering conditions. His views are presented here because he is considered to be a highly educated observer.

Hearings continue before the joint congressional committee on the proposed new labor bill. It is anticipated they will be concluded shortly. All is not going as smoothly as was hoped by the administration officials, but that is another story.

Secretary of Labor Perkins made what administration officials consider a convincing argument before the committee in favor of the bill. On the other hand, William Green of the A. F. of L. was rather cool to the measure and made suggestions for amendments. John L. Lewis also was not over enthusiastic. One of the points at issue, probably not a vital one, is the question of the north and south differentials.

An industrial observer at the hearings referred to the bill the other day as the "horrible centralization bill."

From the industrial standpoint, an interesting matter is whether industry wants specific rates named in the bill or whether it would rather take a chance on having these rates set by the new labor board. Many business leaders would like to know what the rate is, even if it is bad news, rather than be kept in the dark until the five-man board decides what it shall be. However, there is no unanimity of opinion on this point among industrialists. There are many who feel that congress should not give any more power to another Washington board.

Those in touch with affairs say that nothing will be done by congress on the Walsh-Healey government contract bill amendment until after the fate of this new labor bill is positively known.

Would Separate Child Labor

Much talk has been heard before the committee dealing with the labor bill, but it is interesting to note that practically no large industrialist appeared with any suggestions. It is too well known that the stage was set and that there would be no scene shifting. It was deemed a waste of time to try to show the industrial side of the question.

Senator Bridges, New Hampshire, last week made an effort to divorce the child labor features from the others. He proposed an amendment striking out provisions dealing with

child labor. He immediately offered a separate child labor bill, stating that he was convinced that the abolition of child labor would be delayed or prevented if provisions to abolish it were made a part of the controversial wages and hour bill.

"The fight to abolish child labor is too important to be mixed up with any other legislative action," the senator said. "We must not submerge the welfare of children in a discussion of other far reaching problems on which there apparently is not the same unanimity of opinion as there is on child labor."

ROPER SAYS STRIKES HAVE NOT REDUCED PRODUCTION

Secretary of Commerce Roper refused to discuss the steel strike at his press conference last week. He pointed out, however, that strikes since the first of the year have not affected production. He said that production for the first quarter of this year, according to figures reaching the department, are from 15 to 22 per cent higher than for first quarter last year. The increase in automobile production, during first quarter, he stated, was 17.6 per cent higher than the similar period of last year while steel ingot production was 55 per cent higher. He called attention to the fact, however, that the summer slowing down will be coming along shortly and that will cut down the average this year because last summer there was practically no let down.

TO HURRY ALUMINUM CASE

The attorney general announced last week that he had filed with the clerk of the federal district court at Pittsburgh an "expediting certificate" which will automatically place the issues now pending in the Aluminum Co. of America case in the hands of a special expediting court.

The attorney general said that "this statutory procedure seems the most expeditious one that the government can follow in view of the orders entered by the Pittsburgh court. The government is determined to bring to trial on the merits its New York suit against the nation's No. 1 monopoly. We do not propose to play the game of judicial chess. We want an expeditious settlement of the issues raised by these restraining orders and injunctions."

WOULD REORGANIZE FTC

The Brookings Institution, a nongovernmental body, last week made public another chapter in its survey of government reorganization. Among other things the institution recommended the reorganization of the federal trade commission to eliminate confusion of powers and strengthen its functioning. Also it recommended the transfer of the department of justice powers over monopolies and restraint of trade under the antitrust act to the federal trade commission, except trial of criminal cases.

COMPLICATED EMPLOYMENT PLAN BEFORE THE HOUSE

Four members of the house have introduced identical bills to be known as the industrial expansion act. They are: Representatives Allen, Pennsylvania; Amlie, Wisconsin; Maverick, Texas, and Voorhis, California.

The object is to re-employ the 10,000,000 employables now claimed to be out of work in the United States. The bill provides for an increase in the national income from $60 billions a year, the present figure, to $100 billions a year, by means of increased production. This increase, it is contended by the sponsors, will make it possible to increase employment to take care of all the employables now out of work, reduce prices to consumers, and raise wages of those now employed.

The congressmen believe the increase will be attained by means of a plan designed to reconcile the needs of consumers with present productive capacity and the available labor supply. The plan will be drawn by the industrial expansion administration, in conjunction with authorities of the vital industries engaged in interstate commerce. Cooperation would be insured by the collection of a tax from all producers, amounting to 25 per cent of the value they add to their product in processing. If the producer cooperates with the administration, 95 per cent of the tax will be returned to him. Also, the plan provides that the government will guarantee the producer against loss resulting from his co-operation. Needless to say, this is so complicated and unworkable that it will probably never reach the hearing stage in congress.

WOULD NATIONALIZE SHIP AND MUNITIONS INDUSTRY

Senator Bone, Washington, and several other members of the munitions committee of the upper house last week introduced a bill to provide government ownership and operation of shipbuilding facilities and plants for manufacturing war materials.

Describing a program for nationalizing the munitions industry, Senator Bone said that the plan would round out efforts to "take the private profit out of war and preparation for war."

Also, the President last week sent a report to congress from the maritime commission in connection with shipbuilding. He asked for an appropriation of $10,000,000 for a shipbuilding program and a revolving fund of $150,000,000 for the same purpose. Under the new maritime act the government will loan three quarters of construction cost. In sending the message, the chief executive called attention to the fact that it has been 15 years since the United States has built any ships for foreign trade.

Mirrors of Motordom

(*Concluded from Page* 28)

Auburn, Pierce-Arrow and Hupmobile will be new names at the show this year, all having been out of the picture during 1937. . . . Oil Adapter Corp., Detroit, has introduced a device for converting truck motors designed for gasoline into oil burners. Known as the Holmes oil adapter, the unit is a miniature cracking device which pulls its heat from the exhaust manifold and delivers the processed fuel to the conventional carburetor. . . . It provides thermostatic control of both air and oil temperatures. . . . Bendix Products is plugging some new appliances which contribute to safety in driving —a hydraulic hand or automatic steering control to eliminate hazards resulting from sudden blowouts; a back-stop to prevent cars from rolling down hill at traffic stops, similar to the former Stutz "no-back" or hill-holder; and a hydraulic steering mechanism for power steering of trucks. . . . H. T. Youngren, chief engineer of Olds, states Olds is continuing its specification of S.A.E. 1035 double heat treated steel for bolts on 1938 models, except for certain large-diameter bolts in such places where a lower-carbon, less expensive steel furnishes sufficient strength. . . . Chicago Motor Coach Co. has ordered 40 additional double-deck buses and 30 new single deckers from General Motors Truck, all with rear-engine drive and Monodrive transmission. Order amounts to over $1,000,000. . . . Ford has let contracts for a new Norfolk, Va., assembly plant, is planning an expansion of its Louisville, Ky., plant, and is buying equipment for installation in its Japanese plant.

Orient Offers Market for American Air Conditioning

Air conditioning equipment has been installed in the KOAN MARU, 8000-ton liner of the Imperial government railways, Japan. Cooling and heating for all staterooms, public rooms and other parts of the vessel are provided by the 140-ton Carrier system, which will receive a severe test as the KOAN MARU sails the China sea encountering wide varieties of temperature and humidity.

Editorial

Government by Law Imperiled; That Issue Is Paramount

IN THE early part of Grover Cleveland's second term as President, the nation was in a serious depression. Many bank failures had occurred, business was depressed and wages were low. Eugene Debs, leader of the American Railway Union, attempted to capitalize upon the distress of employes by boycotting the Pullman company.

The attempt was attended by great violence. President Cleveland waited a reasonable time for Governor Altgeld of Illinois to act to restore order. When he failed to take action, the President, overriding the protests of Altgeld, ordered federal troops to the scene on the pretext that the strikers were interfering with the service of the United States post office department. Disorder was quelled in a single day, July 6, 1894, and within a week the strike was broken and Mr. Debs was arrested on a charge of conspiracy to obstruct the mails.

In searching the files of newspapers and periodicals of 1894, one finds that public opinion in that year was strikingly similar to that which exists today in regard to the labor situation in the steel industry. The general public was sympathetic to the labor cause, as represented by the American Railway Union and the Knights of Labor.

Defiance of Governmental Authority Lost Support Of Public Opinion and, with it, the Objective

But in 1894, when unionists defied the authority of government, they lost the support of public opinion and lost their battle for recognition. That will happen in 1937 if CIO continues to defy the law.

Referring to the musty pages of *Iron Trade Review,* predecessor of STEEL, we find that in the issue of July 12, 1894, A. I. Findley, then editor, declared that he was not in full accord with certain details of the Pullman labor policy, but that the issue of law observance was vital to the interest of every citizen. To emphasize his point, he quoted as follows from the charge of Judge Grosscup to the federal grand jury.

"The law as it is must first be vindicated before we turn aside to inquire how law or practice as it ought to be can be effectually brought about. Government by law is imperiled and that issue is paramount."

The foregoing words are just as pertinent today as they were 43 years ago. If one permits a general breakdown of constituted authority, the persons who resort to direct action will be the first to suffer.

Compared with the grievances of employes in the Pullman strike of 1897, workmen in the steel industry have small cause for complaint. Today there is no issue as to wages or working conditions. Recognition is the sole point at stake. To achieve recognition, a minority defies the law and risks the calamity of alienating public opinion.

Agents of this minority are charged with these unlawful acts:

1. Broken the postal laws and regulations provided by act of congress, approved Feb. 23, 1931. Title 5, chapter 1, entitled "The Privacy and Safeguarding of the Mails," paragraph 702, declares that "postmasters and others in the postal service shall not give to unauthorized persons information concerning mail matter. . . ."

CIO Goes Beyond One-Sided Wagner Law to Attain Ends but Proves Itself Unworkable

Paragraph 703 reads: "Postmasters shall not permit to have access to any mail matter in the post office any persons except duly sworn assistants, clerks, letter carriers, post office inspectors. . . ."

Section 2 of Paragraph 703 provides that "mails shall not be made up or handled within reach of unauthorized persons and such persons shall be excluded from the room appropriated to the use of the post office. . . ." Events in Ohio recently indicate that these postal laws have been violated.

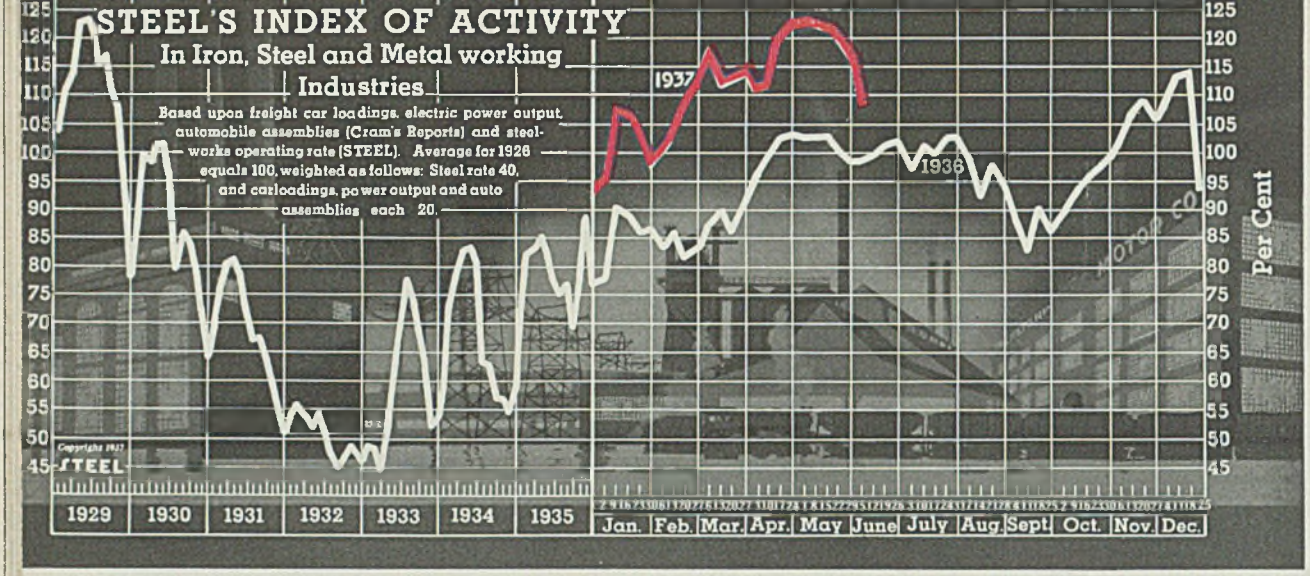
2. Strike sympathizers cut rails to Youngstown Sheet & Tube Co. plants.

3. CIO representatives in many localities have exceeded the lawful limits of "peaceful" picketing.

And there are numerous other instances of law violation. But the most damning element in the situation is the brazen play of cheap politics. Mayor Kelly of Chicago makes an issue of a doubtful technicality on health at the same time that CIO is openly violating recognized laws. Pickets in Cleveland nearly tip over the mayor's automobile, destroy private property and engage in other lawlessness at the same time that a handful of politically-minded councilmen try to find technical flaws in Republic's use of a private flying field.

In other words, CIO, assisted by an admittedly one-sided Wagner bill, finds it expedient to go beyond the laws passed exclusively for its advantage. At the same time, General Motors and other employers who signed with CIO encounter breaches of faith such as were demonstrated last week at Lansing and Flint.

CIO is demonstrating its inability to function. President Roosevelt, in condoning lawlessness and tacitly encouraging anarchy, is undermining the foundation of good government.



STEEL'S index of activity declined 8.2 points to 107.4 in the week ending June 5:

Weed ending	1937	1936	1935	1934	1933	1932	1931	1930
April 17	119.6	103.1	86.3	85 0	55.8	53.4	81.1	103.1
April 24	122.0	103.6	84.9	87.5	59.5	52.3	80.6	103.7
May 1	123.9	103.2	84.6	86.0	60.3	52.5	87.7	103.3
May 8	123.5	103.0	79.4	84.4	62.5	54.7	79.7	102.8
May 15	123.2	103.1	80.5	82.4	65.2	54.3	78.7	102.5
May 22	122.2	100.4	82.8	81.9	66.1	55.1	78.3	102.3
May 29	115.6†	98.6	71.9	75.7	65.3	54.2	75.7	94.9
June 5	107.4*	98.8	79.3	82.3	69.9	51.0	73.5	97.9

*Preliminary. †Revised.

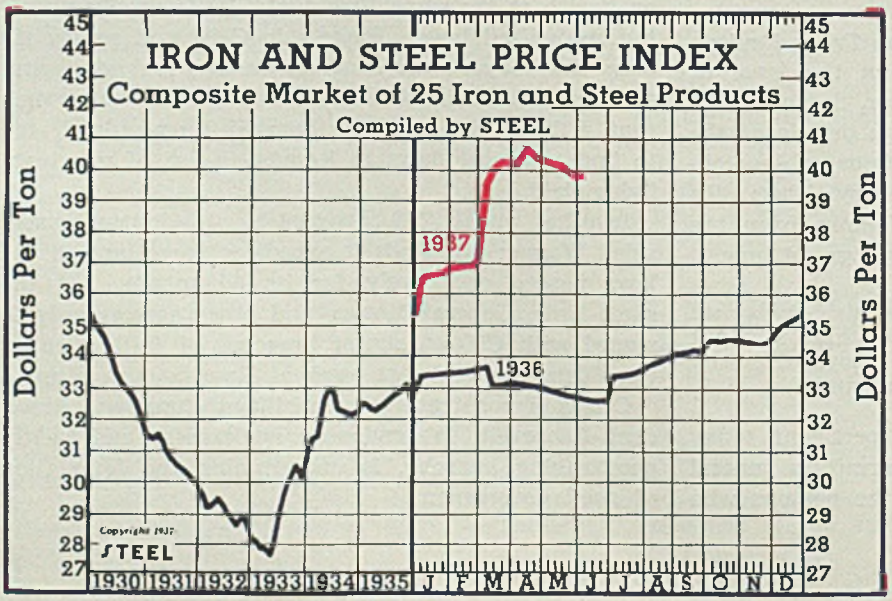
Index of Activity Reflects Holiday and Labor Trouble

BUSINESS reports for the week ending June 5 reflect not only the retarding influence of labor trouble but also the interruption due to the observance of Memorial day. STEEL'S index of activity in the iron, steel and metalworking industries stands at 107.4, a decline of 8.2 points from the previous week. This is the second consecutive sharp recession since the week ending May 22.

Contributing to the drop in the index in the latest week were declines in electric power output, revenue freight car loadings and automobile production. In the case of the first two the major factor was the holiday interruption. The drop of 21,000 in Automobile assemblies probably was due largely to the same cause, although in this and recent weeks automobile output has been affected slightly by sporadic labor trouble, including petty annoyances as well as short sitdowns.

Steelworks operations continued at 75 per cent of capacity, with gains in some districts tending to cancel losses in other centers. The rate for the week ending June 12 (reported elsewhere in this issue) may show an increase of a point or two.

In the main, business sentiment continues sanguine in spite of labor unrest at home, the problem of gold unhoarding abroad, international implications in the Spanish situation and another spell of uncertainty in commodity prices.

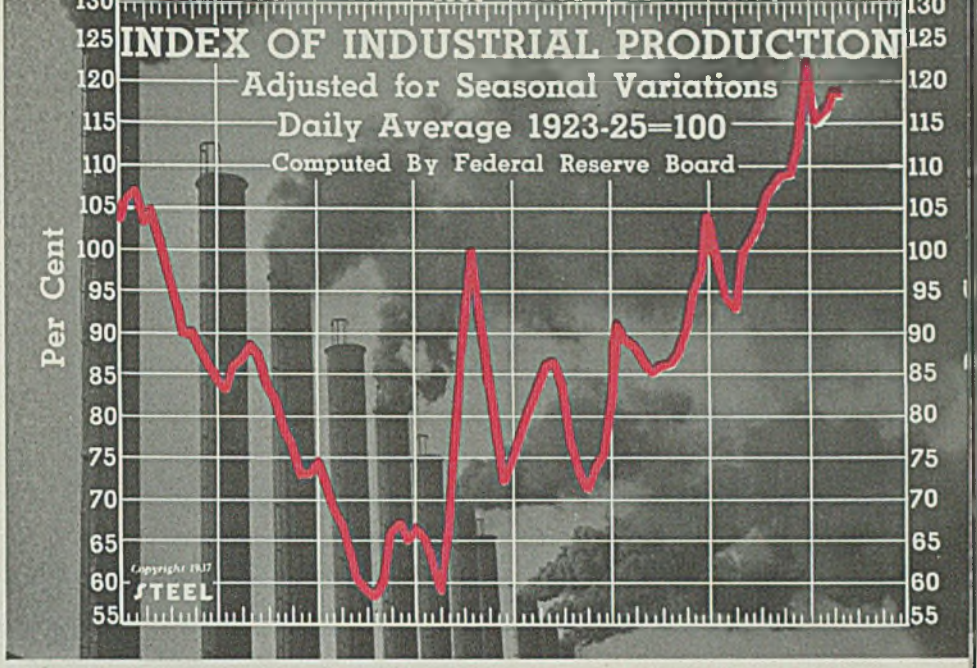


	1937	1936	1935
June 5	39.86	$32.81	$32.45
May 29	39.89	32.83	32.43
May 22	39.97	32.87	32.41
May 15	40.05	32.94	32.34
May 8	40.14	32.96	32.34
May 1	40.25	33.00	32.30
April 24	40.36	33.08	32.30
April 17	40.47	33.09	32.31
April 10	40.55	33.11	32.27
April 3	40.19	33.13	32.27
March 27	40.11	33.13	32.30
March 20	40.10	33.05	32.33
March 13	39.99	33.04	32.38
March 6	39.47	33.60	32.39

BUSINESS TREND

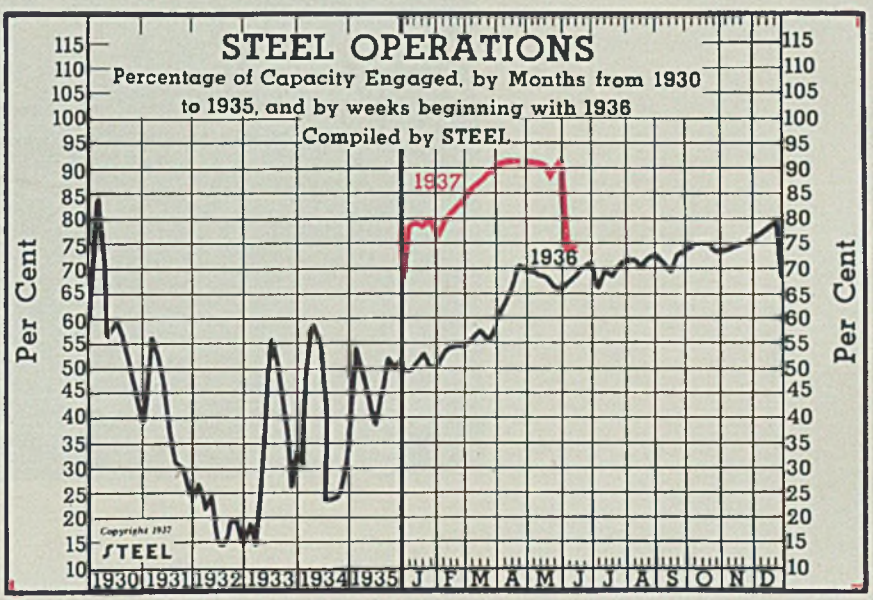
Index of Industrial Production Remains Unchanged in April

January	115	98	91	78
February	116	94	89	81
March	118	93	88	84
April	118	98	91	78
May	...	101	85	86
June	...	103	86	84
July	...	107	86	75
August	...	108	87	73
September	...	109	89	71
October	...	109	95	73
November	...	114	98	74
December	...	121	104	86



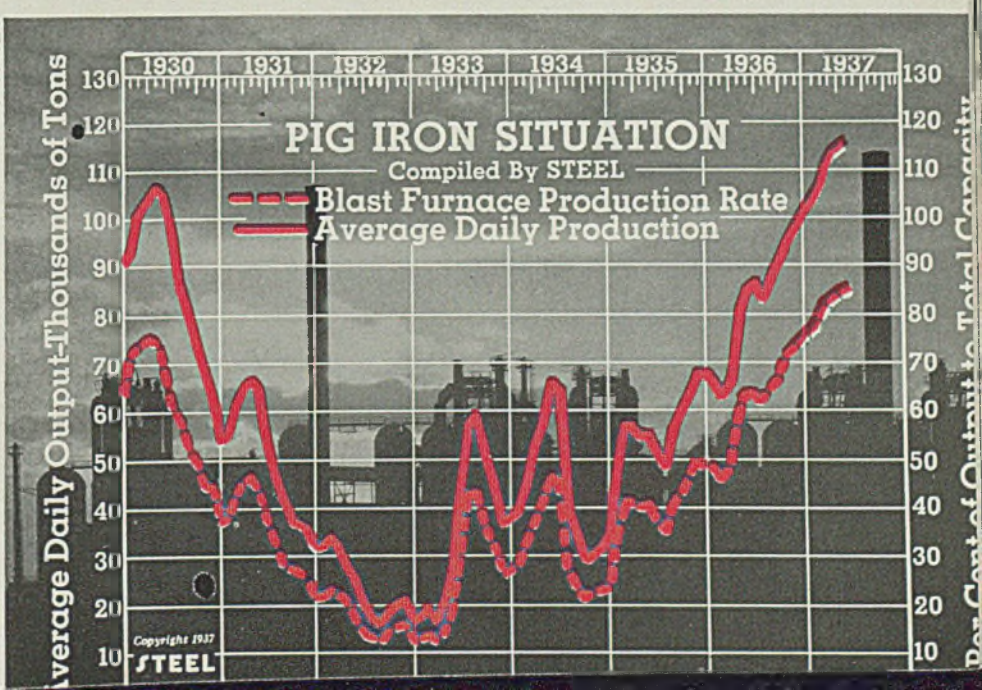
Steelworks Operations Hold at 75 Per Cent

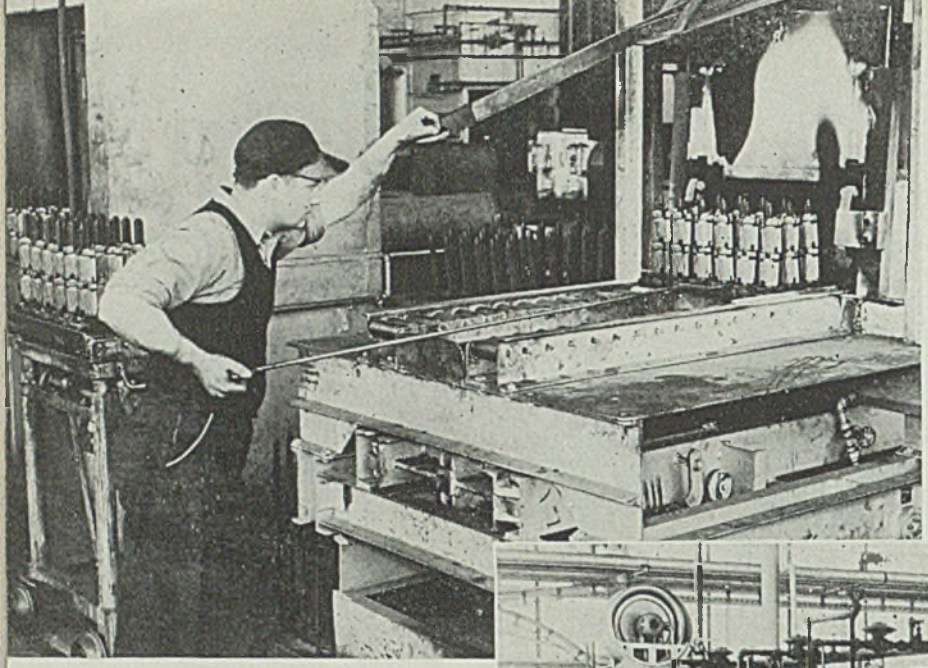
	Per Cent		
	1937	1936	1935
June 5	75	67	41
May 29	75	66	42.5
May 22	91.5	66.5	44
May 15	89	68.5	45.5
May 8	91	68.5	44.5
May 1	91	69.5	44
April 24	91.5	69.5	46
April 17	91.5	70.5	46
April 10	91.5	66.5	45
April 3	91.5	63.5	44



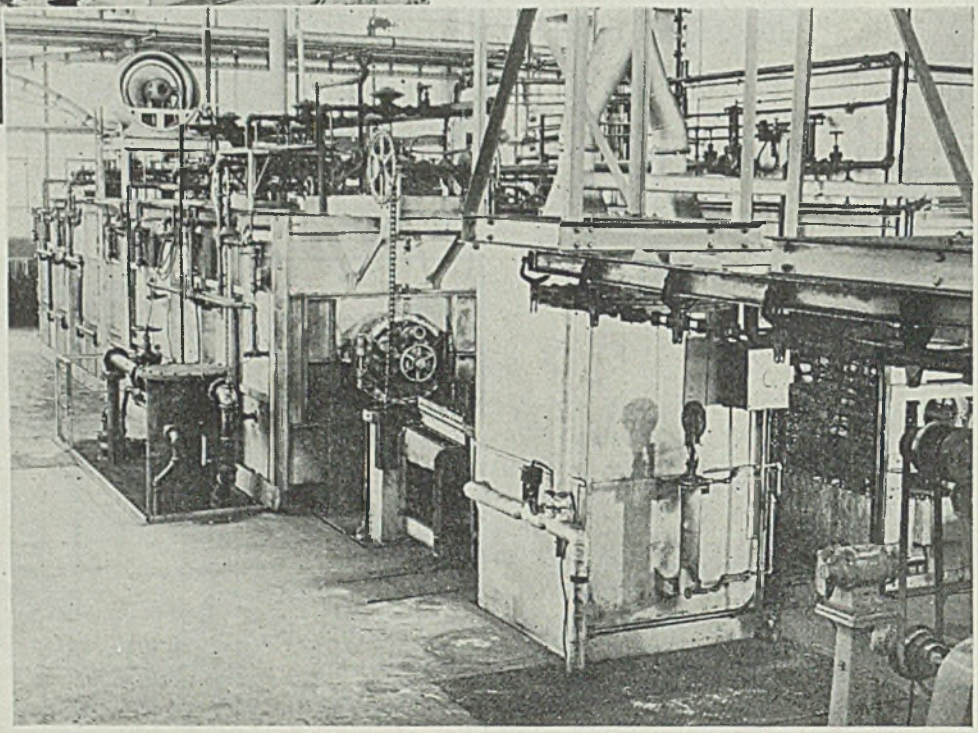
Pig Iron Production Shows Slight Gain in May

	Daily Average, Tons		Blast Furnace Rate, Per Cent	
	1937	1936	1937	1936
Jan.	103,863	65,461	76.6	48.2
Feb.	107,857	63,411	79.5	46.6
March	111,951	66,004	82.5	48.5
April	113,354	80,316	83.7	59.1
May	114,328	85,795	84.2	63.1
June	.....	86,551	....	63.6
July	.....	83,735	....	61.5
Aug.	.....	87,475	....	64.3
Sept.	.....	90,942	....	66.9
Oct.	.....	96,509	....	71.0
Nov.	.....	98,331	....	72.3
Dec.	.....	100,813	....	74.2





AT LEFT is shown charging end of Holcroft light case carburizing furnace, in which transmission parts are hardened. Washer is at extreme left. View below shows discharge end of furnace, with draw furnace at the right

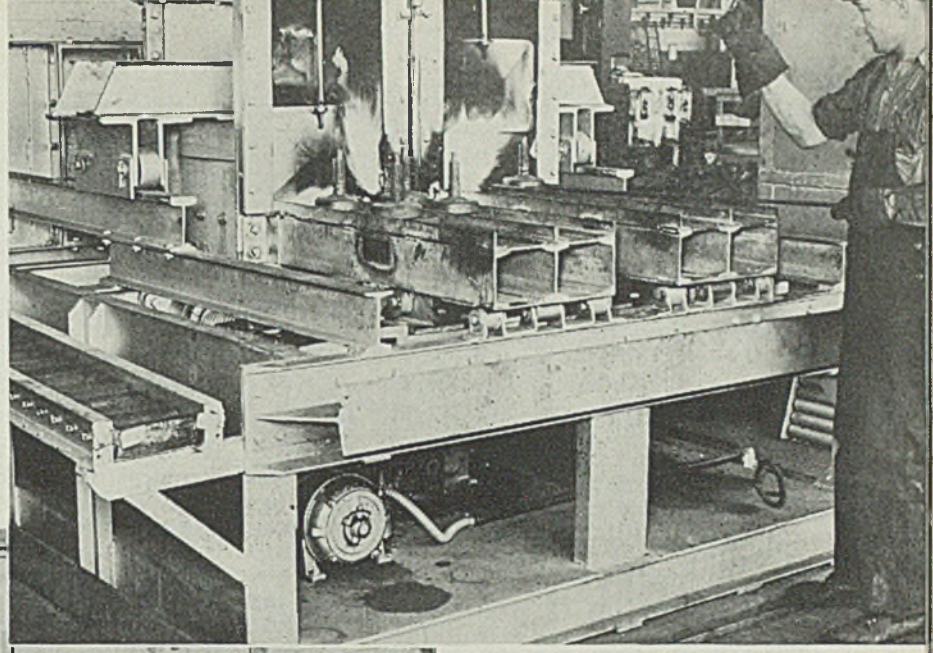


New Concepts of Metallurgical Control In Automotive Steels

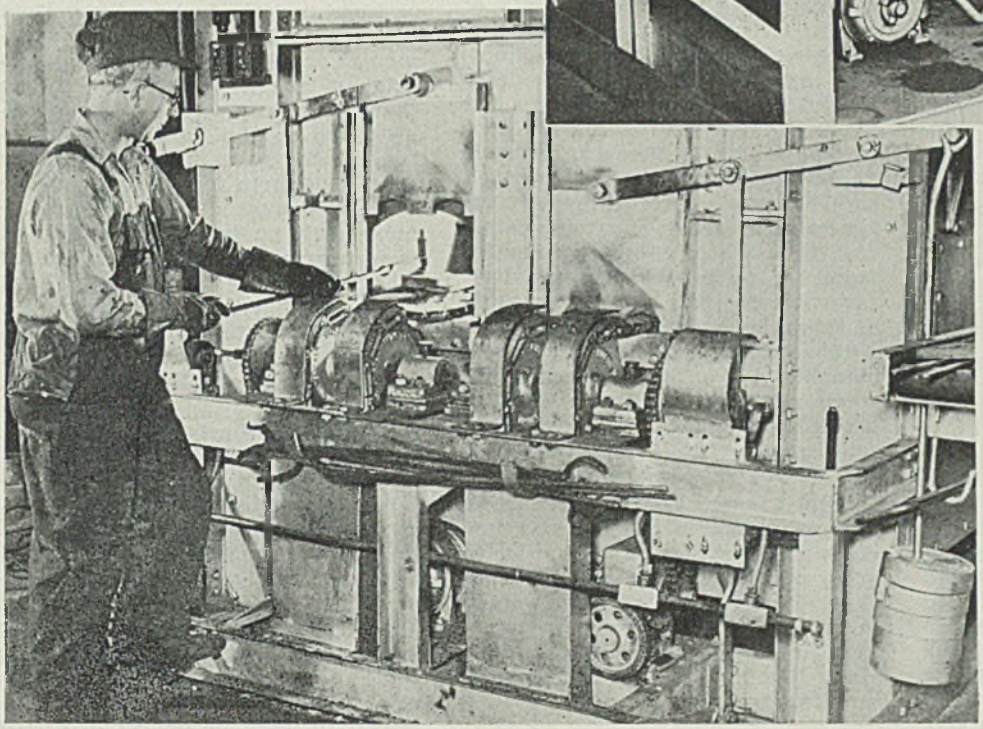
TOO much emphasis cannot be placed on the importance of metallurgical control of automotive steel in this present age of car manufacturing. Automotive engineers are constantly increasing motor speeds and car performance in general, using the most severe testing conditions as a criterion of safety and suitability for public use. At the same time, they are insistent on keeping weights relatively low in spite of stresses involved.

Production department demands are such that the machine shop insists on the highest degree of cutting speed and ease of fabrication of parts at lowest possible tool and labor cost. Cost departments are also in for their share of criticism on the excessive cost of materials; comparing cost of machining operations against those in other high-production shops and periodically bringing to light, with emphasis, the economy of fabricating comparative parts in competitive shops.

All of this means an attempt by the metallurgist, in many cases, to-



CHARGING end of twin muffle furnace is shown at right. It is used for so-called "clean" hardening of certain transmission parts. Illustration below shows the discharge end of the same controlled-atmosphere furnace



ward more delicate metallurgical control and an incessant groping for something better, in order to satisfy the requirements and needs of each of the clamoring divisions which make up one compact manufacturing organization. Probably at no time has there been such an incentive for metallurgical staffs to introduce new developments and new products, and with the decidedly co-operative feeling that prevails between metallurgist, manufacturer and steel mill, much is being accomplished.

There are undoubtedly many means of approach for the control of automotive steels which vary from shop to shop. The number and kind of tests necessary to maintain this control on any incoming material is dependent on the specification and what it is going to make. On transmission gear steels of the nickel-chrome type, specification 3145-A, for instance, it is found essential for good control of heat treating and also to maintain the desired physical properties, to hold the

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IN THE hands of the metallurgist rests to a great extent responsibility for safety, speed and dependability of motor cars today. How well this fact is appreciated may be seen from the accompanying discussion of details involved in the metallurgical control of steels used in vital parts of Buick cars. The author, O. N. Peterson, is plant metallurgist at Buick and delivered this paper at a recent meeting of the new Saginaw Valley group of the American Society for Metals. Particular emphasis is laid upon improved practice resulting from co-operation between metallurgist, manufacturer and steel producer, especially on such parts as transmission and differential gears

carbon to a five point range and the mean analysis on the alloying elements. The range for the alloying elements has always been wide, and perhaps in some steels is necessary, but in many cases, at least, it could be narrowed down with probably greater uniformity of product.

Steel with grain size 6-8 as determined by the McQuaid-Ehn test is used on transmission gear steels because of its inherent improvement in physical properties over coarse grain steels. Steel mills seem to have fine grain control well in hand on this type of material for they rarely miss, and usually hit a No. 7 grain size consistently. On a group of 30 heats received consecutively there were 26 with grain size of 7 and four rated as 7½, which indicates a decidedly uniform trend. Microexaminations for dirt in the rough bar stock as received, type, kind and abundance in a given microscopic area; normality rating, banding, and core conditions in general are all on a routine basis for every heat of transmission gear steel received.

Machinability Is Tested

In addition to the above tests mentioned, a deep acid etch test on a sample from a new heat throws some light on the machinability to be expected. Indications are that fine grain heats which have not been too thoroughly killed in the melting practice will machine better than those which have been thoroughly killed. In order to check this condition, a gear is forged from a new heat, annealed, cut longitudinally, ground on the cut surface, then etched for 45 minutes in a 50/50 muriatic acid solution at a temperature of 160 degrees Fahr. On a heat not too thoroughly killed the machined and ground surface will be attacked deeply by the acid with variations in degree of etch following along the forging flow lines. A thoroughly killed heat, however, will be comparatively unattacked. A type and degree of etch pattern is selected and used as the standard of comparison for all incoming heats of transmission gear steels. The explanation for the difference in etch of the two kinds of material is not exactly clear. Possibly it may be due to the fact there are more soluble oxides of iron in the ferrite of one steel than in the other steel. However, from the information gathered so far, better machining seems to be associated with heats of steel which etch deeper on the standard etch. There seems to be a tendency in cutting for the chip to break and free itself more readily from the cutting tool, thereby permitting increase in feeds and speeds with correspondingly longer tool life.

Another phase of control in processing transmission gear steels, which not only has a bearing on the machinability but on hardenability as well, is the annealing cycle. The annealing cycle of 3145-A specification, nickel-chrome steel, is so selected that the final microstructure will have a coarse pearlite as the predominating constituent with well distributed free ferrite along the grain boundaries and perhaps slight tendencies toward a few spheroids and divorced cementite with a brinell hardness range of 197-207. This seems to give the best general structure and hardness for broaching, turning and hobbing gears. Any attempts to increase the amounts of spheroids or divorced cementite, which will usually bring the hardness to 187 or softer, would be detrimental to good free broaching and hobbing, but would probably favor turning. Slight increase in hardness higher than 207 borders on sorbitic structures with poor turning and fair hobbing and broaching. As the carbon content increases from 0.45 up to 0.50 per cent, it is favorable to have greater amounts of spheroids and divorced cementite with no apparent detriment to machinability. For 3145-A specification steel, an annealing cycle is used which is completed in 9 hours in a four-zone furnace having a capacity of 1250 pounds per hour.

Brinell hardness checks are made on a percentage of the gears as they come out of the furnace in order to keep as close to the cycle as possible. In addition, a traveling couple in a gear is run through each annealing furnace once a week to check heating conditions and microstructure of the gear.

Controlling Distortion

Distortion from hardening is one of the evils so hard to control and so vitally important as far as a quiet transmission is concerned. Fire checks are made in advance of production of a heat in order to check the allowance to be compensated for in cutting angles. Unwinding of helical gear teeth and runout of gears, such as the counter and clutch gears, is the usual occurrence, and even more so when salt baths are used for the heating medium. For a part of the production cyanide salt baths are used as the heating medium. A description of this setup appeared in STEEL for Feb. 17, 1936.

A gradual attempt is being made to work into atmosphere control furnaces for gears and at the present time two are in operation, both giving by far the most satisfactory gears for consistency in distortion, toughness, hardness and cleanliness. In these furnaces a case of 0.005-inch thickness is desired, and this is checked for depth and type microscopically twice every 24 hours. With the type of gas used in the furnace, there is no heavy hypereutectoid case, but one approaching a carbon content of 0.70 per cent.

There is a slight amount of decarburization accompanying gears treated in the atmosphere furnace, which is a variable from top to bottom of a gear tooth, and which, if desired, can be eliminated by the introduction of small percentages of propane gas in the muffle of the furnace. The decarburization is dependent, somewhat, on the amount of CO_2 and O_2 in the gas, and it usually varies from slight to 0.0001-inch at the top of the gear tooth to as high as 0.0003-inch at the bottom of tooth. This has not been detrimental and has not caused any pitting under severe tests, nor has there been any undue fatigue failures due to the light decarburization at the base of the teeth. By the use of these furnaces, too a case can be increased to 0.010-inch or more with no trouble so that if a lower carbon gear steel is desired with carbon 0.30-0.35 per cent, and there is a tendency in that direction at the present time, it could be handled conveniently with slight gas, time and temperature adjustments.

Some Decarburizing Beneficial

Theorizing in reference to decarburization at the base of gear teeth, it may be said that slight amounts of decarburization, if backed by a good eutectoid case, may be beneficial toward greater fatigue life. This, to the writer's knowledge, has never been proved, but there may be some logic to it for this reason. When a load is applied on a gear there is bound to be some deflection in the gear tooth, and with a thin layer of decarburization at the base of the tooth, which means ductility on the surface at least, there should be less likelihood of rupture at the surface of the metal than there would be if there was full hardness and case, which means greater brittleness and stiffness, up to the outermost layer.

Differential gear steels, of which the ring and pinion are the most important, will, for sharpness of control, come in the same category as transmission gear steels. In this case nickel-molybdenum steel, specification 4620-A, grain size 6-8, is used because of its good physical properties, particularly toughness and impact value, after a 1700 degree Fahr. heat and direct oil quench. This property was important with the old conventional design of spiral bevel gear tooth. However, with the advent of hypoid gear design where load application is different and sliding frictional wear comes into the picture in a greater degree, it is probably of secondary importance. Now it is a problem of greater wear and scoring resistance where harder surfaces rather than toughness are

of comparatively greater importance.

One of the things that has caused considerable worry and annoyance is the machinability of 4620-A steel. The finish on the ring and pinion gears is such that any grooving or scratches in cutting that cannot be eliminated in the lapping operation are conducive to noisy differentials, so that finish is of the utmost importance. Whether the roughness encountered in cutting these gears is due to fine grain steel with its accompanying undesirabilities that sometimes come into the picture during the melting practice, or to the incorrect annealing or normalizing cycle, it is hard to say. At any rate, a normalizing cycle involving heating to 1750 degrees Fahr. and air cooling is used on ring gears, which gives a brinell hardness of 156-174. Pinion gears, however, since they must be kept softer due to the different method of cutting, are heated to 1750 degrees Fahr., cooled slowly and held to a brinell hardness of 149-163. In spite of all the consistency maintained in the chemistry of the heat, forging, normalizing, or annealing, a heat often will show poor machining results. This frequently has been traced back to dirt, silicate inclusions, products of hot tops or spalling of refractories somewhere in the melting practice, but an equal number of times there has been no apparent reason for such erratic machining. In cases of this nature, it seems logical to assume that there is something in the heat itself conducive toward poor machining, and the thought naturally occurs that perhaps it may be a characteristic property of nickel-molybdenum steels to be a little more difficult to control in the melting practice and are sometimes prone to hold in the melt products of deoxidation which may or may not be microscopic in size and are entirely overlooked.

Hardening Not Difficult

The carburizing and hardening of ring and pinion gears offer no particular obstacles. All heats are code lettered and carried as such throughout all operations to the finished assembly for identification. The gears are packed in cylindrical boxes with a 3-1 mixture of carburizing compound, heated in a pusher-type furnace on a 10-hour cycle for a case depth of 0.040-0.050-inch and quench direct. Test plugs of the same chemistry are put in every box to check depth of case. The file test is the most reliable check for hardness at the surface since the Rockwell test is rather inconvenient because of the shape of the gear, and furthermore does not add much information over the file test.

The remaining gears in the differential, which are the side pinion and intermediate gears, are purchased on a 5-7 grain size rating, the former S.A.E. X1015 cold drawn, the latter, a forging S.A.E. 1115 hot rolled. These gears are also carburized to the same depth of case as the ring and pinion gears and quenched direct in water.

Manganese steel of the S.A.E. 1300 series, hot rolled, has become one of the popular steels used in car construction for important parts such as knuckles, steering arms, supports, and rear axle shafts. It responds successfully to forging, heat treating and machining, and uniform physical properties with draw temperatures of 800 degrees Fahr. and up can be anticipated.

Low Rating Important

This steel is purchased fine grain (6-8) with an inclusion rating of No. 1 minimum. It is important to maintain as low an inclusion rating as possible for a stringer at the surface of a knuckle or steering arm, for instance, is apt to cause early fatigue failure. Practically all of the 1300 specification forgings are oil quenched with the exception of rear axle main shafts which are partially hardened in water. The drawing temperature ranges from 800-1200 degrees Fahr. A 1200 degrees Fahr. draw is as high as should be used on these steels, for with the apparent rapid rate of spheroidizing at temperatures higher than 1200 degrees Fahr. uniform physical properties cannot be maintained. By the use of manganese steel forgings, it has not been found necessary to normalize after forging and before heat treating, because of the fact they do refine readily in one heat, eliminating the forging structure.

By far the greatest item of tonnage which goes toward the manufacture of a car is the crankshaft. A rather rigid specification for this material is upheld mainly to promote better machinability. S.A.E. 1045 steel is used with coarse grain (2-4) and sulphur addition to 0.055 per cent which is believed to promote better machining with no detriment to the physical properties of the crank. In addition, a section of a crank from each heat is cut parallel to the axis, ground and acid etched to study etching characteristics. There are indications a crank that etches readily is the most durable from the machining standpoint, and therefore is requested. All crank heats are code lettered and carried as such through all machining operations to the final assembly in order to check the machining performance of each individual heat.

In order to maintain any consistency of machining performance on crankshafts, it is essential the heat treatment be uniform. Any shortening of time in the high heat, quench or draw will reflect back on the machining operations. A temperature of 1650 degrees Fahr. with a period of 1½ to 2 hours in the high heat, depending on the size of the crank, at least 2 minutes in the quench and 3 hours in the draw is considered a fairly safe cycle for crankshafts. Using a draw temperature of 1100 degrees Fahr., a brinell hardness of 229-269 is maintained.

A new steel which has entered into automobile construction for parts requiring medium tensile strength is S.A.E. 1050, fine grain (5-7) with a manganese content of 0.70-1.00 per cent. This steel may be classed in a grade between carbon and alloy steel, perhaps a semi-alloy steel. With an oil quench from 1550 degrees Fahr. on such parts as front wheel control arms and intermediate steering arms, it will show fairly good hardenability and give sufficiently high physical properties, providing there is no great degree of abnormality. Such a steel undoubtedly has a field for other forgings as well, such as crankshafts, camshafts and transmission mainshafts. This is a place where fine grain control has worked out successfully and brought to life steels which have been out of the picture in car construction.

Use Heat Treat Test

Spring steels, both rounds and flats for front and rear spring construction, are of silicomanganese steel, S.A.E. 9260. The flats do not offer serious difficulties except for surface defects and decarburization; the chemistry and inclusion rating are consistent. On the front coil springs, however, much more precaution is taken for surface defects and decarburization because it is the outermost fiber in the working of a spring that is most highly stressed, and any defects at the surface will, as a rule, cause localized stresses and early fatigue failure. The material for coil springs is purchased hot rolled, ground close to size, free from decarburization and surface defects which are checked by an acid etch test, the decarburization and hardenability by a heat treat test. The heat treat test, by the way, is carried out on every new heat and every different size round bar shipment from that heat.

By prearrangement, the mill furnishes six prolongs which are bars 12 inches over the regular length on every new size from the heat. The prolongs are cut off and a hole drilled in one end through which a wire is strung for handling in heat treating. An electric muffle furnace set at a temperature of 1600 degrees Fahr. is used for heating. The total time cycle is 20 minutes, after which the pieces are quenched in oil individually with uniform vertical agitation and then shot blasted.

The shot blast is the type used for cleaning hardened high-speed steel

(*Please turn to Page* 72)

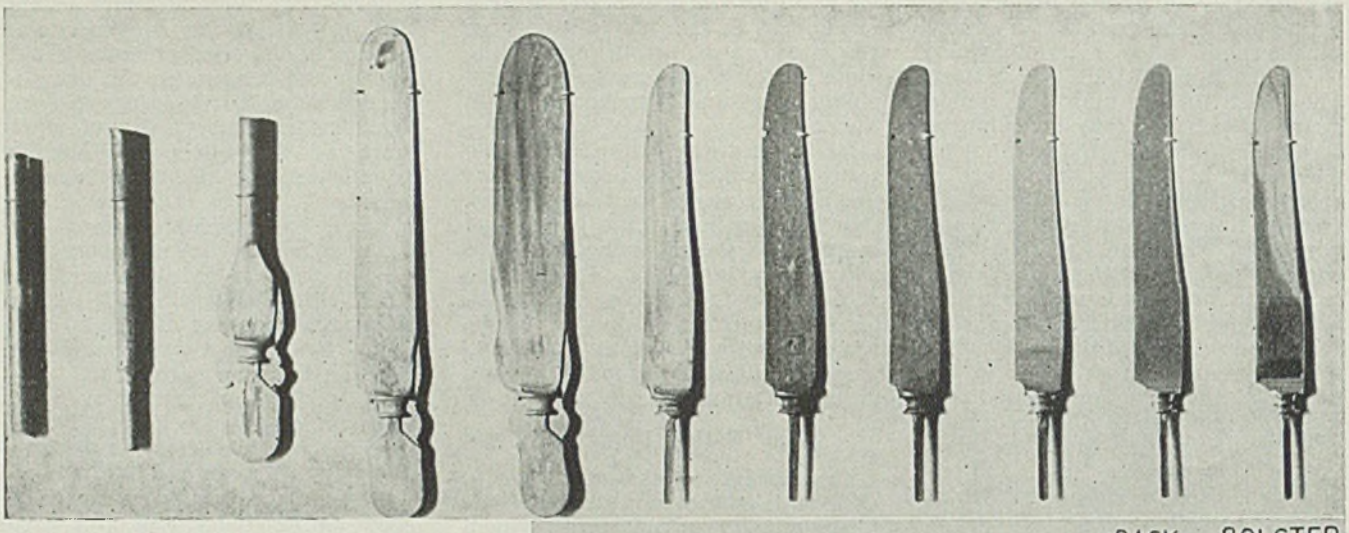
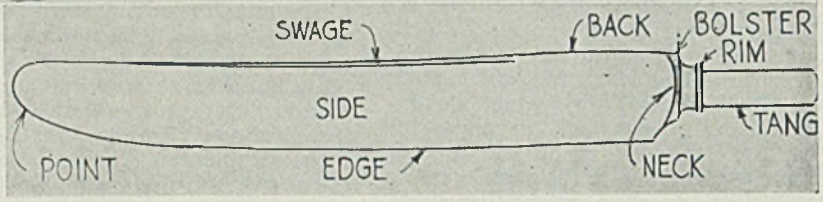


FIG. 1—Sequence of operations in forming and finishing forged steel knife, from round bar stock to polished blade. Fig. 2 (inset)—Various parts of the blade are designated by names peculiar to the trade as shown



Forging and Finishing Steel Knives

BY FRED B. JACOBS

STEEL table knives are among the most common household cutlery. Of both plain carbon and stainless steel, their production runs into millions of dozens annually. In making strictly high-grade product, there are over 50 separate operations practically all of which call for a high degree of manual skill on the part of the cutler.

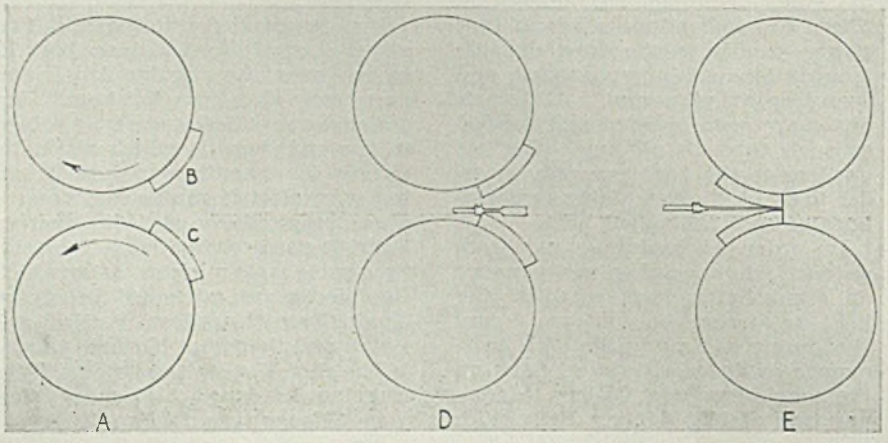
In this article are outlined the principal operations performed in the manufacture of knives at the plant of the Northampton Cutlery Co., Northampton, Mass. This company makes a high-grade forged product only, and has a capacity of 100,000 dozen blades annually. This output requires about 100 tons of steel of which 25 tons represents scrap trimmed from the blades or ground and polished away in finishing operations. The company furnishes its product without handles, these being supplied by others who market the product to distributors.

Fig. 1 gives an idea of the sequence of manufacturing operations. At the extreme left is the rough round stock. Next is shown the stock after the tang has been forged. A drop forging operation then forms the bolster and further shapes the tang. A rolling operation follows and after that the blade is further shaped by hammering. Next the stock is cut out in trimming dies. Hardening and tempering are followed by blade grinding and various polishing operations to bring about a mirror finish on the blade. Cutlers designate the various surfaces on a table knife blade by names peculiar to the trade as given in the diagram in Fig. 2.

Drawing of the tang is a simple operation done under a Bradley hammer fitted with dies having several semicircular depressions to accommodate tangs of different diameters. The hammer makes about 200 strokes per minute. The smith sits at his works and heats his stock in a gas-fired furnace.

Blades are rolled in special equipment furnished by the Farrel-Birmingham Co. Inc., Ansonia, Conn. The process can be comprehended readily by referring to Fig. 3. At *A* are shown two cast iron rolls, about 1 foot in diameter, geared to run together. They are provided with hardened dies, *B* and *C*. With the rolls rotating toward him at a speed of about 60 revolution per minute, the operator holds the hot stock in a pair of tongs. He grips the stock by the tang and brings

FIG. 3—Diagram showing first forming operation on blade. Rolls rotate at a speed of one revolution per second



the bolster against the edge of the lower die. As the rolls continue to revolve, the stock is depressed between them, the completion of the cycle being shown at *E*. Following the rolling, the blades are again heated and subjected to a hammering operation in a Bradley hammer shown in Fig. 4.

The stock then is subjected to an annealing operation after which it is trimmed. Trimming is done in a punch press fitted with a die of the desired outline and a punch to correspond. The chief function of the trimming operation is to get rid of superfluous stock, but it offers the further advantage of shaping the outlines of any number of knives exactly alike, which results in a uniform product.

Shaping the Tang

Back of the rim must be shaped true and square with the tang. This is done by milling with an end-cutting hollow mill such as is used in ordinary machine-shop practice. The mill is high-speed steel, about 1 inch in diameter, and rotates at an approximate speed of 150 revolutions a minute. The tang is fed into the hole in the mill so that the mill teeth finish the tang and square the back of the rim in one operation.

Next the work is heated again and the blade and tang straightened under a drop hammer provided with dies which fit the knife outline and shape. After straightening, the blades are ready for heat treating. Considerable importance is attached this operation for knives which are not properly hardened and tempered do not stay sharp. The blades are heated a dozen at a time by placing them in special racks provided for the purpose, and heating them in gas-fired furnaces at 1880 degrees Fahr., and then quenching in oil. In drawing the temper the heat may run from 550 to 800 degrees Fahr., depending on the carbon content and other characteristics of the steel. A careful inspection follows and any blades out of

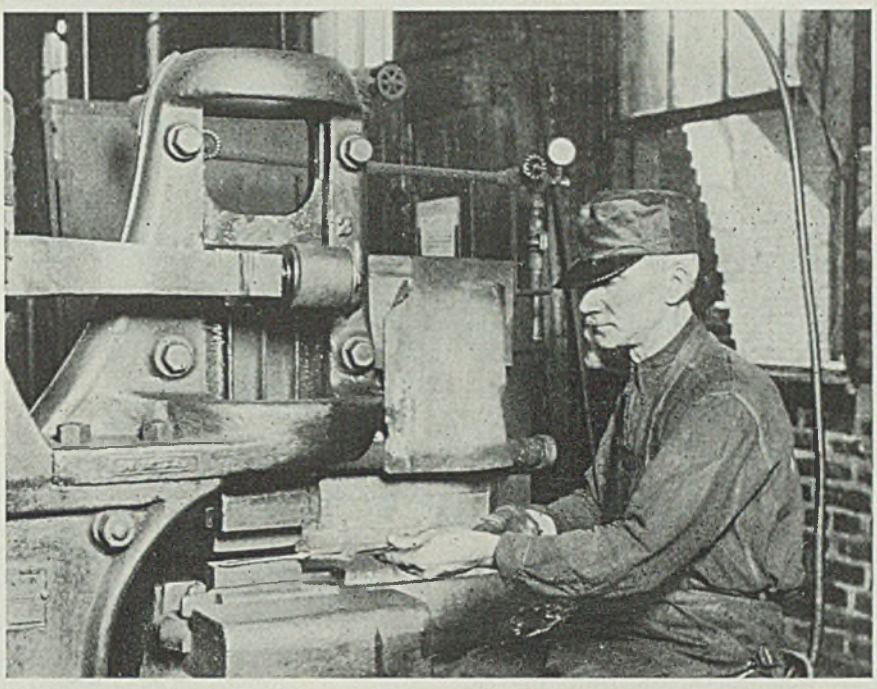
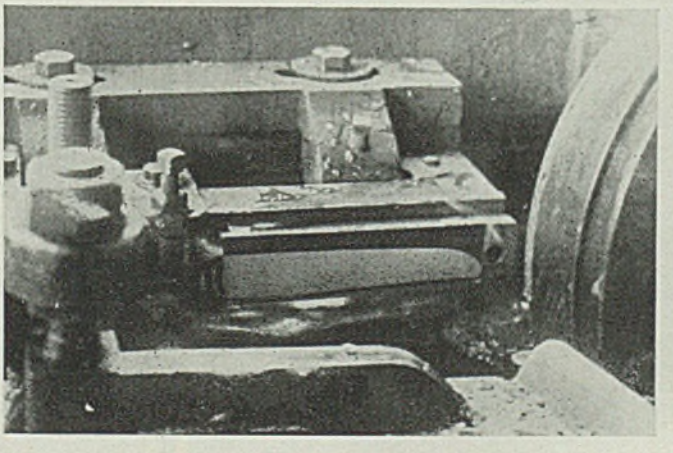


FIG. 4—Bradley hammer fitted with flat dies in which blades are straightened and worked after preliminary forming operation

shape slightly are straightened. This is a manual operation done with a light hammer.

The foregoing constitute the first series of operations performed in the forge shop. The knives now are ready for finishing by grinding and polishing. First, it is necessary to rough out the backs, edges, bolsters and rims. The grinding wheel used is 18 inches in diameter, 2¼-inch face, running at a speed of 1900 revolutions per minute. It also should be mentioned that a wheel of the same diameter with a ½-inch face is used for grinding the rims. These wheels are mounted in center blocks, traditional practice for many grinding and polishing operations in the cutlery trades. Drive is by belt from a shaft under the floor.

At the conclusion of this operation the blades are cleaned by ordinary gravel in tumbling barrels. This process removes all scale from the blades. If the scale were left in place it would glaze the wheels used in the next operation, grinding the sides of the blades. This operation is performed as shown in Fig. 5 on special machines called by the trade Hemming grinders. They are a product of the Hemming Bros. Co., New Haven, Conn. The blade is held by its tang with one side resting against a substantial support provided for the purpose. In this position the blade is fed automatically past the face of a cylinder wheel. These machines are fitted with manufactured alumina wheels 12 inches in diameter, 3½-inch face, 1¾-inch rim, 60 grit, elastic bond. This operation is performed wet,



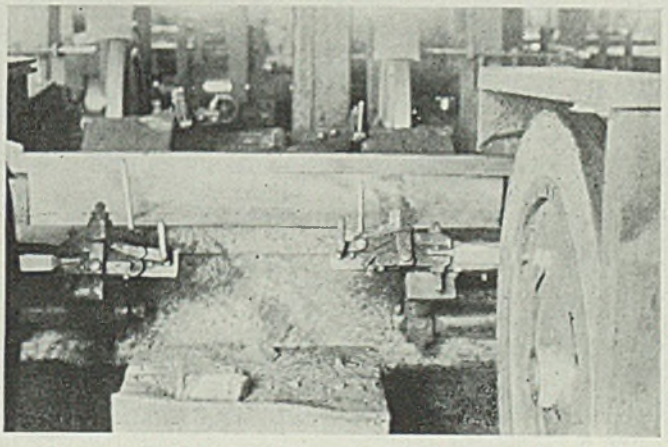
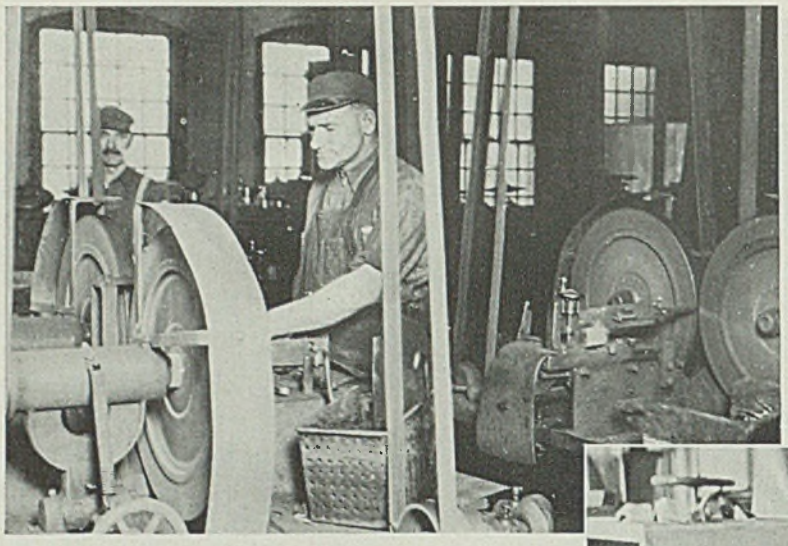


FIG. 5 (left)—Sides of blades are first ground in Hemming grinders with work supported rigidly and fed past cylindrical alumina wheels. Fig. 6 (right)—A similar type of grinder is used to glaze the blades. Wheels are canvas with a head of alundum. Blade holders make 150 strokes per minute



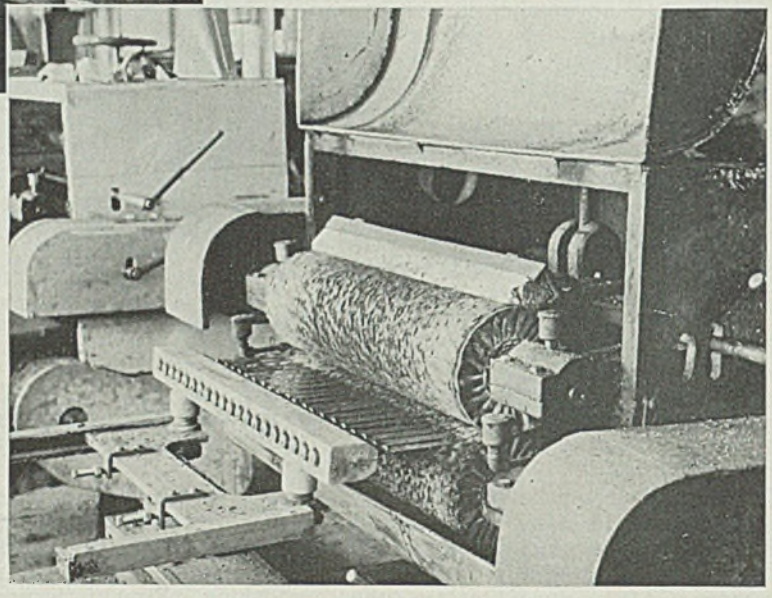


FIG. 7 (left)—After glazing and washing, blades are finished further in this double-head polishing machine with medium texture canvas wheels headed up with alumina. Fig. 8 (below)—Mirror finish on blades is obtained in this specially-built machine with two polishing wheels of felt disks. Polished 24 at a time, the blades are arranged to float between the upper and lower wheels

as it is necessary to keep down the frictional heat which might draw the temper if the wheels were run dry. In Fig. 7 the wheel guard has been removed to illustrate the details. The blade is set at a slight angle, about 15 degrees with the wheel spindle axis, so that the cutting face of the wheel is conical. It is necessary to provide two Hemming machines for each operation, one for each side of the blade.

It is necessary to rough and fine finish knife necks by hand. The wheels used are compressed leather furnished by the Divine Bros. Co., and are 16 inches in diameter, ¾-inch face operated at a spindle speed of 2000 revolutions per minute.

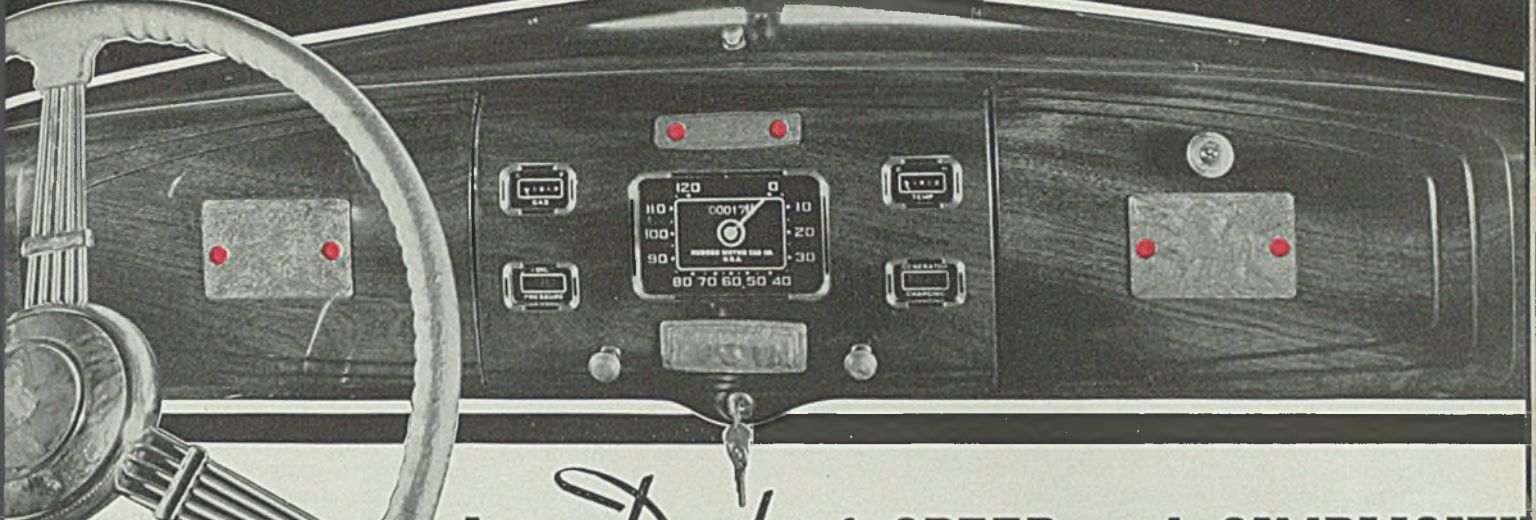
A glazing operation on a Hemming machine is shown in Fig. 6. The machine is fitted with two wheels, one for each side of the blade. These wheels are compressed canvas, 24 inches in diameter, 1½-inch face operated at a spindle speed of 1150 revolutions per minute. The wheels are set up with No. 150 alundum which is brushed in place, coat after coat, until a head of the desired thickness is formed. The abrasive is mixed with glue thinned down to about half its usual strength with hot water. In use, emery cake and beeswax are applied to the wheel also.

FIG. 9—Edging or sharpening the blades is done by hand on an alundum wheel operating at 2500 revolutions per minute

Referring to Fig. 6, it is shown the knives are located by their tangs in holders provided for the purpose. The holders make about 150 strokes per minute to feed the blades past the wheels. For loading and unloading the work, the holders can be swung away from the wheels so that the loading and unloading is readily accomplished without the danger of the polisher's hands coming in contact with the wheels.

Following the glazing operations, the blades are washed in hot kerosene. They are located several at a time in holders provided for the purpose and by a crank and pitman motion from an overhead-shaft the holders are moved up and down about 50 strokes per minute which agitates the solution and results in a thorough cleansing. Following this cleaning, the blades are dried in sawdust.

An important operation now follows on double-head polishing machines. As shown in Fig. 7, one operator runs two machines. The wheels are compressed canvas, 24 inches in diameter, 2-inch face operated at a spindle speed of 1100



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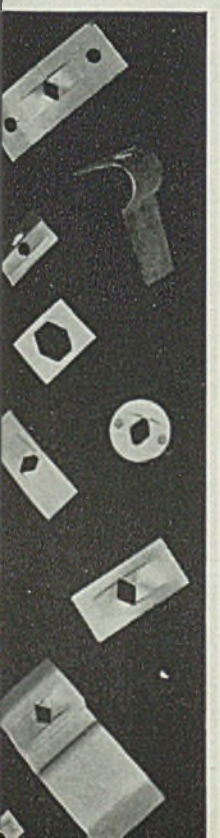
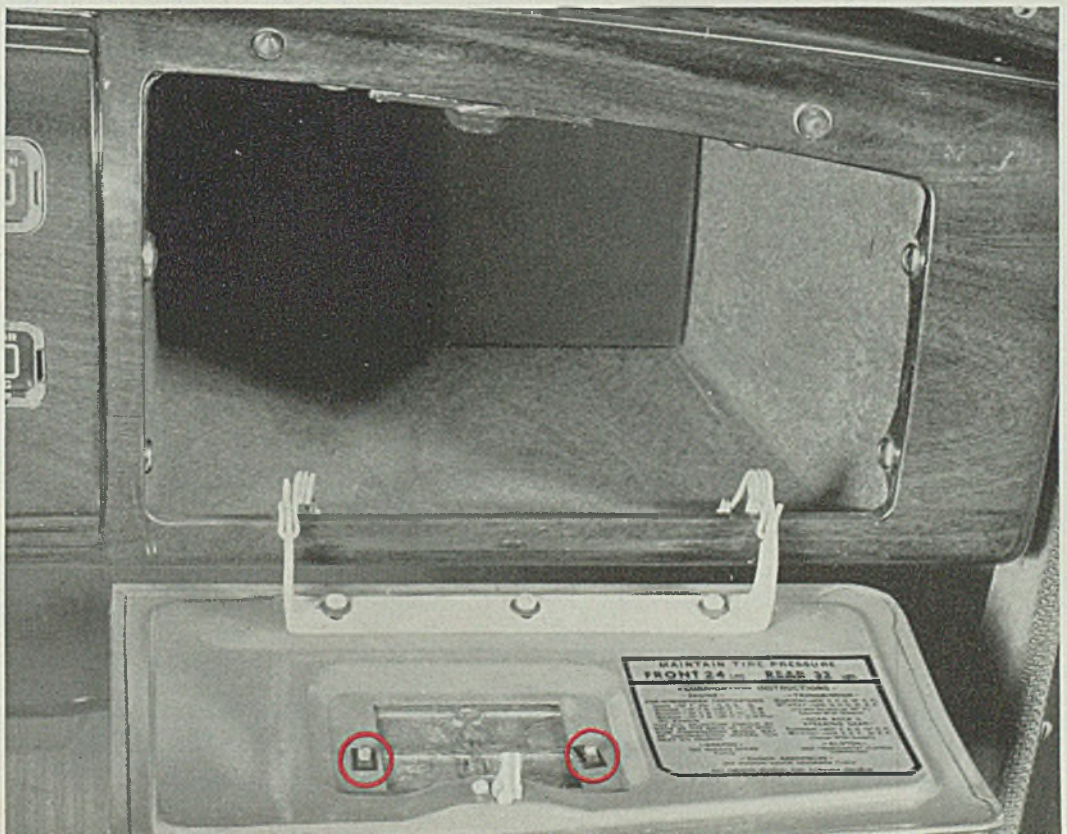
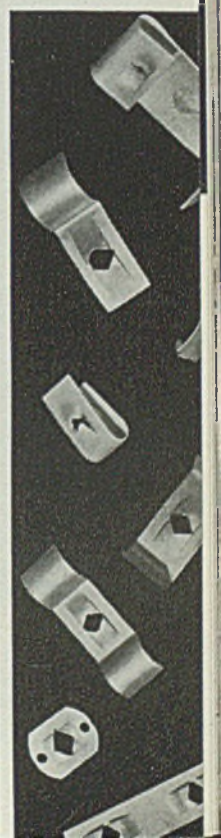
SPEED-NUT assembly indicated by circles (○) on open glove-box door.







revolutions per minute. The wheels are opened and closed automatically. The work slides between the wheels automatically over a rest provided for the purpose.

After this operation the knives again are washed in kerosene, dried, and inspected carefully for surface imperfections. This is followed by swaging. A swage, as pertaining to a table knife, refers to the chamfering at the back of the blade. Not all table knife blades are swaged, however. The operation is manual, done with a manufactured alumina wheel, 18 inches in diameter, 1½-inch face. It is an operation calling for great skill on the part of the operator as he must hold and guide the work wholly by hand. The wheel is operated at a spindle speed of 2000 revolutions per minute.

Other operations which follow include grinding the tang on a leather covered, wood wheel; grinding the back of the rim on an aloxite wheel; and polishing the backs on a compressed leather wheel. After these operations, the tangs are tinned to facilitate fastening them in place later. Then the knives are washed in a hot alkaline cleaning solution.

Sanding Methods

Sanding operation follows; the abrasive, instead of being sand, is manufactured alumina or natural corrundum in a fine powder. The process of sanding is an old one brought from England over a century ago, and according to master cutlers no better method ever has been found for preparing the surface for the so-called mirror finish seen on the best high-grade table knives. The wheels used for the sanding operation are rockhard felt, about 6 inches in diameter, ½-inch face. The face may be flat or rounded depending on the part of the blade to be sanded. The abrasive is mixed with water to keep it moist. In the sanding operation the polisher takes a handful of abrasive and the work in both hands and by skillfully manipulating the abrasive by hand he feeds it onto both the work and the wheel. It requires considerable practice to develop the requisite skill to sand the work rapidly and effectively. The spindle speed is about 4000 revolutions per minute. The wheel operates inside a wood bin so the abrasive thrown off will not be wasted. The wheel runs toward the operator.

Mirror finish is obtained on special machines designed by the Northampton engineers. One of these machines is shown in Fig. 8. Two polishing wheels are used. They are 7 inches in diameter and 26 inches long, and composed of special felt disks spaced ⅛-inch apart by washers. The disks also are slotted radially.

As Fig. 8 shows, the knives are located in a special holder which accommodates 24 blades. They are located by their tangs and "float" slightly so that when they are passed between the wheels the wheel pressure is distributed evenly. They are fed in and out about 20 times a minute and also have a slight sidewise motion. The buffing compound is applied as shown in Fig. 12, with a long stick of compound in its holder in contact with the upper wheel. It is in this position only when it is necessary to apply the compound. Otherwise the compound holder is raised and moved back. The compound is composed of a grease binder and fine polishing powers furnished by the Carborundum Co. The finish imparted is a bright luster in which no marks from previous operations are found possible to be observed.

The final abrasive operation consists of edging as shown in Fig. 9, although one not acquainted with the cutlery manufacturing industry would term this operation sharpening. As Fig. 9 shows, the operator sits before the wheel which revolves away from him. This wheel is alundum, 12 inches in diameter, 2½-inch face, 80 grit and is operated at a spindle speed of 2500 revolutions per minute.

Each blade finally is examined carefully to detect the slightest flaws in the finish and then placed, a dozen at a time, in canton flannel containers for shipment.

Man-Made Windstorms

AIR from the new Lincoln vehicular tunnel under the Hudson river will be supplied and exhausted by these giant fans built by Buffalo Forge Co., Buffalo, N. Y. Each fan weighs approximately ten tons. The 17 supply fans will handle 3,218,000 cubic feet of air per minute, while the 19 exhausters handle 3,088,400 cubic feet per minute

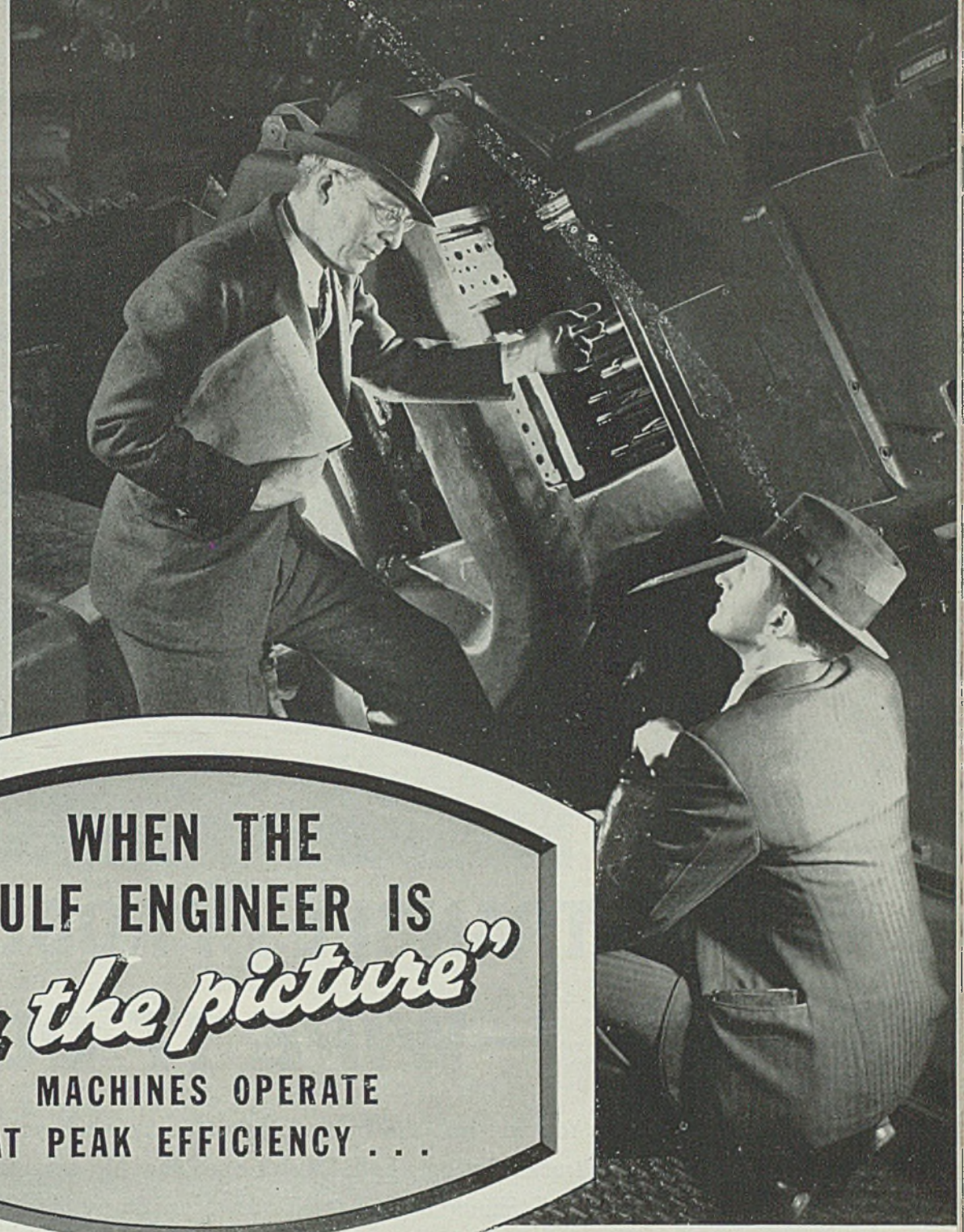
Develop Microfilm Reader

Produced by Bausch & Lomb Optical Co., Rochester, N. Y., a microfilm reader provides a handy, inexpensive means for reading microfilms, tiny photographic films made by microphotometry. Microfilms, so small that a roll picturing as many pages as five large books will fit in a vest pocket, are of standard motion picture film size but too small for direct reading. The Bausch & Lomb microfilm reader magnifies them from 7½ to 8 times and the equivalent of reading a standard page at normal distance is obtained.

Describes Investigation of Action of Metals on Oils

Investigations by P. J. Haringhuizen and D. A. Was of the University of Utrecht have been described in "Research on Thin Layers of Tin and Other Metals. III. The Interaction Between Metals and Lubricating Oils," published as technical publication No. 51 by the International Tin Research and Development council. Object of the investigations was to study the corrosion of copper, lead and tin and the influence of these metals upon the deterioration of commercial lubricating motor oils.

Deterioration in the tests was caused by heating samples of oils in glass basins for two months at temperatures approximately those occurring in practice. Films of the metals were put on glass plates and immersed in oil. Effect of corrosion in thinning films was to increase transparency and this was used as a measure of the corrosion. Results indicated that the viscosity, surface tension and acidity of the oils were not influenced by the metal present, but sludge formation was strongly stimulated in the presence of copper, while tin and lead had the opposite effect. Copper was strongly attacked but tin and lead were protected by a film.



76 operations are performed simultaneously in this machine—76 tools work at one time, drilling, reaming and tapping manifold castings. One tool out of adjustment, causing excessive wear on it or its bushings, would cause inaccuracy. The use of Gulf Harmony Oil A, as recommended by the Gulf engineer in the picture, helps keep this machine in continuous and efficient operation.

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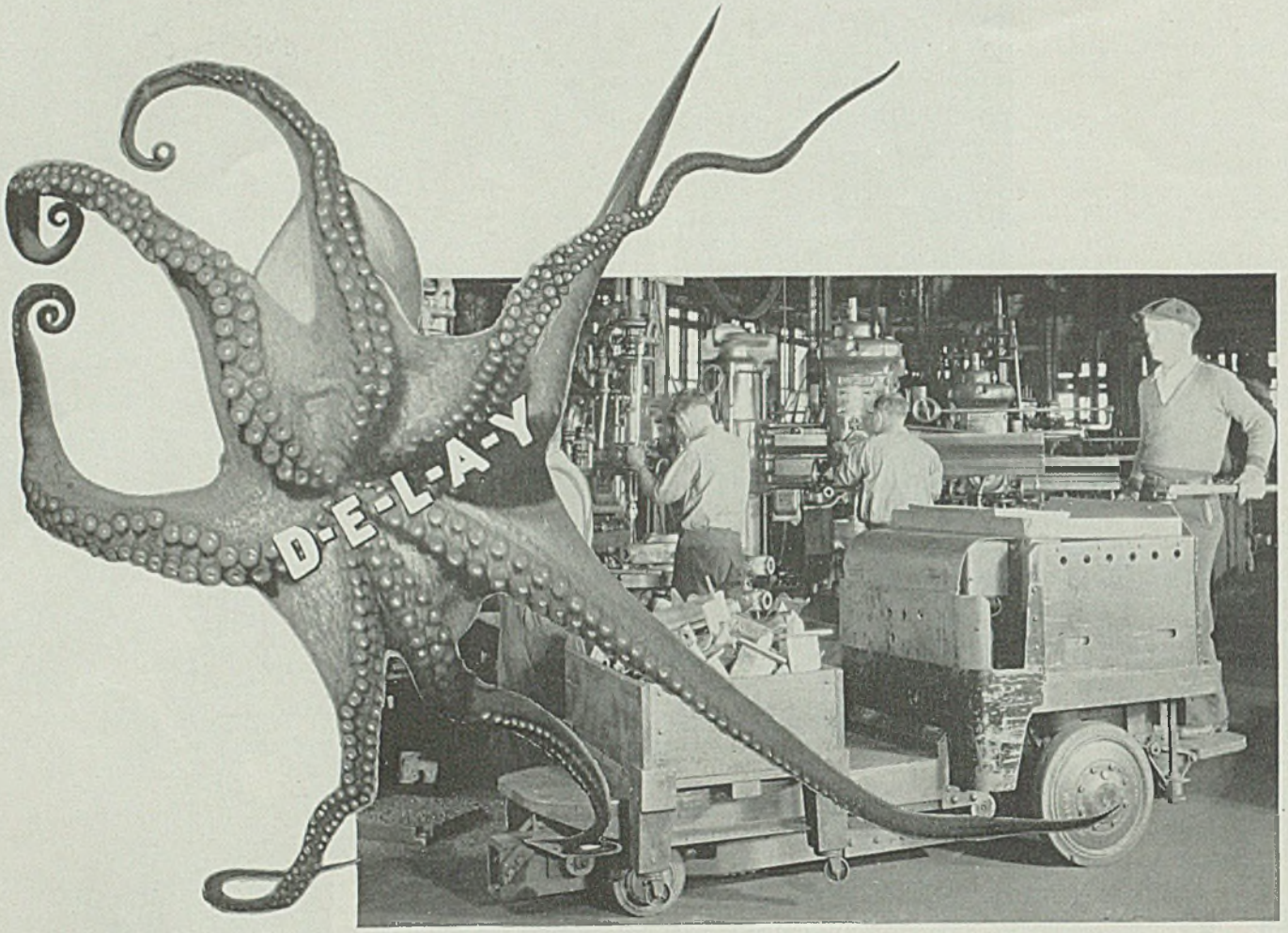

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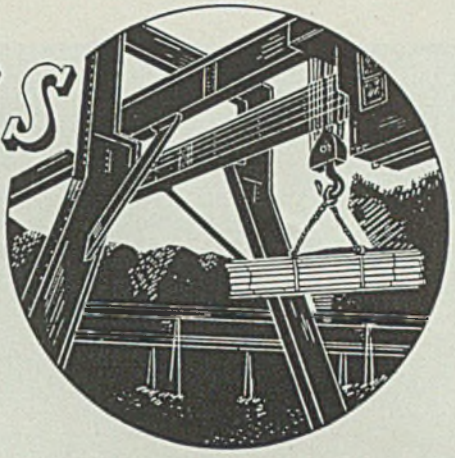


New Automobile Assembly Plant Has Handling Units Well Co-ordinated

DESCRIBED by company executives as the most modern and complete automobile assembly plant they know how to build, the new Linden division of the General Motors Corp., formally opened on Thursday, May 27, (STEEL, May 31, page 24), constitutes the most recent step in the company's decentralization program. This plant was designed and constructed to provide an efficient point from which to distribute Buick, Oldsmobile and Pontiac cars to central eastern territory. Naturally, materials handling operations serve as a co-ordinating force in a system of progressive assembly which, even in its early stages, while employes are still being trained in their respective tasks, is an example of free-flowing, efficient movement.

Located on state highway route 25 and Edgar road, Linden, N. J., only a few miles south of Elizabeth, this new plant, constructed and equipped at a cost of approximately $5,575,000, will employ at its peak over 2000 persons. It is estimated that it will produce 120,000 cars a year. Within a couple of weeks after the start of operations, it was already turning out 200 to 225 cars a day although only one of its two long main assembly lines was in operation. Laid out alongside the main line of the Pennsylvania railroad between New York and Philadelphia, with its red and white striped smokestack standing out beside the attractive brick, steel and concrete buildings and rising up like a great air beacon in the middle of attractive grass lawns and paved yards, the plant already is one of

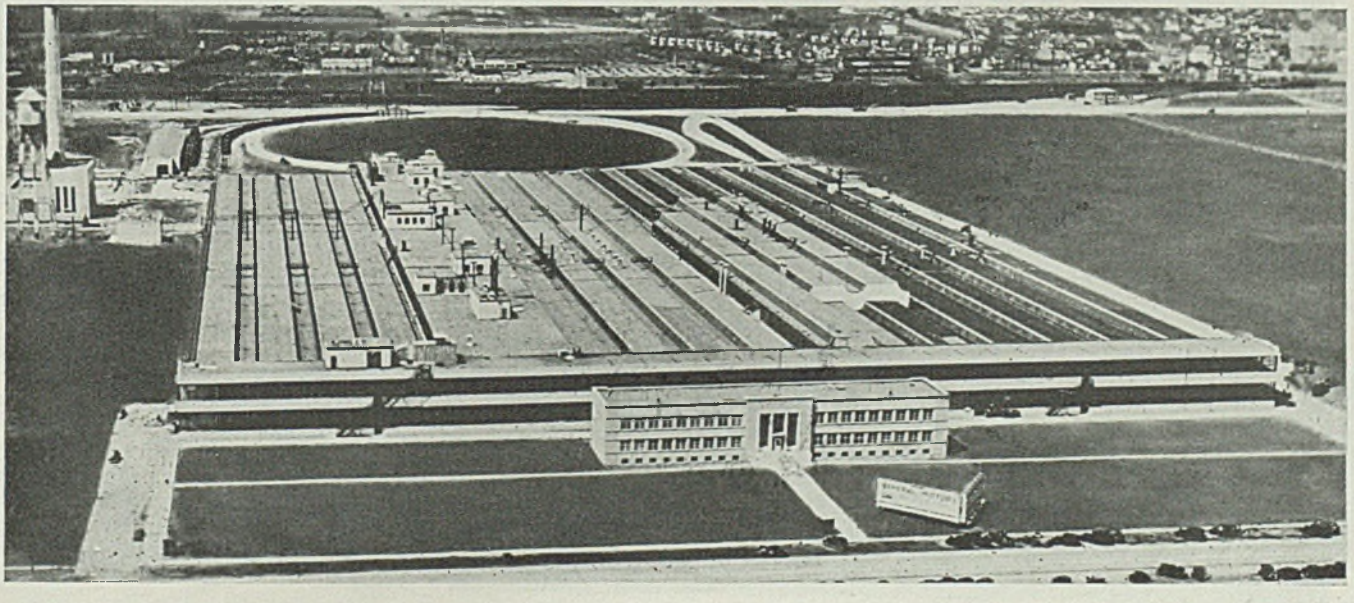
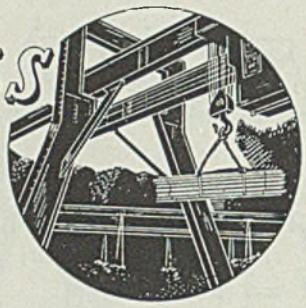


FIG. 1—General view of new Linden plant of General Motors Corp. Behind the office building is the assembly plant and oval test track; at the left rear are the power plant and covered loading dock

MATERIALS HANDLING



the landmarks in that region of busy highway traffic.

Approximately 78 acres comprise the plant site shown in Fig. 1. Four buildings, including offices, main assembly unit, loading dock and power plant, contain a total of about 1,000,000 square feet of floor space. The main unit is 1080 feet long and 680 feet wide, of one and two-story construction, with saw-tooth roof in part. With an abundance of natural light assured by floor to ceiling windows on all sides, it houses a complete body, chassis and finished car assembly. The loading dock is 450 feet long and 50 feet wide, and the power house is 125 feet by 100 feet.

Parts Received by Rail

Switch-tracks from the main line of the Pennsylvania railroad run

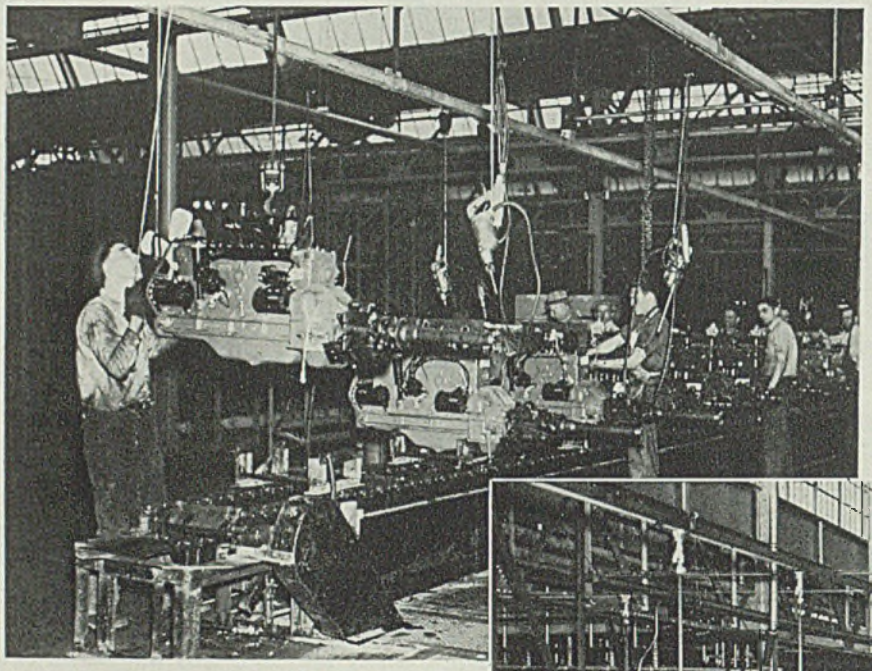
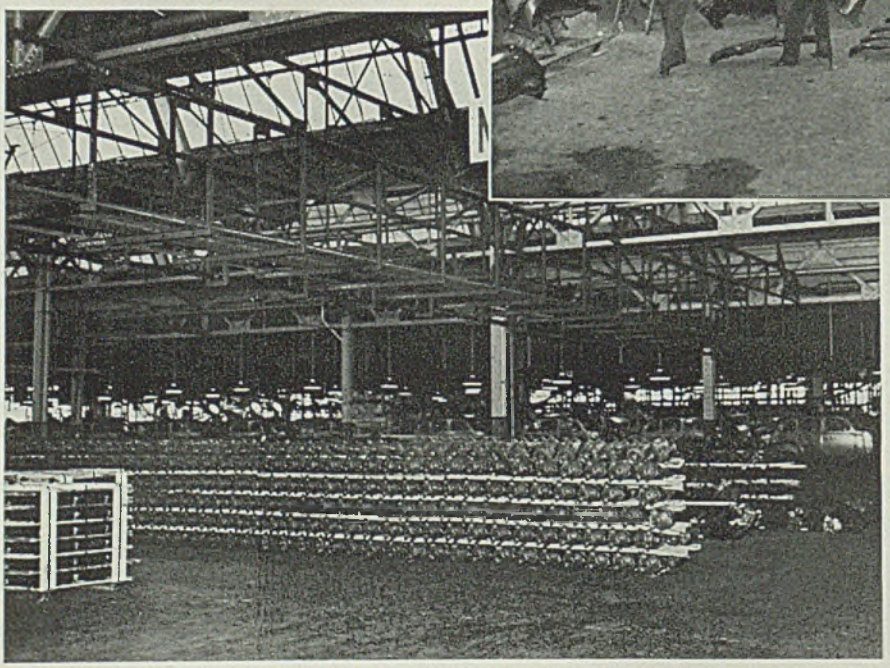


FIG. 2 (left)—End of motor assembly line where a manually-controlled electric hoist lifts each unit off the conveyor and carries it across to the main assembly line. Note the steel storage racks for engines in the background

FIG. 3 (right)—Fenders and other parts are stored nearest to point of first use and any rough spots are smoothed with electric tools. The fenders are suspended from the overhead chain conveyor. Fig. 4 (below)—Axles are received at the plant in six-tier skid loads bound together with steel strapping



down in a network across the plant yard and provide incoming service to two long receiving platforms, one on each side of the entire length of the assembly unit, and also to the loading dock. As assembly operations are the main activity, parts are received from plants in various sections of the United States, principally the Middle West. Receipt of major materials, therefore, is largely by rail delivery. Consequently, unloading of freight cars constitutes the start of the materials handling system, and has been accorded due recognition in layout of receiving

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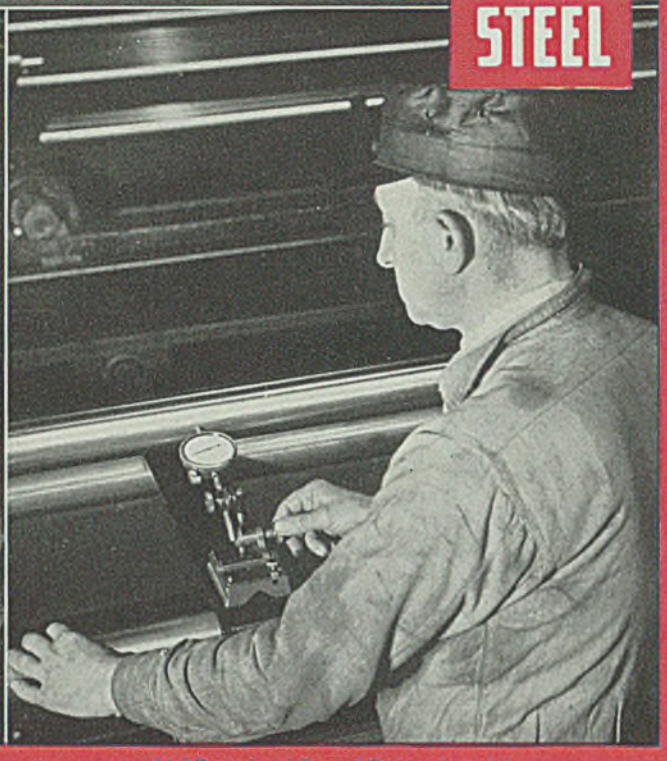

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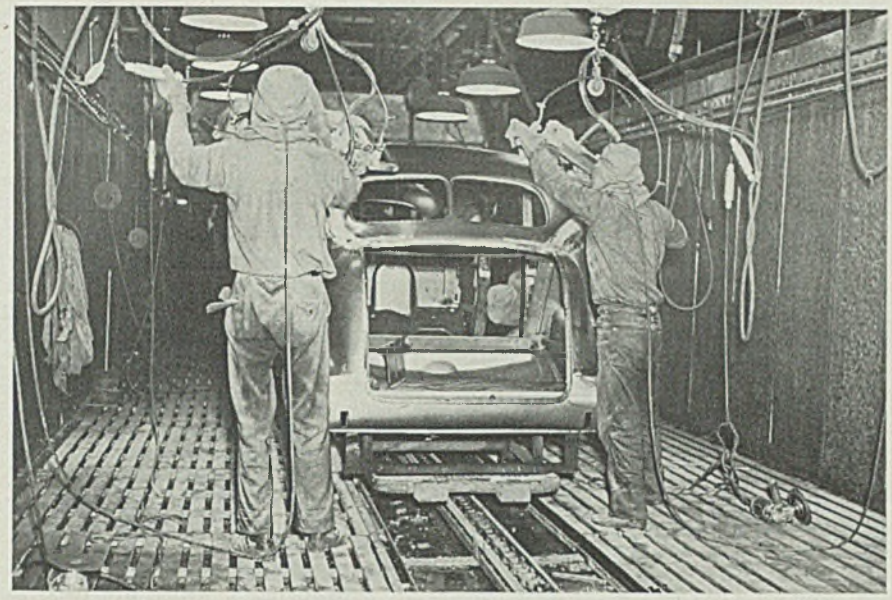


FIG. 5—Protective headgear is worn by welders, polishers and other operators whose body finishing work involves danger. The body rests on a buck which is moved along by the conveyor

stations and in equipment and methods.

Each receiving line has capacity for 22 freight cars. Cars carrying body parts are shunted to the body receiving tracks alongside the south side of the building, while engines and chassis parts arrive and are unloaded at the north side receiving platform. Sections are numbered from 1 to 22, and insofar as possible freight cars containing motors, transmissions, fenders or other parts, are moved to the section which is closest to the area where the contents of the car are to be stored or used.

Arrangement of storage and assembly lines is such that there are really three separate divisions of work: One devoted to bodies; another to motor and frame, spring and axle assembly; and the third to final assembly. Subassembly lines extend perpendicularly from the parts receiving platform toward the two main assembly lines, which in turn run down the center of the main building and parallel to both receiving tracks.

Motors Handled Carefully

Engines are received in carload lots and already assembled except for fans, belts, carburetors and other small fittings. There are 80 motors in some loads, 68 in others, depending upon the particular car model for which they are intended. They are stowed on special carloading equipment so that they are virtually suspended while in transit, avoiding damage from jolts and strains incidental to the trip from the motor manufacturing plant.

Alongside receiving sections at which heavy parts are received are located short sections of monorail supported at the top of a steel stanchion. When a freight car door has been opened, a rail is pushed through the top of the stanchion fixture and into the car. Each rail is equipped with an electric hoist with pendant control, so that the operator has complete direction of all movements within easy reach. A sling is placed around each motor and the latter is lifted by the hoist and is pulled along the rail to a position just outside the car door, where the motor is lowered to a wooden skid platform. The latter is transported by gas-powered industrial truck, equipped with forks, either to storage or to the motor assembly line.

Storage for motors is located on the north side of the first floor, close to the point of use. In fact, its proximity to point of use is typical of the system which holds throughout the entire plant. In storage, motors rest in steel racks, equipped with roller slides, the facilities being ample to accommodate approximately 3000 units. Each rack is three tiers high, but room is left for a fourth tier if it should become necessary at a future date.

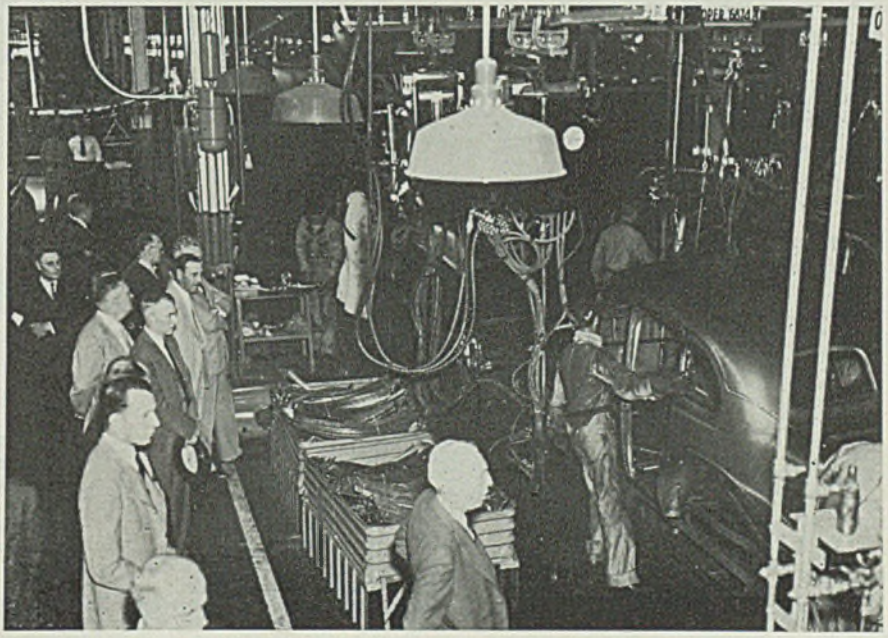
Other parts are stored at numerous points adjacent to the assembly lines. For example, one section is set aside for front fenders, another for hoods and shells, a third for standard parts and bank stocks, and so on through the list. Each is unloaded, transported and placed in storage in a manner best suited to it.

Many Types of Equipment

In addition to the powered lift-truck and skid system, use is made of hand-lift trucks and corrugated steel skids, floor trucks with wood frame platforms, special four-wheel floor trucks with high front and rear racks, small drums for bolts and other small items, and tote pans for still other smaller ones. This same specialization is observed also in storage equipment. For instance, hoods are placed in wood racks, with three-tier arrangement. Each of these racks will hold, for an Oldsmobile for example, 180 units. For moving engines into and out of storage, electric hoists are utilized, but for many of the other parts, such as hoods and fenders, manual handling is utilized.

Fenders, hoods and other parts

FIG. 6—This is a view of the body assembly line. Welding equipment and controls are suspended at a convenient height along the conveyor line. Parts are kept close at hand in steel skid boxes



to be painted are first given a thorough inspection, any rough spot or other marring defect being removed by buffing or grinding, pneumatic buffers and electrical grinding tools being located advantageously near the storage units. These parts are suspended afterwards on hooks, which are carried on a continuous chain conveyor, Fig. 3, through a sheet metal washer 150 feet long and then on the same conveyor through a dryer 60 feet long. They are then removed and placed on hooks, which in turn are suspended from cross bars of a continuous overhead chain conveyor, which carries them through a prime coat dip tank and oven unit.

Engines Put on Conveyor

Adjacent to the motor storage racks is the first of the subassembly lines, where the motor assembly takes place on a chain belt conveyor, consisting of two parallel strands of conveyor chain on top of which are bolted special wood fixtures with cradles to which are attached strips of felt for protective purposes. This conveyor is shown in Fig. 2.

At the end of this line is a push button control, and when work on an individual unit is completed, the entire motor assembly is picked up in a chain sling attached to the hook of an electric hoist of 1-ton capacity. As the motor is being transported, the hoist operator, who walks along holding the control cords, overturns the unit so that it will be in the correct position, and then follows along to the beginning of the chassis assembly line, where it is lowered to a chain conveyor to begin its journey along towards final assembly. A standby chain block hoist on separate runway is used about the subassembly.

In the meantime, body parts, which have been received in box carloads on the body receiving tracks, are unloaded. They are placed on skids and special floor trucks, and transported to the respective first operations in body assembly. Sides of bodies, together with steel turret tops, are spot welded and electric arc welded into a single structure. Four welding machines are employed for work on sedans and coaches and two for coupes.

While on the assembly line, bodies are carried on bucks, which are grasped by fingers extended upward at spaced intervals from the conveyor chain. After bodies have been assembled, they travel on the conveyor up to the second floor, where they are given a washing, a first coat of lacquer, a baking and painting. Then they move on the same conveyor back down to lower level, where they receive upholstery, glass, dash boards and other equipment, and then move to the upper level for a final polishing.

From the end of the polishing line, the bodies are picked up by ar electric hoist and lowered to the chassis line on the first floor, and thence move forward on the main assembly line, while operators perform the various progressive operations that go to make a finished car. During the final stage of the journey, the car is conveyed over the top of a pit. The latter is suf ficiently deep so that workers can stand upright while performing operations underneath the car.

Each of the two main assembly lines is 460 feet long and designed to handle 26 jobs. The final body fit-up conveyor is 205 feet long. There are five storage lines for bodies, each 160 feet long. The assembly lines are arranged to allow sufficient space between consecutive operations to avoid overcrowding along the lines.

Hand Tools Are Suspended

All portable tools, such as electric screwdrivers, which are used in assembly work, are suspended from overhead feedrails so that there are no floor obstructions over which employes might trip and sustain possible injury. This method of suspending tools is typical of the minute detail in attaining better working conditions.

Throughout the entire plant, safety is carried out as a general policy. All aisles are wide and well marked for safety to truckers and

(*Please turn to Page* 81)

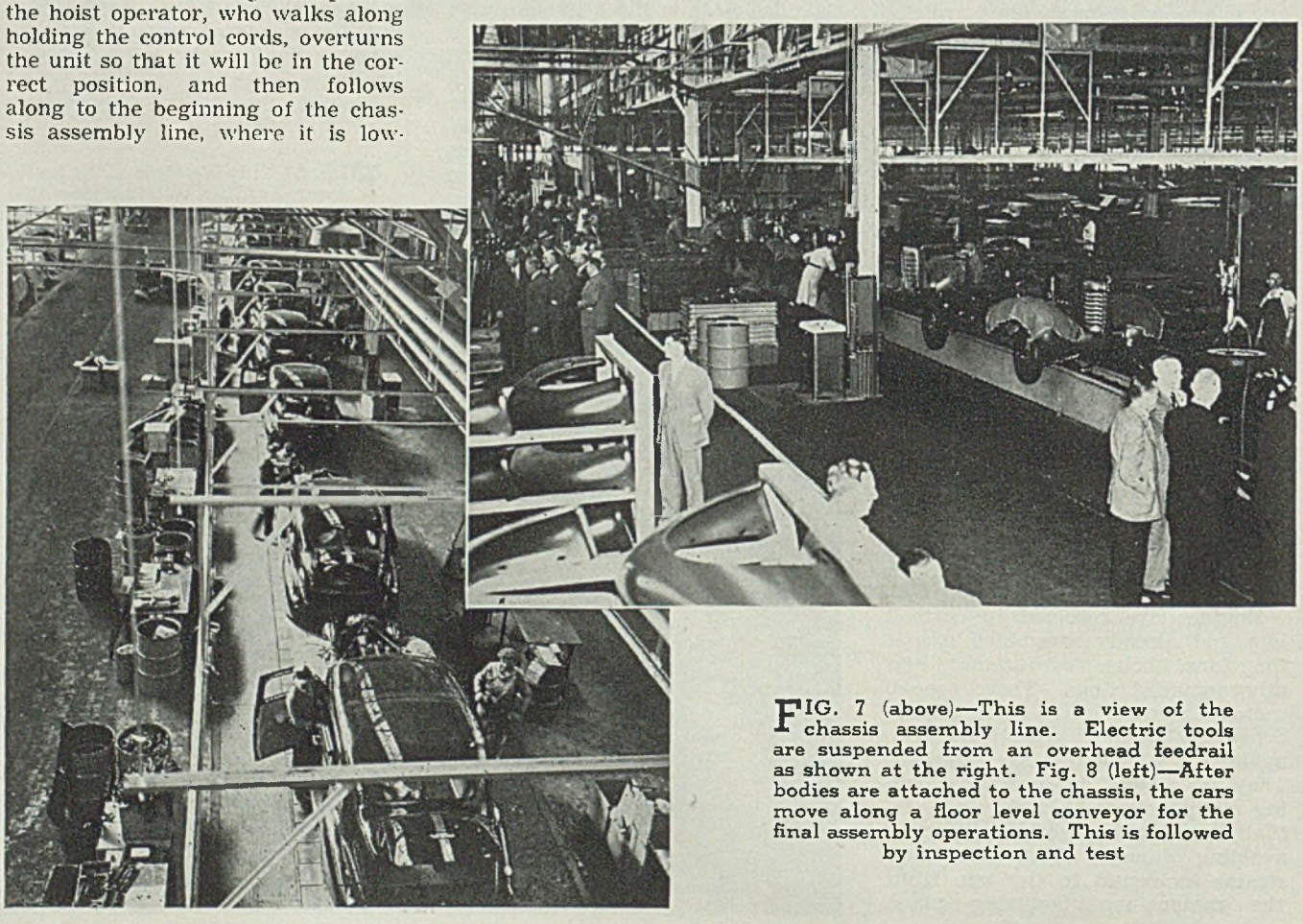


FIG. 7 (above)—This is a view of the chassis assembly line. Electric tools are suspended from an overhead feedrail as shown at the right. Fig. 8 (left)—After bodies are attached to the chassis, the cars move along a floor level conveyor for the final assembly operations. This is followed by inspection and test

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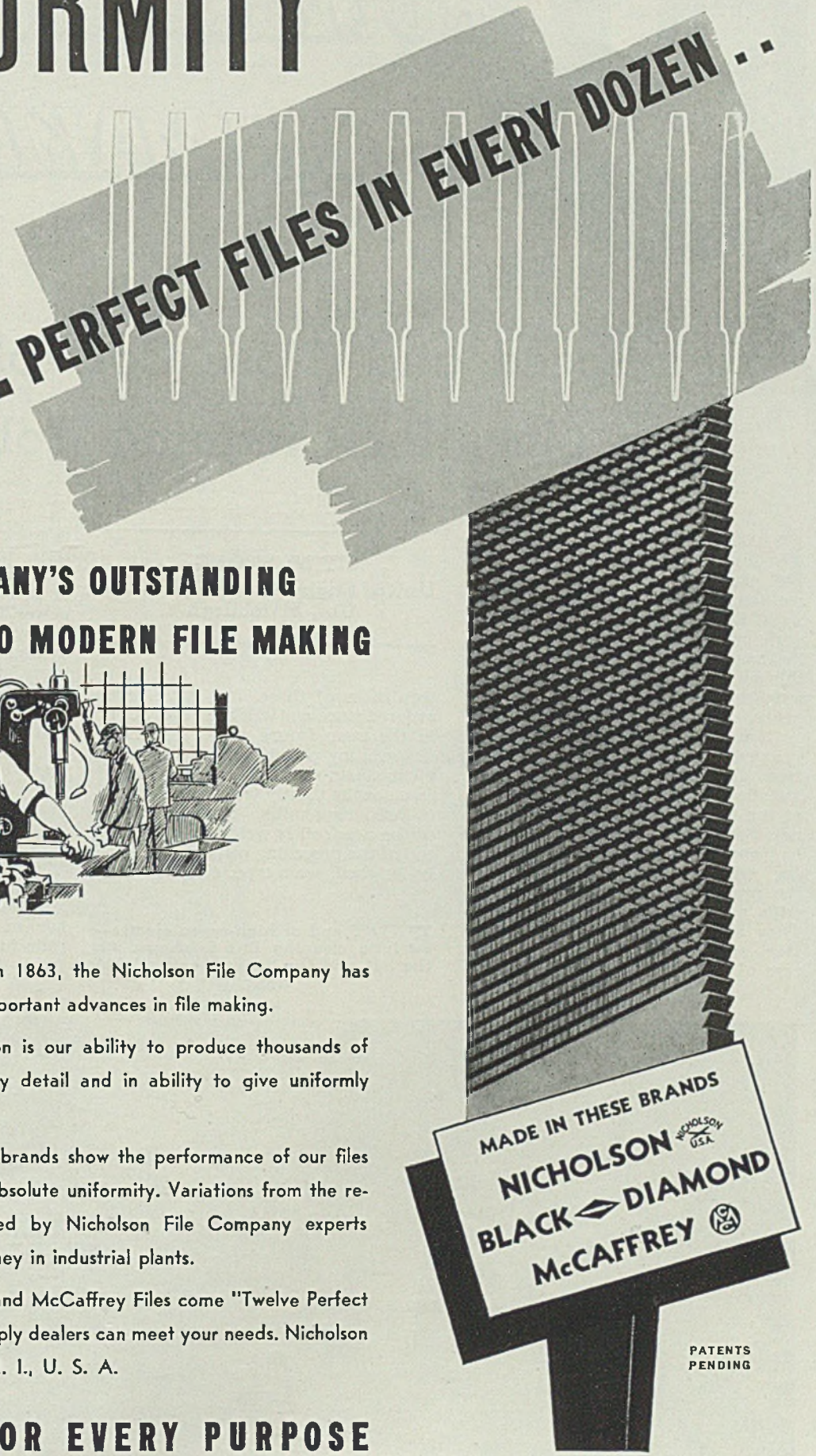

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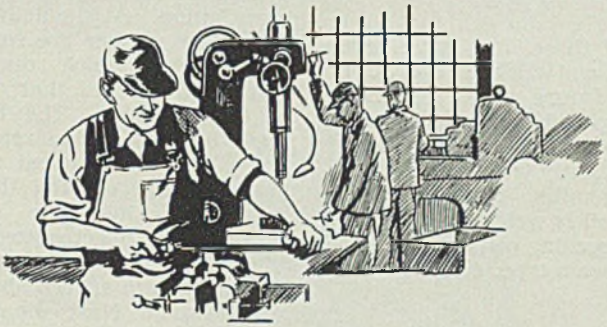

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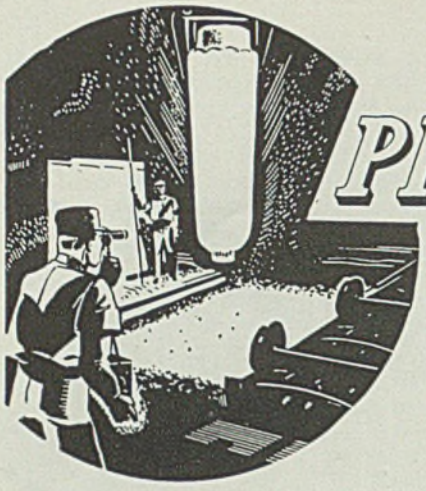
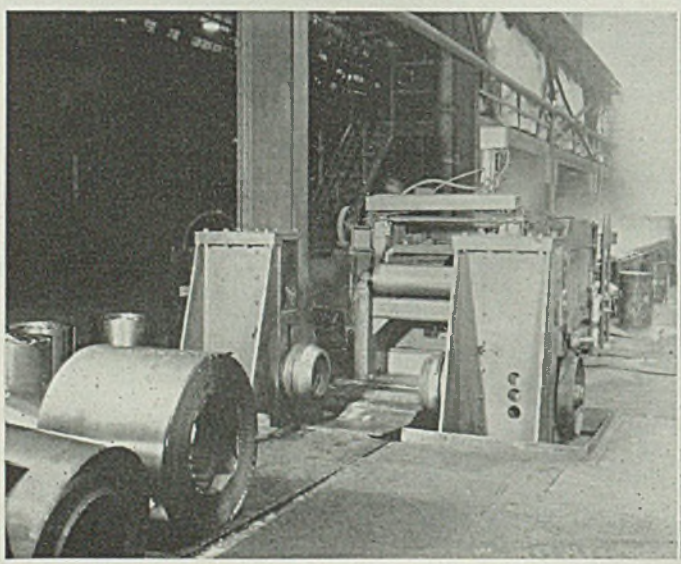


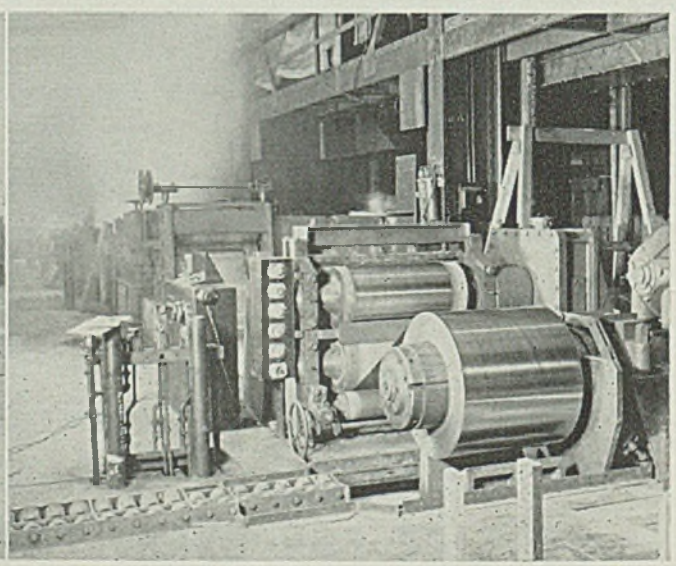
PROGRESS IN STEELMAKING

High-Speed and Close Control Feature New Lines for Cleaning Cold Strip

BY M. STONE,
United Engineering & Foundry Co., Pittsburgh

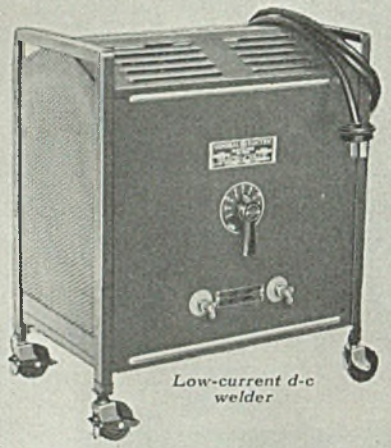
ELECTROLYTIC removal of oil from cold roller strip is a progression from the original method developed by the late Thomas A. Edison for removing oil from wire prior to coating it for use in incandescent lamps. Equipments of this sort have been used in the steel industry for the past three or four years. Recently United Engineering & Foundry Co., Pittsburgh, developed an improved line of this type. The first two such lines were installed about the first of this year at the Gary Works of Carnegie-Illinois Steel Corp. Experience already has shown that they operate with far greater speed and control of the process than has been possible with equipment hitherto available. They are cleaning cold-rolled strip steel successfully at speeds in excess of 900 feet per minute. Fourteen more of these lines have been ordered since and will be in operation in the near future in various cold strip rolling plants. The new equipment starts with an uncoiler which receives the tightly wound coils from cold-reducing mills. The front end of the new coil is welded to the rear end of the preceding coil by a specially-designed, seam-type, electric welder to obtain a continuous flow of the strip through the apparatus with maintenance of the proper amount of tension. It next goes through a power washer whose function is to remove the major portion of the oil by high-pressure sprays of hot cleaning solution. At the delivery end of the power washer are rotary scrubbing brushes which rotate in a direction counter to that of the flow of the material. The function of these brushes is the removal, in a preliminary mechanical manner, of much of the oil and dirt already loosened. Then the strip goes through an electrolyzed tank in which the work is the cathode while the anodes are spaced above and below the strip. Next comes the scrubber in which the main scrubbing rolls further remove sludge and dirt from the strip. Finally, the strip



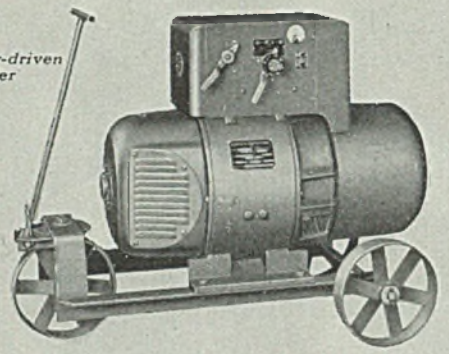


ENTRY end of high-speed electrolytic cleaning line is shown at the left and the delivery end at the right

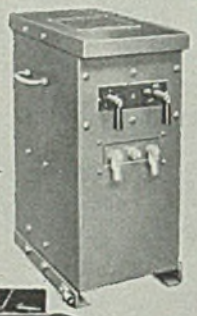
MAXIMUM PROFITS RESULT ONLY WHEN THE RIGHT TYPE OF EQUIPMENT IS USED



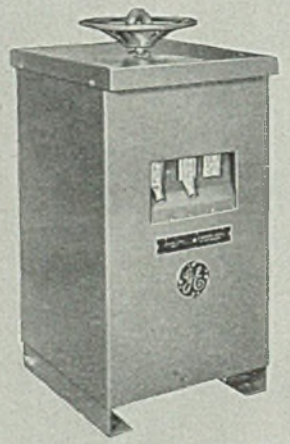
Low-current d-c welder



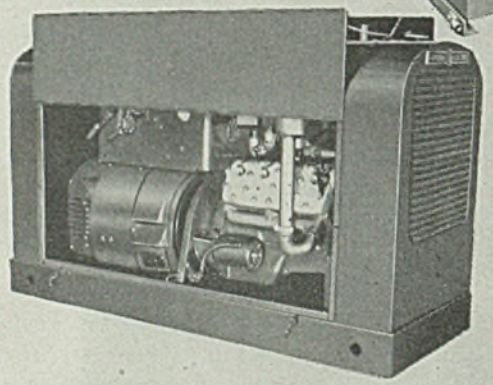
Electric-motor-driven d-c welder



Low-current a-c welder



Typical a-c welder, 1000-amp and smaller

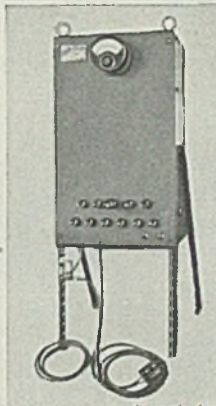


Gas-engine-driven d-c welder

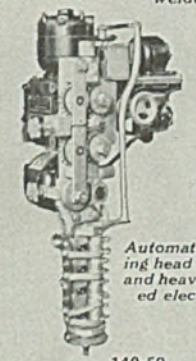
MAXIMUM returns from fabrication and repair work are obtained by users who make doubly sure that their equipment is selected to suit the job. Some savings, of course, can usually be shown with almost any type of arc welder — but *maximum profits* result only when the *right* type is used.

General Electric manufactures the largest variety of arc-welding equipment on the market, thus making it possible for it to supply *any* customer with the *right* type. The costly necessity of compromise selection is avoided. Some of the popular types of G-E welders are illustrated here. No other manufacturer offers such a wide choice.

Are you getting maximum returns from your fabrication and repair work? Your nearest G-E arc-welding distributor or G-E sales office will be glad to assist you in the selection of the type of equipment you need. General Electric, Schenectady, N. Y.



Atomic-hydrogen welder



Automatic welding head for bare and heavily coated electrodes

140-59

GENERAL ELECTRIC

BACKED BY GENERAL ELECTRIC, THE WORLD'S MOST EXTENSIVE USER OF ARC WELDING

passes through a hot-rinse tank whose delivery end is provided with several sets of wringer rolls which dry the strip.

The material is pulled through the line against a controlled back tension by a set of pinch rolls ahead of the wringer rolls. For the purpose of forming clean and straight sided coils at these high speeds a loop is allowed to form between the pinch rolls and the subsequent roll tension drag device which properly guides the strip and provides the controlled back tension against which the rewinding reel operates. This roll tension device is attached to a drag generator and serves as a "flying winch." It produces the same effect continuously that is obtained by wrapping a rope around a post so as to hold heavy weights by means of a light pull. Pinch rolls, roll tension drag and rewinding reel are operated by a motor-generator set with Ward-Leonard control. This arrangement assists materially in controlling the speed and tension during the acceleration and deceleration periods. In addition, this combination permits the high speed to be maintained over a large range of coil sizes.

Whereas all earlier lines have been for the purpose of properly cleaning strip immediately prior to its being used for tin plate, the most recent and revolutionary installation will be for 84-inch wide material to be used in sheet form for special uses.

♦ ♦ ♦

Industry Turns to Diesels

A pronounced recent trend in the purchase of handling facilities by steel plants is the growing popularity of diesel locomotives. They are being used for every kind of incoming handling and outgoing yard and plant service and are being installed in capacities of a wide range, going up to around 900-horsepower. Some of the newer locomotive cranes also are equipped with diesel engines rather than steam boilers. Steel company engineers believe that, while such equipment has about twice the initial cost, it pays for itself in approximately five years.

♦ ♦ ♦

Enlarges Wharf Facilities

Among the bottlenecks in the steel industry at this time are the shipping departments. All through the industry the capacity of loading banks is being increased. More space, more handling facilities, more track storage are being provided. This expansion is due not only to the large volume of shipments, but to the fact that consignments of steel require more pains than formerly required. An increasing percentage of the product is being bundled and wrapped in waterproof protective paper. This is notably the case with quality steels which constitute an increasing percentage of the total output.

♦ ♦ ♦

Vapor Lamps Widely Used

A marked trend in steel plants at the present time is the increasing use of mercury vapor lamps on inspection floors. This is particularly the case in continuous strip, sheet, plate, tin plate and other mills where surface condition of the product is important. The use of such lamps facilitates detection of defects. On the other hand, a good many mills find that consumers are not as particular about inspection as is normally the case. When a customer waits eight weeks or so for a shipment of steel he is apt to use the material if at all possible rather than quibble about slight defects.

♦ ♦ ♦

Install Testing Facilities

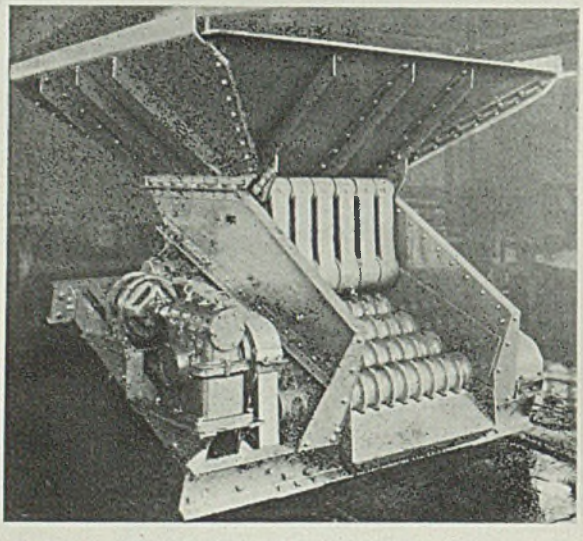
To an increasing extent steel companies are installing facilities for inspecting refractory brick. The purpose is to make sure that incoming brick is in accordance with specifications and to make sure that refractory life will be up to expectations. Some leading refractory manufacturers have encouraged the setting up of such facilities and have extended fullest cooperation in some cases in setting up the testing equipment and procedure. Most frequently the tests are for establishing pyrometric cone equivalents and porosity. In some cases spalling and strength are tested.

♦ ♦ ♦

Eliminates Roll Breakage

Hot and dry rolling of stainless steel at a mill in the Pittsburgh district recently resulted in roll failure. By the adoption of a nickel-chromium-molybdenum chilled iron roll these breakages were eliminated. This type roll is used chiefly for flat work, the softer grades on sheared and universal plate mills, the medium grades for finishing stands of 4-high continuous mills and harder grades for cold-finishing stands. The hardness of the chilled surface has high resistance to spalling and fire cracking. In addition to minimizing the danger of breakage nickel alloy iron rolls require less reduction in diameter per dressing and afford a high finish on the product on which they are used.

Steelmaker Installs Roll-Type Grizzly at Michigan Mine for Segregating Coarse Ore



OPERATORS of hard ore mines will be interested in a recently developed roll grizzly for use in segregating the coarse from the fine ore. This machine may be used instead of the conventional bar-type grizzly which has been employed by the iron ore industry for many years. It affords accurate graduation of material and high output. With a screening area of 3 x 5 feet 4 inches the unit with a 2½-inch opening has an approximate capacity ranging from 100 to 120 tons an hour. The rolls made of chrome-nickel steel are driven by a 5-horsepower motor through worm gears and roller chain. The hopper can be loaded with 65 cubic feet of material. A machine of this type recently was installed at the Greenwood mine of the Inland Steel Co. at Ishpeming, Mich. by the Lake Shore Engine Works, Marquette, Mich.

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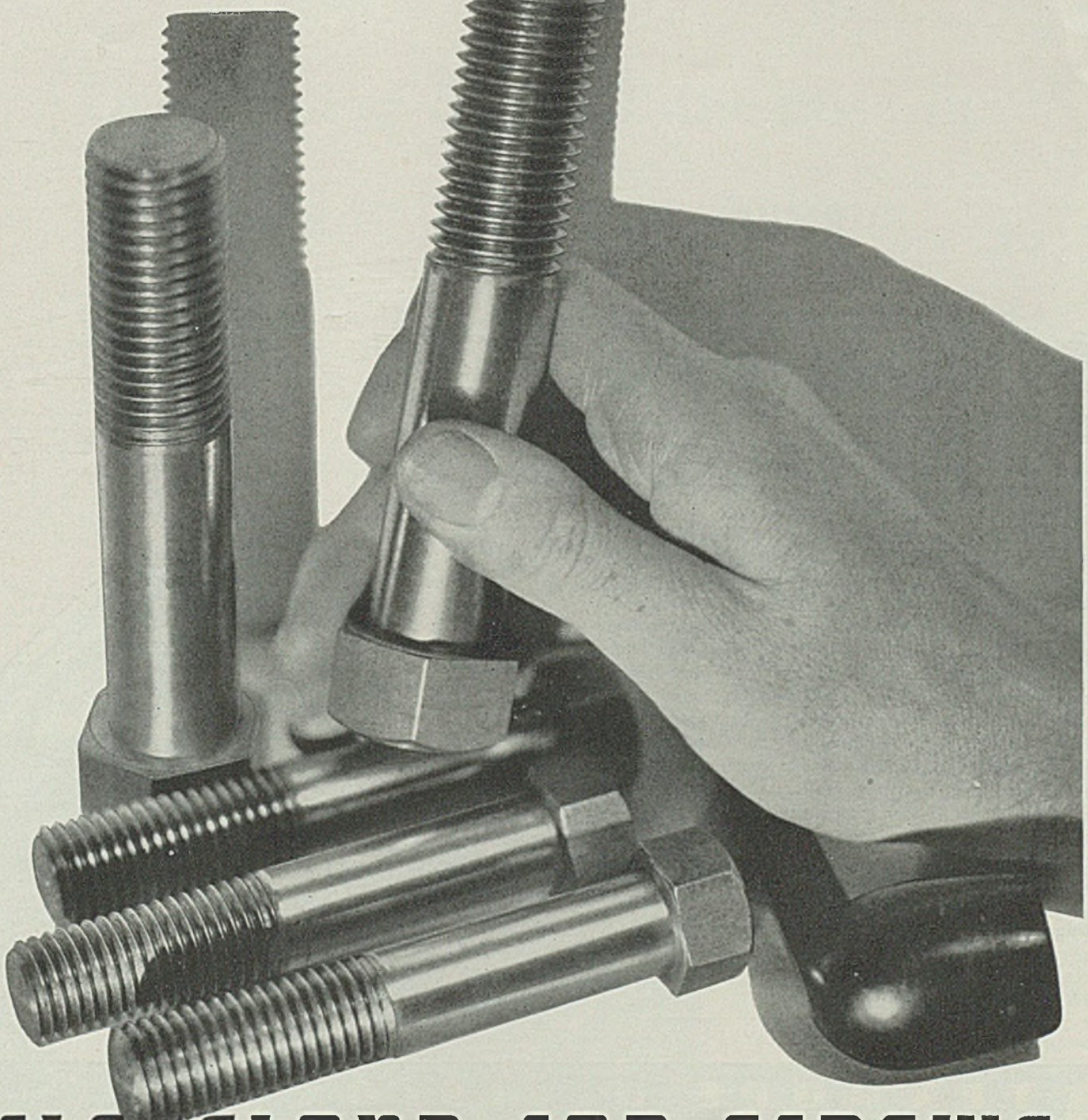

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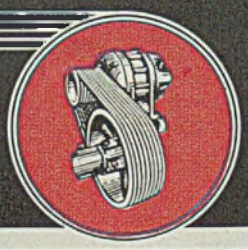
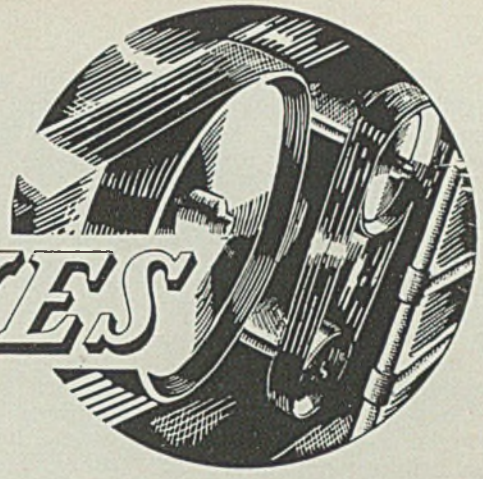


MILWAUKEE WISCONSIN

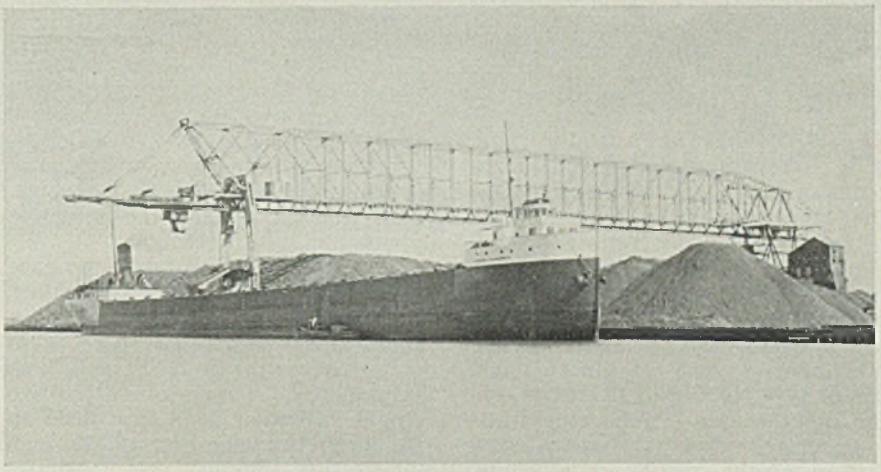
POWER DRIVES



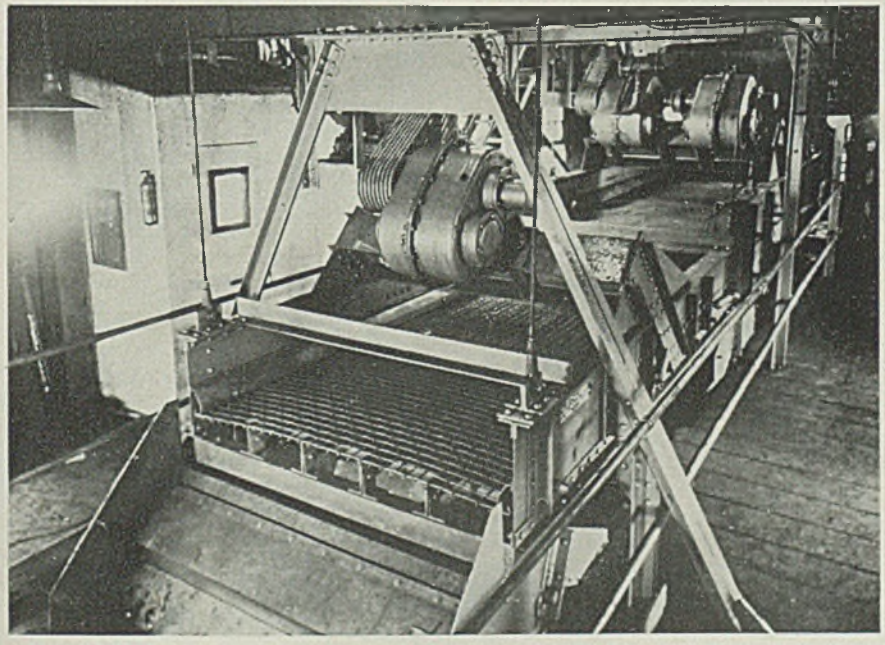
Overcoming Shock Difficulties in Drives to Vibrating Screens

DRIVES to vibrating screens, because of the shock of the vibrating mechanism, are a severe load. In the accompanying illustration of vibrating screens multiple V-belts are used. Both screens are driven by 15 horsepower direct-current motors with vari-pitch V-belt sheaves to permit regulating the speed of screening.

The vibrating mechanism which moves the material forward operates in an oil- and dust-tight housing. Being horizontal, these new screens, developed by Allis-Chalmers Mfg. Co., Milwaukee, during the past year, require a comparatively small amount of headroom for their operation.



PIER end of this movable bridge is equipped with a screening plant for sizing coal before loading in cars. Coal is unloaded at a rate of 600 tons per hour



INSTALLED on the movable coal bridge of Northwestern Fuel Co., Superior, Wis., is this V-belt drive on vari-pitch sheaves. The drive operates vibrating coal screens developed by Allis-Chalmers Mfg. Co., Milwaukee

This screening plant is attached to the pier end of a 715-foot movable coal bridge, one of the largest in the world, at the dock of the Northwestern Fuel Co., Superior, Wis., which has pioneered in the use of vibrating screens located on the movable coal bridges. The screens used are a 6 x 12-foot single deck and a 6 x 14-foot double deck heavy-duty unit. The larger

double-deck screen is provided with a double vibrating mechanism.

This movable bridge can handle 600 tons of coal per hour continuously when handling coal from boats. The clam has a capacity of 10 tons with a hoisting speed of 200 feet per minute and a trolley travel speed of 700 feet per minute. A total capacity of 1120 motor horsepower is installed on the bridge, which is used both for unloading from lake boats and the rapid handling for sizing and delivery to railroad cars.

Progress in coal handling is indicated by the fact that the founder of this company first unloaded boats of 250 to 300 tons capacity by hoisting the coal from the hold in hand-filled half-barrel buckets by a horse on the shore and moving it ashore in wheelbarrows. Later steam power was substituted for the horse. This installation is only one of many whereby through the application of power back-breaking labor tasks have been eliminated and costs of performing work kept at a minimum.

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Shafts on Sloping Ceilings Present Difficult Problem

A MIDWESTERN metal-working concern recently moved into a building which had been erected for the occupancy of a manufacturer of textile products. As sewing machines are never driven from overhead the ceiling structure consisted of light I-beams supporting the roof and was not designed to receive the additional weight of lineshafting. These I-beams sloped from the center monitor bay to the side walls to provide the necessary roof pitch.

Most of the metalworking equipment in the old plant was designed for lineshaft belted drive, and the management was favorable to continuing the use of group drive. Providing individual drive for each machine with the additional expense for motors, mounting, wiring and control would have used much of the available funds. This would have depleted the capital available for the expansion of equipment and other facilities, which made the move necessary.

The superstructure to support the stringers for the lineshafting, therefore, had to be attached in such a way as to add a minimum load to the ceiling and also provide a horizontal base, instead of a sloping or inclined base. The solution adopted was to suspend horizontal 8-inch I-beams attached by clamps to the sloping ceiling beams. The two clamps on each beam are attached near the ends close to the sidewall and the building column, thus making the additional weight on the ceiling beam a shearing rather than bending load. These 8-inch I-beams were also tied to the building columns and wall to prevent side sway.

The horizontal I-beams extending across the center bay under the monitor did not support any roof load, simply tying the span together. These I-beams were strong enough to support stringers for lineshafting.

Two 6-inch channels, mounted back to back with spacers to permit inserting bolts for the cross footings for the hangers were used in pairs for stringers. These were bolted to the 8-inch I-beams for mounting lineshafts extending lengthwise of the building. In sections of the plant where the lineshafts were installed across the building a pair of 8-inch I-beams were attached to the cross beams installed.

This method of installation takes care of all shafts installed at low expense. As the beams were clamped together, practically no drilling and fitting was necessary. Over the floor-space left vacant for expansion this overhead reinforcing has been omitted until required.

Some of the larger and special machines are individually driven. Several of these machines are multi-motored. Groups are small, consisting of five to eight machines from a single shaft. These small groups, with a few individually driven units of each type of machine, take care of special and overtime production requirements.

Each shaft is a unit as in no case are two shafts cross-belted together. All shafts are driven by silent chain enclosed in an oil-tight case from motors operating at 1200 revolutions per minute. This permits a positive single reduction at a low ratio to the lineshafts operating at 250 revolutions per minute. All lineshafts are mounted in dumbell type ball bearings with dust seals to protect them against abrasives in the air from the grinding operations.

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Avoid Large Reductions

ATTEMPTING to make too great reductions in speed in a single step, particularly where the drive is heavily loaded or subjected to shock loads, is often responsible for trouble in drives. For example, in a drive to a machine controlled by a clutch the engineer used a 7-inch motor pulley to drive a 24-inch clutch pulley. When the clutch was thrown in, the motor belt slipped excessively.

After various expedients were tried, such as attempting to increase tension and installation of a jackshaft with a crossed belt, the drive continued to cause trouble.

The final solution of the trouble was obtained by increasing the motor pulley to 11 inches in diameter and obtaining the reduction in 2 steps through the jackshaft instead of one. Also, the belt from the jackshaft to the clutch pulley, which received the shock of the engagement of the clutch, was made 1-inch wider and heavier than the higher-speed motor belt. On the last of the installations special belts were used.

Another point often overlooked but found in this installation is that heavier belts may be required on the second reduction than on the first. In this case one reason was to absorb the shock load of clutch engagement. The most common reason, also applicable here, is that horsepower transmitted is a function of speed and tension. With decreased speed either the tension, or preferably cross section of the belt, must be increased to transmit the same amount of power from the motor. This power transmitted to the machine would be the same as that supplied by the motor except for the minor loss in the jackshaft. Neglect to take decreased speed into account when designing belt drives with multiple reductions is a common cause of trouble.

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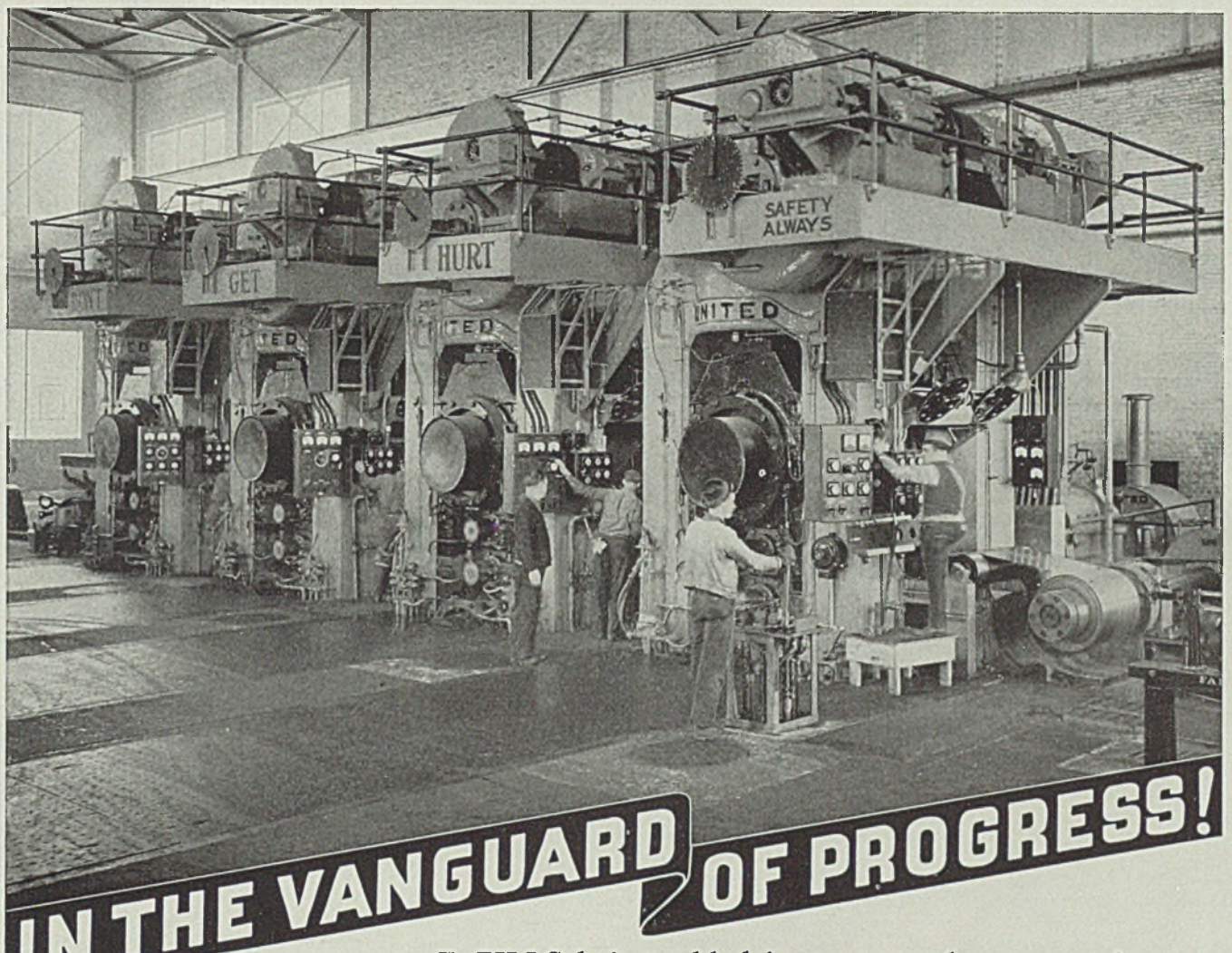
Fewer Neglected Bearings

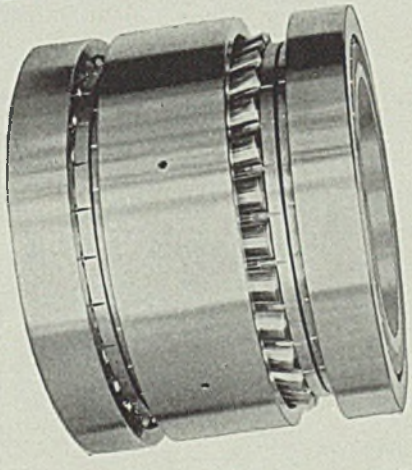
LUBRICATION points difficult of access or presenting an accident hazard to the oiler are often neglected. Several methods of making oiling or greasing points more accessible or safe are available to the plant engineer although the designer of the machine should have considered and provided for these important factors in its construction or used antifriction bearings which require attention only at long periods.

Where bearings are pressure grease lubricated replacing the straight fitting with an angle fitting is a cheap and quick method of overcoming most of the difficulties. In some cases it will be necessary to add a short length of tubing to carry the fitting to a more accessible point on the outside of the machine. This tubing must be mounted securely to withstand the pressure of application. Similar pipe lines may be used with oiling and, if short, with screw-down grease cups.

Providing a centralized oiling or greasing panel with tubing to all bearing openings and fittings or closures on the lines at the panel is probably the best method of insuring attention to all points of lubrication where the engineer or designer does not consider it necessary to provide full automatic lubrication or antifriction bearings.



IN THE VANGUARD OF PROGRESS!



The bearing shown is one of 20 furnished for this new mill in the Warren District. It is a BANTAM 4 Row Tapered Roller, 26″ I.D. x 42″ O.D. and 25½″ long.

MILLS being added in a tremendous expansion program by one of the industry's leaders, graphically demonstrate the desire of business leaders to give better service and better products to their customers.

The new 4 Hi Cold Strip Mill for rolling tin plate, recently completed in the Warren District, is an important part of this development. It very naturally represents the last word in modern equipment designed to produce tin plate economically.

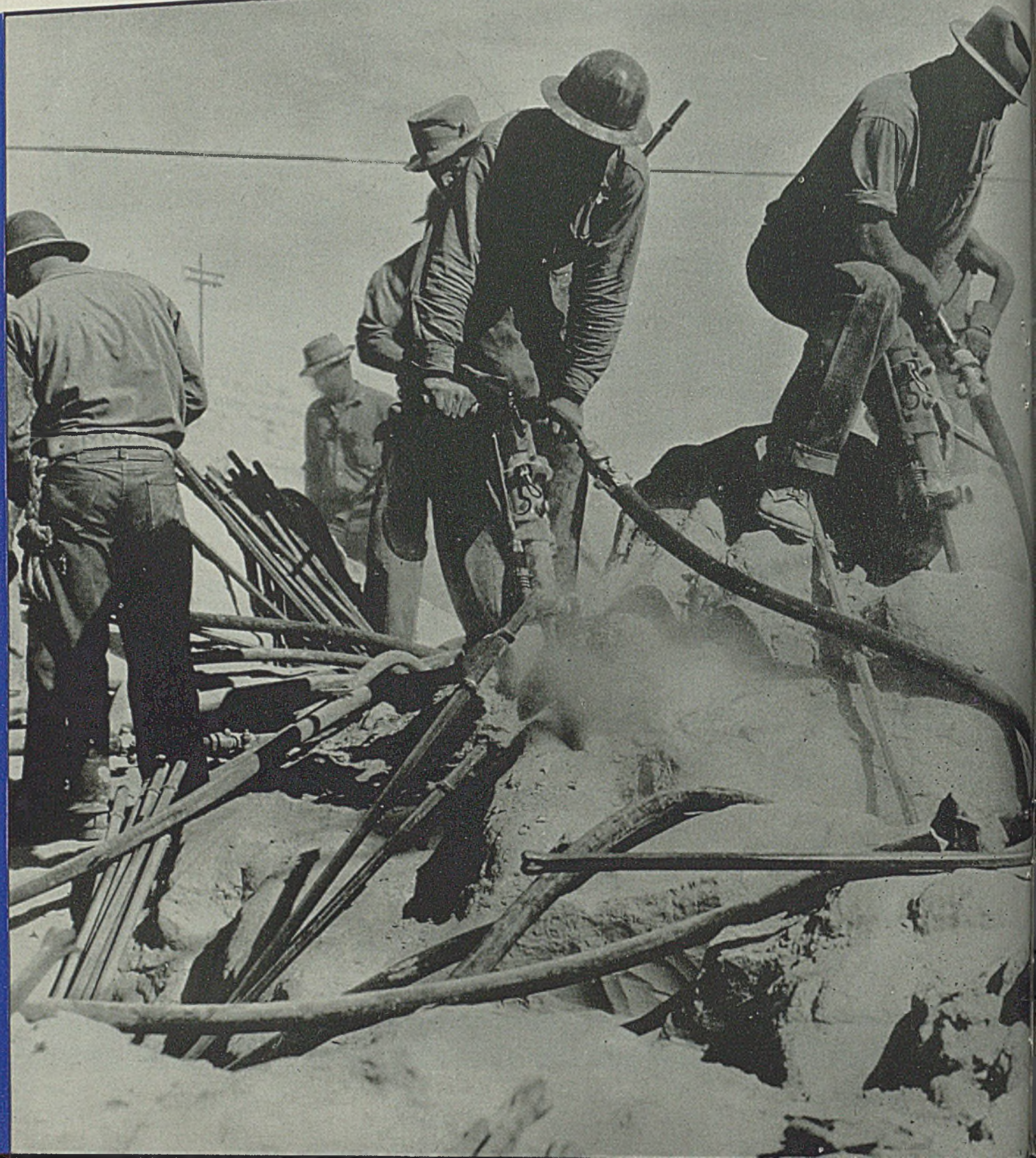
We feel that the choice of BANTAM Tapered Roller Bearings as original equipment on this mill is an indication that BANTAM engineers are also keeping pace with the requirements of industry.

BANTAM BEARINGS CORPORATION
SOUTH BEND, INDIANA
Subsidiary of THE TORRINGTON COMPANY
Torrington, Conn.

BANTAM BEARINGS

TAPERED ROLLER • • • STRAIGHT ROLLER • • • BALL BEARINGS

THEY "Go to bat" FOR



U·S·SUPER ROYAL CORD

Air hose

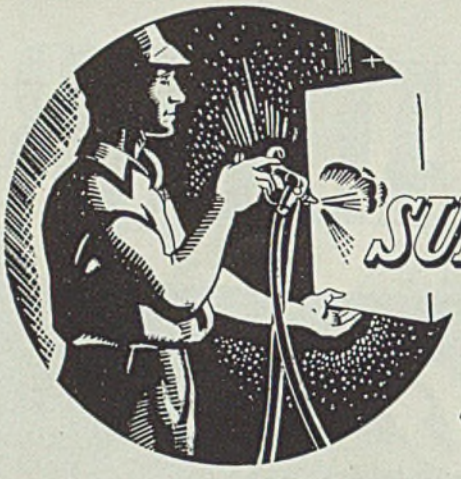
"MEN BEHIND THE GUNS" **on industry's roughest jobs go to bat for U. S. Super Royal Cord Air Hose because it absorbs punishment without quitting—and comes back for more! Literally, they like its guts! Briefly, here are the specifications of this remarkable hose that's built like a tire: High-grade oil-resisting tube; four spirally laid, extra-strong cord plies separately cushioned in rubber; and a very thick cover of extreme toughness bonded to this impact-and-pressure-proof carcass. Into U. S. Super Royal Cord Air Hose is built U. S. Rubber's matchless engineering skill; its special knowledge of the chemistry of rubber; and its years of experience in the manufacture of every kind of mechanical rubber goods. That's why U. S. Super Royal Cord Air Hose gives—**

SERVICE BEYOND PRICE AND SPECIFICATIONS

UNITED STATES RUBBER COMPANY · US · TRADE MARK

United States Rubber Company

United States Rubber Products, Inc., New York, N. Y.



SURFACE TREATMENT AND FINISHING OF METALS

Rustproofing Process Involves Electrodeposition of Metal Alloy

A NEW type of rustproofing process involving the electrodeposition of a special alloy metal is announced by Oxoseal Co. Ltd., 815 West Hastings street, Vancouver, B. C., Canada.

The process is carried out in ordinary still or continuous plating tanks or treating barrels, using direct current with a tank voltage of from 1 to 6 volts and a current density of from 2 to 5 amperes per square foot or per pound depending on the type of work being processed. Thickness of the coating varies from 0.0001 to 0.0005-inch and time of application from 5 to 15 minutes. Coatings of specified thickness may also be applied.

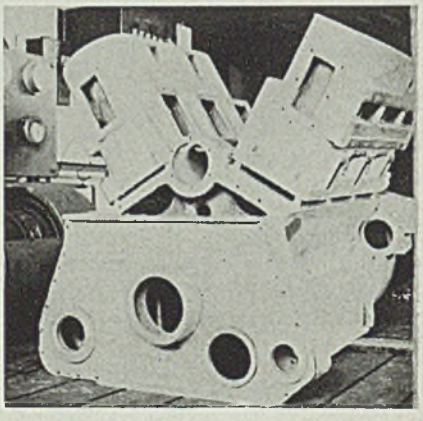
The company claims that the Oxoseal alloy penetrates the surface porosity of the treated part, thus forming a perfect bond with the metal.

As the process is applied at room temperature, the temper or strength of the treated part is not affected.

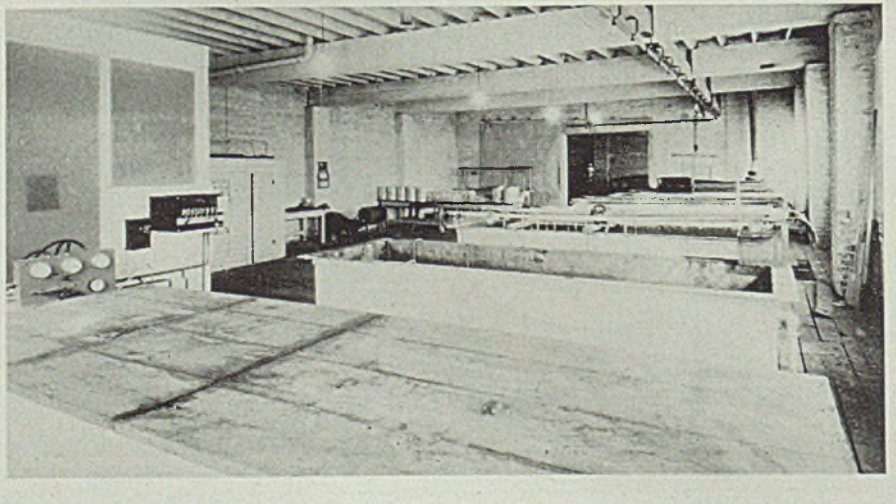
The alloy coating has a pleasing appearance resembling silver and will take a high polish. Treated metal can be welded or soldered or can be plated with some other metal such as nickel or chromium. Lacquers also adhere readily to this alloy. Structural steel, after treatment with Oxoseal, can be assembled with hot rivets without impairment of the protection even under the rivet heads.

The solution is said to have great throwing power and give uniform coverage with low power consumption. Solution balance is easily maintained from the anodes without the addition of salts, according to the company. Anodes are supplied in sizes and shapes to suit the user and solution is delivered in steel drums ready for use. A research laboratory is maintained and no charge is made for consultation.

The coating is said to be very corrosion resistant, treated wire screen having withstood the standard salt-spray test for 753 hours



V-TYPE diesel engine shown here is typical of heavy machinery which can be advantageously rustproofed by the Oxoseal process



INTERIOR view of rustproofing plant where all types of metal products can be treated for protection against corrosion. Tanks shown here are for heavy parts. Barrel units are used for small parts

THE Dings Magnetic Clutch is 30% heavier than the ordinary clutch. The hubs are of high quality steel far superior to cast iron hubs. Friction surfaces are larger for better wearing and are provided with a perfect means for adjustment. Capscrews are locked tight and cannot work loose. Through and through it is a Mill Type Magnetic Clutch—simple, rugged, tough!

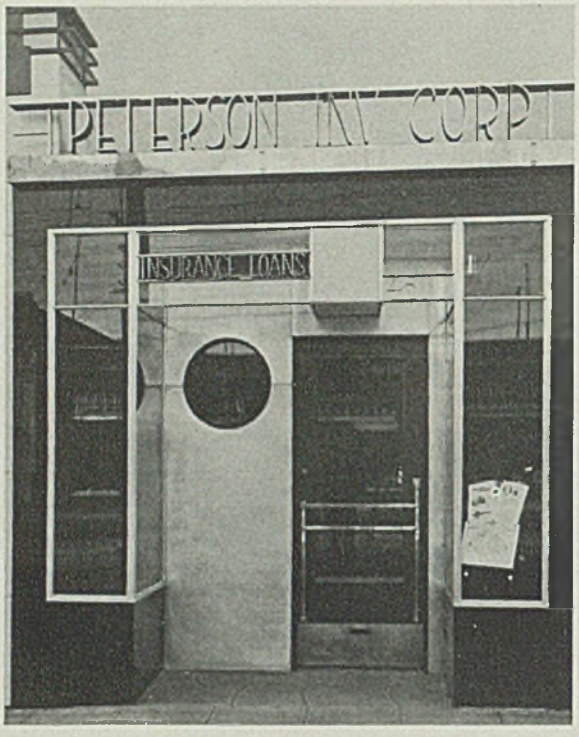
Here is the ultimate in positive action and sensitive control for synchronizing those "brute" motors on the screw-downs of your rolling stands.

Equipment for the steel mill must be of the most rugged and sturdy construction possible if it is to stand up under the severe treatment it receives. Dings Engineers have kept that in mind when designing their clutch. As a result, Dings Magnetic Clutches are a favorite with the leading steel industries, such as Republic Steel Corp., Sharon Steel Hoop Corp., Carnegie-Illinois Steel Corp., Jones & Laughlin Steel Corp., Ford Motor Co., Otis Steel Co., Youngstown Sheet & Tube Co., and many others.

DINGS MAGNETIC SEPARATOR COMPANY
663 Smith Street
MILWAUKEE, WIS.

Dings High Intensity MAGNETIC CLUTCHES

Experience that goes back to 1899



STEEL sash, door panels, grill work and metal trim acquire a silver-like appearance when rust-proofed by this process

without breakdown. The process can be applied to parts which must be held to close dimensional limits without necessity of preliminary undercutting or subsequent machining, thus is applicable to threaded and closely machined parts. The protective coating has no effect upon conductivity and has a low co-efficient of friction.

The Oxoseal process has been in commercial use on the Pacific coast for the past four years where it is being used in such lines as woven wire, structural steel, machinery and equipment, pole line hardware, building hardware, and many specialty lines. It has been found especially suitable for use on marine equipment such as bilge pumps, deck hardware and other parts exposed to corrosion. Other uses include ornamental metal grills, railway equipment, refrigerator equipment, canning machinery, automobile parts and many others.

It is understood that in the use of the process there are no objectionable fumes or gases injurious to the health of plant operators.

The use of the process is granted under license. Full particulars may be had by writing to Oxoseal Co.

Electroplates Iron at Five Times Usual Rate

A method by which iron can be deposited from an electrolytic bath at five times the usual rate has been developed by Charles Kasper of the electrochemistry section of the national bureau of standards.

Many of the plates used by the bureau of engraving and printing for printing currency and securities are made by electrodeposition of nickel and iron, and are finally coated with a thin, very hard layer of chromium.

In seeking to improve the electrolytic process, it was found that by careful control of the temperature and acidity of the iron chloride bath, it was possible to deposit iron (which makes up most of the printing plate) at the rate of about 0.012-inch per hour, or about five times as fast as usual. However, the favorable conditions for this rapid deposition are more critical, and hence the process will probably be used chiefly on special occasions, as for example, when new designs of plates are to be made, it was stated.

Nickel Plate Thickness Measured without Damage

A nondestructive method for measuring thickness of nickel coatings on metals such as brass and zinc has been developed by the national bureau of standards. It is believed this method will prove useful for factory control of nickel plate on many types of nonferrous articles.

To make the test a small spring balance is used to measure the force of attraction between the nickel coating and a small permanent magnet. Thickness of nickel is indicated by the reading of a dial which is standardized against a similar nickel coating of known thickness. Before testing nickel coatings of unknown origin they should be annealed for a short time at 750 degrees Fahr.

In general, the protective value of nickel coatings on either steel or brass, including those covered with the usual thin chromium layer, depends largely upon the thickness of nickel. This has usually been specified in terms of average thickness but now certain minimum thickness is often required, especially on irregular parts. Rapid methods of measuring thickness at any point are therefore desirable but most methods now in use destroy either the coating or the entire article.

This new method is described in Research Paper 994 and can be obtained from the Superintendent of Documents, government printing office, Washington, D. C.

Compound Permits Painting Of Surfaces While Damp

Damp surfaces can be painted with ordinary paint, varnish or lacquer when a new compound is added in 1-19 proportion, according to the manufacturer. The compound is said to combine with water forming a substance which rises to the surface of the paint film, decomposes and evaporates.

Further information concerning this compound may be obtained by writing to U. S. Industrial Chemical Co. Inc., 60 East 42nd street, New York.

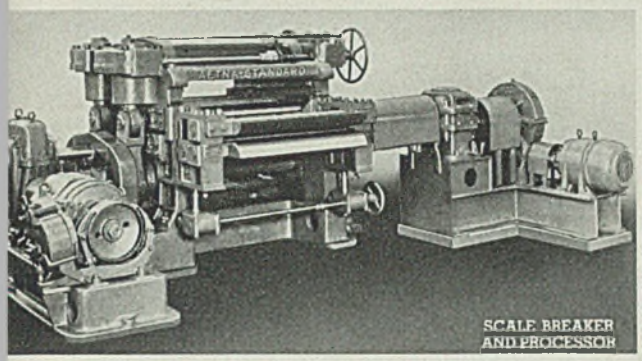
Electro-Galvanized Sheets Will Be Produced Soon

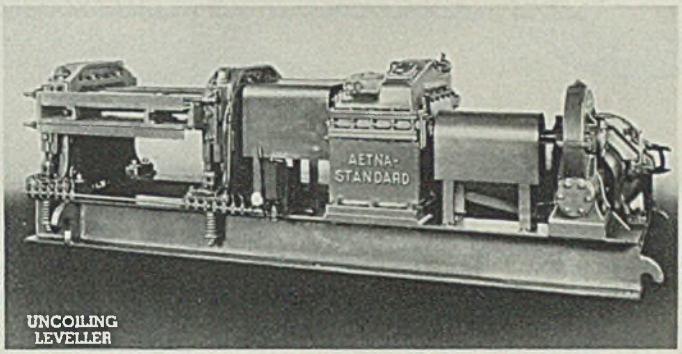
Electro-galvanizing of wire having met with full success attention has been turned to the production of electro-galvanized sheets. A pilot plant capable of making standard full sized sheets has been in operation for some time. A unit of commercial size will be placed in operation in the near future.

Sheets present certain special problems, one of which is the question of the best type of finish to be employed. It is perfectly practicable to produce a bright surface, even spangled if desired, but in so doing the disability to which hot-dipped sheets are subject is encountered, namely the poor adhesion of paint to newly galvanized sheet.

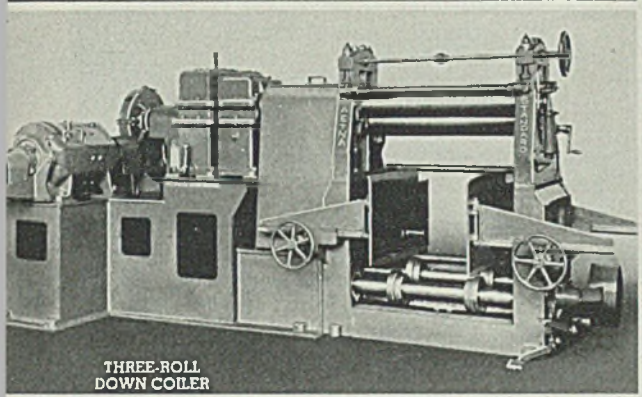
With the electrolytic process there is a greater freedom of choice with regard to certain variables and it is desired to investigate the field more fully before going into full commercial production.

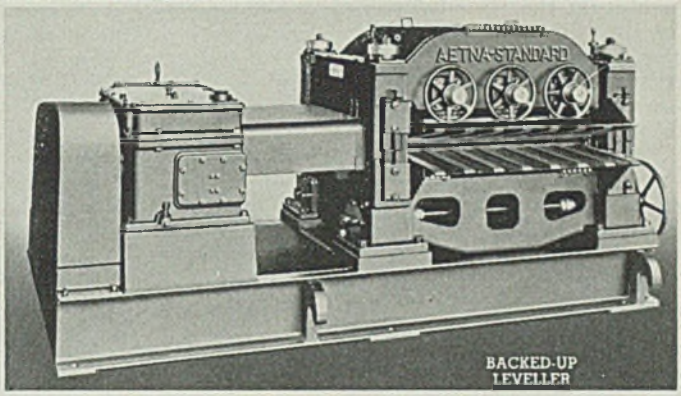
MODERN MACHINERY for MODERN MILLS


SCALE BREAKER AND PROCESSOR

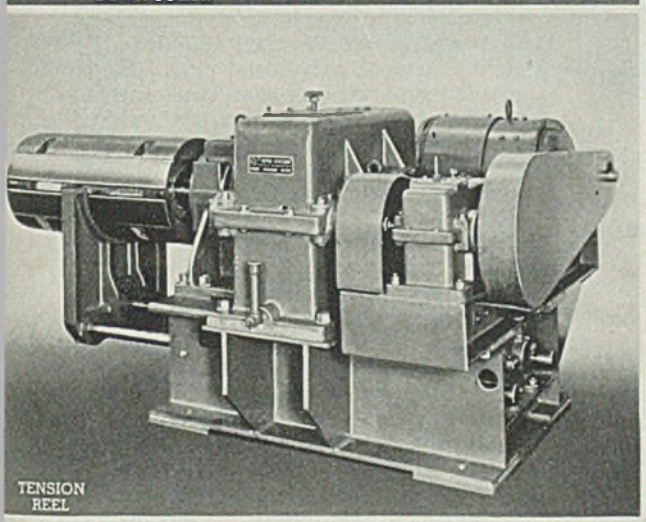


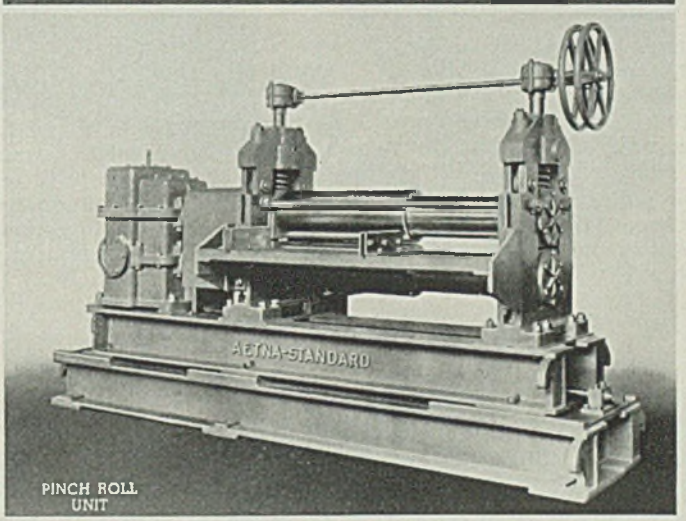
UNCOILING LEVELLER


THREE-ROLL DOWN COILER



BACKED-UP LEVELLER


TENSION REEL



PINCH ROLL UNIT

THE AETNA-STANDARD ENGINEERING COMPANY has established a reputation for building high grade, efficient auxiliary equipment used in processing strip and strip sheets.

As builders of *modern machinery*, AETNA-STANDARD has become the leader in furnishing Strip Finishing Equipment: such as Continuous Strip Picklers, Two and Four High Levellers, Coilers, Uncoilers, Shears, Cut-To-Length Lines, Straight Line Galvanizing and Tinning Equipment.

AETNA-STANDARD also designs and builds Straighteners, Cold Drawing Equipment, Seamless Tube Mills, Bar and Billet Mills, Edging Mills and other types of Rolling Mills for ferrous and non-ferrous industries.

THE **AETNA-STANDARD** ENGINEERING COMPANY

CONSULTANTS · DESIGNERS · BUILDERS

STEEL AND NONFERROUS INDUSTRIES

YOUNGSTOWN « OHIO » U.S.A.

WELDING, ETC.

BY ROBERT E. KINKEAD

Best Informed in Welding Seek Even More Knowledge

AT A recent organization meeting of the Youngstown, O., Chapter of the American Welding society a man from the Greenville, Pa., plant of the Chicago Bridge & Iron Co., handed in 29 applications for membership. Similar solidarity is being shown by others who have seen the vision of what is to come in welding. It has been our privilege to see the list of those who are participating in the building of the technical structure of the industry. It is perhaps a paradox that those who know the most about welding are the most eager to know more. Men and managements of the rich, the powerful, the companies that lead, are the most active and persistent in perfecting the state of technical knowledge about welding. One might expect that those who do not know about welding would be most active in acquiring new knowledge and information. Such is not the case.

Of all the political schemes which have ever been devised to give the same reward to the dumb as to the smart, none has so far worked. Human will to survive, enthusiasm, willingness to work creates a division between those who want to do more, to have more, and to know more and the others who want to get more and do less.

With a possible expansion of the welding industry of eight to one before the next big depression catches us, men who want to do well for themselves are interested in the subject.

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

• • •

Welded Pipe vs. Seamless

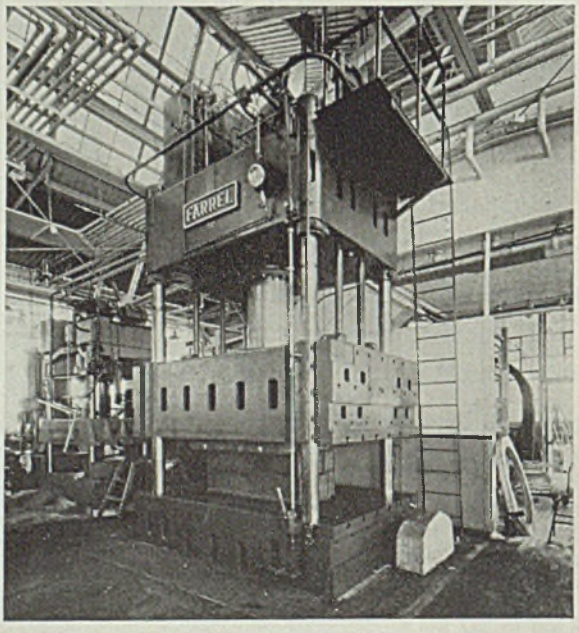
COMPETITION in the field of pipe and tube revolves around the question of whether it is seamless or welded. Large producers with millions in capital investment are on each side of the argument. Probably no competitive race ever involved a larger number of complicated problems. If those whose judgment has led them to pin their hope on seamless as the winner are in error, they stand to lose many millions of dollars in equipment which must be scrapped. On the other hand, any kind of a welding set-up for production of commercial tonnages of welded pipe is expensive and if it proves impractical, the loss might be fatal.

Leaving out of account the cases in which either seamless or welded pipe are on an economic parity, which in general involve mechanical uses, the battle will be waged in the large tonnage markets which are present for small diameter pipe and line pipe. Welded pipe has consistently won by far the greater tonnage in these fields. If there are any reasons why this condition will change, they are not yet apparent. On the other hand, there are legitimate reasons for believing that welded pipe will broaden its market as improvements in the various cladding processes are made. So far, seamless tube is of uniform maerial. The difficulties in the way of making surface different from body of the metal are almost insuperable in the seamless process but relatively simple in the case of welded pipe.

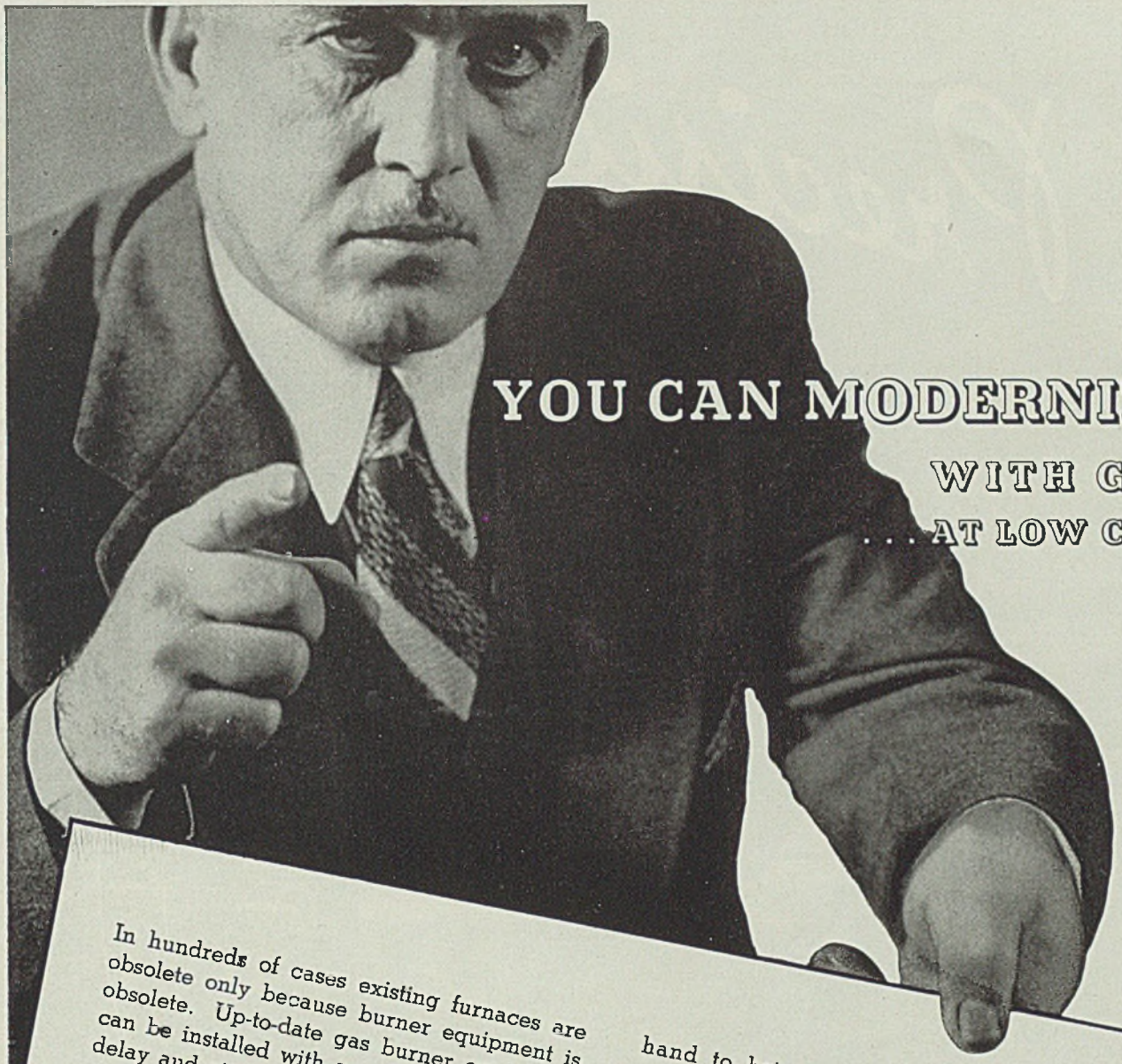
The idea of protecting the surface of metal in pipe is well illustrated in the case of galvanized pipe. Use of such superior corrosion resistance as may be obtained from the chromium and chromium nickel alloys may be expected—particularly as it becomes possible to get this protection at lower costs. Corrosion conditions are almost never the same on the inside and the outside on pipe used for any purpose other than mechanical. The idea of using a uniform material to make the conduit means that the worst condition determines its analysis and cost. Thus the corrosion conditions on the inside of the pipe might require 18 and 8 while ordinary low carbon steel would be entirely satisfactory for the outside surface. Made in seamless, the entire body of metal would have to be 18 and 8 at a high cost. Using clad or coated metal and making the pipe by welding the cost might be very much less.

But for the implications of the new processes of making ingots and slabs of two or more metals, it is conceivable the seamless tube manufacturing process might become perfected to compete in cost with welded pipe for any use. But seamless now has the tough side of the argument because it can move only in the direction of lower cost, while welded pipe can move in two directions—very much higher quality and lower cost.

New Press for Aircraft Plant



BUILT for blanking and forming duralumin parts in the Chance - Vought Aircraft division, East Hartford, Conn., is this 500-ton Farrel hydraulic press of down-acting type with self contained oil power unti and having 24-inch diameter ram, 2250 pounds per square inch working pressure, 60-inch opening, 36-inch stroke and platen area of 80 x 126 inches



YOU CAN MODERNIZE WITH GAS ... AT LOW COST

In hundreds of cases existing furnaces are obsolete only because burner equipment is obsolete. Up-to-date gas burner equipment can be installed with a minimum amount of delay and at only a fraction of the cost of a complete new furnace.

In this way many furnaces are converted to gas, gaining all the advantages of this preferred fuel. In many instances, where gas has always been used, up-to-date burner equipment, improved controls and new knowledge of gas utilization—all work hand in hand to bring important new economies.

Manufacturers who have modernized with gas report many worth while advantages. Typical statements are: "Paid for itself in a few months," "Reduced fuel costs 40%," "Saves time, improves quality, permits accurate control of heating and reduces over-all costs."

It will pay you to consult your gas company about efficient and up-to-date gas burning equipment and what it can do for you in the way of increasing production, making a better quality product, and reducing over-all costs.

THE TREND TODAY IS TO GAS

THE MODERN INDUSTRIAL FUEL

AMERICAN GAS ASSOCIATION

INDUSTRIAL GAS SECTION: 420 LEXINGTON AVENUE, NEW YORK

Review Progress in Gas Radiant Tube Furnaces And Atmosphere Control

INDUSTRIAL applications of gas continue to reflect the progress of research and development in this field. Evidence of this was given in papers presented at a national conference on industrial gas sales held in Chicago, June 8-9. The meeting, sponsored jointly by the industrial gas section of the American Gas association and the Midwest Industrial Gas Sales council, attracted an audience of about 150.

Four of the papers comprised a comprehensive review of the application of gas radiant tubes to different types of furnaces. Controlled atmospheres provided the subject for two papers while the seventh was a report on the use of gas engines for power generation. This last subject, representing a radical departure in adaptation of gas engines for power development, is believed to open a new and broad field for use of this equipment.

Describes Changed Furnace

Ralph L. Manier, Niagara Hudson Power Corp., Syracuse, N. Y., was chairman of the opening session. In a paper, "Application of Gas Radiant Tubes to an Enameling Furnace," George M. Parker, Mississippi River Fuel Corp., St. Louis, described an installation at the National Enameling & Stamping Co. plant, Granite City, Ill. The furnace formerly was heated by electric elements prior to the use of the gas radiant tubes. Following a year's operation, a fuel cost saving of $20,000 was reported. This was accomplished on a gas rate of 30 cents per 1000 cubic feet, compared with electricity at 1 cent per kilowatt-hour. Production increased 20 per cent in the same period.

Better drying of the ware and smaller temperature differential between the top and bottom of the furnace also was noted by the speaker. Favorable results from this unit are marked compared with the performance of another furnace of identical capacity in the same plant. The latter, of latest design prior to introduction of the radiant tube and employing a nickel alloy muffle, requires about twice as much fuel to produce the same quality and quantity of ware as the radiant tube furnace. Temperature range from top to bottom of the furnace is controlled less easily, and cost of upkeep is higher.

Valuable operating data were contained in a paper on "Application of Gas Radiant Tubes to Batch Type Enameling Furnaces" by F. S. Markert, Ferro Enamel Corp., Cleveland. Describing the 3½ x 6½-foot box type furnace used in his own plant for laboratory control, Mr. Markert said, "The maximum gas consumption is 750 cubic feet per hour (1050 B.t.u.) and it has now been in constant use for 14 months. Consumption figures are of no importance since there is no uniformity of loads, ware burned, etc., but at a 48 cent gas rate for natural gas its operating cost averages $75 per month. More than three dozen technicians use it and each requires varying but accurate operating temperatures from 1250 to 1650 degrees Fahr."

A paper on "Application of Gas Radiant Tubes to Galvanizing Furnaces," by A. M. Thurston, East Ohio Gas Co., Cleveland, was a detailed description of a recent installation at the plant of the National Telephone & Supply Co. of that city. One of the outstanding achievements of this furnace is the delivering of a large portion of the heat to the upper third of the pot where the cold work is immersed and surface radiation heat losses are great.

Vertical radiant tubes with blast type gas burners firing from the top down are used, and automatic temperature control is a part of the combustion equipment. The installation is a jobbing pot employed for galvanizing miscellaneous stampings, forgings and castings varying in weight from one-half ounce to 15 pounds.

With a capacity for 46,000 pounds of spelter this unit is capable of an average hourly production of 1100 pounds with a consumption of only 650 cubic feet of 1100 B.t.u. natural gas, according to Mr. Thurston. The gas radiant tube method of heating the pot eliminates flame impingement and local overheating, thereby increasing pot life materially. A more uniform distribution of heat helps to produce a better and more uniform finish while the use of the economical fuel gas provides a further saving. Heat is supplied by 20 vertical radiant tubes in which blast type gas burners fire downward.

Development of the gas fired radiant tube has made it possible to apply gas heat to the malleable annealing furnace and take advantage of all the features developed in the electric furnace, and at a material saving in fuel costs, it was pointed out in a paper on "Application of Gas Radiant Tubes to Short Cycle Malleable Annealing Furnaces" by C. H. Martin, Holcroft & Co., Detroit, and Eclipse Fuel Engineering Co., Rockford, Ill.

Mr. Martin described a recent installation in Chicago of a radiant tube furnace, 60 x 10 feet, for short cycle annealing an average of 20 net tons of malleable castings per 24 hours. Total annealing cycle is 14 hours. Castings after annealing have an ultimate tensile strength of 58,000 pounds, elongation of 15 per cent and elastic limit of 38,000 pounds. Tubes extend horizontally across the furnace both below and above the work. All portions of the furnace are heated or cooled entirely by radiation, no products of combustion being admitted to the furnace chamber. Scaling of castings is prevented by special atmosphere introduced into the furnace chamber.

Discuss Copper Annealing

Based on the average production of 20 net tons of castings annealed per day, using the 14-hour cycle, gas consumption by this furnace has been about 1¾ cubic feet of 800 B.t.u. gas per pound of casting annealed, including the gas used for the atmosphere generator.

The afternoon session was opened by Lawrence R. Foote, chairman, Midwest Industrial Gas Sales council, as presiding officer. A paper on "Application of Controlled Atmospheres to the Annealing of Copper and Copper Alloys," by W. A. Darrah, Continental Industrial Engineers Inc., Chicago, was presented by R. A. Hastings of the same company.

This paper included a searching

exposition of the various actions and reactions during the heating of these metals in various atmospheres and at different temperatures. In discussing the boiling out of zinc from brass annealed at 1100-1200 degrees Fahr., it was suggested that "the addition of refined kerosene (sulphur free) appears to protect the surface of the brass from excessive loss of zinc and permits the formation of a fairly clean, bright surface. Formaldehyde, alcohol and at higher temperatures methane and ethane, will give similar results, the principle being apparently that a sufficiently high temperature must be provided to crack the protecting vapor."

As to simple strain relief the author said, "In those cases in which it is only desired to relieve strains or slightly anneal metal and operating at temperatures between 600 and 900 degrees Fahr., zinc losses may be maintained quite low by careful control of atmosphere and heat distribution. Within this temperature range clean, practically unstained brass may be produced using an atmosphere low in water vapor and containing around 3 to 4 per cent carbon monoxide. The ratio of carbon dioxide to carbon monoxide is a vital factor and to obtain the best surface at temperatures of 1100 degrees or over this ratio should preferably be around 1 - 2 or 1 - 3, assuming water vapor is low."

Equipment for the generation of controlled atmospheres employed in furnaces for the annealing and hardening of metals was reviewed by William O. Owen, Surface Combustion Corp. The smoke or carbon diffusion burner, used independently of the heating system to precipitate free carbon for the furnace atmosphere, has found application in conjunction with clear flame combustion and has done much to limit oxidation and decarburization in direct fuel fired furnaces, he indicated. An important use of this burner is in sheet mill furnaces for heating bars and packs for hot rolling. Other applications are in car bottom furnaces and in wire mills.

Metallurgical Control Of Automotive Steels

(*Concluded from Page* 39)

tools, and it readily shows up the hard and soft areas on the pieces treated. The soft and hard spots as revealed by the shot blast are then Rockwelled and held to a predetermined minimum. Spots showing low readings are cut for microexamination to note amount of decarburization and general structural conditions. The above test offers a good solution for control of coil spring material, and the shot blast, with variations in size of shot and velocity of application, may have possibilities in hardening tests for steels which do not harden so intensely, so that variations in surface hardness could be detected with greater facility than before.

Transmission mainshaft material is made of S. A. E. 1340-A hot rolled, fine grain (6-8), turned close to size, and annealed by the supplier to a brinell hardness of 197-217, with a pearlitic structure as free from divorced cementite and spheroidized sorbite as possible. This, as mentioned before, gives the most desirable structure for turning and hobbing shafts. Since the material is also purchased free from decarburization, the mills are somewhat prone to furnish a spheroidal structure because a low temperature in the neighborhood of 1300 degrees Fahr. is all that would be required and would cut down surface decarburization.

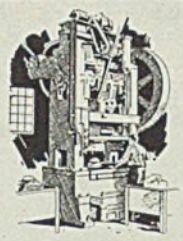
Another requisite asked on this material, and seldom obtained, is freedom from banding. With banded structures, there is more likelihood of distortion and this shaft in the hardened state is not so easy to straighten. Good heat treating practice must be maintained to hold breakage down to a minimum. Every shipment from a heat which usually represents one annealing charge at the mill, is checked for structure and brinell hardness, and even though the source is constantly making a serious effort for uniformity in annealing, there is still pronounced variation from charge to charge and from one part of a charge to another, due perhaps to the excessive loads that are handled. It would seem possible to construct a continuous pusher-type furnace for annealing bars, so that lighter loads could be handled and a more uniform product obtained. Cold drawn manganese steels are handled in much the same way as transmission mainshaft steel with equally as great care in control of chemistry, physical properties and machining performance.

Cold drawn carburizing steels, S.A.E. X1015 and 1115 used for such parts as piston pins, knuckle pins, support pins and shafts are purchased fine grain (5-7). The greatest variation in such material is normality and hardenability. In changing from coarser to a finer grain material of this type, there is a noticeable increase in hardening difficulties so that more drastic quenches are resorted to in order to keep the percentage of spotty hardening low. Cold drawn tubing, S.A.E. 1010, used particularly for valve rocker arm shafts, which are carburized, cooled, in the box, then rehardened, and quenched in water between rolls, are usually spotty in hardness and warped when the material shows indications of abnormality on the McQuaid-Ehn test. In order to hold the degree of abnormality low the mills usually work to a higher manganese content, approximately 0.60 per cent maximum. In cases where abnormal valve rocker arm shafts have been processed, it has been found that the higher the hardening temperature the more spotty the shafts became, which is the reverse of information on abnormal steels, and that the best results were obtained using a low temperature of about 1400 degrees Fahr. and a quench in brine or water.

The greatest bulk of cold drawn material is S.A.E. 1112 and X1112 bessemer screw stock, the latter with sulphur as high as 0.30 per cent, selected because of its free machining properties at high speeds. With the present set-up of cutting speeds on automatic machines, no occasion is found for desiring higher than 0.30 per cent sulphur content. Furthermore, a number of parts made from XIII2 steel are carburized and hardened and higher than 0.30 per cent sulphur would not be desirable. However, the time will undoubtedly arrive when faster working machines will be desirable and higher sulphur content will be resorted to.

Inspection Is Close

The metallurgical inspection of the finished parts is watched carefully. For the important parts a 100 per cent brinell, Rockwell or file test, as the case may be, is maintained. In carburizing, test plugs are used in every box to check depth of case and bend tests are made wherever feasible for core toughness. Temperature recorders are checked periodically, and wherever possible traveling couples are used to check furnace heating conditions. Often times, when everything seems to be running smoothly, there is a feeling the inspection is a little too heavy and should be cut down for economic reasons, but just about that time a few failures will come in from the territory for investigation. Immediately there is a tightening up of the inspection instead of the reverse. The time has not arrived when anything can be overlooked metallurgically. There is too much at stake in the way of public safety, car reputation, competition and a satisfied customer.



Experience on one Lubrication Problem Solves Three

A large automobile manufacturer was having considerable difficulty with an upsetting operation on aluminum parts. Dies were sticking and required frequent cleaning. A Standard Lubrication Engineer carefully analyzed the conditions, recommended a readily available Standard Oil product, and corrected the trouble.

A short time later an automobile parts manufacturer frantically called a Standard Lubrication Engineer. A new operation in their plant was giving trouble. The Engineer investigated, only to find a similar type of operation and a similar set of conditions repeated here. His recommendation stopped the trouble.

And still a third time, just recently, another manufacturer of parts installed a new upsetting machine. The lubricant recommended by the erector was not satisfactory. Under high operating temperatures (2200 degrees F.) the oil flashed, dies were sticking and the finished parts were rough. Again, the Standard Lubrication Engineer had a ready answer, and solved the problem.

That is a typical example of the services offered by Standard Lubrication Engineers. Through their broad experience in the field many of your lubrication problems have already been solved. Their services—and experience—are yours for the asking. Call your local Standard Oil Office.

Standard lubricants for metal working include:

ACME CUTTING OIL
PREMIER CUTTING OIL
SUPERLA SOLUBLE OIL
STANOSTAMP

For Your Information On

"LUBRICATION IN HONING AND LAPPING"

The above booklet discusses the increased importance of honing and lapping in present day metal working operations, outlining briefly the modern equipment, abrasives and lubricants used. A well illustrated, practical manual of definite interest to those charged with reducing operating costs. This and other booklets listed below are waiting for you. Write Standard Oil Company (Ind.), 910 S. Michigan Ave., Chicago, Ill.

"Lubrication in Grinding"
"Lubrication in Gear Cutting"
"The Lubrication Engineer—His Value to You"

"Isn't this a slow way to save money, Dad?"

"No, Son . . . big industrial plants save in just such small ways.

I KNOW.. I help them!"

SONNY wasn't to be criticized . . . a penny or two a day did seem like a woefully small amount . . . particularly when dad talked of dollars, even hundreds of dollars, that he had helped other people save.

But dad was a Lubrication Engineer. The lesson he tried to impress on Sonny was not far removed from the one he preached and practiced every day. It was his job to make savings—not in pennies but in lubricants—and he had proved the effectiveness of multiplied *small* savings, in the hundreds of plants he served.

He had found that no item of lubrication was too small to be checked. He knew that by making seemingly insignificant corrections—reducing an oil feed here—using a more effective type of grease there—being continually watchful for mechanical wear that stealthily took an increasing share of lubricant—he *could* and *did* help many department and plant executives make substantial reductions in their lubricating costs. When these individual economies were added together they bulked large in yearly totals.

Here is an engineer trained in the job of finding leaks in lubrication costs. There's one or more right in your local Standard Oil Office. Why not take advantage of this valuable help and advice today? There is no obligation. Ask any Standard Oil representative or call your local Standard Oil (Indiana) Office.

STANDARD OIL COMPANY
(INDIANA)

NEW EQUIPMENT

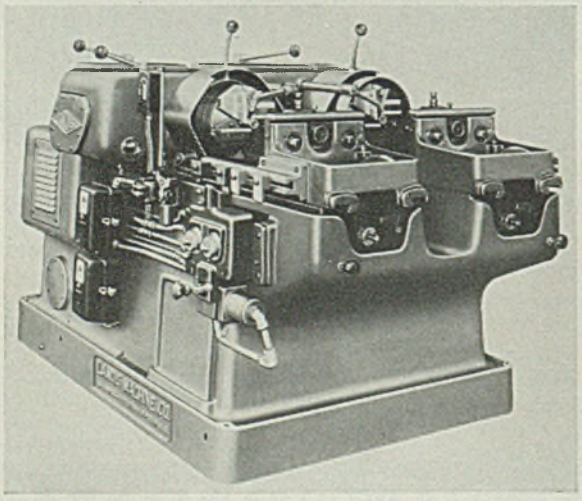
Industrial Heater—

Electric Air Heater Co. division of American Foundry Equipment Co., Mishawaka, Ind., has announced a new Electromode industrial heater having as a heat source a cast aluminum grid poured around a calrod heating element. Operating quietly, a motor driven four-bladed, aluminum fan dissipates heat from the entire surface of the circular grid and circulates the warm air. Heat can be directed by adjustable deflectors mounted on front. The new unit, equipped with an on-off switch, thermal safety switch and also obtainable with thermostatic control, can be suspended from ceiling or fastened to wall.

♦ ♦ ♦

Turning Machine—

Landis Machine Co., Waynesboro, Pa., recently designed a hydraulically operated, double spindle machine for turning operations. The new "Lanhydro" proceeds through its entire cycle automatically with one tripping of the control lever. A rapid feed is provided to carry the work to the turning head, a coarse turning feed then being used throughout the machining operation to a point within 0.008 inch to 0.010 inch of the shoulder. Where a shoulder must be faced, a fine finishing feed is used. Length of travel of the finishing feed is adjustable for any material or condition. Carriage of the machine advances under a finishing feed to a definite stop, and a variable dwell time is then provided for final clean up and to make possible the holding of extremely close limits in length from end of shaft to face of shoulder. After dwell period, turning head opens under hydraulic pressure and carriage is rapidly returned to complete the cycle. Turning head automatically closes as the carriage returns.



New "Lanhydro" double spindle turning machine is semi-automatic and hydraulically operated

♦ ♦ ♦

Recording Potentiometer—

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., is marketing a new type of recorder, the Tag "Celectray" recording potentiometer. A sensitive mirror galvanometer is the primary controlling element in which an inertialess beam of light takes the place of the customary metal boom or pointer. The beam of light from the galvanometer, in moving on and off a phototube, passes the controlling edge of a screen, thus operating relays which in turn control a reversing motor which drives the moving contact of the wheatstone bridge or potentiometer. The phototube is not a calibrated element but only detects the direction of the light beam and brings the

Tag "Celectray" recording potentiometer has a sensitive mirror galvanometer as the primary controlling element

galvanometer to zero deflection, according to the null method of balancing an electric circuit. The unit is in black enameled aluminum, dust and fume proof case, universal mounting, with enclosed connection terminals with conduit openings top and bottom near back and external on-off switch and standardizing knob. For alternating current only, standard is 110 volts, 60 cycles with 220 volts or 50 cycles being special.

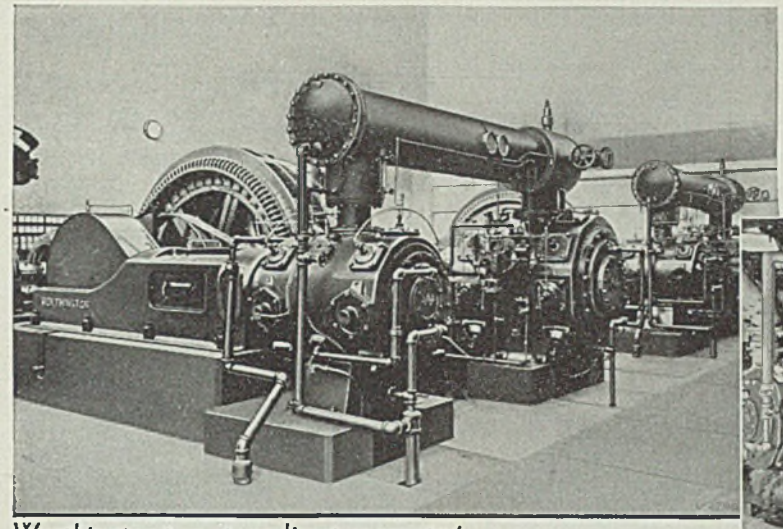
♦ ♦ ♦

Power Take-off—

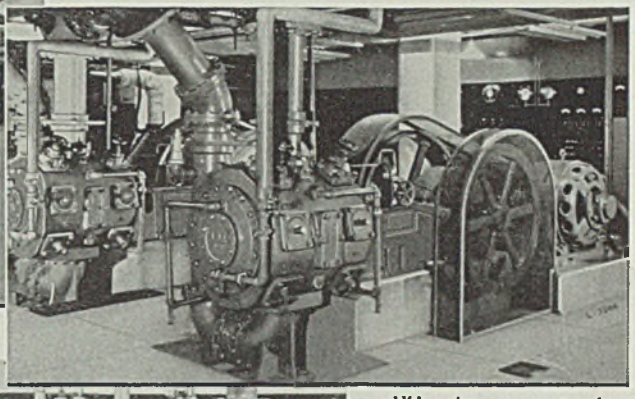
Davey Compressor Co., Kent, O., is manufacturing a split propeller power take-off for transmission of truck power up to 75 horsepower. Of heavy construction and weighing 250 pounds, the take-off has three roller type universal joints for independently floating action relative to propeller shaft, two double row self aligning ball bearings to float power take-off in relation to chassis distortion and ball bearings for support of shafts and lateral pull of driven belts. Drive is entirely through large

YOUR COMPRESSED AIR SERVICE . . .

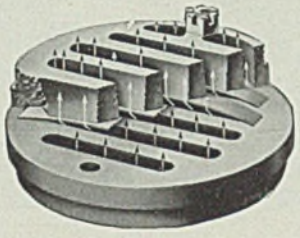
Have you considered the profit possibilities from higher efficiency and uninterrupted service in this important production factor?



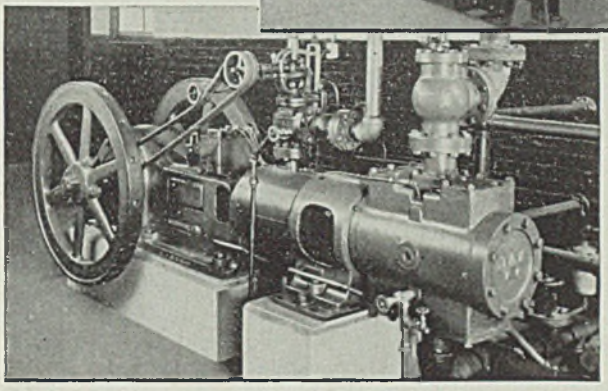
Worthington two-stage direct-connected motor-driven compressor



Worthington single-stage motor-belt-driven compressor



THE WORTHINGTON FEATHER VALVE UNIT



Worthington single-stage steam-driven compressor

Simplest . . . lightest . . . most efficient yet devised for compressor service.

- Three elements only...a self-contained unit
- Valve element a simple one-piece valve and spring combined...no separate spring required
- No cushioning device required
- Seats by contact...not impact
- Unusually tight...due to flexibility of strip
- Minimum air friction...result, minimum power consumption due to flexibility, large lift area and tight seating
- Maximum accessibility...removable in five minutes...replaceable in eight
- Intake and discharge valves complete are interchangeable
- Negligible maintenance...nominal expense for valve strip renewal at long intervals

WORTHINGTON Feather Valve Air Compressors assure maximum compressed air economy.

The product of unexcelled engineering, they exemplify the best in every detail of their design.

Among the most important of their many noteworthy features is the FEATHER VALVE equipment . . . giving high volumetric efficiency and smooth quiet operation, and contributing largely to the remarkable dependability, negligible maintenance and long operating life reported by prominent users in every field and under the most exacting conditions.

AN EXACT UNIT FOR EVERY REQUIREMENT

● ***Literature on request***

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A-36199

external and internal gears to either rear axle or driven equipment while shifting mechanism, which is controlled from cab, operates without friction.

♦ ♦ ♦

Cable Insulation —

General Electric Co., Schenectady, N. Y., has recently introduced a new synthetic insulating compound known as Flamenol which, while similar to rubber in its characteristics, contains no rubber and will not support combustion. Strong mechanically, it has excellent aging characteristics and is highly resistant to moisture, acids, alkalies and oils. Flamenol can be made to be soft and flexible or to have celluloid-like rigidity, can be put into solution for coating or impregnating and can be compounded, filled, calendered and extruded in much the same fashion as rubber. Flamenol-insulated cable is suitable for power and control circuits at 600 volts and less, and for operation at a maximum copper temperature of 60 degrees Cent. With a permanently smooth finish to which foreign materials do not readily adhere, Flamenol is available in a variety of colors for circuit tracing and only in cases where the cable is subjected to extreme mechanical abuses is it used with any protective finish such as braid, lead or armour.

♦ ♦ ♦

Portable Sander—

Porter-Cable Machine Co., Syracuse, N. Y., has announced its new type T-4V portable sander-grinder, a four inch belt machine with aluminum alloy frame, dust collecting system and equipped with a 1¼-horsepower universal motor. Abrasive belt operates flush with the right side of the frame to allow working all the way in to upright objects. Designated as "Take-About," the new machine was designed for grinding down metal strips, plates, grills and other metal parts.

Porter-Cable "Take-About" sander-grinder has four inch abrasive belt flush with one side of frame

♦ ♦ ♦

Flexible Couplings—

Falk Corp., Milwaukee, is offering an improved design of flexible couplings known as Steelflex, using the principle employed in previous designs, based on shock absorption and compensation for misalignment through the action of a resilient grid member. Details have been improved through the use of symmetrical design on both the driving and driven hubs and also through the use of a symmetrical design on the halves of the coupling cover which protect the operating elements and act as a grease reservoir for the coupling lubricant. Openings between the shell and the coupling hubs are effectively sealed against leakage of lubricant as well as the entrance of dirt or foreign material through the use of molded Neoprene seals. Type FA Steelflex couplings are available in ratings from 0.4 to 18,000 horsepower. Company's bul-

letin No. 4100 is descriptive of the couplings.

♦ ♦ ♦

Air Eliminator—

Gorton Heating Co., Cranford, N. J., has placed on the market a high pressure air eliminator for automatically venting driers, steam coils

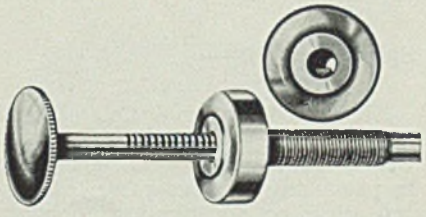
Gorton air eliminator replaces hand venting of driers, steam coils or traps

and traps otherwise vented by hand. Designed for operating pressures up to 150 pounds per square inch, operating member, which is of non-corrosive metal extremely sensitive to heat changes, closes valve at 212 degrees Fahr. and keeps it closed until temperature drops below that point, when it automatically opens the valve. It is impossible to stick valve shut or blow it shut when steam is turned on. Body of the air eliminator is of nickel-plated bronze. Diameter is 2½-inches, 4⅝-inches high overall, ½-inch bottom pipe connection and air outlet size is 3/16-inches in diameter.

♦ ♦ ♦

Positive Position Control—

Shakespeare Products Co., Kalamazoo, Mich., has developed a positive position control head which will



Shakespeare position control holds any position without friction

lock in any position without employing friction as a means of holding. Control is locked at the desired point by the engagement of a slotted pawl in the milled teeth of the sliding rod and strength of the lock is such that repeated shock load of 250 pounds neither releases the mechanism nor impairs the locking members, it is claimed. Because of its positive action the knob always locks in the same position.

♦ ♦ ♦

Sand Conditioner—

Beardsley & Piper Co., 2541 North Keeler avenue, Chicago, are manufacturing the Speedmullor, new type of foundry sand muller in which centrifugal force is used to quickly and thoroughly mull large quantities of facing, backing or compound and oil core sands with equal facility. With shaft revolving at approximately 90 revolutions per minute, all sand of the batch is delivered into the effective muller track area while being subjected to approximately two mulling and four aerating actions per revolution. Manufacturer's bulletin S-G describes models of various capacities.

♦ ♦ ♦

Heavy Capacity Switch—

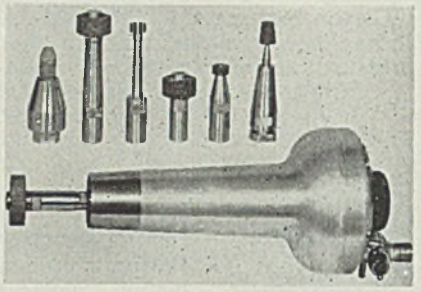
Delta-Star Electric Co., 2400 Fulton street, Chicago, is manufacturing a 2000 ampere, 34.5 kilovolt, pole top switch designed, after initial setting, to stay in adjustment for long pe-

riods without attention. Blade operating mechanism is so made that the levers and linkages are securely locked and future adjustments for blade position are confined to the interconnecting steel pipes underneath the mounting bases, far removed from the switch unit itself. Operating pipes are equipped with drop-forged clamp fittings, in turn equipped with piercing type set screws which, after final switch adjustments, are turned down until they punch holes in the pipes forming absolute locking points and preventing slippage. Possibility of one blade of a three pole switch under or over traveling in relation to the others is made impossible by the new construction.

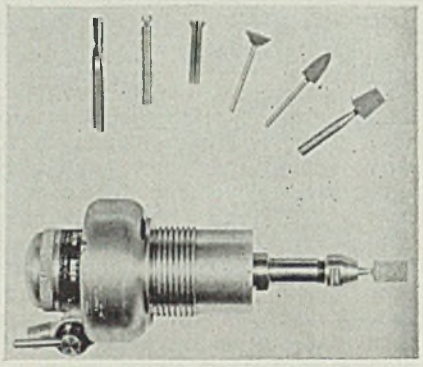
♦ ♦ ♦

Air Driven Grinders—

Onsrud Machine Works Inc., Chicago, has recently announced its new E-1 and its remodeled and redesigned MD-1 air driven grinding tools. Designed for such grinding as forgings and large dies, the E-1 develops ½ horsepower and 38,000 revolutions per minute on 90 to 100 pounds air pressure. Housing is of aluminum alloy, rotor of alumium bronze, and spindle of nickel steel, heat treated, ground and held to a tolerance of 0.0001-inch. The MD-1 has the same construction as the E-1 and has been redesigned to comfortably fit into the palm of a hand. This tool develops ¼-horsepower and



Onsrud air driven grinders, E-1 above and MD-1 below, have interesting oil system and run cooler than room temperature



50,000 revolutions per minute on 90 to 100 pounds air pressure. For lubrication of both tools the hollow spindle is filled with fine oil which is fed, by centrifugal action, through resistance elements to the precision ball bearings in a film, resulting in proper lubrication when tool is running and none when idle. Bearings are also kept cool by expanded exhaust air and machines will operate continuously at less than room temperature.

♦ ♦ ♦

Spinning Lathe—

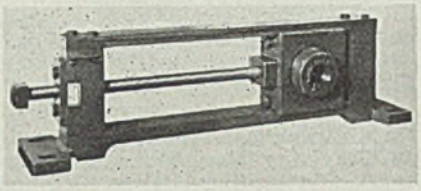
Oliver Machinery Co., Grand Rapids, Mich., has announced a new Oliver metal spinning lathe for use in producing samples prior to making dies, or for production work where quantity does not warrant the manufacture of dies. In small size the lathe is 12 x 48 inches, although metal spinning lathes are also available from the manufacturer in 16-inch and 20-inch swing with 6-foot bed, and 24-inch swing with 7-foot bed. Having a compound slide rest and capable of adjustment to any speed from 800 to 2400 revolutions per minute, the 12-inch lathe has a ¾-horsepower motor for single, two

or three-phase, 60 cycle, 110 or 220-volt lines and is particularly efficient for metal turning.

♦ ♦ ♦

Take-up Bearing—

Smith Power Transmission Co., 1213 West Third street, Cleveland has recently designed a new type of take-up bearing on which the user can make replacements of individual parts which wear rapidly due to sand or other abrasives. The new unit is



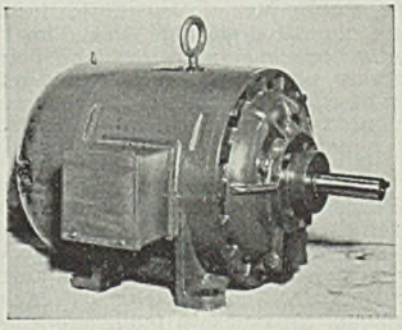
Construction of Smith take-up bearing allows replacement of individual parts

of cast construction with standard anti-friction or babbitt bearings interchangeable and adjusting screw and nut are replaceable without removing bearing or frame. To remove take-up screw and nut, plate on adjusting end of frame is taken off, key in bearing frame is removed and screw and nut are pulled out and replaced.

♦ ♦ ♦

Fan Cooled Motor—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is manufacturning a new dual ventilated, fan cooled, type CS, squirrel-cage motor protected against abrasive dust, moisture and corrosion and designed for industrial use indoors or out.



Westinghouse dual ventilated, fan cooled, squirrel-cage motor is protected against abrasive dust, moisture and corrosion

Motor frame contains a set of internal air ducts which open in the interior part of the motor, and an external set open on the outside of the motor frame. The two sets are separated by a common wall. An internal fan on the rotor circulates warm internal air through the internal ducts, the walls of which are cooled by the external fan blowing larger volumes of cool air through the external ducts, providing rapid transfer of heat from the motor. Housing is designed so fresh grease enters outside edge at top of bearing, and excess or used grease is discharged at bottom inner edge into overflow sump. Periodic dismantling of the motor to clean bearings is unnecessary as addition of fresh grease cleans used from the bearing.

♦ ♦ ♦

Lift Trucks—

Lewis-Shepard Co., 125 Walnut street, Watertown station, Boston, has announced a new line of hydraulic tin plate and sheet lift trucks of heavy steel construction. Features include brake on front wheels, new type release valve mechanism, frame designed for greater strength and life time, grease packed ball bearings. With a 3-inch lift and 2½-inch clearance under frame, loads may be released or locked at any height of lift.

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

Clutches—Rockford Drilling Machine division of Borg-Warner Corp., 113 Catherine street, Rockford, Ill. Illustrated booklet dealing with Pullmore clutches and their applications.

Couplings—Falk Corp., Milwaukee, Wis. Bulletin No. 4100, covering Falk Steelflex flexible couplings and showing many uses and installations.

Electroplating Rectifier—Hanson-Van Winkle-Munning Co., Matawan, N. J. Bulletin No. ER-101, describing electroplating rectifier as new source of direct current.

Foundry Equipment — Whiting Corp., Harvey, Ill. Bulletin No. 217, "Cleaning Castings at Low Cost"; bulletin No. 218, "Pointing the Way to Lower Foundry Costs; bulletin No. 219, "The LH Traveling Crane."

Treatment—Rodman Chemical Co., Verona, Pa. Folder dealing with Carbo Pellet carburizers; booklet covering R-1 quenching oil for hardening and toughening steel without distortion.

Coal Screens—Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin No. 1476A, giving illustrations of various types of vibrating coal screens and installations as well as sizes and dimensions.

Gages—Sheffield Gage Corp., Dayton, O. Large, plastic bound catalog, covering a complete line of Sheffield gages and containing section devoted to terminology as well as one on engineering data and conversion tables.

Construction Material — Johns-Manville, 22 East 40th street, New York. Brochure, "J-M Corrugated Transite," dealing with economy of asbestos-cement. Also folder showing properties and uses of J-M-20 insulating brick.

Planers and Shapers—Rockford Machine Tool Co., Rockford, Ill. Three circulars describing, respectively, double-housing hydraulic planer, 12-inch high speed hydraulic shaper and 36-inch hydraulic open-side shaper.

Spectrometric Equipment — Bausch & Lomb Optical Co., Rochester, N. Y. Catalog D-221, describing and illustrating current line of spectroscopes, spectrometers, spectrophotometric equipment and monochromator.

Brazing Alloy—Handy & Harman, 82, Fulton street, New York. Bulletin No. 10, describing Easy-Flo, its new brazing alloy which flows freely at 1175 degrees Fahr., and is designed for use with ferrous and nonferrous metals, joining dissimilar metals at low temperatures.

Switchgear Equipment—General Electric Co., Schenectady, N. Y. "Modern Switchgear," bulletin illustrating air and oil circuit breakers, switches and devices and power switching and switchgear equipments; an index to publications describing each product in greater detail.

Meters and Recorders—Brown Instrument Co., Philadelphia. Catalog No. 3005, covering line of indicating and recording CO_2 meters and combined CO_2 and flue gas temperature recorders; also folder describing use of Brown Analy-graph in heat treating processes.

MATERIALS HANDLING

Auto Plant Handling Units Are Well Co-ordinated

(*Concluded from Page* 52)

other employes. Welders all wear new type overalls and face hoods with shatterproof glass fronts. A completely equipped plant hospital is maintained and each employe is given a thorough physical examination at time of employment. A complete record of each employe's physical condition is kept. Infra-red light treatments are given when needed. In general, everything is done to insure the physical well-being of the men. Numerous drinking fountains, showers and toilets are provided. The floor of the assembly unit is of creosoted wood blocks.

Accessories such as radios and heaters are stored in a separate section at the southwest corner of the assembly building. Janitor's supplies are also kept in a separate storage section. Both of these storage areas are behind wire mesh partitions.

Plant Reflects Care

All in all, the plant gives a well-founded impression that in this materials handling system backward movement is eliminated; distances for transportation of materials to the line have been shortened to a practical minimum; there is an apparent adaptation of equipment for the handling job to be done, by which is meant fitting the power truck, hand lift truck, floor truck, corrugated skid boxes, electric hoists, conveyors and storage racks into their proper respective jobs; and there is plenty of natural light.

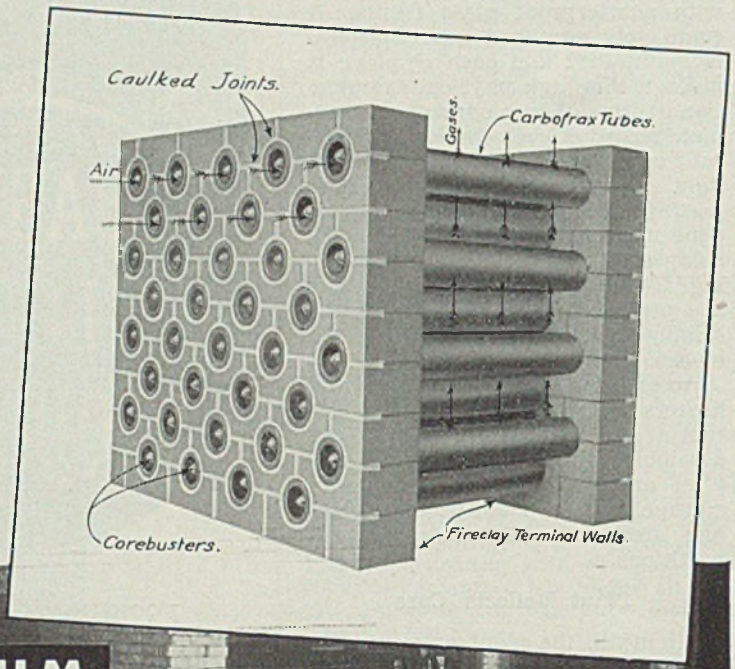
The plant reflects a careful work planning job because assembly of the three makes of cars—Buick, Oldsmobile and Pontiac—is carried on in orderly fashion on the self-same conveyor lines. This is made possible by synchronization of movement, which provides the correct color and correct part for the correct car at the correct place and time. This is nothing new in the automobile industry for color synchronization has been utilized for the past several years, but its application to three separate and distinct makes of automobiles, involving many additional combinations of parts and colors, makes the Linden plant system a noteworthy example of what layout, equipment and method properly applied to materials handling can accomplish.

Why a Carborundum Company RECUPERATOR?

THERE are six good reasons, reasons based on the experience of many great industries where The Carborundum Company recuperators are functioning with highest efficiency.

1. The heat transfer elements or tubes of "Carbofrax", the Carborundum Brand Silicon Carbide Refractory.
2. The originally conceived and designed corebusters.
3. The accessibility of the recuperator for examinations, repairs and quick, inexpensive replacement of the tubes.
4. Minimum amount of air leakage.
5. The low first cost of installation.
6. The adaptability of the design of this recuperator to either existing or new furnaces.

Complete information regarding The Carborundum Company recuperators (engineering bulletins etc.) upon application.



THE CARBORUNDUM COMPANY, REFRACTORY DIVISION, PERTH AMBOY, N. J.

District Sales Branches: Boston, Chicago, Cleveland, Detroit, Philadelphia, Pittsburgh. Agents: McConnell Sales and Engineering Corp., Birmingham, Ala.; Calvin M. Christy, St. Louis; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas.
(Carborundum and Carbofrax are registered trade-marks of The Carborundum Company)

Steel Buying Lighter; Deliveries Gain Slowly

Export Demand Heavy; Ingot Rate Steady; Scrap Goes Lower

MARKET IN TABLOID

DEMAND . . . *Lighter, but export buying heavy.*

PRICES . . . . *Steady, ferromanganese and other alloys reaffirmed.*

PRODUCTION . . *Operations down one point to 74 per cent.*

SHIPMENTS . . . *Heavy, with less delay in deliveries on many products.*

A MINIMUM of inconvenience is being met by steel consumers by interruption of steel deliveries from blockaded mills. In a few instances tonnage has been booked by other producers to supply urgent needs of users, but this has been of small proportions.

While buying is less than in earlier weeks new business on mill books is sufficient to retard reduction of backlogs. Deliveries are improving, but slowly, and some producers continue unable to offer anything under several weeks.

Pressure for export tonnage is strong and in addition to the 40,000 tons of ingots for Japan, placed a week ago in the Pittsburgh district, a like tonnage has been booked in another district for the same destination. It is understood both these sales were at about $40 per ton, f.a.s., which is an attractive price. Inquiries for pig iron continue to offer premiums over domestic prices, one now current involving 40,000 to 70,000 tons for shipment to France.

Tin plate makers are being rushed for delivery of as much as they can produce at fullest operation. Demand for cans to care for bounteous crops resulting from excellent growing weather is causing heavy specifications. Tin plate producers abroad appear to be oversold and much export tonnage is offered American makers.

A drop of one point in the national operating rate brings it to 74 per cent of capacity. Youngstown district gained one point to 30 per cent and Buffalo one point to 89 per cent. Chicago at 63 per cent, Cleveland at 46, Birmingham at 83 and New England at 45 per cent showed no change from the previous week. Pittsburgh lost three points to 92 per cent, Eastern Pennsylvania 6½ points to 64½, Wheeling one point to 95, Detroit five points to 95, Cincinnati three points to 93 and St. Louis six points to 85 per cent.

For the third consecutive month steel ingot output in May exceeded 5,000,000 tons, the first time in steel history so sustained a rate has been made. May production was 5,153,559 tons, exceeded only twice previously, in March this year and in May, 1929. Five months production totals 24,580,871 tons, compared with 24,133,319 tons in the same months of 1929, the record year. This indicates possibility of a new record for production in 1937.

Great Britain established a new record for ten years in production of pig iron in May, turning out 696,300 tons, exceeding April output by 15,600 tons. British steel production continues above 1,000,000 tons per month but is slightly below the peak of a few months ago.

Placing of freight cars in May is an indication of the activity of railroads in the steel market. With 4732 cars bought during the month the total placed this year reaches 45,437, practically double the number placed during the corresponding period of 1936.

Automobile builders stepped up production last week from the revised previous figure of 101,779 units to 115,900. General Motors increased from 34,472 to 44,520, Ford held steady at 29,240 and Chrysler increased from 22,250 to 27,300. Other manufacturers underwent a slight decline from 15,817 to 14,840. June output shows the seasonal decline, each week running well below the record of May.

Slight recession is recorded in shipments of finished steel by the United States Steel Corp. with a total of 1,304,039 tons in May, compared with 1,343,644 tons in April. Cumulative shipments for five months are 53 per cent higher than during the same months last year.

In scrap the situation is somewhat mixed, signs of strength appearing in the East, with prices holding steadily at Pittsburgh, but declining $1 per ton on steelmaking grades at Chicago. As a result of this weakness the scrap composite declined 54 cents last week, to $16.96, reaching the level prevailing at mid-December. The iron and steel composite was lowered two cents by the decline in scrap, to $39.84. The finished steel composite remains unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	June 12	June 5	May 29	One Month Ago May, 1937	Three Months Ago Mar., 1937	One Year Ago June, 1936	Five Years Ago June, 1932
Iron and Steel	$39.84	$39.86	$39.89	$40.06	$39.92	$32.79	$29.09
Finished Steel	61.70	61.70	61.70	61.70	60.70	52.20	47.64
Steelworks Scrap	16.96	17.50	17.60	18.49	20.95	12.55	6.62

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

	June 12, 1937	May 1937	March 1937	June 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.40c	1.85c
Steel bars, Chicago	2.50	2.50	2.45	1.90
Steel bars, Philadelphia	2.74	2.74	2.74	2.16
Iron bars, Terre Haute, Ind.	2.35	2.35	2.25	1.75
Shapes, Pittsburgh	2.25	2.25	2.20	1.80
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.01½
Shapes, Chicago	2.30	2.30	2.25	1.85
Tank plates, Pittsburgh	2.25	2.25	2.20	1.80
Tank plates, Philadelphia	2.43½	2.43½	2.43½	1.99
Tank plates, Chicago	2.30	2.30	2.25	1.85
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.35	1.85
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.10	2.40
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.70	3.10
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.45	1.95
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.20	2.50
Sheets, No. 24, galvan., Gary	3.90	3.90	3.85	3.20
Plain wire, Pittsburgh	2.90	2.90	2.85	2.40
Tin plate, per base box, Pitts.	$5.35	5.35	4.85	5.25
Wire nails, Pittsburgh	2.75	2.75	2.70	2.10

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$36.40	$28.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	36.40	28.00
Billets, open-hearth, Pittsburgh	37.00	37.00	36.40	28.00
Wire rods, No. 5 to $\frac{5}{32}$-inch, Pitts.	47.00	47.00	46.20	38.80

Pig Iron

	June 12, 1937	May 1937	March 1937	June 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$24.85	$20.81
Basic, Valley	23.50	23.50	23.10	19.00
Basic, eastern del. East Pa.	25.26	25.26	24.76	20.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	24.80	20.31
No. 2 fdy., Chicago	24.00	24.00	23.20	19.50
Southern No. 2, Birmingham	20.38	20.38	19.88	15.50
Southern No. 2, del. Cincinnati	23.69	23.69	23.19	20.2007
No. 2X eastern, del. Phila.	26.135	26.135	25.635	21.68
Malleable, Valley	24.00	24.00	23.60	19.50
Malleable, Chicago	24.00	24.00	23.20	19.50
Lake Sup., charcoal, del. Chicago	30.04	30.04	28.95	25.2528
Gray forge, del. Pittsburgh	24.17	24.17	23.75	19.67
Ferromanganese, del. Pittsburgh	107.29	107.29	90.80	80.13

Scrap

Heavy melting steel, Pittsburgh	$18.25	$19.55	$22.40	$13.80
Heavy melt. steel, No. 2, East Pa.	15.25	18.85	18.75	10.81
Heavy melting steel, Chicago	15.75	17.55	20.90	12.75
Rail for rolling, Chicago	20.25	21.45	22.25	14.00
Railroad steel specialties, Chicago	19.75	21.35	22.35	14.40

Coke

Connellsville, furnace, ovens	$4.65	$4.85	$4.05	$3.50
Connellsville, foundry, ovens	5.30	5.30	4.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	10.25	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 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
Moline, Ill.	2.35c
Cleveland	2.35c
Buffalo	2.40c

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	2.65c
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 straight or mixed carloads; less carloads $5 higher; less carloads fencing $5 over base column.

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	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. l.)	$74.00
Single loop bale ties, (base column, c. l.)	63.00

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.
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 23⅛-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	60-10 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	60 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-inch	60-10 off
Do., ½ 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.	$5.75 off

Cut Nails

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

Welded Iron, Steel Pipe

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

Butt Weld

Steel

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

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

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

Iron

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

Line Pipe

Steel

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

Butt Weld

Iron

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

Lap Weld

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

Boiler Tubes

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

Lap Weld

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

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2½" 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	36.96
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 and Young.	$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 ⅜-inch incl.	47.00
Do., over ⅜ to 47/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.50- 4.75
Connellsville, fdry.	5.25- 5.50
Connell. prem. fdry.	6.00- 6.50
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	7.25
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)	14.75c
do. (450 lbs.)	14.00c

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. for each 0.25 below 1.75. 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	24.50
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

Valley furnace $23.50
Pitts. dist. fur. 23.50

Charcoal

Lake Superior fur. $27.00
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

Fire Clay Brick

Super Quality

Pa., Mo., Ky. $64.60

First Quality

Pa., Ill., Md., Mo., Ky. ... 51.30
Alabama, Georgia 51.30

Second Quality

Pa., Ill., Ky., Md., Mo. ... 46.55
Georgia, Alabama 41.80

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
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) .. 25.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick $49.00
Chem. bonded chrome .. 49.00
Magnesite brick 69.00
Chem. bonded magnesite 59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton $23.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $19.00
Do., for barge $20.00

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 1.80-1.85
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 58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage .. 75.00
Ferromolybdenum, stand. 55-65%, lb. 0.95
Molybdate, lb. cont. 0.80
†Carloads. Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
June 5	14.00	14.12½	13.75	56.50	56.12½	6.00	5.85	6.75	20.00	14.75	35.00
June 7	14.00	14.12½	13.75	56.00	55.62½	6.00	5.85	6.75	20.00	14.75	35.00
June 8	14.00	14.12½	13.75	56.12½	55.80	6.00	5.85	6.75	20.00	14.75	35.00
June 9	14.00	14.12½	13.75	55.87½	55.60	6.00	5.85	6.75	20.00	14.75	35.00
June 10	14.00	14.12½	13.75	55.37½	55.00	6.00	5.85	6.75	20.00	14.75	35.00
June 11	14.00	14.12½	13.75	55.50	55.12½	6.00	5.85	6.75	20.00	14.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper

Sheets

Yellow brass (high) 19.75
Copper, hot rolled 21.87½
Lead, cut to jobbers 9.50
Zinc, 100-lb. base 13.00

Tubes

High yellow brass 22.50
Seamless copper 22.62½

Rods

High yellow brass 16.25
Copper, hot rolled 18.62½

Anodes

Copper, untrimmed 19.12½

Wire

Yellow brass (high) 20.00

OLD METALS

Nom. Deal. buying prices

No. 1 Composition Red Brass

*New York 8.50-8.75
*Cleveland 8.75-9.00
*Chicago 8.75-9.00
*St. Louis 8.75-9.00

Heavy Copper and Wire

*New York, No. 1 .... 10.50-10.75
*Cleveland, No. 1 .... 10.50-10.75
*Chicago, No. 1 ..... 10.50-10.75
*St. Louis, No. 1 ..... 10.50-10.75

Composition Brass Borings

*New York 8.00-8.25

Light Copper

*New York 8.50-8.75
*Cleveland 8.50-8.75
*Chicago 8.50-8.75
*St. Louis 8.50-8.75

Light Brass

*Cleveland 5.00-5.25
*Chicago 5.75-6.00
*St. Louis 5.25-5.50

Lead

New York 4.75
Cleveland 4.75-5.00
Chicago 4.75-5.00
St. Louis 4.50-4.75

Zinc

New York 3.25-3.50
Cleveland 3.00-3.25
St. Louis 3.00-3.50

Aluminum

*Borings, Cleveland .. 9.50-10.00
Mixed, cast, Cleve .. 13.25-13.50
Clips, soft, Cleve ... 15.00-15.50
Mixed, cast, St. L ... 12.50-13.00

SECONDARY METALS

Brass, ingot 85-5-5-5, lcl, 14.00
Stand. No. 12 alum. 19.00-19.50

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.10c
Chattanooga	3.96c
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	4.45c
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	3.96c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.96c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.45c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle, under 1 ton	4.22½c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.35c
Chattanooga	4.01c
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)	4.45c
San Francisco	4.05c
Seattle (i)	4.45c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.47c
Chattanooga	4.01c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ¼-in. and over	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	4.95c
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
Boston (g)	4.00c
Buffalo	3.72c
Chattanooga	3.91c
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	4.50c
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
Boston (g)	4.75c
Buffalo	3.35c
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	5.35c
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
Buffalo	4.10c
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	5.55c
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	3.52c
Chattanooga	4.16c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅛-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.50c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	4.95c
San Francisco	4.50c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	3.52c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.30c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	3.70c
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)	5.85c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	5.85c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.39c
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
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	65
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, June 10

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$29.64 6 9 0	$32.60	4 1 0
Basic bessemer	19.39 3 18 6*	30.99	3 17 0
Hematite, Phos. .03-.05	21.61 4 7 6	.....	.....
SEMIFINISHED STEEL			
Billets	$38.90 7 17 6	$35.27	4 7 6
Wire rods, No. 5 gage	53.48 10 16 6	56.42	7 0 0
FINISHED STEEL			
Standard rails	$50.01 10 2 6	$48.36	6 0 0
Merchant bars	2.43c 11 0 0	1.82c	5 0 0
Structural shapes	2.35c 10 12 6	1.77c	4 17 6
Plates, †¼ in. or 5 mm.	2.55c 11 11 3	2.24c	6 2 6
Sheets, black, 24 gage or 0.5 mm	3.31c 15 0 0	3.09c	8 10 0††
Sheets, gal., 24 gage, corr.	4.14c 18 15 0	4.37c	12 0 0
Bands and strips	3.04c 13 15 0	2.37c	6 10 0
Plain wire, base	2.43c 11 0 0	2.73c	7 10 0
Galvanized wire, base	3.20c 14 10 0	2.91c	8 0 0
Wire nails, base	3.09c 14 0 0	3.09c	8 10 0
Tin plate, box 108 lbs.	$ 6.05 1 4 6	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$20.50 4 3 0(a)	$18.91	425	$27.80	825	$25.24	63
Basic bessemer pig iron	24.70 5 0 0(a)	12.24	275	14.66	435	27.86 (b)	69.50
Furnace coke	8.03 1 12 6	6.59	148	6.23	185	7.62	19
Billets	38.82 7 17 6	29.15	655	28.14	835	38.68	96.50
Standard rails	2.24c 10 2 6	1.95c	975	1.80c	1,200	2.38c	132
Merchant bars	2.53c 11 9 0	1.77c	885	1.46c	975	1.98c	110
Structural shapes	2.44c 11 0 6	1.72c	860	1.46c	975	1.93c	107
Plates, †¼-in. or 5 mm.	2.59c 11 14 3	2.21c	1,105	1.87c	1,245	2.29c	127
Sheets, black	3.48c 15 15 0§	2.80c	1,400‡	2.19c	1,460‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.31c 19 10 0	4.30c	2,150	2.85c	1,900	6.66c	370
Plain wire	2.60c 11 15 0	2.72c	1,360	2.48c	1,650	3.11c	173
Bands and strips	2.70c 12 4 0	2.00c	1,000	2.02c	1,350	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 65.30 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†	11.50-12.50
Bos. dock No. 1, exp.	16.00
N. Eng. del. No. 1	14.75
Buffalo, No. 1	18.00-19.00
Buffalo, No. 2	16.00-17.00
Chicago, No. 1	15.50-16.00
Cleveland, No. 1	17.00-17.50
Cleveland, No. 2	15.50-16.00
Detroit, No. 1	14.50-15.00
Eastern Pa., No. 1	16.50-17.50
Eastern Pa., No. 2	15.00-15.50
Federal, Ill.	13.25-13.75
Granite City, R. R.	15.50-16.00
Granite City, No. 2	13.25-13.75
New York, No. 1	†13.00-13.50
N.Y. dock, No. 1 exp.	14.50-15.00
Pitts., No. 1 (R. R.)	20.00-20.50
Pitts., No. 1 (dlr.)	18.00-18.50
Pittsburgh, No. 2	16.00-16.50
St. Louis, R. R.	15.50-16.00
St. Louis, No. 2	13.25-13.75
Toronto, dlrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	18.00-18.50

COMPRESSED SHEETS

Buffalo, dealers	16.00-17.00
Chicago, factory	15.00-15.50
Chicago, dealer	14.50-15.00
Cleveland	16.50-17.00
Detroit	15.25-15.75
E. Pa., new mat.	17.50-18.00
E. Pa., old mat.	14.00-14.50
Pittsburgh	18.50-19.00
St. Louis	11.00-11.50
Valleys	17.00-17.50

BUNDLED SHEETS

Buffalo	13.00-13.50
Cincinnati, del.	13.00-13.50
Cleveland	13.50-14.00
Pittsburgh	17.00-17.50
St. Louis	9.50-10.00
Toronto, dealers	8.00

SHEET CLIPPINGS, LOOSE

Chicago	11.00-11.50
Cincinnati	11.00-11.50
Detroit	10.50-11.00
St. Louis	9.00- 9.50

STEEL RAILS, SHORT

Birmingham	15.50-17.50
Buffalo	23.50-24.00
Chicago (3 ft.)	20.00-20.50
Chicago, (2 ft.)	21.00-21.50
Cincinnati, del.	20.00-20.50
Detroit	18.50-19.00
Pitts., 3 ft. and less	24.00-24.50
St. Louis, 2 ft. & less	18.50-19.00

STEEL RAILS, SCRAP

Boston district	†14.00-14.25
Buffalo	19.50-20.00
Chicago	15.50-16.00
Cleveland	21.00-21.50
Pittsburgh	20.50-21.00
St. Louis	17.00-17.50

STOVE PLATE

Birmingham	9.50-10.50
Boston district	†9.00- 9.50
Buffalo	14.50-15.00
Chicago	11.00-11.50
Cincinnati, dealers	10.00-10.50
Detroit, net	11.25-11.75
Eastern Pa.	14.00
New York, fdry.	†9.50-10.00
St. Louis	11.25-11.75
Toronto, deal'rs, net	9.50-10.00

SPRINGS

Buffalo	22.00-22.50
Chicago, leaf	21.00-21.50
Chicago, coil	22.00-22.50
Eastern Pa.	24.00-24.50
Pittsburgh	24.50-25.00
St. Louis	19.00-19.50

ANGLE BARS—STEEL

Chicago	19.50-20.00
St. Louis	17.00-17.50

RAILROAD SPECIALTIES

Chicago	19.50-20.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	22.00-23.00
Cleveland, billet, bloom crops	24.00-24.50
Eastern Pa., crops	22.50-23.00
Pittsburgh, billet, bloom crops	25.00-25.50
Pittsburgh, sheet bar crops	24.50-25.00

FROGS, SWITCHES

Chicago	16.50-17.00
St. Louis, cut	17.00-17.50

SHOVELING STEEL

Chicago	15.50-16.00
Federal, Ill.	13.25-13.75
Granite City, Ill.	13.25-13.75
Toronto, dealers	9.00- 9.50

RAILROAD WROUGHT

Birmingham	12.00-13.00
Boston district	†10.00-10.25
Buffalo, No. 1	16.00-17.00
Buffalo, No. 2	18.00-19.00
Chicago, No. 1 net	15.00-15.50
Chicago, No. 2	15.50-16.00
Cincinnati, No. 2	14.25-14.75
Eastern Pa.	18.00
St. Louis, No. 1	13.00-13.50
St. Louis, No. 2	14.75-15.25
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	16.50-17.00
New York	†12.50-13.00

BUSHELING

Buffalo, No. 1	16.00-17.00
Chicago, No. 1	15.00-15.50
Cincin., No. 1, deal.	14.50-15.00
Cincinnati, No. 2	8.50- 9.00
Cleveland, No. 2	12.50-13.00
Detroit, No. 1 new	14.50-15.00
Valleys, new, No. 1	17.00-17.50
Toronto, dealers	9.00

MACHINE TURNINGS

Birmingham	7.00- 7.50
Buffalo	11.00-11.50
Chicago	9.50-10.00
Cincinnati, dealers	9.00- 9.50
Cleveland	12.50-13.00
Detroit	9.50-10.00
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
Pittsburgh	14.00-14.50
St. Louis	7.50- 8.00
Toronto, dealers	8.00- 8.50
Valleys	13.00-13.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†7.25- 7.75
Buffalo	12.50-13.00
Cincinnati, dealers	8.50- 9.00
Cleveland	12.50-13.00
Detroit	10.25-10.75
Eastern Pa.	12.00
New York	†7.50- 8.00
Pittsburgh	14.00-14.50
Toronto, dealers	8.00- 8.50

CAST IRON BORINGS

Birmingham	7.00- 7.50
Boston dist. chem.	†10.00-10.25
Boston dist. for mills	†9.00
Buffalo	12.50-13.00
Chicago	9.00- 9.50
Cincinnati, dealers	8.50- 9.00
Cleveland	12.50-13.00
Detroit	10.25-10.75
E. Pa., chemical	14.50-15.00
New York	†7.50- 8.00
St. Louis	8.00- 8.50
Toronto, dealers	9.00

PIPE AND FLUES

Cincinnati, dealers	11.50-12.00
Chicago, net	13.00-13.50

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	12.00-12.50
Cincinnati	10.50-11.00
Eastern Pa.	14.00
New York	†9.50-10.00
St. Louis	11.50-12.00

FORGE FLASHINGS

Boston district	†11.25-11.50
Buffalo	16.00-17.00
Cleveland	16.50-17.00
Detroit	13.25-13.75
Pittsburgh	17.00-17.50

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	21.50-22.00
Eastern Pa.	15.50

ARCH BARS, TRANSOMS

St. Louis	18.00-18.50

AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	16.00-16.50
Chicago, elec. fur.	17.50-18.00
Eastern Pa.	16.00-16.50
St. Louis	12.00-12.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	18.00-20.00
Buffalo	22.00-22.50
Boston district	†20.00
Chicago, net	22.00-22.50
Eastern Pa.	25.00-26.00
St. Louis	23.00-24.00

SHAFTING

Boston district	†18.00-18.50
New York	†20.00-20.50
Eastern Pa.	23.50
St. Louis	14.00-14.50

CAR WHEELS

Birmingham	16.50-17.50
Boston dist., iron	†15.00-15.25
Buffalo, iron	18.50-19.50
Buffalo, steel	22.50-23.00
Chicago, iron	19.00-19.50
Chicago, rolled steel	20.00-20.50
Cincinnati, iron	18.00-18.50
Eastern Pa., iron	19.00-19.50
Eastern Pa., steel	23.00
Pittsburgh, iron	20.00-20.50
Pittsburgh, steel	24.50-25.00
St. Louis, iron	18.50-19.00
St. Louis, steel	19.00-19.50

NO. 1 CAST SCRAP

Birmingham	12.00-13.00
Boston, No. 1 mach.	†14.50
N. Eng. del. No. 2.	16.50
N. Eng. del. textile.	18.50
Buffalo, cupola	17.50-18.00
Buffalo, mach.	18.50-19.00
Chicago, agrl. net	13.00-13.50
Chicago, auto	14.00-14.50
Chicago, mach. net	15.00-15.50
Chicago, railr'd net	14.00-14.50
Cincin., mach. cup.	15.00-15.50
Cleveland, mach.	19.00-19.50
Eastern Pa., cupola	18.50-19.00
E. Pa., mixed yard	17.00-17.50
Pittsburgh, cupola	18.75-19.25
San Francisco, del.	13.50-14.00
Seattle	12.00-13.00
St. Louis, No. 1	14.50-15.00
St. L., No. 1, mach.	14.00-14.50
Toronto, No. 1, mach., net	16.00-17.00

HEAVY CAST

Boston dist. break.	†13.00
N. Eng. del.	15.00-15.25
Buffalo, break.	15.00-15.50
Cleveland, break.	13.50-14.00
Detroit, break.	13.50-14.00
Detroit, auto net	14.50-15.00
Eastern Pa.	17.50
New York, break.	†13.50-14.00
Pittsburgh	15.00-15.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	20.00
Buffalo	20.00-21.00
Chicago, R. R.	19.50-20.00
Cincin., agri. del.	15.00-15.50
Cleveland, rail	20.50-21.00
Detroit, auto, net	15.00-15.50
Eastern Pa., R. R.	19.00-20.00
Pittsburgh, rail	20.00-20.50
St. Louis, R. R.	18.00-18.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-18.00
Boston	†17.50-18.00
Buffalo	19.50-20.00
Chicago	20.00-20.50
Eastern Pa., R. R.	21.00-21.50
New York	†17.00-17.50
St. Louis	18.00-18.50

LOCOMOTIVE TIRES

Chicago (cut)	21.50-22.00
St. Louis, No. 1	17.50-18.00

LOW PHOS. PUNCHINGS

Buffalo	22.00-22.50
Chicago	20.00-20.50
Eastern Pa.	24.00-24.50
Pittsburgh (heavy)	23.50-24.00
Pittsburgh (light)	23.00-23.50

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 ports

Foreign manganiferous ore, 45.55% iron, 6-10% man.	*17.00
No. Afr. low phos.	17.50
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	*16.00
Tungsten, spot sh. ton, unit, duty pd.	$22.00-22.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.00

*Nominal asking price for spot.

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	44.00-45.00
So. African, 50-52%	Nominal
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 84

New York—Sheet tonnage is less active, yet far from slow, with volume exceeding trade expectations. Most sellers are well booked for the greater part of third quarter, with some scheduling tonnage for fourth quarter. Others are refusing to book for that position, preferring to await developments in the expectation they will have no difficulty in filling books when the time comes. Sheet requirements for shelving and files for the national archives building in Washington have been heavily reduced by a revision in the program; nevertheless, there will still be close to 6000 tons of plates, shapes, bars and sheets required. As noted in a previous issue, the Breeze Corp., Newark, N. J., is low bidder on the contract. The sheet requirements involve principally 18 and 22-gage material.

Philadelphia — Despite seasonal influences, the decline in sheet demand is unusually slow. This is noticeable particularly in tonnage for stovemakers, where volume has been holding up far better than might normally be expected. This is accounted for in part by the unusual amount of dwelling construction, a situation which is also making for consumption of sheets for refrigerators and certain other items of household equipment. A local autobody maker is inquiring for 500 tons of brake band sheets for affiliated interests in Manchester, England. Sheet deliveries still average several weeks, with suspensions at mid-western plants affected by strikes contributing to this situation. To date little tonnage here has apparently been diverted from the books of companies affected by strikes to other producers.

Pittsburgh—With sheet bookings extending well into fourth quarter and mills here under continually heavy pressure for deliveries, little assistance could be given in this district to consumers affected by the strikes in other centers. Hot-rolled and galvanized inquiries continue heaviest. On the national scale, operations of full finished mills are approximately 66 per cent; common black, 71 per cent; hot and cold strip, 62 per cent; and galvanized around 66 per cent of capacity. Prices are steady.

Cleveland—Sheet mills report a slight increase in specifications over the comparable period of May. This is not traceable to strikes, although if the labor trouble continues a few more weeks consumers thus affected will be forced to seek their supplies elsewhere. However little room is available on mill schedules for such tonnage.

Chicago—Sheet deliveries continue at a better rate than new business but backlogs are little reduced and deliveries extend well into third quarter. Smaller demand from automotive interests is improving deliveries somewhat on cold-rolled material. Some business is being diverted because of strikes and unaffected plants are attempting to accommodate consumers when rolling schedules permit.

Boston — New sheet buying is lighter, mostly of a fill-in character, with some decline in specifications and shipments. Except by several quantity consumers and jobbers, covering for third quarter has been rather limited. Regular customers of mills affected by strikes are reluctant to divert tonnage to other producers unless stock is urgently needed.

Youngstown, O.—Eastern Ohio independent sheet mills operating under the 1936-37 Amalgamated wage agreement, which does not expire until midnight June 30, are booked up solidly to that date and operating at capacity. Some of this business may require deliveries well into July. At the same time a fair amount of third quarter orders for both black and galvanized sheets is being taken.

Cincinnati—Sheet buying is in better volume than during May but still is below capacity. Inquiries for rush material to customers whose regular supply has been affected are not important. Rolling schedules are being maintained at capacity. Automotive specifications are fairly heavy. The delivery situation is gradually becoming easier.

St. Louis — Demand for sheets generally continues active, with interest centering principally in galvanized and hot-rolled material. The leading local producer continues to operate at the high rate of recent weeks. This interest has had substantial inquiries as a result of the strike at Chicago and elsewhere, but is sold too far ahead to offer any relief.

Cold-Finished

Cold Finished Prices, Page 85

Pittsburgh—Cold-drawn producers report new bookings are still light and exceeded by shipments. Backlogs now are two to three weeks in some sizes and four to five weeks in others. Order files have been fattened only slightly by the labor situation in other steelmaking districts. One independent auto maker placed a few specifications last week. Prices are steady at 2.90c, base, Pittsburgh.

Strip

Strip Prices, Page 85

Philadelphia—Of all major products, narrow strip is available for perhaps the quickest shipment. Certain producers are unable to do much under three weeks or so, but a buyer would have little difficulty in obtaining deliveries in less than a week on hot strip, and in doing almost as well on cold strip. At no time during the recent rush of steel business were narrow strip deliveries particularly far extended, so that the schedules now being offered are not necessarily surprising. Prices are unchanged.

Pittsburgh—Hot and cold-rolled strip steel bookings showed a gain last week. Fill-in orders from automotive parts makers and specifications from electrical equipment manufacturers were major factors. Hot strip is quoted 2.40c, Pittsburgh, and cold strip, 0.25 carbon and under, 3.20c.

Cleveland—Specifications for hot and cold-rolled strip, while considerably better than a year ago, continues the downward trend since the March peak. Most mills are now in a position to offer deliveries within five to six weeks. Most consumers have substantial stocks. In some instances seasonal influences are curtailing operating schedules and as a result most mills look for a continued decline in specifications over the next 30 days.

Boston—Incoming narrow cold strip volume continues well diversified, new buying about maintaining the rate of the last three weeks, substantially below the recent peak. Buying for third quarter delivery is slow. Consumption by strip fabricators continues heavy with some consumers apparently drawing from stock more liberally. As a result, while mill backlogs move lower, consumer stocks are also being reduced in proportion. Some sellers are still uncertain as to near-future costs, but prices are steady. Operations in a few finishing departments are slightly lower.

New York—Cold strip buying for third quarter delivery is tight. New orders with most sellers barely hold incoming tonnage to the recent level. Backlogs on some specifications are down to where immediate rolling is possible with deliveries generally around four weeks. As with cold strip consumers, buyers of hot strip appear to have substantial stocks for the next few weeks. Few attempts to divert business from strike-hampered producers have been made, another factor indicating well rounded stocks. Regular customers of these mills sympathize with such

producers as do most competitors who frankly admit reluctance in taking such volume as offered.

Youngstown, O.—Strip mills are turning out capacity production. Mills here are not in position to take on much additional tonnage for consumers whose usual connections are hampered by strike conditions.

Pennsylvania Pump & Compressor Co., Easton, Pa., has appointed General Engineering Equipment Co., Indianapolis, as its representative in that district.

Plates

Plate Prices, Page 84

Philadelphia—While miscellaneous demand continues to taper, volume is being bolstered by railroad buying. In addition to the Reading Co., the Norfolk & Western is distributing tonnage, estimated to include close to 8000 tons of plates, for its car repair and car building and locomotive building program. Of this latter distribution to date approximately 500 tons of plates of one size are reported going to a Pittsburgh mill. Deliveries show moderate improvement, although this may be accelerated shortly as new business over the past fortnight has become increasingly light. Nevertheless, most producers are comfortably fixed with respect to summer backlogs and, in fact, certain of them appear to be so well situated in this respect that they are paying little attention to some of the attractive foreign inquiries which continue to be offered at premiums above the domestic market. Plates are steady at 2.35c, Coatesville, or 2.435c, Philadelphia.

New York—The recent decline in plate demand is becoming increasingly reflected in the delivery situation. While most mills still have substantial backlogs, rolling schedules are unquestionably easier in most cases. One mill, which a fortnight or so ago had little to offer under 12 weeks on wide plates, is able to offer quite a little in eight weeks; and on narrow plates, can offer shipments within three to six weeks. Another mill, which had little to offer under eight weeks, can accept a good range of specifications within four to six weeks.

Export inquiry includes 6000 tons of locomotive plates for Russia, through the Amtorg Trading Corp. here. Generally speaking, export demand for finished steel is somewhat more spotty and there seems to be less general tension. Japan, while having recently bought 80,000 tons of raw steel, is less active in the finished steel lines. Africa, on the other hand, continues active in covering on a diversity of products.

Early announcement is expected as to low bidder on two tankers for Sinclair Navigation Co., requiring about 5000 tons of hull steel each, on which bids were opened June 10.

Pittsburgh — While inquiry for plates has relaxed somewhat little slackening has been noted in pressure for deliveries, which continue extended into July. New business from railroad equipment makers has been light recently, but in most quarters here renewed buying is expected before long as the carriers' equipment may be taxed in the fall, from present indications. Barge inquiry continues dull. Shipments to tank fabricators are well maintained. Plate prices are steady at 2.25c, base, Pittsburgh.

Cleveland—New business is holding well in contrast to most other steel products, with some mills unable to make headway against backlogs. A mixed delivery situation exists with four to six weeks in one mill, to early October as the other extreme, placing some mills at a

distinct competitive disadvantage. Railroad demand continues inactive with no change expected soon. However, miscellaneous requirements are well above normal.

Chicago—Plate mills are unable to offer delivery before August and backlogs already have absorbed a large share of that month's probable output. Active demand from freight car builders, tank fabricators, and to a lesser degree from structural fabricators, is providing the principal support to current production. Several thousand tons of plates are involved in recent bookings from tank fabricators.

Boston—Supported moderately by shipyards, bridge needs and railroads, plate specifications and new buying have tapered with some recession in miscellaneous demand. Large-diameter pipe and new tank work are in smaller volume.

San Francisco—The Mad River pipe line at Eureka, Calif., was awarded on the reinforced concrete pipe basis to United Concrete Pipe Corp. Approximately 1000 tons of No. 10 gage blue annealed sheets will be required in addition to 500 tons of plates. New inquiries were confined to less than 100-ton lots. Awards aggregated 1230 tons and brought the total for the year to 26,692 tons, compared with 69,313 tons for the corresponding period in 1936.

Seattle—While no large tonnages are pending, fabricating plants have a considerable aggregate of small tonnages on books, much of it for industrial plants and maritime jobs.

Plate Contracts Placed

620 tons, two 80,000-barrel tanks, Union Oil Co., Avila, Calif., to Western Pipe & Steel Co., Los Angeles.

500 tons, 18 to 30-inch reinforced concrete pipe for Mad River pipe line, Eureka, Calif., to United Concrete Pipe Corp., Los Angeles.

310 tons, oil storage tank for Texas Co., Portland, Oreg., to Steel Tank & Pipe Co., Portland, Oreg.

150 tons or more, three lumber plant boilers, to Puget Sound Machinery Depot, Seattle.

110 tons, repair work, bear traps at lock and dam No. 7 and lock and dam No. 10, Ohio river, to Hunter Steel Co., Neville Island, Pa.

Unstated, 39 inch outlet pipe for Grassy Dam, Idaho, to Southwest Welding & Mfg. Co. Inc., Alhambra, Calif.

Plate Contracts Pending

400 tons, mostly plates, two steel hull, steam-driven derrick lighters, U. S. engineer, first district, New York; United Dry Docks Inc., New York, low, $604,000; bids May 28, cir. 227.

105 tons, 30-inch shore pipe for treasury department, Portland, Oreg.; bids postponed until June 18.

Caspers Tin Plate Co., Chicago, will formally open its new building at 4100 West Forty-second place, June 19.

Bars

Bar Prices, Page 84

Pittsburgh—Hot-rolled bar bookings are light, largely the result of lessened automotive specifications, but backlogs are sufficient to insure continuance of the high rate of activity through this month, barring unforeseen developments. Deliveries on large size bars generally are easier than on smaller sizes, depending on the mill. Agricultural implement manufacturers continue active and have bright prospects. Bars are quoted 2.45c, base, Pittsburgh.

Cleveland—Requirements for commercial carbon steel bars continue to decline somewhat but are still well above this time last year. Strikes in some plants have affected shipments, but so far only a few consumers have been pinched as most have sufficient stocks. Deliveries can be made within six weeks in most instances. Consumption of alloy bars

is well above normal, with deliveries further extended than on carbon bars.

Chicago—While steel bar specifications are lighter, consumption is fairly steady. A decrease in automotive requirements is in early prospect but there are expectations that operations of farm implement and tractor manufacturers will hold close to their present high rate for another 60 days. Brisk retail demand for farm equipment is holding production near capacity to a considerably later period than usual. Bar deliveries generally average 30 days.

Boston—With stocks better maintained by improved deliveries from eastern mills, commercial steel bar buying declines slowly. Specifications for alloy, cold-finished and forging bars in smaller tonnages continue numerous. On nickel steel bars for Boston, 12 suppliers bid like prices on 245 tons of corrosion-resisting bars for Norfolk, Va., navy yard, part of the tonnage being awarded to Republic Steel Corp., Cleveland, at 26.85c, delivered.

New York—Commercial bar demand includes an increasing volume from railroads, which are now entering the market for third quarter maintenance requirements. Bar demand in general continues to decline, with deliveries showing steady improvement. Most standard sizes appear available in about three weeks, and less in the case of some mills.

Philadelphia—An easier tendency is noted in commercial bar deliveries, with shipments substantially in excess of incoming business. Most sellers can offer a wide variety of specifications for delivery in three to four weeks and in some cases materially better. Prices are steady at 2.45c, Pittsburgh, or 2.47c, delivered, Philadelphia.

Behind the Scenes with STEEL

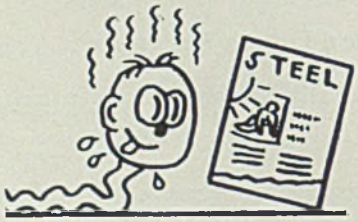
Contrast

BULLETINS from European nations are infested with notices of industrial plants humming with activity, building munitions of war. Over here the reverse is true, and we were happy to find somebody beating guns into washing machines the other day. The somebody was General Electric, and the act was the taking over of a Bridgeport plant belonging to Remington Arms Co. for the purpose of making washing machines. Berlin and Rome papers please copy.

* * *

H'mmm

WELL, sir, they laughed when we looked for sex in industrial advertising, but now look what they've gone and done. Sex rears its beautiful head, and on the cover of STEEL, too. Not, of course, that we mind the presence of the beautiful damsel on our illustrious cover. Far, far from



that. But when the advertising boys find a perfectly beautiful and applicable pun like that, it tears our very fiber to find it hiding its light under a bushel of beautiful woman. For we are from the new school which no longer considers the pun the lowest form of wit, but a sign of an agile mind.

* * *

Heat

WITH the heat waves shimmering up and down and doing a rhumba on our typewriter keys, we dream of seashores and air-conditioned buildings. Not so the editors of our book. Hot off the griddle they come to us with sizzling news of a new story to appear in two instalments beginning June 28, all about how unit heaters can save youse guys in the plants some bucks here and there. Always on the lookout for such material, these editors spend countless hours in ferreting out things which will make life easier for steel and metalworking executives everywhere, and when they say they've got something, well, don't miss it. And in spite of rising costs everywhere else, this service still costs you only $0.008 per day, or about the cost of one cigarette.

* * *

Airy

LOOKING at the feature cut on the bottom of page 44 in this week's book, we thought we discovered something in that more fans blow the air out than draw it in, and less air comes out than goes in. Consulting our vice-president in charge of hot air on the subject, we found out that the air gets warmed up inside the tunnel and expands, taking up more room than it did outside and making it necessary to have more fans to take it out. Wonder who thinks of all the things like that? Anyhow, we were assured, the blower-out fans were big enough to take the breath away from ten million people and that is more than we have seen standing in one place for the last week or two.

* * *

Padded

LACK of clothing on the feminine form may cause poets to sing paeans to the skies, et al., but at least one German lady can poohpooh the poets and thank her underwear for her life, if we may be so indelicate. It seems that a bold bad bandit held up the lady and demanded in tones stentorian her money or her life. The lady turned and ran, whereupon the BBB fired a shot at her. The bullet went through eleven of the lady's twelve skirts, gave up the ghost and was later found sound asleep in that spot. Take note, inhabitants of strike-infested areas!

* * *

Bats

BASEBALL bats make strange bedfellows these days. Last week STEEL showed pickets equipped for the national pastime, and this week on page 62 U. S. Rubber says air hammer operators are going to bat for their products.

—SHRDLU

Pipe

Pipe Prices, Page 85

Pittsburgh—While a few tonnages have been booked here as a result of the labor situation in other steelmaking districts, jobbers' stocks have been cushioning the effect of the strikes to some extent. Mechanical and seamless tubing shipments are well maintained. National Tube Co., Pittsburgh, is reported to have been awarded 40 miles of 12-inch pipe for a line in Texas. Several small pipe lines are approaching the contract stage and may be awarded within the next two weeks. Prices are steady.

Cleveland — Requirements for commercial standard steel pipe declined about 20 per cent during May. Further recession is expected through June, as unsettled labor conditions are expected to hamper expansion programs. Cast pipe awards continue dull with most foundries operating well under this time last year. J. B. Clow & Sons Co., Cleveland, received the contract for 150 tons of 12-inch cast pipe water supply line for Fremont, O.

Chicago—Cast pipe sales lack improvement but compare favorably with recent weeks. Business is made up almost entirely of small individual lots and are more numerous than a year ago despite lack of major change in total tonnage. Impaired financial condition of a number of municipalities is postponing proposal work.

Boston—Most cast pipe needs have been placed by cities and towns for water line extensions during the next few months, and buying is light for fill-in requirements with inquiry meager. Several cities with blanket contracts are specifying moderately.

Merchant steel and wrought pipe buying is steady in small lots, the largest construction project, Suffolk county courthouse, Boston, taking several hundred tons.

New York—With few exceptions, cast pipe buying is limited to fill-in purchases. For a world's fair project, Queens, 350 tons, including fittings, have been bought, mostly concrete pipe on alternate bids. A fair tonnage of steel pipe will be bought by the contractor for this job, however. Approximately 1000 tons of cast pipe.

Youngstown, O. — While district wrought pipe mills are down owing to the strike, a fair volume of inquiry continues. This largely is for merchant pipe. Line pipe inquiry continues light.

Tulsa, Okla.—Oklahoma Pipe Line Co. will build 12-mile 8-inch oil line from Wewoka, Okla., to Canadian river and 14-mile 8-inch line Fittstown to Centrahoma, Okla., by own forces with Lindeweld oxyacetylene welding for all joints.

San Francisco—Bids will be opened June 14 for 835 tons of 2 to 16-inch pipe for San Francisco. This is the largest inquiry in a month. Bids open June 11 for 19,000 feet of 2 to 8-inch pipe for Circle, Mont. To date this year 16,600 tons have been booked, compared with 12,756 tons for the same period last year.

Seattle—No improvement is noted in cast iron pipe market. Business is confined to small tonnages. Large projects are lacking.

Steel Pipe Pending

200 tons, 18-inch and under, dam project, Wawarsing, N. Y., board of water supply, New York; Triest Construction Co., low.

Cast Pipe Placed

350 tons, 20-inch, with fittings, world's fair project, Queens, New York, to Warren Foundry & Pipe Co., Phillipsburg, N. J.

348 tons, 12 and 16-inch, specification X-103, Los Angeles, to American Cast Iron Pipe Co., Birmingham, Ala.

150 tons, 12-inch water line, City of Fremont, O., to J. B. Clow & Son Co., Cleveland.

123 tons, treasury department, San Francisco, Invitation 3568, to Pacific States Cast Iron Pipe Co., Provo, Utah.

108 tons, treasury department, San Jose, Calif.; to Walworth Co. of California on steel basis.

100 tons, 6 and 8-inch, Providence, R. I., to Warren Foundry & Pipe Co., Everett, Mass.

Unstated tonnage, 40 miles of 12-inch line, for Texas Co. project in Texas, to National Tube Co., Pittsburgh.

Cast Pipe Pending

1000 tons, various sizes, Tallmans Island sewage treatment plant, Queens, New York; North Eastern Construction Co., New York, low.

835 tons, 2 to 16-in., Invitation 1817, San Francisco; bids June 14.

100 tons, including accessories, Yellowstone county commissioners; bids at Billings, Mont., June 16.

Unstated tonnage, 11,000 feet of various sizes, Dresser Junction, Wis.; bids June 11.

Transportation

Track Material Prices, Page 85

Close to 10,000 tons of steel is being purchased by the Norfolk & Western for car and locomotive work in its own shops at Roanoke, Va. In addition, this railroad is inquiring for its usual quarterly maintenance needs of 2500 tons of plates, shapes and bars and several hundred tons of pipe. Seaboard Air Line also is in the market for its routine quarterly needs.

The Norfolk & Western program is the largest recent one now active in the East, with the Reading Co.'s program also outstanding and involving 3000 tons or so of rolled steel, just placed.

Recently noted report that Norfolk & Western would build 10 locomo-

tives in its own shops has been confirmed. This, with the purchase of six 3600-horsepower electric locomotives by the New York, New Haven & Hartford from the General Electric Co., Schenectady, N. Y., is outstanding in locomotive business. Some diesel-electric engines are included in recent orders. Pressed Steel Car Co., McKees Rocks, Pa., has booked 50 subway cars for Philadelphia.

Awards of freight cars in May totaled 4732, bringing the total for the year to date to 45,437, compared with 22,909 in the first five months of 1936. Comparisons are shown below:

	1937	1936	1935	1934
Jan.	17,806	2,050	24	152
Feb.	4,972	6,900	806	19,725
March	8,155	632	0	30
April	9,772	4,427	350	800
May	4,732	8,900	2	717
5 mos.	45,437	22,909	1,182	21,424
June	.....	5,200	5,151	1,835
July	.....	7,229	500	19
Aug.	.....	225	200	105
Sept.	.....	1,750	875	7
Oct.	.....	2,210	1,250	75
Nov.	.....	1,550	100	254
Dec.	.....	23,450	10,050	110
Total	.....	64,643	19,308	23,829

Car Orders Placed

City of Philadelphia, 50 subway cars, to Pressed Steel Car Co., McKees Rocks, Pa.

J. G. Brill Co., Philadelphia, 16 trolley coaches for St. Joseph Railway, Light, Heat & Power Co., St. Joseph, Mo.

United States Sugar Corp. of Florida, 60 thirty-ton standard gage cane cars, to Magor Car Corp., Passaic, N. J.

Locomotives Placed

Canton railroad, one 600-horsepower diesel-electric engine to Electro-Motive Corp., La Grange, Ill.

Chicago & North Western, one 4-6-4 steam engine, to American Locomotive Co., New York.

East Erie Commercial railroad, one diesel-electric switch engine, to General Electric Co., Schenectady, N. Y., with diesel equipment to be supplied by the Cooper-Bessemer Corp., Mt. Vernon, O.

New York, New Haven & Hartford, six 3600-horsepower, 4-6-6-4 electric locomotives to General Electric Co., Schenectady, N. Y.

Locomotives Pending

Chief of engineers, munitions building, Washington, one 30-ton mechanical drive locomotive, for Raritan arsenal, New Jersey; bids June 15, cir. 63.

The Newfoundland, one 2-8-2 type locomotive, bids asked.

Redmond & Co., New York, has removed its offices from 48 Wall street to 44 Wall street.

Wire

Wire Prices, Page 85

Pittsburgh — Wire specifications generally are about even with shipments. Producers anticipate a fairly active summer, with manufacturers' wire remaining good and merchants' continuing spotty until possibly August. Wire rods are in especial demand. Export inquiry has been livelier. Prices are steady.

Cleveland—Wire producers report a slight upturn in specifications, contrary to the general trend of the last 30 days. While this movement has not taken any definite form a gradual improvement is anticipated over the next few months. Heavy consumers' stocks resulting from extensive forward buying during March, are being depleted rapidly, for most have experienced little recession in operations. Demand for manufacturing and merchant wire products continue well above last year.

Chicago—Wire demand is fairly steady though at a reduced rate compared with activity earlier. Backlogs are receding and producers are in a better position as regards deliveries. Effects of strike on business received by companies still operating so far are not pronounced. A seasonal decrease in consumption of manufacturers' wire is in prospect for coming weeks. Continuation of favorable prospects in agriculture are expected to be reflected in further gains in sales of merchant wire products.

Boston—Bookings of wire hold at the recently reduced rate with third quarter covering lagging. Buying is well distributed among various manufacturing wires. Specialties are more spotty. While automotive demand for spring wire is somewhat uneven, buying is well sustained. Operations continue high with backlogs gradually shrinking. Deliveries on more standard specifications improve and prices are firm.

New York—Buying in most wire products is fairly well maintained with a few sellers noting a slight gain in orders for some items. More volume is being taken for forward delivery, although third quarter covering is not heavy. Well sustained demand for electrical goods, cable, wire rope, heavier products and manufacturers' wire continues, although buying lacks the snap seen earlier in the quarter. Operations hold high and deliveries still improve, with backlogs on some items substantially lower. Prices are firm and unchanged.

Buffalo—There is a steady inquiry for wire, road mesh and rods. Operations in Buffalo mills specializing

in these products has been on the highest scale of recent years through the present quarter. It is doubted whether the mid-summer slump will be as drastic as usual this year.

Shapes

Structural Shape Prices, Page 84

New York—Following direct steel bids on 3650 tons for four New York city schools, three additional such buildings are out for figures, taking close to 2500 tons. Awards are not numerous, but the volume already bid and about to be placed is large. Marc Eidlitz & Sons, contractors, will buy 3300 tons for the Memorial hospital this week. Frederick Snare Corp. is about to close on 4200 tons, mostly piling, for two projects. Less new tonnage has come out during the last 10 days, but at least 30,000 tons has been bid and is near purchase in this area.

Philadelphia—An 1840-ton Pennsylvania state bridge and an 860-ton school in Philadelphia are among the few large awards. Another school in North Philadelphia, requiring about 900 tons of shapes and a still larger tonnage of bars, is being figured for bids later in the month and the 4500-ton Market street courthouse is being estimated for bidding June 29, this latter date representing the second postponement this month. Structural activity otherwise is light, although fabricators are manifesting much interest in the proposed government printing building involving 8000 tons, up for bids June 29. Shapes are steady at 2.35c, Bethlehem, Pa., or 2.455c, Philadelphia.

Boston — Awards of approximately 1600 tons, mostly bridges, further reduces unplaced figured volume. Nearly a score of stringer bridges, taking small tonnage each, are up for bids. Except for 325 tons for a tannery building, Peabody, Mass., most of the larger contracts continue to go to fabricating shops outside the district. Under 5.00c a pound on structural steel in place is being quoted by some contractors on bridge construction.

Pittsburgh—Inquiries and awards are considerably lighter. Pending business includes 3000 tons for an Electro-Motive Corp. building at McCook, Ill. Indiana Bridge Co. was awarded 750 tons for a power house addition, American Gas & Electric Co., Windsor, W. Va.

Cleveland — Fabricators report only slight improvement in deliveries from the mills, as small miscellaneous private orders show no signs of receding. Most fabricators are booked solid for six weeks with little improvement expected soon. Excluding the Lorain avenue bridge, Cleveland, little public work is pending.

Chicago—Structural inquiries are the heaviest in a number of weeks but in small lots. Leading items among new projects are 8000 tons for an International Harvester Co. plant at Indianapolis. Fabricators are booking a fair number of small lots for industrial building and the increase in pending business aids the outlook for future operations.

San Francisco — Private work is slow in coming forth for figures, but a fair volume was placed during the week, aggregating 2102 tons and bringing the total for the year to 100,947 tons compared with 69,551 tons in 1936. Atlas Scraper & Mfg. Co. booked the largest award, 750 tons for a transit shed at Long Beach, Calif.

Seattle — No awards in excess of 100 tons were announced, but considerable tonnage is pending. Bids were opened June 3 for Coulee dam

Shape Awards Compared

	Tons
Week ended June 12	15,403
Week ended June 5	32,915
Week ended May 29	15,660
This week, 1936	18,215
Weekly average, 1936	16,332
Weekly average, 1937	25,890
Weekly average, May	19,607
Total to date, 1936	469,629
Total to date, 1937	621,366

Includes awards of 100 tons or more.

trash racks, about 1000 tons, but figures are not yet available. Seattle will open bids July 1 for the first unit of the Ruby dam, Skagit river project, calling for 400 tons.

Shape Contracts Placed

1840 tons, Pennsylvania state bridge, Weissport, through M. A. Carty Construction Co., Phillipsburg, N. J., to the Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, plant, Lincoln Electric Co., Cleveland, to Austin Co., Cleveland.

990 tons, bridge, FAP 147-B San Juan county, New Mexico, to Pittsburgh Des Moines Steel Co., Pittsburgh.

860 tons, superstructure, public school, Sixty-seventh and Elmwood avenue, Philadelphia, through McCloskey & Co., general contractors, to Bethlehem Steel Co., Bethlehem, Pa.

825 tons, bridge, Moorhead, Minn.-Fargo, N. D., to Bethlehem Steel Co., Bethlehem, Pa.; W. O'Neil Sons Co., Fairbault, Minn., general contractor.

750 tons, power house addition, American Gas & Electric Co., Windsor, W. Va., to Indiana Bridge Co., Muncie, Ind.

750 tons, transit shed, Long Beach, Calif., to Atlas Scraper & Mfg. Co., Bell, Calif.

600 tons, including approximately 10 tons, stainless steel, embedded parts for spillway gates, Chickamauga dam, Tennessee valley authority, Knoxville, Tenn., to Lakeside Bridge & Steel Co., Milwaukee.

500 tons, three radio towers, 600 feet high, and repairs to six existing towers, bureau of yards and docks, Navy, Annapolis, Md., to Pittsburgh Des Moines Steel Co., Pittsburgh.

450 tons, power house, Rochester Electric & Gas Co., Rochester, N. Y., to Belmont Iron Works.

450 tons, plant additions, Packard Electric Co., Warren, O., to Truscon Steel Co., Youngstown, O.

435 tons, plate girder bridge, New York, New Haven & Hartford railroad, Union street, Braintree, Mass., to American Bridge Co., Pittsburgh; M. F. Gaddis, general contractor.

405 tons, superstructure, state bridge, Boston & Maine railroad crossing, North Kennebunkport, Me., U. S. WPGH, project No. 101-A, to American Bridge Co., Pittsburgh, $42,800; bids June 1, state highway commission, Augusta L. D. Barrows, chief engineer. Concrete Construction Co. and Ceralli Contracting Co., Chelsea, Mass., joint bid, low on concrete portion, $139,214.

369 tons, H columns, Sacramento river bridge, Red Bluff, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, state highway bridge, Broome county, New York, to American Bridge Co., Pittsburgh; through Howes & Farrell Inc., Sidney Center, N. Y.

334 tons, bridge, Vicksburg Mississippi National Park, to Illinois Steel Bridge Co., Jacksonville, Ill.; Kellher Construction Co., Dallas, Tex., general contractor.

325 tons, building, A. C. Lawrence Leather Co., Peabody, Mass., to New England Structural Co., Everett, Mass.

300 tons, building, Linde Air Products Co., South Chicago, Ill., to American Bridge Co., Pittsburgh.

280 tons, I-beam locks, Canadian crossing of Thousand Islands bridge, placed by Canadian Bridge Co. with Carnegie-Illinois Steel Co., Pittsburgh.

275 tons, turbine room extension, New Orleans, to Jones & Laughlin Steel Co., Pittsburgh.

250 tons, building, Clifton Paperboard Co., Clifton, N. J., to Joseph T. Ryerson & Son, Inc., Jersey City; Austin Company, general contractor.

250 tons, addition to Claus Spreckles building, San Francisco, to Western Iron Works, San Francisco.

250 tons, alterations, Cudahy Packing Co., Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

230 tons, factory building, Hazel Atlas Glass Co., Lancaster, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.

225 tons, dam, Imperial, Nevada, bureau of reclamation, specification 910-D, to St. Louis Structural Steel Co., East St. Louis, Ill.

200 tons, building, Dennison Mfg. Co., Chicago, to Hansell-Elcock Co., Chicago.

200 tons, packing plant, Lake Charles, La., to Orange Car & Steel Co., Orange, Texas.

175 tons, power and switch building, Chevrolet Motor Co., Cincinnati, to R. C. Mahon Co., Detroit.

175 tons, addition, Harvey Machine Co., Los Angeles, to Bethlehem Steel Co., Los Angeles.

165 tons, factory, Coca Cola Co., Cincinnati, to Pittsburgh Bridge & Iron Co., Pittsburgh.

165 tons, bridge, Oswego, Ill., to Milwaukee Bridge Co., Milwaukee.

160 tons, building, Sundstrand Machine Tool Co., Rockford, Ill., to A. C. Woods & Co., Rockford.

155 tons, 12 beam spans, Seaboard Air Line railroad, Savannah, Ga., to American Bridge Co., Pittsburgh.

150 tons, industrial arts building, Polytechnic high school, Long Beach Calif., to Pacific Iron & Steel Co., Los Angeles.

135 tons, steel stinger bridge and approaches, WPFR-32, Ware, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; H. P. Cummings Construction Co., Ware, general contractor. Truscon Steel Co., Youngstown, O., awarded reinforcing bars.

120 tons, I-beam spans, Dawes county, Nebraska, to Lincoln Steel Works, Lincoln, Neb

110 tons, fabricated beams, Manchester, N. H., to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, building addition, Taylor Instrument Companies, Rochester, N. Y., to Genesee Bridge Co., Rochester; A. W. Hopeman & Sons Co., Rochester, general contractor.

100 tons, building, Harrington & King Perforating Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

Shape Contracts Pending

8000 tons, plant, International Harvester Co., Indianapolis.

6500 tons, separate steel contracts, fabricating and erecting, Christopher Columbus high school, Bronx; Lafayette high school, Brooklyn, and public school 191, Brooklyn; bids June 24, board of education, New York.

4500 tons, Market street courthouse, Philadelphia, bids postponed until June 29.

3300 tons, building, Memorial hospital, New York; Marc Eidlitz & Sons, New York, general contractors.

1208 tons, public school 68, Manhattan, New York; Harris Structural Steel Co., New York, low, $117,500.

1077 tons, including 175 tons, cutting edges; 847 tons, carbon structural steel and 57 tons, anchor bolts and frames, tower pier and foundations for anchorage and approach, Bronx-Whitestone bridge, New York, Frederick Snare Corp., low.

933 tons, public school 115, Bronx, New York; Bethlehem Steel Co., Bethlehem, Pa., low, $89,970.

923 tons, public school 113, Manhattan, New York; Lehigh Structural Steel Co., Allentown, Pa., low, $89,100.

750 tons, federal office building, Houston, Tex.; James I. Barnes, Springfield, O., $573,000, low.

730 tons, beam bridges, River Junction, Fla.

615 tons, addition, public school 131, Brooklyn, N. Y.; Bethlehem Steel Co., Bethlehem, Pa., low, $59,170.

600 tons, Quartz creek state bridge, Oregon; Hoffman Construction Co., Portland, Oreg., low.

600 tons, bridge, Astoria, Oreg.

565 tons, fabricated structural steel, pony truss bridge, Westmoreland and

Armstrong counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., June 18; includes 8 tons of plain steel bars.

500 tons, post-office garage, Chicago; bids July 1.

350 tons, building, McGraw Electric Co., Elgin, Ill.

325 tons, power house, Potomac Edison Co., Cumberland, Md.; Sanderson & Porter, New York, general contractors.

325 tons, foundry building, Westinghouse Electric & Mfg. Co., East Springfield, Mass.

290 tons, steel stringer bridges, various locations, State of Massachusetts; bids June 15 and 22, department of public works, Massachusetts, G. H. Delano, chief engineer.

240 tons, crane runway, Libbey-Owens-Ford Glass Co., Ottawa, Ill.

215 tons, overhead structure, Neshkoro, Wis.; bids June 18.

200 tons, building, St. Clairs hospital, New York.

180 tons, St. James Church, Madison avenue and Seventy-first street, New York.

150 tons, 50 muck cars, metropolitan water district, Los Angeles; bids opened.

130 tons, four utility buildings, government air depot, Sacramento, Calif.; bids June 17.

Unstated, two gantry cranes, 80 ton capacity each, and one gantry crane, 30 ton capacity, Tennessee valley authority, Pickwick landing dam and power plant; bids June 24 and July 1 respectively.

Unstated, two bridges Challis national forest, Idaho, project; bids to bureau of roads, Ogden, Utah, June 17.

Reinforcing

Reinforcing Bar Prices, Page 85

Pittsburgh—Concrete reinforcing bar sellers are confronted with numerous large inquiries recently, including 6000 tons for an experimental model basin for the navy; 1200 tons for the treasury printing building in Washington; and 500 tons for Kansas State college, Manhattan, Kans. Prices are fairly steady.

Cleveland — Estimated reinforcing bar requirements during May from private sources totaled 385 tons; joists 10. This compares with 526 tons and 83 tons respectively for April. Recent demand is moderately active with most awards under 100 tons. However, the Industrial Rayon Co.'s plant, Painesville, O., involving approximately 1000 tons, has created considerable interest here. Bids are due June 17.

Chicago—Concrete bars are fairly active. Pending and prospective business is substantial in the aggregate, with prospects for good shipments during coming months. Largest projects pending are of a public nature, but there is fair demand for private building. Curtailment in shipments recently as a result of steel plant strikes partly has been offset by a strike of structural erectors and reinforcing steel setters, which has tied up a number of jobs and suspended steel deliveries.

Boston — Small-lot reinforcing contracts are more numerous, contributing materially to new tonnage which approximates 1000 tons, including 450 tons for two veterans' hospital projects. Connecticut and Massachusetts bridges make up most unplaced tonnage. Numerous bridge contractors are bidding under 5.00c on reinforcing bars in place and as low as 4.00c in one instance, resulting in pressure on distributors for concessions.

New York—Bids have closed on sewers, bridges and miscellaneous engineering projects taking approximately 10,000 tons, assuring a sharp increase in buying shortly. Awards include more than 1000 tons of highway mesh for New York state. New tonnage is coming out in increasing volume while a 3400-ton Brooklyn sewer is being readvertised. Pending volume is the heaviest in many months. Prices continue to be shaded.

Buffalo—Demand is improving as several pending projects approach contract stage. A revised plan for elimination of the New York Central tracks from the Terrace in Buffalo is practically ready for submission to the public service commission, involving the expenditure of $1,900,000, and the use of several thousand tons of reinforcing bars. Efforts also are being made to obtain funds for the $2,000,000 high level bridge over the harbor here. Production in reinforcing bar plants here is said to be practically double that of this time a year ago.

Philadelphia — Sweets Steel Co., Williamsport, Pa., was awarded approximately 1700 tons of bars, for a public school at Sixty-seventh and Elmwood avenue; a similar tonnage for a school in North Philadelphia, is up for figuring later in the month. The Market street

Concrete Awards Compared

	Tons
Week ended June 12	10,403
Week ended June 5	7,493
Week ended May 29	3,394
This week, 1936	3,195
Weekly average, 1936	6,005
Weekly average, 1937	5,200
Weekly average, May	7,773
Total to date, 1936	159,788
Total to date, 1937	124,802

Includes awards of 100 tons or more.

courthouse, involving at least 1200 tons of bars, has been postponed, until June 29. Recent awards have been negligible, with prices easy.

San Francisco — San Francisco has postponed the opening of bids on 1800 tons for the Sunset reservoir until July 8. Bids have been opened on 415 tons for transition structures for the San Gabriel dam No. 1, Los Angeles county, California. Largest pending inquiry, to be opened June 16, calls for close to 3500 tons for the San Francisco terminal facilities, in connection with the San Francisco-Oakland bridge. While mills in the Pacific Northwest have caught up on backlogs, California mills are still booked some weeks in advance. Awards totaled 1706 tons, bringing the year's aggregate to 39,959 tons, compared with 101,648 tons a year ago.

Seattle — Mill prices are stable at 2.95c, which will be the level for the third quarter. Backlogs are decreasing but local plants have sufficient to carry them to capacity through the current month. Bethlehem Steel Co., took 150 tons involved in Washington state highway projects. Orders pending approximate 1500 tons including 400 tons for Seattle's Ruby dam, bids July 1.

Reinforcing Steel Awards

4700 tons dam, Hastings, Nebr., Central Nebraska Power and Irrigation district, to Sheffield Steel Corp., Kansas City, Mo.

1500 tons, school, Sixty-seven and Elmwood avenue, Philadelphia, to Sweets Steel Co., Williamsport, Pa.; through McCloskey & Co., Philadelphia.

800 tons, 8-story addition, Montgomery Ward Co., Fort Worth, Tex., to Concrete Engineering Co., Inc., Dallas; Quisle & Andrews, Fort Worth, general contractors; Fort Worth Structural Steel Co. awarded structural material.

625 tons, highways, Auburn-Seneca Falls, Cayuga, Cortland, Seneca and Dutchess counties, New York, to Wickwire-Spencer Steel Co., New York.

590 tons, armory, St. Louis, to Joseph T. Ryerson & Son Inc., Chicago.

450 tons, superstructure, Suffolk county courthouse, Boston, to Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Co., general contractor.

250 tons, plant, Alka Seltzer Co., Elkhart, Ind., to Concrete Engineering Co., Chicago.

225 tons, substructure Mississippi river bridge, La Crosse, Wis., to Minneapolis Bridge Co., Minneapolis.

218 tons, school buildings, Encinitas, Calif., to unnamed interest.

206 tons, Sacramento river bridge, Red Bluff, Calif., to Truscon Steel Co., San Francisco.

177 tons, bridge, Moorhead, Minn.-Fargo, N. D., to Bethlehem Steel Co., Bethlehem, Pa.; W. O'Neil Sons Co., Fairbault, Minn., general contractor.

162 tons, Wilson Way crossing, Stockton, Calif., to Kyle & Co., Fresno, Calif.

150 tons, building, New York Telephone Co., Buffalo, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, Washington state highway projects, to Bethlehem Steel Co., Seattle.

100 tons, bridge, Vicksburg Mississippi National Park, to Southern States Steel Corp., Dallas, Tex. Kelliher Construction Co., Dallas, general contractor.

100 tons, post office, Downey, Calif., to unnamed interest.

Unstated tonnage, recreational building No. 210, veterans' hospital, Tougas, Me., to Capitol Steel Co., New York; Industrial Fireproofing Co., New York, general contractor.

Reinforcing Steel Pending

6000 tons, Carderock experimental model basin for U. S. navy, Carderock, Md.; bids July 21.

3400 tons, sewer, Flatbush avenue, Brooklyn; readvertised.

2810 tons, sewer, contract 1, project 2, Queens, New York; Charles F. Vachris Inc., Brooklyn, low, $977,912.

2075 tons, sewer, Williams avenue, Brooklyn; Luang Construction Corp., Brooklyn, low.

1800 tons, Sunset reservoir, San Francisco; bids postponed until July 8.

1750 tons, Tallmans island sewage treatment works, section 2, contract 2, structures and equipment, Queens, New York; North Eastern Construction Co., New York, low.

1318 tons, tower pier and foundations for anchorage and approach, Bronx-Whitestone bridge, New York; Frederick Snare Corp., low.

1300 tons, Brewster housing project, Detroit; Maurice L. Bein Inc., Chicago, general contractor.

1200 tons, Market street courthouse, Philadelphia, bids postponed until June 29.

1200 tons, printing building, U. S. treasury department, Washington; bids soon.

500 tons, building, Kansas State college, Manhattan, Kans.

400 tons, highway, Seventy-ninth to 105th streets, west side, New York; J. F. Fitzgerald Construction Co., New York, low.

300 tons, Roza canal project, Washington state; H. J. Adler Co., Caldwell, Idaho, contractor; materials furnished by reclamation bureau.

275 tons, stop log, Bonneville dam project; Gilpin Construction Co., Portland, Oreg., low.

250 tons, two exploratory caissons, Lackawack dam, Warwarsing, N. Y., Board of water supply, New York; Triest Construction Co., New York, low, $737,777. Also includes 200 tons, 18-inch and under, steel pipe; 100 tons, miscellaneous metal, and structural steel.

224 tons, Laurel Hills housing project, Cincinnati; bids in.

200 tons, six buildings, government air depot, Sacramento, Calif.; bids June 17.

200 tons, post office garage, Chicago.

194 tons, state highway work, Illinois.

150 tons, administration building, for dam project, Belchertown, Mass.

Refining Co., Whiting, Ind.

100 tons, plant, American Smelting &

Unstated tonnage, chain bridge, Washington, D. C., Teller Construction Co., Red Bank, N. J., awarded general contract.

Unstated, Washington county, Oregon, state overspan; Jacobsen-Jensen Co., Portland, low.

Unstated, Tillamook county, Oregon, state bridge; E. F. Philpott, Portland, low.

Chrome Ore Imported

Philadelphia—Imports in the Philadelphia customs district the week ended June 5 included: 4552 tons chrome ore, South Africa; 100 tons pig iron, British India; 124 tons structural shapes, Belgium; 34 tons steel bars, Belgium, and 12 tons steel bands, Belgium.

Pig Iron

Pig Iron Prices, Page 86

Pittsburgh—Inquiries for export pig iron have been unusually numerous recently, including 50,000 to 75,000 tons of foundry iron for shipment to France, 10,000 tons of low phosphorus, 3000 tons of basic, and numerous other tonnages. Apparently, little of this business has been taken in this district. All things considered, business is holding up well and shipments are good. Sales of occasional carloads are reported as a result of the labor situation in other steelmaking districts. Signing of third-quarter contracts has been slower than if the incentive of an impending price advance were present.

Cleveland — Little third quarter tonnage has been booked. Most foundries still have considerable tonnage to be shipped this quarter and there is no price incentive for forward buying. Producers affected by strikes claim they have lost only a small portion of new business. Few have thought it worth while to solicit third quarter tonnage under present conditions, but have accepted all tonnage sent in otherwise.

Chicago—Opening third quarter books has resulted in placing of a surprisingly large volume of new business. Foundries have fair stocks on hand and a substantial tonnage is due against old contracts but the outlook for active consumption in the fall is stimulating coverage on future needs. A seasonal decline in operations of some foundries is in prospect for the summer but average schedules are expected to be higher than usual. Strikes so far have not adversely affected pig iron supplies.

Boston—Pig iron buying for third quarter delivery, while light, is slowly gathering momentum. General covering is not expected for two or three weeks. Shipments against old contracts are steady and considerable foreign inquiry is resulting in some quiet buying at premium prices. Foundry melt has declined slightly. About 1000 tons of Indian iron recently arrived against old orders.

New York—Pig iron consumers continue slow in covering for third quarter as no change in price has been made. Some small seasonal recession in foundry melt is noticed.

Buffalo—Little activity is noted in pig iron although some buyers are quietly covering for third quarter. With heavy shipments taken this month and with operations on a broad scale, except where labor troubles have intervened, some buyers will start the new period with only small inventories. Movement of iron by barge canal continues heavy.

Philadelphia—Routine contracting for third quarter is still getting under way slowly, with most consumers well covered on immediate requirements and with no early change in price in prospect. Some consumers undoubtedly have enough tonnage on order to run them well into third quarter, notwithstanding the melt in this district has held up well. There has been some recession recently as summer approaches.

Cincinnati—A few third quarter contracts for pig iron were booked after announcement of unchanged prices, but most melters are delaying commitments. Furnaces making shipments against first quarter contracts are insisting all material must be taken in this month. The melt, supported by backlogs which are rapidly being reduced, is heavy.

St. Louis — While new business, following opening of books for third quarter, has been in disappointing volume, shipments are well main-

tained, the daily average being only slightly less than in May. Generally foundries are operating at or near capacity, mainly on backlogs, though considerable new business has been placed during the past ten days or two weeks.

Toronto, Ont.—Sales are holding at high level with total awards approximately 1700 tons. Melters are beginning to show interest in third quarter needs and producers probably will open books for third quarter contracts within a few days. At present, however, no future buying is being done, but inquiries are appearing. Spot sales are in good volume and melters are using larger quantities of pig iron owing to scarcity of iron scrap materials. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 88

Boston — Dullness continues in domestic buying of scrap, shipments being light with most prices nominal. Weakness has not been halted, however, with heavy melting steel down to $14.75, delivered, Worcester. Activity continues centered on export, prices for dock delivery being unchanged. While the Interstate Commerce Commission has refused to suspend increased freight rates which went into effect June 7, despite protests of scrap shippers, the Massachusetts public utilities commission has issued a temporary suspension which applies only to shipments within the state. On material shipped to docks, the new mileage rate applies, such shipments being under interstate jurisdiction. This rate is considerably higher, based on mileage. From Worcester, for instance, the rate is now $2, Boston piers, an advance from $1.25.

New York—With numerous eastern mills holding back shipments and new buying light scrap prices are largely nominal, although borings and turnings are 50 cents lower. Most steelworks have fairly heavy stocks and are apprehensive of the labor situation. Most activity is in buying against contracts for export. Material for this purpose is coming out freely at unchanged prices. Some barge shipments are moving to Buffalo but the total is not heavy.

Buffalo—Scrap is quiet, as purchases by consumers ended with recent buying from railroad lists. Purchase of this material at prices said to be between $18.50 and $19, probably nearer the latter figure, has reaffirmed the confidence of dealers and they are prepared to play a waiting game in an effort to get higher values than are now possible.

Philadelphia—A distinctly firmer tone is noted in scrap. Both grades of melting steel are unchanged for the first time in three or four weeks, heavy breakable cast is higher at $18, delivered, and buying in general is showing a little more life. Moreover, no revisions have been made recently in most items. Only a few grades have been reduced, including old compressed sheets and cupola cast. Old compressed sheets are lower on sales to Pencoyd at $14 and to another eastern Pennsylvania point at $14.50. Export buying in this district is negligible with dealers making no offerings.

Pittsburgh — No. 1 heavy melting steel is off 50 cents to $18 to $18.50 as a combined result of a sale at $18.50 into mill consumption and the fact that scrap has been offered to other mill buyers at $18.50. No. 2 is also weaker, the quotable range now being $16 to $16.50. A small sale of hand bundled sheets was made into mill consumption at $17.50. Offerings from small dealers are light and brokers find it hard to obtain good material under $18.50.

Cleveland — Lack of buying is bringing a decline in quotations here and in the Valley, cast grades being marked down $1 and steelmaking grades about 50 cents lower. Some grades of scrap are being accepted under restrictions at the Lowellville, O., mill. Shipments are fair to all but plants blockaded by labor troubles.

Chicago—Activity is confined almost entirely to broker and dealer trading since steelworks are out of the market and demand from other consumers is light. Mill prices are nominal but dealers are able to buy heavy melting steel as low as $14.50 to $15. Producers of scrap are holding their accumulations when possible in view of the depressed status of the market. Railroad offerings also are light. Water shipments from northern lake points are suspended pending the re-opening of strike-bound plants.

Detroit—Trading in scrap is dull and with no lists of any size up for figures, prices are difficult to determine. Negotiations are being conducted with the union by the scrap institute and pending their outcome, the labor situation is decidedly unsettled. Coupled with this development is the uncertain labor situation already prevalent in steel mills which makes them unwilling to proceed with scrap purchases.

Cincinnati—Scrap prices are unchanged, but weak and nominal. Steelworks and foundry operations are at high level but sentiment ordinarily bolstered by this condition is affected by strikes in other districts. Bidding for 5000 tons chiefly rails, on a current Louisville & Nashville list will be less aggressive than last month.

St. Louis—Influenced by strikes to the east, presence of some distress scrap and seasonal factors, the market for scrap continues downward. There has been some purchasing, however, particularly of No. 2 heavy melting steel. This purchasing has been so spread that it is difficult to ascertain the tonnage. Estimates, however, range from 8000 to 10,000 tons during the past week or ten days. The price paid was at or

around the lowest figure on the present decline.

Seattle—Japan has withdrawn entirely from the market and lack of export demand has weakened the situation materially. Local mills are well supplied and tidewater yards and warehouses are fully stocked. Further shipments are being discouraged. Considerable tonnages are being forwarded to the Orient under old commitments but freight rates have softened in sympathy with the lack of new business.

Toronto, Ont.—Demand is at a high level and dealers report steady shrinkage in yard stocks. Mills in the Hamilton area are taking all the heavy melting steel and turnings offered and dealers are having difficulty meeting demands. Montreal dealers also complain of scarcity of steel grades and state that domestic consumers are taking all their surplus stocks, with the result that they are not interested in export business.

Warehouse

Warehouse Prices, Page 87

Pittsburgh—Warehouse bookings continue spotty in certain lines while in others, notably sheets, structurals and plates, business is good. Some reflection of labor situation in other steelmaking districts has been felt, but not as great as might have been expected. Aggregate sales still are well above the volume in the first part of June last year.

Cleveland — Warehouse distributors report a slight improvement in orders over the corresponding period in May. This is more apparent in bars and small structural shapes than in sheets and some lighter gage products. The general feeling among sellers is that this recent trend will continue through the month, despite uneasiness resulting from labor disturbances.

Chicago—Sales are fairly steady, showing little change. Steel plant strikes so far are having only moderate effect on warehouse demand but are thought likely to be a factor in the event shut-downs are protracted. Warehouse prices are steady.

Philadelphia—Trend of warehouse business continues downward, although most distributors still report receipt of good tonnage, with business far in excess of that of a year ago. Prices are steady.

Cincinnati — Moderate decline in demand for warehouse products last week was the first sign of seasonal shrinkage. Mill deliveries on sheets and plates are improved but still so tardy that jobbers are selling large tonnages for immediate needs.

St. Louis — Distribution of iron and steel from warehouses continues in satisfactory volume, with daily average sales so far this month only slightly below the like period in May. As has been the case for some time, interest centers chiefly on sheets, plates and strip, though demands are still unusually well diversified.

Semifinished

Semifinished Prices, Page 85

Buoyed by recent heavy bookings for export semifinished production continues virtually unchanged at the high rate maintained since early this year. Tin plate mills are pressing for sheet bars, demand for wire rods is steady, and inquiries for ingots are numerous. Semifinished prices are steady at $37 per gross ton, Pittsburgh, for sheet bars, billets, slabs and blooms; $43 for forging billets; $47 and $52 for wire rods; and 2.10c for skelp.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 85

Bolt, nut and rivet shipments continue heavy and some producers have sufficient backlogs to support active deliveries into July. New business is quiet. Third quarter contracts will be out shortly and will include higher prices on nuts and small rivets. Bolts and structural rivets are unchanged. Jobbers are expected to buy sparingly for next quarter in view of heavy stocks accumulated earlier in the year. Inventories of users are only moderate, with consumption holding at a high rate in the farm implement, tractor and railroad equipment industries.

Iron Ore

Iron Ore Prices, Page 88

Buffalo — Railroads are moving heavy tonnage of iron ore from unloading docks here to points as far east as Sparrows Point, Md. This is the first year in a decade that a movement of this character has assumed the volume now being reached. Some predictions are that as much as 1,000,000 tons of ore will be shipped over this route this year.

Tin Plate

Tin Plate Prices, Page 84

New York — Tin plate specifications are the heaviest of the year as the canning season nears its peak. Domestic requirements are augmented by continued heavy inquiry from abroad. Leading foreign producing countries appear oversold and foreign consumers are exerting increasing pressure for tonnage from the United States. Domestic producers have relatively little available tonnage even for regular export customers. Export quotations are about on a parity with domestic prices, which is said to represent a

premium over the nominal prices of foreign producers.

Steel In Europe

Foreign Steel Prices, Page 87

London—(*By Cable*)—Great Britain's production of pig iron in May was the highest for ten years, at 696,300 gross tons, an increase of 15,600 tons over April. One additional blast furnace brought the total at the end of May to 122 stacks. Steel production continues at a high rate, with 1,047,300 tons for May, compared with 1,080,400 tons in April.

Demand for steel is unabated and buyers are offering premiums but largely without success. Mills have large backlogs of structural material against which heavy production schedules make little impression. Need for semi-finished steel is unrelieved and Continental deliveries are still inadequate, though slightly better. Some sheet and strip mills are idle from lack of billets and bars. Some Continental pig iron has been sold in British markets but the price is too high to be attractive.

The Continent reports the market is quieter as buyers refuse to pay premiums on the official prices. Exports of steel for May have been heavier than for several months.

Metallurgical Coke

Coke Prices, Page 85

Demand for Connellsville beehive coke continues slack, although prices have held up well and considerable output is being shipped. Bituminous coal production also has been off, estimates for the first week in June showing a decline of about 1,000,000 tons under the previous week, but total output of 6,500,000 tons being comparable to the corresponding week of 1936. Several hundred coke ovens have been banked in the Connellsville region.

Foundry coke shipments at Chicago so far in June are slightly ahead of the rate a month ago. Foundries last month curtailed stocks and with consumption holding well, the receipt of additional tonnages has been necessary.

Mill Scale and Cinder Is in Light Demand

Philadelphia—Demand for mill scale and cinder is sluggish. As a matter of fact, a heavy surplus of cinder has developed in the East, with some producers with many thousand tons on their banks and with certain others, more crowded for space, actually having it trucked away at little or no profit. Prices for cinder under such circumstances are largely nominal.

Mill scale, which has a higher iron content, is moving in somewhat better volume at a price averaging around $6 a ton, delivered, blast furnace.

That the market for mill scale and cinder in eastern Pennsylvania has lagged so much in recent years is due in no small measure to the fewer number of merchant furnaces in the East. Much of the mill cinder now moving, it is said, is on more or less a reciprocity basis, with cinder being exchanged for pig iron. Where the producer uses little or no pig iron, he finds himself usually with a heavy supply of cinder on hand, it is stated.

In years gone by there was much contracting on a semi-annual basis, Jan. 1 and July 1. But much of this has long since disappeared, trade interests declare.

Ferroalloys

Ferroalloy Prices, Page 86

New York—Ferromanganese prices have been reaffirmed for third quarter at $102.50 gross ton duty paid or $107.29 delv. Pittsburgh on spot and contracts. This will represent an increase July 1 of $7.50 for the larger contract customers who were protected prior to the last increase which became effective late in April. Domestic spiegeleisen 19 to 21 per cent has been reaffirmed at $33 per gross ton Palmerton, Pa., and 26 to 28 per cent material at $39. This will represent an increase of $3 for the larger contract buyers. Silicomanganese prices were also reaffirmed at $101.50 per gross ton, freight allowed, for 3 per cent carbon, $106.50 for 2½ per cent carbon, $111.50 for maximum 2 per cent carbon and $121.50 for maximum 1 per cent. These apply to carloads on contracts, with carloads for spot continuing $5 a ton higher. This represents an advance of $6.50 for the larger contract buyers. The advances to the contract customers thus protected in the above mentioned ferroalloys will become effective July 1. It is expected that such customers will now specify to the limit of their contract. This should more than offset the somewhat delayed movement recently to some steel plants affected by strikes. Among ferroalloys being reaffirmed without effect on contract customers are ferrosilicon, ferrovanadium, silico briquets and manganese briquets.

Nonferrous Metals

Nonferrous Metal Prices, Page 86

New York — Nonferrous metal markets recovered late last week from the weakening effect of a sharp decline around mid-week in prices on the London Metal Exchange which resulted from heavy liquidation of accounts. Unsettlement was attributed indirectly to the spread of strikes in this country. Fresh demand for metals is expected to be light until some of the uncertainties are cleared up.

Copper—Export copper slipped to around 13.55c to 13.65c, c.i.f. European ports, permitting domestic refiners to lower their bids for copper and brass scrap by $10 per ton. Casting and electrolytic copper, however, held at 13.75c, f.o.b. refinery, and 14.00c, Connecticut, respectively. Sales in the domestic market were surprisingly large in view of the bearish developments but business was done mostly with company-owned fabricators.

Lead—Although sales declined slightly from the previous week's total, consumers absorbed a substantial tonnage on the unchanged basis of 5.85c, East St. Louis, and 6.00c, New York.

Zinc—Tightness of spot supplies supported prime western prices here at 6.75c, East St. Louis, despite the fact that some metal was imported from abroad. There has been no serious threat to the domestic price structure in view of the limited supplies and well sold positions of some of the leading Interests.

Tin—Prices slumped to around 55.50c for Straits spot on the decline in prices abroad. The market was weakened by the lack of any active consumer buying and strikes in the steel industry. Export quotas were reaffirmed at 110 per cent of standard tonnages for the third quarter.

Equipment

New York—Machinery orders are fewer. Buying is limited mostly to one or two tools at a time from diversified sources. Deliveries show no improvement and orders now being booked on some lines can not be shipped before early next year. Kearney & Trecker Corp., Milwaukee, booked milling machines for the Norfolk, Va., navy yard at slightly more than $41,000; Tide Water Supply Co., Norfolk, booked the remainder.

Pittsburgh—Although new bookings are lighter than two months ago, machine tool manufacturers have backlogs assuring a high rate of operations well through the summer. In certain lines pressure for deliveries has not slackened appreciably. Foreign inquiries remain fair-

ly active. All in all, manufacturers are far from disheartened over the outlook.

Cleveland — Continued labor troubles in this district are blamed for decline in new business by dealers. Orders and inquiries have been scarce with distributors although manufacturers are busy, working on backlogs. Deliveries continue extended but are expected to show some improvement within the next few weeks.

Chicago—Machinery and equipment markets show the quieter situation which is expected to prevail during the summer. Buyers are less anxious to close promptly on inquiries but dealers are optimistic regarding prospects for later in the year. Good activity continues in the market for small tools. Chief among prospective inquiries are machine tools and other equipment for Electro-Motive Corp., LaGrange, Ill., and the new International Harvester plant at Indianapolis.

Experiment with Mile-Long Rails Proving a Success

(*Concluded from Page* 23)

including the removal of the molds, was approximately 58 minutes. The average number of joints poured in eight hours was 17. The joints were prepared and welded in groups of four. A series of grinding operations completed the work.

No difficulty was encountered in lining and surfacing the track, in spite of the fact that the rail was in a single piece a mile long, according to Mr. Layng.

Methods of conducting tests on the Bessemer & Lake Erie's one-mile stretch are interesting.

Part of the study includes an investigation to determine the relationship between air temperature and the internal temperature of the rail. To secure data on the internal temperature, a short section of rail was placed on the ties between the rails of the southward track. A hole 1-inch in diameter and 1½ inches deep was drilled into the head of the short section of rail and this was filled with mercury. A thermometer was placed in the mercury.

Readings were taken every 15 minutes for a period of one week.

"This study," said Mr. Layng, "shows that in hot weather the internal temperature of the rail builds up higher than that of the air; for instance on July 22, 1936, with a maximum air temperature of 104 degrees Fahr. the internal temperature of the rail was 119 degrees."

Permanent monuments have been set up alongside the track from which to record the longitudinal and transverse movements of the rail. Readings are made once a month.

Construction and Enterprise

Michigan

ADRIAN, MICH.—Lenawee County Rural Electric Co-operative Inc. plans steam electric generating plant for rural electric supply. Federal loan of $630,000 is being secured. E. Cyril Bevan, National Bank building, Detroit, attorney and representative.

DEARBORN, MICH.—Bopp Steel Co., Maple avenue, has awarded contract to Austin Co., Detroit, for erecting a $32,000 addition to its plant.

DETROIT—Koestlin Tool & Die Corp. has plans prepared for a 60 x 200-foot addition to its plant. The new building will be of overhead crane construction and will add 12,000 square feet to the present plant area.

DETROIT—Acorn Iron Works is building a $12,000 building on Freeland avenue.

DETROIT—Timken-Detroit Axle Co. has awarded contract to Barton-Malow Co., Detroit, for erection of addition, 80 x 117 feet, to its factory.

DETROIT—O. W. Burke Co., Detroit, will build a $30,000 factory addition to the plant of L. A. Young Spring & Wire Corp., Detroit, on Holbrook avenue.

DETROIT—Atlas Metal Plating Inc., 1570 East Larned street, has been incorporated with 500 shares of no par value, to engage in business of metal plating, by C. A. Just, 1415 Parker avenue.

DETROIT—Experimental Tool & Die Co., 12605 Greiner street, has been organized to manufacture tools and dies, by John J. Paulus, Detroit.

FLINT, MICH.—Fisher Body division of General Motors Corp., Detroit, plans to construct immediately a new press room and die shop at its plant here. The new unit will add approximately 170,000 square feet of floor space, and will consist of five large crane-served bays to house press shop and die shop with receiving, unloading and loading facilities. Approximately 35 new presses will be installed.

GLADSTONE, MICH. — City plans extensions in municipal electric plant. Cost close to $100,000.

GRAND HAVEN, MICH.—Oldberg Mfg. Co. is erecting an addition and making alterations to its recently acquired plant here at a cost of about $35,000.

MARYSVILLE, MICH.—Pate & Hirn, Detroit,, engineers, are drawing plans for a water filtration system, costing $150,000, for city of Marysville. Plans will be ready about July 1.

MUSKEGON, MICH. — Viking Steel Treating Corp., 1823 Commerce building, has been incorporated with $50,000 capital stock to engage in smelting, treating, etc., by Carl L. F. Agerstrand, 3073 Larkin street.

MUSKEGON HEIGHTS, MICH.—United Iron & Metal Co., 1157 Lethen street, has been incorporated with $15,000 capital stock to deal in scrap iron, by Charles Smith, Muskegon Heights.

PONTIAC, MICH.—Austin Co., Detroit, has contract for erecting a $33,000 foundry addition here for Pontiac Motor Co.

PONTIAC, MICH.—Wilson Foundry & Machine Co. will erect a two-story office building, 40 x 100 feet on South Saginaw street. All previous bids rejected. L. J. Heenan, Pontiac, architect.

UBLY, MICH.—Thumb Electric Co-Operative of Michigan, recently formed, is having plans prepared for a $300,000 power plant here.

Ohio

BRYAN, O.—Holabird Co., W. S. Holabird Jr., general manager, plans one-story, 100 x 200-foot finishing and machine room addition to its present plant. Cost $40,000.

CINCINNATI — Chevrolet Motor Co., division of General Motors Corp., 4726 Smith road, will make extensions to power plant at local automobile works. Cost estimated at $250,000.

DAYTON, O.—Moraine Products division of General Motors Corp. has awarded a $450,000 contract for erecting a new factory building here, to National Concrete Co., Cleveland. Work is to begin immediately.

DELPHOS, O. — Town will hold an election June 22 to vote on a $300,000 bond issue for construction of municipal electric plant.

GLOUSTER, O. — Town is considering construction of municipal electric plant. Estimates of cost will be made soon.

LOGAN, O.—City is having plans prepared for erection of filtration plant costing approximately $15,000. Roy Loomis is service director, and Burgess & Miple, 568 East Broad street, Columbus, O., consulting engineers.

MORAINE CITY, O.—Frigidaire division of General Motors Corp. will begin erection of two new factory buildings here soon, involving an expenditure of about $4,000,000.

READING, O.—City is preparing specifications for equipment and will take bids soon for municipal light and water plant expansion. Cost about $82,000. Phil G. Bok is service director.

TOLEDO, O.—City, D. E. A. Cameron, commissioner of purchases and supplies, 324 Safety building, will take bids June 15 for air compressor and tools.

TORONTO, O.—Follansbee Bros. Co., Pittsburgh, has plans for dismantling its present forging press, bar and hot sheet mills here, and replacing with 43-inch combination slabbing and hot strip mill. Estimated cost $4,000,000.

WARREN, O.—City, Dan B. Gutelius service director, will soon take bids for water softening plant, to cost $90,000.

WARREN, O.—Ohio Public Service Co., Hanna building, Cleveland, is having detailed plans prepared by its own engineering department for remodeling generating plant here and constructing an addition. Approximate cost $2,500,000.

Connecticut

BRIDGEPORT, CONN.—Stone & Webster Engineering Co., general contractor, 90 Broad street, New York, has sublet general contract for one-story, 312 x 544-foot, and two-story buildings for rolling mill; one-story, 140 x 160-foot storage building, to Hewlett Construction

Co., 1385 Iranistan avenue, for Bridgeport Brass Co.

NAUGATUCK, CONN.—United States Rubber Co., of Naugatuck and Akron, O., plans additions and improvements to rubber reclaiming plant here. Cost to exceed $40,000 with equipment.

Massachusetts

BOSTON—New England Coal & Coke Co., 250 Stuart street, plans to build a coal hoisting tower and installing mechanical handling facilities on Water street, Beverly, Mass.

New Jersey

GLOVERSVILLE, N. Y.—City has plans nearing completion and will take bids in August for erection of filtration plant and equipment, costing $200,000. Morrell Vrooman Inc., 21 North Main street, engineer.

New York

BATAVIA, N. Y.—Raymond L. Little & Son has been organized to conduct a general sheet metal business at 113 Trumbull place.

BUFFALO—Chevrolet Motor Co., care of General Motors Corp., East Delavan avenue, will soon let contract for constructing boiler house addition, cost of which will exceed $40,000.

BUFFALO—Elmer J. Goetz Oil Corp. has begun work on a barge canal terminal here from which to handle supplies of petroleum. A tank of 1,000,000 gallons capacity is included in the project.

BUFFALO—Lakeland Engineering Co. has received contract for a new service building for the Niagara, Lockport & Ontario Power Co., to be erected in Fredonia, N. Y., at a cost exceeding $50,000. Construction to start immediately.

LANCASTER, N. Y.—Hazel Atlas Glass Corp. has begun a $100,000 addition to its plant here.

LONG ISLAND CITY, N. Y.—National Enameling & Stamping Co., 57-02 Forty-eighth street, plans plant improvements and alterations, costing $40,000.

TONAWANDA, N. Y.—A. Kahn, architect, New Center building, Detroit, will soon let contract for constructing manufacturing plant and office here for Chevrolet division of General Motors Corp.

Pennsylvania

DUNMORE, PA.—Erie Railroad Co., W. White, general manager, Midland building, Cleveland, plans expansion of car rebuilding shops here, including erection of one or more new buildings and installation of considerable new equipment. H. R. Adams is superintendent of Dunmore shops.

PHILADELPHIA—S. K. F. Industries, Front and Erie avenues, has awarded contract to Turner Construction Co., Architects building, Philadelphia, for factory addition.

PITTSBURGH—Standard Gas & Electric Co. has preliminary plans under way for an additional 60,000 kilowatt steam generating plant for Duquesne Light Co.

Illinois

CHICAGO—Wilson & Bennett Mfg. Co., maker of steel pails and drums, 6532 South Menard avenue, is building two new three-story additions to its plant. These new buildings will provide over 116,480 square feet of additional space. Machinery and equipment costing over $200,000 is being constructed.

KANKAKEE, ILL.—Kankakee Foundry Co. is constructing a $30,000 addition to its molding department.

Indiana

BRAZIL, IND.—Board of county commissioners plans to purchase stokers for power plants in several county buildings. Appropriation is being arranged.

FORT WAYNE, IND. — Caldwell Well Screen Co. Inc., Harrison and Sixth streets, has been incorporated to manufacture deep well pumps, well screens and well machinery, by Farley M. Caldwell, Starley M. White and Arthur L. Goodall.

FORT WAYNE, IND. — Wayne Iron & Metal Corp., 702 Hayden street, has been organized to deal in scrap iron and metals, by Max Zinn, Joseph Zinn and Abe Zinn.

INDIANAPOLIS — All-Rite Fan & Parts Co. Inc., 1222 Kentucky avenue, has been formed to manufacture motors, ventilating fans and equipment and air conditioning equipment. Incorporators are Ewell F. Ewing, Delmar R. Binford and Edmund L. Brown, the latter being named resident agent.

RICHMOND, IND. — Crosley Radio Corp., Cincinnati, will build a new refrigerator cabinet factory here to replace the one destroyed by fire at Cincinnati. The Richmond plant will be 200 x 1200 feet and construction will begin Aug. 1.

Delaware

SEAFORD, DEL.—Seaford Power & Light Co., recently organized subsidiary of Fairbanks, Morse & Co., Chicago, will begin work soon on new diesel-driven generating station. Project scheduled for completion in September. Estimated cost $200,000.

Florida

TAMPA, FLA.—American Can Co., 230 Park avenue, New York, has building permit for $194,500 addition to plant at Twenty-second street and First avenue here. Work to begin soon.

Arkansas

LITTLE ROCK, ARK.—Dr. Pepper Bottling Co., W. I. Moody, 1107 West seventh street, has acquired a site at Seventh and Ringo streets for addition to its bottling plant. Cost $20,000.

Oklahoma

BRITTON, OKLA.—City has voted bonds for constructing three deep wells, and installing pumping equipment for water supply system, at a cost of $27,000. G. Yoelkum, Britton, engineer.

Texas

BEAUMONT, TEX.—Oil City Brass Works, George E. Bryant Sr., president, 326 Neches street, will rebuild its burned pattern department and install a new electrical system.

BISHOP, TEX.—Miracle Feed Mill, John A. Wuensche, is constructing a grain elevator and dryer. Automatic loading and conveying machinery will be installed.

DENISON, TEX.—City, A. M. Brenneke, city engineer, will soon take bids for two electric driven pumping units.

EDEN, TEX.—City voted $36,000 waterworks bonds.

FORT WORTH, TEX. — Landreth Production Corp., Petroleum building, E. A. Landreth president, plans to install engines and compressor units in proposed natural gasoline plant. Cost over $400,000.

HOUSTON, TEX.—Byron Jackson Co., Los Angeles, E. S. Dulin, president, has acquired eight acres and plans constructing plant for manufacture of all types of oil well tools and supplies. Estimated cost $500,000.

HOUSTON, TEX.—Houston-Chronicle, Travis street, plans installation of electric power equipment in four-story addition to printing and publishing plant. An air conditioning system will be installed as well as conveyors and other mechanical handling equipment. Cost about $600,000. Robert J. Cummings, Bankers Mortgage building, Houston, consulting engineer.

MISSION, TEXAS — Hidalgo County Rural Electrification Co-operative Inc., care of G. Morrison, Professional building, Waco, Tex., consulting engineer, has surveys and plans under way for primary and secondary lines for rural electrification in Rio Grande valley district, totaling about 800 miles, outdoor power stations and service facilities. Fund of about $900,000 is being arranged through federal aid.

SHERMAN, TEX. — Andrew Korioth, 301 South Montgomery street, plans to erect a machine shop at 305 South Montgomery street.

Wisconsin

BELOIT, WIS.—Lakeside Railway Fuse Co. is building new factory, 50 x 150 feet, on Vincent street to manufacture signal flares. Vincent Campo is president.

CHIPPEWA FALLS, WIS.—Board of education has rejected bids on wood and metalworking machinery and tools for new vocational school and is taking new bids until June 17.

CORNELL, WIS. — Cornell Paper Mills has awarded contract for construction of an addition to paper mill.

EAU CLAIRE, WIS. — Gillette Rubber Co. has awarded contract to Hoeppner-Bartlett Co. for construction of a one-story addition to machine shop, 68 x 120 feet, and a one-story cement plant, 40 x 60 feet.

LA CROSSE, WIS.—Service Transfer & Storage Co., Third and Cass streets, has let contracts for construction of new garage, warehouse and service building, 100 x 150 feet, costing about $45,000 with equipment.

MILWAUKEE—Charles A. Krause Milling Co. plans reconstruction of mill, elevators, etc., damaged by fire April 10. Most of the machinery requires replacement. Charles A. Krause Jr., secretary-treasurer.

PARDEEVILLE, WIS. — Pardeeville Electric Light Co. plans early rebuilding of power plant recently damaged by fire.

Kansas

IOLA, KANS.—Co-operative Power & Light Co., Fred Schultz, secretary-treasurer, has been granted charter to construct 65 miles of rural electrification lines, costing about $65,000.

KANSAS CITY, KANS.—Armour Packing Co., 18 Central street, plans rebuild-

ing and modernizing its packing plant here. Cost about $1,000,000.

TOPEKA, KANS.—Hill Packing Co., foot of Jefferson street, plans steam power house. Cost $40,000. B. W. Friedel, company architect and engineer.

North Dakota

KINDRED, N. DAK. — Cass County Electric Co-operative will take bids June 16 for construction of 488 miles of rural transmission lines in Cass, Barnes, Traill and Richland counties, to cost about $440,000. M. S. Hyland, Fargo, N. Dak., consulting engineer.

PIERRE, N. DAK. — State Engineer D. W. Toucko is preparing plans for purchase and installation of turbogenerator in state sanitorium at Custer.

Minnesota

ALEXANDRIA, MINN. — Douglas County Co-operative Light and Power association, Clifford R. Hove, secretary, will take bids June 17 for construction of second portion of rural transmission lines to cost about $140,000. Pillsbury Engineering Co., 1200 Second avenue, South, Minneapolis, engineer.

MINNEAPOLIS — General Electric Co., Schenectady, N. Y., will soon start construction of a 3-story building, 114 x 210 feet, to cost $300,000. The building will be used as a district office, warehouse, distributing and service plant, and a one-story service shop will adjoin it. E. M. Pinkerton is manager of the Minneapolis district office.

MINNEAPOLIS — Reiss Coal Co. plans construction of a new modern coal unloading trestle, 252 feet long, to cost about $40,000. Roland C. Buck Inc., Telegram building, Superior, Wis., is engineer.

NORTH ST. PAUL, MINN. — Dobbins Mfg. Co., manufacturer of portable drinking fountains, sheet metal hardware specialties, plans immediate construction of an addition and improvements to factory.

ST. PAUL — Socony-Vacuum Oil Co., White Eagle division, has awarded contracts for construction of a petroleum barge terminal, costing $500,000.

ST. PAUL — Hubbard Oil Burner Co., manufacturer of oil burners, Minneapolis, has acquired a large two-story factory here which is being equipped with special machinery for the manufacture of Nitroil pressure atomizing nozzles.

ST. PAUL — Simplex Electric Door Co. has been organized to manufacture automatic electric door opening devices for both swing or overhead type garage doors. A factory will be built or acquired near the St. Paul-Minneapolis city limits. R. A. Moren is manager.

Iowa

BELLEVUE, IOWA — City has asked bids for improvements in municipal power plant, including installation of 500-horsepower diesel and generator.

CARROLL, IOWA — Glidden Rural Electric Co-operative has been granted permission by the Iowa state railway commission to construct 22 miles of rural transmission lines in Carroll county costing about $22,000.

CEDAR RAPIDS, IOWA—Iowa Electric Light & Power Co. has been granted permission by the state railway commission to construct rural transmission lines at a cost of $28,000.

CENTERVILLE, IOWA—Iowa Southern Utilities Co. will construct rural transmission lines in Washington and Jasper counties at a total cost of $24,000.

DES MOINES, IOWA—State board of control plans to erect power plant at institution at Fort Madison, Iowa, and proposes appropriation of $170,000 for equipment. E. H. Felton is chairman.

DUBUQUE, IOWA — Maizewood Insulation Co., manufacturer of insulation products, plans construction of a two-story factory addition, 35 x 148 feet, and will install additional machinery and equipment. C. I. Krajewski, Roshek building, is architect.

IOWA FALLS, IOWA — Federated Co-operative Power association, has asked bids for proposed electric plant near Hampton, including three diesel generators and auxiliaries. Cost about $225,000. Young & Stanley, Muscatine, Iowa, consulting engineers.

LAKE MILLS, IOWA — Village will take bids June 21 for improvements to municipal light and power plant, including a diesel generating unit, with auxiliary equipment, switchboard panel and voltage regulator. O. N. Styve is village clerk.

MASON CITY, IOWA.—Peoples Gas & Electric Co. has received permission from state railway commission to construct rural transmission lines at a total cost of about $60,000.

ONAWA, IOWA—Monona County Rural Electrification association is making a survey for construction of 140 miles of rural electric lines.

POCAHONTAS, IOWA—Central Electric Federated Co-operative association has asked bids for diesel generator for rural electrification system. Fund of $185,000 has been arranged. Young & Stanley, Muscatine, Iowa, consulting engineers.

Nebraska

HAVELOCK, NEBR.—Chicago, Burlington & Quincy railroad, A. W. Newton, chief engineer, 547 West Jackson boulevard, Chicago, plans alterations and improvements to power plant, costing $35,000.

Pacific Coast

GLENDALE, CALIF.—General Controls Co., W. R. Roy, chairman, 624 East Fourth street, Los Angeles, plans erecting new factory for manufacturing pressure and flow control equipment. Total cost $50,000.

LOS ANGELES—Emasco Derrick & Equipment Co. is erecting a warehouse building, 20 x 200 feet, at 6811 South Alameda street here. Approximate cost $4500.

LOS ANGELES—A one-story commercial building is being erected at 2034 Imperial street here for Consolidated Machinery & Supply Co.

LOS ANGELES—Harvey Machinery Co., Sixty-second street and Avalon boulevard is preparing plans for alterations and an addition to its machinery plant.

LOS ANGELES—Fox West Coast Theatres Corp., 1609 West Washington boulevard, plans erection of boiler plant. Bids will be asked soon. Cost about $150,000.

MONTEREY, CALIF.—Del Mar Canning Co., 756 Ocean View, plans new boiler house at new fruit canning plant. Estimated cost $240,000.

DAYTON, WASH. — Dayton Lumber & Coal Yards Inc. has purchased a site and proposes to erect a modern sawmill.

PORTLAND, OREG. — Bids will be taken June 17 for enlarging boiler and power facilities of the city isolation hospital on Powell boulevard. F. Marion Stokes is architect.

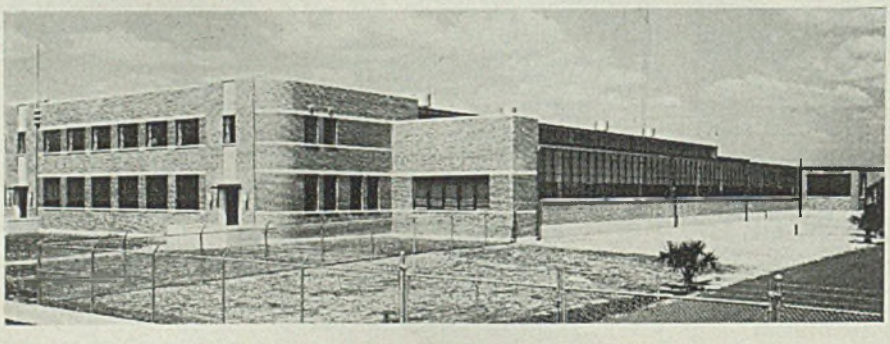
Alaska

SEWARD, ALASKA—Bids were opened by city clerk June 7 for construction of a municipal diesel-electric power plant and distribution system, for which $90,000 is available.

Canada

ST. CATHARINES, ONT.—Meadows Sharp has organized a new company to manufacture metal aerials for motor cars and will shortly begin production on a large scale. He has established headquarters at 43 St. Paul street in that city.

Modern Can Plant in Heart of Citrus Belt



THIS modern plant has been completed by the Austin Co., Cleveland, for the Continental Can Co., at Tampa, Fla. The structure provides a total of 60,000 square feet for manufacturing, warehousing and handling of cans, on one floor and a 3200 square foot office area on the second floor. Constructed entirely of concrete, brick and steel with insulated metal roofing, it is entirely free from attack by termites, as well as fireproof. It employs buff colored face brick, simple decorative art stone and horizontal runs of steel sash to attain interesting detail