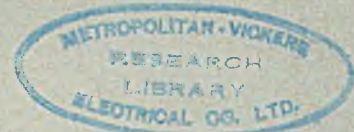


# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW



## Contents . . . . June 21, 1937

Volume 100 - No. 25



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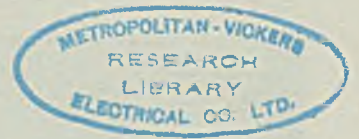
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## As the Editor Views the News

**A**LL eyes this week are focused upon the efforts of the new mediation board to effect a peaceful settlement of the steel strike. The board assumed its duties at a time when the "back-to-work" movement was gaining ground steadily and when the public was well fed up with the "wildcat" strikes of undisciplined union members in Michigan and the lawlessness of pickets in Ohio and Pennsylvania. Last week, as Messrs. Taft, McGrady and Garrison were preparing to convene in Cleveland, Washington was appealing to strike principals and local officials to maintain a status quo until the board began to function.

• • •

If these appeals succeed in "freezing" the labor situation as it stood last Friday, then the new board will find, in studying the facts, that in some strike centers public and employe sentiment is overwhelmingly against the strikers and union organizers. The board is authorized (p. 22) "to investigate issues, disputes, facts, practices and activities of employers and employes" (too bad that the words "agitators and union organizers" were omitted) and "to make findings of fact and recommendations for settlement. . . ." Under this authorization for fact finding, the board has a great opportunity to report grave deficiencies in the Wagner act.

• • •

For instance, the board could report to Washington factual evidence showing how the failure of the act to hold unions responsible for their actions, coupled with the federal government's tacit approval of lawbreaking by agitators and undisciplined unionists, has created in the minds of many employes and of a substantial portion of the public (p. 41) the impression that the Wagner act—far from being an agency for collective bargaining—in practice is an instrument for encouraging intimidation, coercion and racketeering under

government sanction. The board could point out that this impression is responsible for the threat of a vigilante movement, and that the Wagner act, as administered thus far, conflicts with the fundamental right of a man to work at a job of his choosing. The least the board can do is to show that in practice the act fails to live up to the high moral promise of its theory.

• • •

One of the impressive features of the new continuous hot strip mills is the individually motor driven runout table. Experience shows that in designing a new installation it is important to consider whether the rollers and coilers should be driven by alternating current squirrel-cage induction motors or by direct current motors. A comprehensive study of this question (p. 57), including tests, shows certain advantages for each type of drive which should be weighed carefully before a choice is made. . . . Use of an acetylene flame for preparing bearings for re-babbiting (p. 65) has become routine practice in many shops. . . . Ford Motor Co., in processing 15,000 pounds of plastics daily (p. 42), is exploring a field which some day may be directly competitive with ferrous metals.

### AC or DC? Is The Question

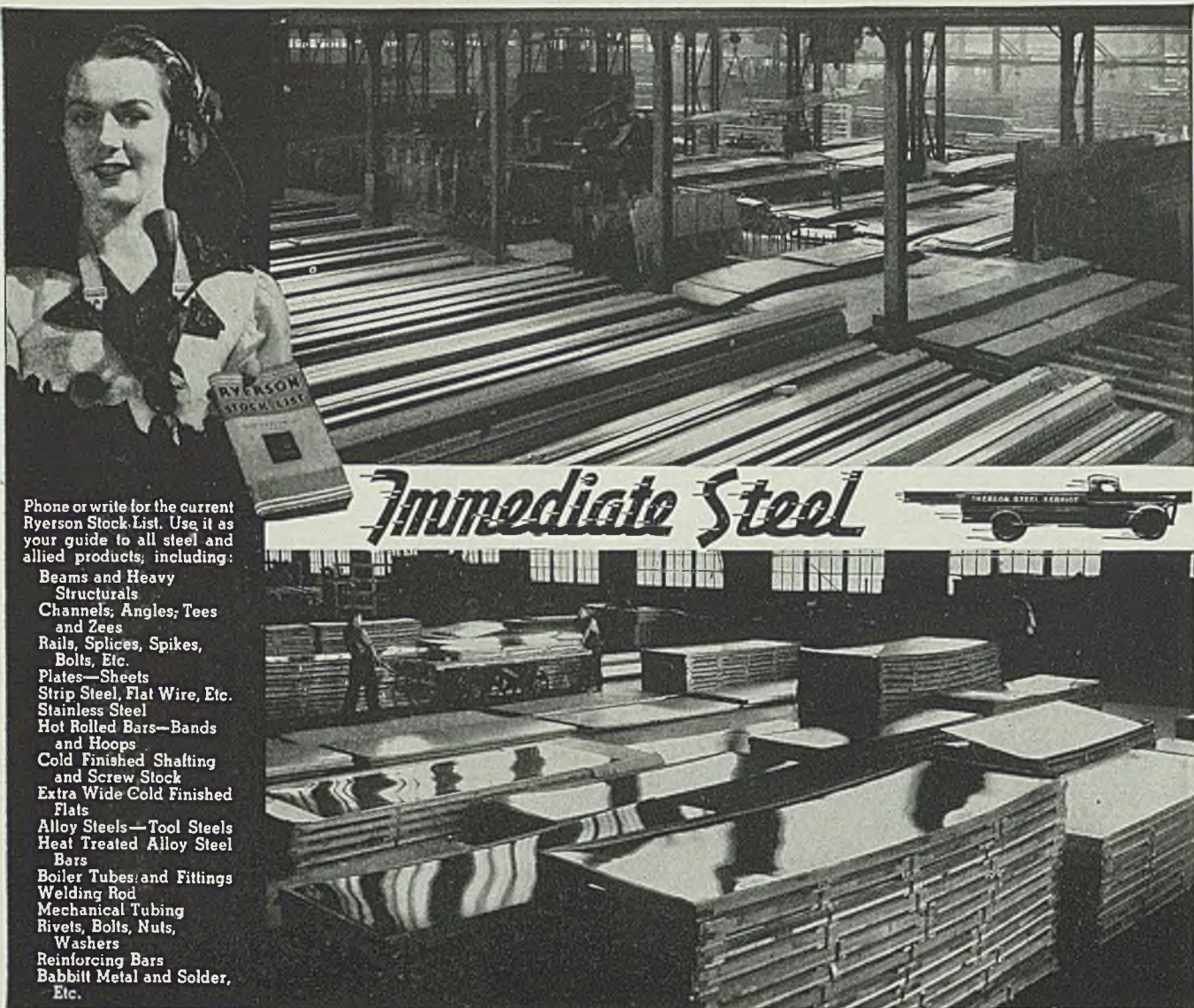
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A midwestern steel company facilitates the exchange of storage batteries for its large fleet of electric industrial trucks (p. 49) by the use of roller tables. . . . Sometimes manufacturing operations require lineshafts which cannot be installed overhead. One alternative is to drive from lineshafts in a concrete tunnel below the floor (p. 52); another is to take power from lineshafting on concrete pedestals between rows of machine. . . . Robert E. Kinkead touches on two controversial subjects, "Welding versus Casting" and the peening of welds (p. 77) and in each case he makes the point that one cannot be too dogmatic—the truth is somewhere between the extremes—and each problem must be judged upon its individual merits.

### Don't Be Too Dogmatic!

*E. L. Shaner*





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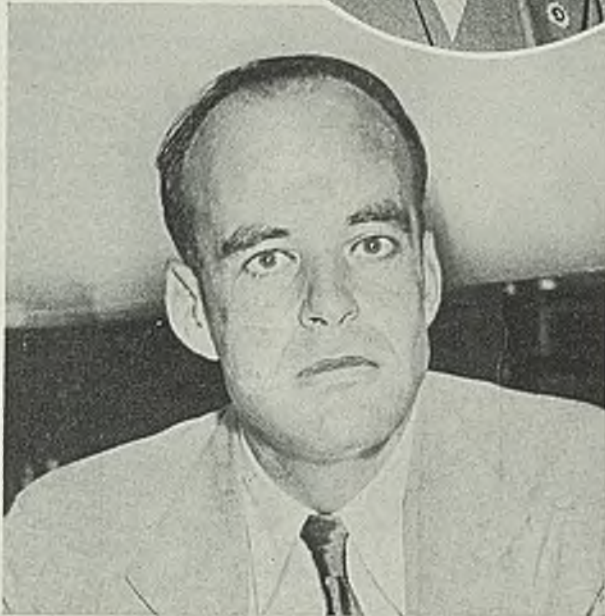
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# RYERSON STEEL-SERVICE

Charles P. Taft II



Lloyd K. Garrison



Edward F. McGrady

## *Government's Steel Mediation Board*

**T**HE board appointed by Secretary Perkins to mediate the steel strike consists of two democrats and one republican. Two of these are lawyers, the third was for years a labor union official.

**EDWARD FRANCIS McGRADY**—Began his career as a newspaper press man in 1894; served as president of the Boston central labor union; Massachusetts state federation of labor, and Newspaper Printing Pressmen's union.

McGrady was formerly a vice president of the American Federation of Labor and was for 14 years the federation's legislative representative.

McGrady, 65 years old, is a democrat; was said to have been for Roosevelt for president before the Chicago convention. After Roosevelt's first election he had Secretary Perkins appoint McGrady as assistant secretary of labor.

He was one of General Hugh S. Johnson's associates in "perfecting" the NRA bill, and was made

its chief deputy administrator in charge of labor relations.

Known as the labor department's "ace" conciliator he officiated in the General Motors, Seamen's, A & P, and Toledo general strikes. He was credited with having originated the Toledo industrial peace plan, whereby a board of 18 neutral members investigates labor complaints and endeavors to settle disputes before a strike occurs.

**LLOYD KIRKHAM GARRISON**—He is a great grandson of the abolitionist, William Lloyd Garrison, and has been associated with numerous so-called progressive, and reform activities. He is a democrat, 40 years old, and is dean of the University of Wisconsin law school.

A graduate of Harvard college and Harvard law school he was admitted to the New York bar in 1923. He began legal practice with the firm of Root, Clark, Buckner & Howland, New York. Served in the United States army from May, 1917 to February, 1919.

He was associate counsel for the

New York city bar association, engaged in various investigations of illegal practices, and was special assistant to the United States attorney general in a bankruptcy investigation in 1930-31. In 1934 he was "drafted" for several months to serve as chairman of the national labor relations board.

**CHARLES P. TAFT II**—Son of former President Taft; lawyer, born in Cincinnati Sept. 20, 1897; graduated from Yale university; enlisted in the United States army May 23, 1917, and was in France from Jan. 5 to Dec. 27, 1918. He figured in the presidential campaign of 1936 as a G. O. P. "liberal"; as a research worker and adviser for Governor Landon. He is the author of the campaign book "You and I and Roosevelt"; also of "City Management", and "The Cincinnati Experiment."

Mr. Taft, who was designated as the chairman of the board, successfully mediated the Electric Auto-Lite Co. strike in which there was considerable violence in Toledo in 1934.

# Government Moves in Steel Strike, as CIO Ruthlessness Is Censured

**P**UBLIC resentment against CIO's tactics in the steel strike, against federal labor policies, and against the Wagner labor act for its partiality to organized labor, apparently reached a new peak last week.

The CIO was censured for its unbridled lawlessness. The government's failure to enforce laws came under fire from many newspapers—democratic as well as republican—regardless of how they stood on the question of a contract between the CIO and employers.

Radio commentators—speaking to millions—pointed out how government policies were fomenting discord. The consensus of public opinion undoubtedly was that the government's pro-labor tendencies and the legislation for which it is responsible had failed to promote industrial peace.

The Wagner act was criticized in the press and over the radio for giving organized labor a weapon "with which to club into submission employes who do not wish to be ruled by the CIO." This act was especially condemned for giving organized labor the right to call an election or to refrain from calling one until organizers could brow-beat enough employes to insure winning the election.

## Wagner Act Is Studied

The basic features of the Wagner act were subjected to more critical examination, and received more general public attention than ever before. As a result, this may lead eventually to the amendment of the act.

The back-to-work movement was growing in strength. Demands were made by committees representing nonstrikers that steel plants be opened; that the workers be given protection. The strike, three and one-half weeks old today, has cost idle steelworkers an average of \$124, and a total of \$10,000,000—with no question of wages or hours ever having been raised. The formation of law and order committees also were clearly indicating the trend of public sentiment.

Then early last week Philip Murray, chairman of the Steel Workers Organizing committee, called on Sec-

retary Perkins to ask her help in settling the strike.

At a press conference, President Roosevelt recognized the situation to the extent of saying to correspondents that he could see no good reason why conditions which might be agreed upon by the steel companies and the CIO should not be put in writing.

Friday Secretary Perkins, evidently acting in accord with the President, appointed the "federal steel mediation board"—Charles P. Taft, Lloyd K. Garrison and Assistant Secretary of Labor E. F. McGrady. James F. Dewey and Robert F. Pilkington, federal conciliators, were appointed to assist them.

## "Maintain Order"

The board is "authorized to investigate, conduct hearings, make findings of fact and act as voluntary arbitrator if the parties to the dispute so request." It has headquarters in Cleveland and was to hold its first meeting last Saturday. McGrady was on his way home from Geneva, Switzerland where he had been attending the international labor conference.

The secretary also sent a telegram to Governor Davey of Ohio, whose own efforts to settle the strike had failed. She asked him to maintain order and civil rights, and a *status*

*quo* with regard to steel plant operations, during the period of mediation. Spokesmen for the steel companies announced their intention to co-operate with the board, and a similar statement was issued by CIO.

Secretary Perkins' order explained how the board will operate:

"The board is further authorized (a) to investigate issues, disputes, facts, practices and activities of employers and employes that are burdening or obstructing, or threatening to burden or obstruct the free flow of interstate commerce; (b) to conduct hearings, take testimony under oath, and to make findings of fact and recommendations for settlement; (c) to act as voluntary arbitrator on request of the parties to the dispute and render awards with respect to the subject matter of such disputes as are submitted to it as shall be binding upon the parties to the submission.

"The board shall have its headquarters at Cleveland, O., and shall make a weekly report to the secretary of labor and shall have authority to recommend to the said secretary of labor the appointment of additional employes necessary to the performance of the duties of the said board. Each commissioner of the board shall receive the necessary traveling and subsistence expenses and each commissioner who prior to the issuance of this order was not an officer or employe of the United States shall receive \$25 per diem in addition thereto."

## Law-and-Order Groups Organized

**C**ITIZENS, outraged by CIO terrorism, formed their own law-enforcement groups in at least five strike-affected communities last week. Leaders announced their purpose was to insure peaceful picketing, protect the right of nonstrikers to work, and assist local authorities in preventing intimidation by pickets.

Similar to the vigilantes of the western frontier, such groups were organized at Monroe, Mich., Johnstown, Pa., Warren, Canton and Columbus, O. Their membership included nonstrikers, merchants, farmers and professional people.

At Monroe and Johnstown, the

vigilantes had the active assistance of city administrations. Monroe's Mayor Daniel A. Knaggs personally commanded 500 American Legionnaires and 500 other volunteers, armed with shotguns, rifles and pistols. Guns were kept handy in event union organizers attempted to make good their threat to invade the city. It was there that Van A. Bittner, Chicago CIO organizer, declared "There will be no peace at Monroe until Republic signs with SWOC."

The Johnstown organization was sponsored by Mayor Daniel Shields who armed 700 citizens with clubs and pistols to prevent CIO

pickets from stoning homes and automobiles.

The John Q. Public league gained strength at Warren, its ranks augmented by many farmers from nearby communities. Registrations were being taken at Canton for a law and order league sponsoring a back-to-work movement.

At Columbus, a Presbyterian minister, Rev. Frank H. Throop, headed

## "Let Them Amend the Wagner Act!"

IF THE CIO leaders sincerely become willing to drop the closed shop and check-off in the steel industry let them join in a request to congress to amend the national labor relations act so as to prohibit the closed shop and check-off," said Frank Purnell, president, Youngstown Sheet & Tube Co., in a statement to employes last week.

"The railway labor act forbids these things and only by law can we be given assurances that the CIO will not demand them."

Mr. Purnell reviewed the company's reasons for not wishing to sign a contract, citing among others "its complete worthlessness."

"The leaders cannot enforce their part of it; they have no power to do so," he said. "A petty strike in one department in our industry throws many hundreds out of work in other departments. And yet the CIO has been entirely unable to prevent these repeated troubles in other industries.

### Refuse Future Commitments

"There has been much said about the conference last week with the CIO leaders and the governor of Ohio. The CIO men said they would not agree as to what the demands of their members might be at the time of the next contract. They indicated their refusal to sign any contract preventing them from demanding a closed shop at its expiration. In view of the avowed purpose of its leaders, any agreement by the CIO not to ask for the closed shop would be insincere and not in good faith, for Mr. Lewis has said what his demands will be.

"What pledge can the CIO give as to responsibility? Are they willing to give a bond, to pay you any wages you may lose because of the uncontrolled and unlawful acts of themselves or their members? And to pay the company for its losses in business and customers and orders—all of which means work for both you and us? No other assurance is worth a scrap of paper. A one-sided contract is no contract at all.

"Some CIO organizers, who are very active in its public speeches, are

the "Committee of Two Hundred," characterized as an organization "of the middle class to protect that class in the conflict between organized capital and organized labor."

At Youngstown, a group of non-union workers called on Frank Purnell, president, Youngstown Sheet & Tube Co., and demanded the Campbell and Brier Hill plants be reopened immediately.

avowed communists," Mr. Purnell continued. "Some of them have been in trouble with the law for this reason. It seems unbelievable that any of us should be kept from our lawful work and away from our places at the machines by efforts of agitators, who stir up disorders, carry guns, threaten and terrorize decent men and their families in their right to work."

### At Johnstown

A CIO strike at the Cambria plant of Bethlehem Steel Co. in Johnstown, Pa., failed to halt operations. Estimates of the number of men on strike varied, but at least two thirds, and possibly more, of the plant's 15,000 employes, did not walk out.

The strike was called in support of a walkout by members of two

brotherhoods employed on the Conemaugh & Blacklick railroad. The brotherhoods claimed that the steel company had not signed contracts with them.

Ralph E. Hough, assistant general manager of the plant, said it would continue to run.

Violence at the gates of the Cambria plant brought sharp warnings from Mayor D. J. Shields, of Johnstown, who sent the following telegram to President Roosevelt:

"I earnestly appeal to John L. Lewis, through you as our President, to withdraw the murderous element that now infests my city. The situation has grown so bad that strikers have resorted to the most dastardly crime in our nation today—that of kidnaping."

The reference to kidnaping was due to the fact that James M. Hess, identified by police as a nonstriking worker, had been seized by six men, stripped of his clothes, and thrown out of their automobile.

Two hundred Pennsylvania state policemen, 700 vigilantes and 200 special officers were patrolling the strike area.

In an effort to help force Bethlehem, Republic, Youngstown Sheet & Tube and Inland into submission, John L. Lewis ordered miners to walkout at their "captive" mines.

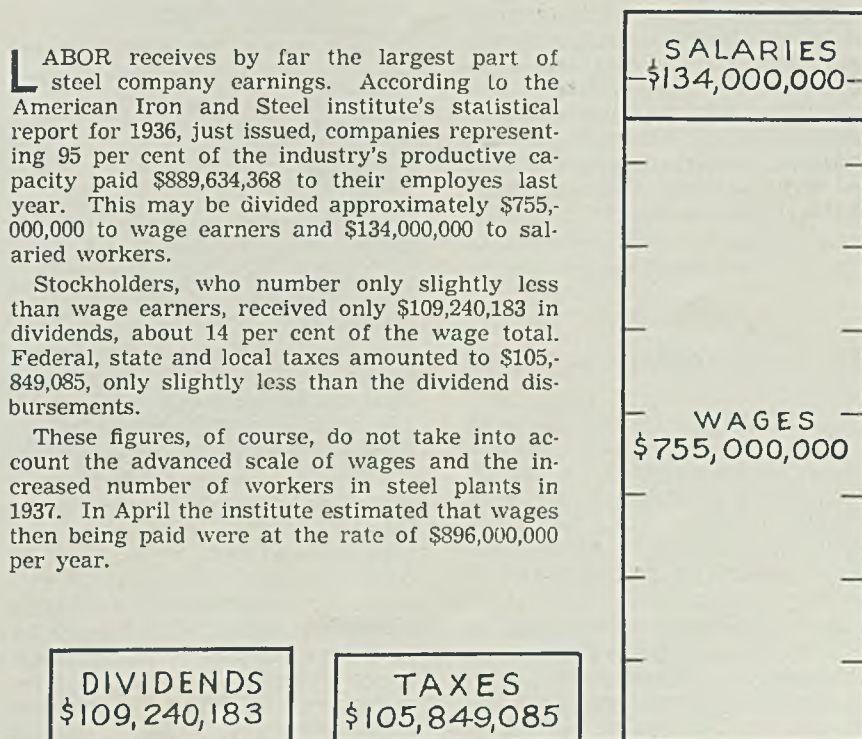
In many instances, however, this was an empty gesture because most of these mines had already been closed. Contracts with United Mine Workers expired April 3 and such operations as were conducted be-

### Steel Wages Seven Times Dividend Payments

LABOR receives by far the largest part of steel company earnings. According to the American Iron and Steel institute's statistical report for 1936, just issued, companies representing 95 per cent of the industry's productive capacity paid \$889,634,368 to their employes last year. This may be divided approximately \$755,000,000 to wage earners and \$134,000,000 to salaried workers.

Stockholders, who number only slightly less than wage earners, received only \$109,240,183 in dividends, about 14 per cent of the wage total. Federal, state and local taxes amounted to \$105,849,085, only slightly less than the dividend disbursements.

These figures, of course, do not take into account the advanced scale of wages and the increased number of workers in steel plants in 1937. In April the institute estimated that wages then being paid were at the rate of \$896,000,000 per year.



yond that date were under verbal agreements.

Lewis then decreed that a walk-out would be called at any non-captive mine shipping coal to any of the four companies. This threat was met promptly by Byron Canon, secretary, Western Pennsylvania Coal Mine Operators association. In a letter to Lewis he said that such action would be a violation of existing contracts which specify that operators at all times are at liberty to ship to any consumer without restraint from the United Mine Workers.

Philip Murray, SWOC chairman, sent a telegram to Eugene G. Grace, president of Bethlehem, saying "We propose as settlement of this entire controversy an election by secret ballot to be conducted under the supervision of the national labor board."

Bethlehem replied as follows:

"We call your attention to the fact we have never refused to meet and bargain with representatives of your committee on behalf of those of our employes whom it represents. . . .

"Your action in calling a strike at this plant is not based on any claim that the terms of employment are unsatisfactory, but rather for the purpose of forcing our employes to join your union and pay for a chance to work.

"We cannot legally and will not knowingly be a party to the coercing and intimidating of our employes as your telegram asks us to do. Your determination to coerce and intimidate our employes is clearly shown by the lawless methods employed by your committee here at Johnstown.

"Your armed pickets have ruthlessly attacked our employes who have at great personal peril continued at work. Your pickets have intimidated our employes and their families and have brought disorder and anarchy into a peaceful city and have disrupted the normal life of the entire community."

The telegram was signed by S. D. Evans, management representative.

## At Chicago

CONDITIONS at Chicago last week were quiet in contrast to disturbances at eastern centers. Inland and Youngstown continued to pursue a waiting attitude, but meanwhile signs of restlessness among employes anxious to go back to work were increasing.

The independent union of Inland workers charged that a minority of all employes is responsible for the shutdown and threatened to bring suit against CIO leaders and mem-

## Forty Iron and Steel Companies Signed

CIO headquarters at Pittsburgh issues statements as to the number of "iron and steel companies" which it claims have signed collective bargaining agreements. Widespread publicity has been given to its figures, ranging recently from 140 to 170. The fact is that as of June 14 CIO had agreements with only 40 companies which have capacity for pig iron, steel, and rolled steel. They represent 18 per cent of the total number which may properly be classified as "iron and steel companies." They have 254,000 wage earners, or 48 per cent of all wage employes in the industry. The 40 companies:

Allegheny Steel Co.  
Alan Wood Steel Co.  
American Car & Foundry Co. (St. Louis Works).  
Andrews Steel Co.  
Babeock & Wilcox Tube Co.  
Blair Strip Steel Co.  
Braeburn Alloy Steel Corp.  
Central Tube Co.  
Clayton-Mark Co.  
Columbia Steel & Shafting Co.  
Continental Steel Corp.  
Copperweld Steel Co.  
Crucible Steel Co. of America.  
Henry Disston & Sons Inc.  
Ellwood Ivins Steel Co.  
Empire Sheet & Tin Plate Co.  
Jessop Steel Co.  
Jones & Laughlin Steel Corp.  
Kilby Car & Foundry Co.  
Latrobe Electric Steel Co.  
McKeesport Tin Plate Co.  
Northwestern Barbed Wire Co.  
Penn Iron & Steel Co.  
Pittsburgh Tube Co.  
Rotary Electric Steel Co.  
Sharon Steel Corp.  
Pittsburgh Steel Co.  
Sharon Tube Co.  
South Chester Tube Co.  
Spang Chalfant & Co.  
Timken Steel & Tube division, Timken Roller Bearing Co.  
Wheatland Tube Co.  
Wheeling Steel Corp.  
Worcester Pressed Steel Co.  
American Steel & Wire Co.  
American Bridge Co.  
Carnegie-Illinois Steel Corp.  
Columbia Steel Co.  
National Tube Co.  
Tenn. Coal, Iron & R. R. Co.

bers for loss of pay. Youngstown's independent union called upon municipal authorities to protect its members if they return to work.

Operations at Republic's South Chicago plant were back to the rate prevailing prior to the strike—85 per cent. Part of the new wire mill has been outfitted as living accommodations for workers, about one-half of whom are making the plant their temporary home. The remainder have been going back and forth between the mill and their individual residences without trouble. Clerical help has returned to the office and

practically normal conditions prevail.

Representatives of the La Follette senate civil liberties committee went to Chicago last week to inquire into the Memorial day riot outside Republic's plant. An investigation by the state's attorney also continued. Another death resulting from injuries received in the battle three weeks ago between rioters and the Chicago police brought the total to nine.

Responding to the charge of the SWOC at Chicago that Inland has refused to bargain collectively with the union, the national labor relations board issued a complaint against the company and set June 25 for a hearing in Chicago. The point of dissension is whether or not a signed contract must follow collective bargaining.

## PRICE GAGE REMOVED IN SHEET MILL SETTLEMENT

Final settlement of the 1937-38 wage conference was reached in Columbus, O., last Friday by representatives of the Western Sheet and Tin Plate Manufacturers' association and the sheet and tin committee of the Amalgamated Association of Iron, Steel and Tin Workers.

The agreement provides for practically the same scale as the one which will expire June 30. It also was agreed that instead of wage rates moving in accordance with prices of the mill product, as in the past, they will rise and fall with the progress of the industry itself.

The wage advance granted March 16 is retained. Workmen will receive 2 per cent of their earnings in a lump sum at the end of the scale year. If the mills follow the usual custom and shut down for a period in midsummer this money would be considered a vacation pay.

The Western Bar Iron association resumed its conference with the bar iron wage committee of the Amalgamated association in Pittsburgh. Most of the details of the agreement were worked out but there remained the question of vacations with pay.

## WIRE COMPANY TO REPAIR MILLS DURING VACATION

Approximately 1100 employes of the American Steel & Wire Co.'s plant at Donora, Pa., will take a vacation the week of June 28. During this period the open hearth, blooming mill and three rod mills will be closed for repairs. The zinc works, wire mill and blast furnace will continue to operate.

The company offers a week's vacation with pay to employes having five years' service. Approximately two-thirds of the company's employes are eligible.



# Production

**S**TEEL ingot production gained 1½ points to 75½ per cent last week, due to heavier operating schedules at Chicago, eastern Pennsylvania, Detroit, New England and St. Louis. Wheeling was the only steelmaking center to show a decline. Details follow:

**Central eastern seaboard**—Up 2½ points to 67 per cent, with little change indicated for this week.

**Birmingham**—Continued at 83 per cent for the eighth consecutive week.

**Youngstown**—Held at approximately 30 per cent, with a slight decline to 29 per cent expected this week as a result of seasonal decline in orders. Sharon Steel Corp. is dropping one furnace at its Lowellville plant, leaving four active there, while Carnegie-Illinois continues to operate 14 units and a bessemer at its Youngstown works and 11 at Farrell.

**Cleveland-Lorain**—Unchanged at 46 per cent, with 18 open hearths continuing to melt.

**Pittsburgh**—Continued to hold at 92 per cent, excluding Johnstown where the exact figure was impossible to determine. Forty-eight blast furnaces are active.

**Wheeling**—Down 2 points to 93 per cent.

**Cincinnati**—Continued at 93 per cent, all on light rolled materials. Only two open hearths are idle.

**Chicago**—Increased ½ point to 63½ per cent as a result of better schedules by Carnegie-Illinois Steel

## District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended June 19	Change	1936	Same week 1935
Pittsburgh ..	92	None	67	30
Chicago .....	63½	+ ½	71	39
Eastern Pa...	67	+2½	45½	29
Youngstown ..	30	None	78	41
Wheeling .....	93	-2	71	48
Cleveland ...	46	None	82	48
Buffalo .....	89	None	84	32
Birmingham .	83	None	54½	30
New England	82	+37	83	56
Detroit .....	97	+2	100	70
Cincinnati ...	93	None	76	†
St. Louis ....	93	+8	†	†
Average ...	75½	+1½	70½	35½

†Not reported.

Corp. and Republic Steel Corp. The latter now is back to the rate in effect prior to the start of the steel strikes. Inland Steel Co. and Youngstown Sheet & Tube Co. continue idle. Twenty-seven of 39 blast furnace stacks continue active.

**New England**—Up 37 points to 82 per cent, as five open hearths resumed operations following repairs.

**Detroit**—Rose two points to 97 per cent, as one furnace down for repairs was placed back in production Thursday.

**Buffalo**—Remained at 89 per cent, with 38 open hearths active.

**St. Louis**—One producer put on an additional open hearth, lifting the ingot rate to 93 per cent, a gain of 8 points. Twenty-nine out of 33 furnaces are melting.

# Swanson Would Curb Scrap Exports

**I**N IDENTICAL letters to the house and senate committees on military affairs last week, Secretary of the Navy Swanson recommended passage of bills opposing scrap exports except under license.

"It is believed," said the secretary in his letter to the house committee, "that the purpose of this bill will more closely support the national defense if the words 'scrap steel' are changed to 'iron and steel scrap'."

He recommended that section 2 of the Koppleman bill be changed to read as follows: "There shall not be exported from the United States after the expiration of 60 days from the enactment of this act any iron or steel scrap except from licenses issued by the President of the United States. The President is authorized to grant licenses from such conditions and under such regulations as he may find necessary to assure in the public interest fair and equitable consideration to all producers of this commodity."

With this recommendation the secretary suggests that the house bill be passed.

## Committee Schedules New Series of Scrap Meetings

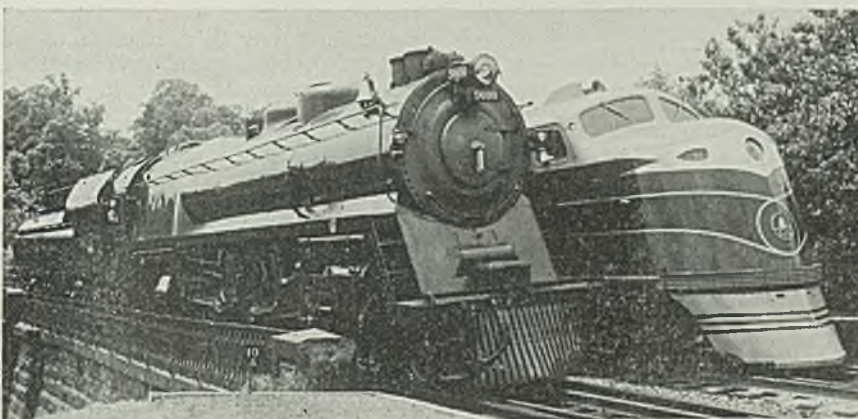
Another series of regional meetings will be held by the Independent Steel and Iron Producers' committee on scrap to inform companies interested in the progress of the committee's program for restricting scrap exports. The first three have been scheduled as follows: June 23, William Penn hotel, Pittsburgh; June 24, Palmer House, Chicago; June 25, Hotel Cleveland, Cleveland. Meetings will start at 2 p. m.

Dates for other meetings will be announced later.

## Recuperative Soaking Pit Furnaces Placed

Amsler-Morton Co., Pittsburgh, has obtained a contract from the Steel Co. of Canada for eight of its recuperative soaking pit furnaces, each approximately 13½ feet square and having a capacity for 96 ingots. This order combined with other contracts on hand totals 35 pits, averaging 14 square feet square and approximately 12,000 tons daily heating capacity. All the pits will be equipped with the company's seal-type cover and will include complete automatic control.

## New Steam, Diesel-Electric Locomotives Exhibited



**L**AATEST developments in rail motive power are these locomotives exhibited by the Baltimore & Ohio railroad at the annual meeting of the mechanical division, Association of American Railroads, Atlantic City, N. J., June 16-23. At left is the GEORGE H. EMERSON, first 4-4-4 type, 4-cylinder, single unit, single expansion steam locomotive ever built. Designed for passenger and fast freight service, it was completed June 3 in the company's shops at Baltimore. At right is the 3600 horsepower diesel-electric built for the B. & O. by Electro-Motive Corp., which on June 11 made the longest nonstop run east of the Mississippi, 551.4 miles from Cincinnati to Washington in 12 hours

# Urges Contacts With Workers

**A**N INSIGHT into the industrial relations policies of the Detroit plant of United States Rubber Products Inc., Detroit, was given by M. A. Clark, manager of industrial and public relations for this plant, in a recent address before the Detroit chapter of American Society of Tool Engineers.

In describing the activities at the plant, where 6000 are employed manufacturing 35,000 tires daily six days per week, Mr. Clark emphasized the necessity for constant contact with the worker and the importance of obtaining for him all the benefits which the industry and joint effort of management and the worker can produce.

For some years in this plant, he stated, there has been a different philosophy in the employment of the individual. The company looks first for character and after character the other necessities, physical, mental and training, by which an individual can earn a living. By far the great majority of all employes in this plant have been brought in or recommended by employes already there who can vouch for the character and the background of the applicant.

## Fitness Is Determined

Physical examinations by the company's doctor determine the fitness of the individual and help to place him where he can be of the best benefit to himself as well as to the industry.

The company, in co-operation with its employes, has established a mutual benefit society operated by committees of the employes, every member paying 50 cents per month and receiving \$13.50 per week during periods of sickness and immediate \$250 death benefit. The society has set up part of its funds for the purpose of loaning to employes, members of the society, sufficient amounts, at no interest, to cover the average doctor and hospital bill.

The company years ago offered a group insurance plan to all employes at a small monthly premium for policies ranging from \$500 up and each year sees thousands of dollars paid from this insurance fund to beneficiaries.

The employe now has, according to these plans, some reasonable degree of economic security but there still remains the necessity for providing for lack of work, periods of lay-off and old age. In order to meet this situation, some six years ago the company offered employes a retirement and savings plan whereby em-

ployes may have deductions made for retirement and for savings up to any amount, the money invested through a trust fund controlled by a board of trustees on which the employes have representation and the company guarantees interest at 4 per cent, compounded semiannually. Through this fund employes have been enabled to purchase homes, secure higher education for children and build up a financial estate for future needs, giving a new feeling of security and independence.

# Carnegie-Illinois Contracts Awarded

**C**ONTRACTS were placed last week by Carnegie-Illinois Steel Corp., Pittsburgh, for the principal mill and equipment installations at the new Irvin works and for the Edgar Thomson works. These include:

Eighty-inch continuous hot strip mill at Irvin works, awarded to Mesta Machine Co., Pittsburgh.

Forty-eight-inch slabbing mill at Edgar Thomson works, awarded to United Engineering & Foundry Co., Pittsburgh.

Three 32 x 84-inch two-high temper pass mills (two for sheet and strip and one for sheet); three 20½ x 56 x 84-inch four-high temper pass mills (two for sheet and strip and one for sheet) awarded to E. W. Bliss Co., New York. This equipment is for the Irvin works.

One 20½ x 56 x 84-inch three-stand tandem four-high cold reduction mill for the Irvin works, placed with Continental Roll & Steel Foundry Co., Chicago.

One 20½ x 53 x 54-inch four-high reversing cold reduction mill for the Irvin works, to E. W. Bliss Co.

## Foundation Contract Placed

Contract for excavation and sewerage and installation of foundations and concrete work for the slabbing mill was let to the Rust Engineering Co., Pittsburgh. The mill, which will have a capacity of 1,000,000 tons annually, will supply semi-finished steel for the Irvin works and other plants of the company.

Four 250-ton ladle cranes and one 75-ton charging crane were awarded Alliance Machine Co., Alliance, O.

The 80-inch hot strip mill with its storage yard, and accessories, will be housed in a building 2520 feet long.

Excavating for the Irvin works at Camden hill in Mifflin township, on the Monongahela river, is now under way.

A contract for what will be the world's largest benzol refining plant has been awarded by Carnegie-Illinois to the Semet-Solvay Engineer-

ing Corp. of New York, to be erected at Clariton, Pa.

This will be a complete, modern unit, employing the continuous refining process, perfected over 15 years of operation by Semet-Solvay at its Syracuse, N. Y. plant.

The light oils recovered from the by-product coke ovens will be processed in the new equipment to obtain benzol, toluol, xylo, solvent naphtha, and residues to meet strict specifications required by the industries using these products.

## AMERICAN STEEL & WIRE TO DEDICATE NEW ROD MILLS

More than 300 prominent citizens of Joliet, Ill., officials of the United States Steel Corp. and the American Steel & Wire Co., industrialists and railroad men of Joliet and Chicago will join in formally dedicating the American Steel & Wire Co.'s new continuous rod mills, June 23.

Visitors will attend a luncheon given by the local association of commerce, and later will be guests of C. F. Blackmer, president, and C. F. Hood, executive vice president, of the Wire company, on an inspection tour.

This installation brings the company's employment in Joliet to an all time peak of 2000 men, compared with about 1400 in 1917.

The mills replace two former rod mills which were shut down in 1930, and subsequently scrapped. They will supply rods to the company's wire mills in Joliet, Waukegan and DeKalb, Ill.

## GM To Build Ternstedt Plant at Trenton, N. J.

General Motors Corp.'s new Ternstedt plant for manufacture of hardware and metal interior trim for closed cars will be located in Trenton, N. J. The plant will be built on a 60 acre-plot and will include 900,000 square feet of floor space, mainly on the first floor.

It will be built of brick, steel and glass. One section, two stories high and extending the entire length, will be used for metal finishing work and will be air-conditioned. Production will be distributed to Fisher Body and General Motors plants in the East.

Equipment needed will be small machine tools (punch presses, die casting machinery, all classes of plating equipment, graining equipment, enamel bake ovens and small production machinery.

The corporation also announced additional loading facilities and more space in the die shop for the Cleveland division of Fisher Body. All are part of General Motors large expansion program which includes new plants at Flint and Grand Rapids as previously reported.

## Advises Research In Accountancy

**A**S RESEARCH studies are applied to engineering and marketing, why is it not logical to apply them to accountancy and profit earnings? This question was asked by R. E. W. Harrison, vice president, Chambersburg Engineering Co., Chambersburg, Pa., at the annual meeting of the Pennsylvania institute of certified public accountants, held at Skytop Lodge, Skytop, Pa., June 17-19.

All too often the comptroller is a conscientious, painstaking individual, whose plea for caution can be "too easily dismissed, by the injection of the simplest fact of a technical nature thrown into the discussion." He is full of facts and figures but his facts are those of the present day, and are not guide posts along which to chart a future course.

### Depreciation Causes Trouble

In having permitted the depreciation problem to become the football of finance the accountancy profession has failed in its duty, and in too many cases has earned for itself the label of "yes men," Mr. Harrison stated.

Administrative government, as practiced by the regime in power, is rapacious for increased income from all taxable sources. Only by accurate accountancy practice, and the quoting of past precedent, as well as life history in similar lines of business, can this rapacity for confisca-

tion of earnings be curbed, he declared.

Far too much emphasis is placed on the assumption that businesses are automatically self-perpetuating, an assumption refuted by statistics showing the life of the average business to be about 5½ years. A brief analysis reveals that many businesses fail because of inadequate provision in their accounting for depreciation and obsolescence. The cost of such depreciation and obsolescence always must be recovered from current sales.

### Would Size Up Competitors

"If I were asked to name the first item of information which I would like from one of our company accountants," said Mr. Harrison, "I would say: 'Give me the financial histories of all the concerns engaged in our line of business, together with your estimate of the situation which resulted in the failure of those that fell by the wayside, and the successes of those of our competitors who live to plague us.'"

"In many cases such a brief survey would automatically dictate the major policies of our company. And yet, where can I find a company accountant or comptroller who can briefly and in an interesting way present such a picture at a board meeting?"

Mr. Harrison cited the case of the comptroller of a large corporation who developed a way of presenting his facts and figures to his board in an interesting and effective manner. This comptroller since has been advanced to the position of executive vice president of his company.

## Less Public Work, Structurals Gain

**T**HE fabricated structural steel industry in the United States has a capacity to meet promptly a much larger demand than is at present being experienced. This condition is probably greatly different from that which exists in Europe, as was accentuated in reports presented June 21 at the opening meeting of the sixth international conference on steel development in Duesseldorf, Germany. The report from the United States was sent by the American Institute of Steel Construction, V. G. Iden, secretary.

The conference draws representatives from England, France, Germany, Holland, the United States, and other countries. After viewing the Craftsmanship exposition in Duesseldorf, the delegates will adjourn on Wednesday to Paris where they will continue in session through June 25.

### Business Volume Improves

The American report stated in part:

"Coincident with the announcement of the government that it will exercise greater economy and greatly curtail expenditures for public works, the structural steel industry is facing a decided improvement in the volume of business. This is further proof of the fact that government expenditures on made work have failed to demonstrate the practicability of effecting business recovery through extravagant use of the tax machine.

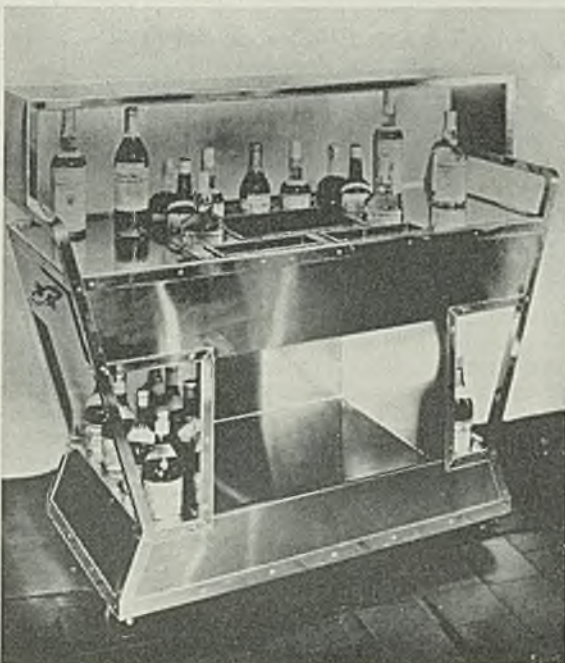
"The volume of business of this industry during the past year has approximated 57 per cent of normal (normal being the average annual volume for the years 1928 to 1931 inclusive). The shipments of our industry during the first three months of 1937 were 19 per cent larger than the shipments for the same three months of 1936, while the bookings for these same three months were 9 per cent larger than the bookings of the same period last year. The apparent hesitancy on future business results from buyers' apprehensions over prices which have been advancing constantly in recent months."

More than 1,600,000 tons of fabricated structural steel were produced in 1936. Of this, 37 per cent went into bridges, 25 per cent into buildings, and 22 per cent into erection of new industrial plants.

A considerable portion of the report was devoted to tests of various types of structures, conducted by the institute.

Delegates were invited to attend the institute's fifteenth annual convention in White Sulphur Springs, W. Va., Oct 27-29.

## Portable Bars Made of Stainless Steel



**S**TAINLESS steel portable bars for the Waldorf Astoria hotel, New York, and the liner NORMANDIE have been fabricated by the Biedmar Kitchen Equipment Co., New York. The steel is Armco 18-8 stainless made by American Rolling Mill Co., Middletown, O. It is impervious to stains, easy to clean and is not affected by spilled alcoholic liquors or fruit juice

# Men of Industry

**W** G. Hulbert, elected general works manager of Taylor-Wharton Iron & Steel Co. on May 1, was elected vice president May 22 to succeed the late S. M. Buck. He continues his duties in charge of manufacturing at both the High Bridge, N. J., and Easton, Pa., plants of the company.



W. G. Hulbert

Harvey T. Harrison has been appointed sales manager, Duraloy Co., Scottdale, Pa. For several years Mr. Harrison was in charge of sales in the Cleveland territory for the company.

Victor E. Karminski, president, Hokar Products Corp., New York, sailed June 16 to visit England, France, Belgium, Sweden, Norway and possibly some countries in the Near East.

T. P. Alder has retired as vice president and treasurer, United States Steel Products Corp., New York. He is being succeeded as vice president by A. C. Mundle, and as treasurer by C. E. Thomas.

B. C. Heacock, president, Caterpillar Tractor Co., Peoria, Ill., and William C. Dickerman, president, American Locomotive Co., New

Buildings Inc., Middletown, O. James W. Swank has been elected vice president. Several years ago Messrs. Calkins and Swank invented and developed the "Steelex" method of construction used by Steel Buildings Inc., in the construction of houses.

Gilbert R. Eichelberger, Dayton, O., heretofore one of the leading distributors of Steelex homes, has been appointed general sales manager of the organization. He will make his headquarters at the general offices in Middletown.

Donald C. Bakewell has resigned as vice president and chairman of the executive committee, Continental Roll & Steel Foundry Co., East Chicago, Ind., in which capacity he has served since 1930, to become special representative of Blaw-Knox Co. He will make his headquarters in the executive offices in Pittsburgh.

Joseph L. Trecker, treasurer, Kearney & Trecker Corp., Milwaukee, maker of milling machines, has been elected vice president to succeed Philip P. Edwards, who resigned to become an executive of the Ingersoll Milling Machine Co., Rockford, Ill. O. W. Carpenter, secretary, has been given the added duties of treasurer.

Elmer J. Kopf, since 1933 manager of advertising and sales promotion, Union Drawn Steel Co., Massillon, O., has joined the staff of the advertising division, Republic Steel Corp., Cleveland. In addition to enlarged duties, he also will continue to handle advertising and sales promotion activities of Union Drawn, a subsidiary of Republic.

J. M. Watson, formerly associated with Hupp Motor Car Co. and Jones & Laughlin Steel Corp. in Detroit, and at one time president of the American Society for Metals, is now active in consulting engineering work with the buyer's office of Volvo Co., a Swedish automobile company, building passenger cars, trucks and submarine engines. Mr. Watson's office is at 6432 Cass avenue, Detroit.

L. H. Hill, electrical engineer in charge of the transformer department, Allis-Chalmers Mfg. Co., Milwaukee, has been elected chairman, Milwaukee section, American Institute of Electrical Engineers, to take office Aug. 1. R. R. Ransom, Cutler-Hammer Inc., was elected secretary and treasurer. Mr. Hill is vice chairman of the annual midsummer meeting of the AIEE in Milwaukee, June 21-25. K. L. Hansen, Harnischfeger Corp., is general chairman.

Gosta Lofberg, president of S.K.F. Steels Inc. for the past few years, has resigned to become president of

York, have been elected to the board of directors, Chamber of Commerce of the United States.

J. F. Lincoln, in whose honor was created the James F. Lincoln arc welding foundation, sponsor of a \$200,000 arc welding award program, is in England giving a series of talks at the invitation of various engineering societies and institutes.

Ray M. Calkins, of Chicago, has been elected president of Steel

## Tool Company Celebrates Fortieth Anniversary

**S**TRESSING the part played by grinding machines and other machine tools in lowering the cost of many of today's necessities and conveniences, notably the automobile, Landis Tool Co., Waynesboro, Pa., recently celebrated the fortieth anniversary of its incorporation. At the same time the company honored

J. Elmer Frantz, president of the board of directors, whose service started with Landis Bros., its predecessor, seven years before Landis Tool Co. was formed.

In the early eighties F. F. Landis and Abram Landis, employes of the Geiser Mfg. Co., Waynesboro, devised a small universal grinder to perform some operations in producing machine parts, solving a difficult problem by the use of a large volume of coolant. In 1889 the Landis brothers decided grinding machines had a future and formed a partnership to manufacture them. In 1890 Mr. Frantz became associated with the brothers.

Of the 63 employes at the time of incorporation six are still on the payroll and 80 of the present employes have been associated with the company 25 years or more. Average wages have increased 350 per cent over the level of 1897.

At the beginning the company built only one type of universal grinder, weighing about 2300 pounds, while now there are almost 150 types and sizes, weighing up to 100 tons.



J. Elmer Frantz

Uddeholm Co. of America Inc., New York. Prior to his association with S.K.F. Steels, Mr. Lofberg was for many years vice president of the Uddeholm company.

E. T. Corbus, president of Uddeholm since 1932, will be chairman of the board and treasurer, and Erik Enevik, vice president continues in charge of the Chicago branch.

John B. Campbell has been elected vice president of Pettibone-Mulliken Co., Chicago. Mr. Campbell has been general manager of the company since joining it in 1932. Previously for ten years he had been associated with Fairbanks, Morse & Co. at Beloit, Wis. H. R. Prest has been elected secretary and treasurer. H. J. Brazelton has been named assistant secretary and assistant treasurer.

Maurice E. Nichols for the past eight years dean of Fenn college, Cleveland, has joined American Steel & Wire Co., as superintendent



Maurice E. Nichols

of training. Mr. Nichols has had a wide experience in industry and education. A native of Ohio, he received both his A.B. and masters degrees from Western Reserve university, Cleveland. After a variety of experiences, he joined the staff of Fenn college in 1927. He became dean of engineering in 1935. The Wire company established its first course for employe training in 1911.

E. W. Smith, former general manager of sales for Pittsburgh Steel Co., Pittsburgh, has become associated with Bethlehem Steel Co. in the wire sales department, Bethlehem, Pa. Mr. Smith was with Pittsburgh Steel more than 33 years. After considerable experience in the office of the company, he became a traveling representative, and in 1922 went to Chicago as assistant general manager of that district office. In 1924 Mr. Smith was transferred to the general offices as sales agent; in 1926



Ambrose Swasey

he became assistant general manager of sales, and in 1930, was appointed general manager of sales.

Stuart G. Baits, associated with Hudson Motor Car Co., Detroit, for 22 years, has been appointed president of Hudson Motors of Canada. He started as draftsman, was designer until 1923 when he became assistant chief engineer. In 1928 he was made chief engineer, in 1934 assistant general manager and later first vice president of Hudson Motors of Canada. Still later he became second vice president of the American company, then first vice president.

Clair L. Barnes, president, Houdaille-Hershey Corp., Detroit, automotive partsmaker, has been elected to the newly created office of chairman of the board. Charles Getler, formerly vice president, has been named president. Donald S. Devor, vice president and general manager, General Spring Bumper Co., and executive vice president of Oakes Products Corp., both Detroit subsidiaries of Houdaille-Hershey, has been named a vice president of the parent organization. Melville C. Mason has also been elected a vice president.



E. W. Smith

## Died:

**A**MBROSE SWASEY, 90, founder and chairman, Warner & Swasey Co., Cleveland, June 15 in Exeter, N. H., of pneumonia. International renown was won by Mr. Swasey in two distinct fields—designing accurate and efficient machine tools and building some of the finest astronomical instruments.

Born in Exeter, he attended the community schools and learned the machinist's trade in the Exeter Machine works. In 1870, he entered the employ of Pratt & Whitney, Hartford, Conn. Also working at Pratt & Whitney was the late Worcester R. Warner, with whom Mr. Swasey formed a partnership for the manufacture of machine tools in 1880. First starting in Chicago, they transferred to Cleveland in 1881.

Mr. Swasey had a prominent role as a public benefactor. A member of many technical and scientific societies, he was the recipient of literally hundreds of honors.

Axel Sahlin, 82, well known steel engineer and one-time superintendent, Maryland Steel Co., Sparrows Point, Md., in York, Pa., June 10.

A. C. Heinzen, 58, one of the founders of the Wausau (Wis.) Iron Works, and president until his retirement in 1933, in Wausau, June 7.

Otto C. Rohde, vice president and chief engineer, Champion Spark Plug Co., Toledo, O., of injuries received May 28 at the Indianapolis speedway. He was a member, Society of Automotive Engineers and various mechanical and electrical engineering groups.

Harold B. Dinneen, 53, vice president, Minneapolis-Moline Power Implement Co., Minneapolis, in that city, June 9. From 1904 to 1920 he was employed by Deere & Co., Moline, Ill., and from 1920 to 1929 was associated with the Moline Plow Co., Moline. Since the amalgamation in 1929 of Moline Plow with the Minneapolis Steel & Machinery Co., resulting in the formation of the Minneapolis-Moline Power Implement Co., he had been an officer of the latter firm.

Dr. J. Baxeres de Alzugaray, 71, metallurgical chemist, in New York, June 12. Born in Buenos Aires, he came to this country as consulting chemist of the newly organized Vanadium Co. of America in 1904. Dr. Baxeres was an early experimenter in the field of vanadium steels, and as consulting chemist to the Vanadium Co. Ltd., London, was among the first to produce vanadium steel on a commercial basis.

# Steel Corp. Picks 594 College Men

UNITED STATES STEEL CORP. has chosen 594 graduates of 91 colleges and universities to enter the employ of its subsidiary companies. This is the result of five months of work by recruiting committees of engineering, operating and sales departments who visited schools in every state.

The purpose is to bring into the organization each year a number of specially trained men. It does not mean that all important positions in future will be filled with college men, as it will continue to be the policy of the corporation to fill many important posts with employes who have not had the benefit of college training but have worked up through the ranks.

## Will Study Operations

All the college men who have been engaged whether technical or nontechnical, will begin with an intensive study of operations. Technical graduates will be designated as observers or practice engineers and will spend one to two years in various plants. The practical work will be supplemented by lectures, informal talks, observation and frequent rotation among different jobs.

During this period the industrial relations departments will keep record of the work of each man to determine the work for which each man is best equipped.

In addition to the college recruits, summer employment will be offered to about 300 undergraduates in mills, mines and plants. Under this plan regular employment with comparative subsidiaries probably will follow as a normal outgrowth of two or three years of summer work and study. It will also enable students to choose courses best suited to a career in the steel industry.

## Minnesota House Acts To Raise Ore Taxes

Increased taxes on the Minnesota iron ore mining industry are imposed in two bills recently passed by the house of representatives and awaiting action by the senate. One raises the occupational tax in the ore industry from 6 to 12 per cent. The other increases the royalty tax from 6 to 12 per cent. Other legislation affecting the industry is pending in the house.

## Tool Engineers Inspect Plant

Members of the American Society of Tool Engineers were the guests

of the Firth-Sterling Steel Co., at a dinner recently at the Penn-McKee hotel, McKeesport, Pa. The speaker was Malcolm F. Judkins, of Firth-Sterling Steel, whose subject was "A Description of Production Processes in the Making of Firthite Sintered Carbide Tools." Following the dinner, the members inspected the company's new Firthite-Firthaloy plant.

## Meetings

### SHEET METAL DISTRIBUTORS ANNOUNCE OCTOBER MEETING

National Association of Sheet Metal Distributors will hold its semiannual meeting at the Palmer House, Chicago, Oct. 19, during the forty-third annual convention of National Wholesale Hardware association at the same place, Oct. 18-21. George A. Fernley, 505 Arch street, Philadelphia, is secretary of the two associations which are affiliated. American Hardware Manufacturers' association will also hold its semiannual convention at the same time as the National association. Charles F. Rockwell, 342 Madison avenue, New York, is secretary of the American association.

## Electroplaters Society Elects New Officers

A. B. Wilson, Chevrolet division, General Motors Corp., Detroit, was elected president of the American Electro-Platers' society holding its twenty-fifth annual meeting at Hotel Pennsylvania, New York, June 14-17. Other officers named were: Franklyn J. MacStoker, Medallie Art Co., New York, first vice president; Roy Goodsell, Milwaukee, second vice president; and Austin Fletcher, Binghamton, N. Y. W. J. R. Kennedy, 90 Maynard street, Springfield, Mass., was re-elected executive secretary of the organization.

Milwaukee was selected as the 1938 convention city, with the meeting probably to be held in June. For the first time, a convention city was chosen two years in advance, the 1939 meeting to be held at Asbury Park, N. J., under auspices of the Newark, N. J. branch of the society.

A resume of early technical sessions at the New York meeting appears on page 75 of this issue of STEEL.

## Power Plant Engineers Hold Fuel Conference in Detroit

Industrial executives and power plant engineers from the lower peninsula of Michigan and northwest-

ern Ohio were guests of Appalachian Coals Inc., in Detroit, June 15, for a fuel engineering conference in the Book-Cadillac hotel. This symposium—patterned after the 19 fuel engineers' meetings held in Cincinnati almost every six weeks since 1934 and sponsored by the Appalachian organization—was designed to offer a "common meeting ground" for "coal producers, consumers, equipment manufacturers, and fuel and research engineers." Approximately 200 attended.

Speakers at the Detroit meeting included Dr. R. Thiessen, bureau of mines, Pittsburgh; B. E. Tate, power plant engineer, National Cash Register Co., Dayton, O. R. A. Foresman, stoker department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Henry Kreisinger, chief research engineer, Combustion Engineering Co. Inc., New York; and E. A. Sitter, power plant engineer, Chevrolet gear and axle division, Detroit.

## Machine Tool Orders Drop Below March Level

New machine tool orders in May dropped sharply from the April peak to near March levels, according to the National Machine Tool Builders association, Cleveland. The index for May stood at 208.5, compared to 282.5 in April, 211.6 in March, and 118.9 in May, one year ago.

Domestic orders declined most abruptly, the May index of 161.4 comparing with 232.5 in April. Foreign orders declined from 50 to 47.1. Foreign orders represented 22 per cent of the May total.

## Foundry Equipment Buying Increased in May

Orders for foundry equipment in May were at a higher rate than in April, according to the index of the Foundry Equipment Manufacturers' association. Net order index for May was 237.6, compared with 208.1 in April and 165.1 in May, 1936. Index of shipments was 226.2 in May, compared with 232.5 in April and with 146.7 in May, 1936. Unfilled order index was 376.8 for May, 365.4 for April. Indexes are based on averages of 1922-24 as 100.

## List Connecticut Firms

A 256-page directory of manufacturers in the state of Connecticut in 1936 has been published by the department of labor and factory inspection of that state. Copies may be had by addressing Joseph M. Tone, commissioner, Hartford, Conn. Conn.

# Activities of Steel Users and Makers

**I**NDUSTRIAL STEEL CASTING CO., maker of carbon steel castings, and Wine Railway Appliance Co., manufacturer of patented devices and equipment for railroad cars, both of Toledo, O., have been consolidated to form the Unitcast Corp. Industrial Steel Casting Co., formed in 1920 by officers of the Wine company, is now engaged in a \$100,000 expansion program. Officers of the new corporation are: Chairman of the board, William E. Wine; president and treasurer, Ralph F. Tillman; vice presidents, Lambert J. Tillman, Joseph L. Tillman and Cyrus Hankins; secretary, H. W. Morgan.

Hetz Construction Co., Niles, O., has purchased the malleable foundry division of the Warren Tool Corp., Warren, O.

Detroit Electric Motor Works has removed its plant from 40 Custer avenue, Detroit, to new and larger quarters at 83 East Milwaukee avenue.

Struthers-Wells Co., with plants at Warren and Titusville, Pa., is now represented in the Pittsburgh district by Goldsborough & Vansant

Inc., with offices in the Farmers Bank building, Pittsburgh.

Joseph Monahan, Grand Rapids, Mich., engineer-agent selling modern machine tools, has moved from 321 Lake Michigan drive to 351 Indiana avenue, Northwest.

Bossert Co. Inc., Utica, N. Y., producer of metal stampings, has opened a new sales office at 916 New Center building, Detroit, in charge of Harry L. Stadt, with the firm the past 12 years.

Electric Alloy Foundry Co., Houston, Tex., will be placed in operation soon by James V. Reich, 5034 Rusk avenue, Houston. The company will specialize in heat and corrosion resisting alloys, high test cast irons and miscellaneous alloy steel castings.

Winton Engine Works, subsidiary of General Motors Corp., has divided \$5,000,000 navy contract with General Machinery Corp., Hamilton, O. The Winton award is for two diesel electric engines for submarines. Work probably will start in about 60 days.

Cleveland Tractor Co., Cleveland, has made a sales arrangement with the Mid-Lakes Sales Co., Marion building, Cleveland, whereby the latter company will handle the sale of Cletrac crawler tractors to manufacturing and industrial corpora-

tions in 21 northeastern Ohio counties.

Graham Transmissions Co., Springfield, Vt., founded by L. A. Graham, Milwaukee, has moved its general offices to 739 North Broadway in Milwaukee. Manufacturing operations will continue for the present in the plant of the Fellows Gear Shaper Co. at Springfield. Mr. Graham was formerly sales manager, Falk Corp., Milwaukee.

Directors of Briggs Mfg. Co. and Motor Products Co., Detroit, have ratified the merger plan for the two companies. Two shares of Briggs will be offered for three shares of Motor Products. Briggs stockholders will vote on the plan July 23 and Motor Products stockholders July 22.

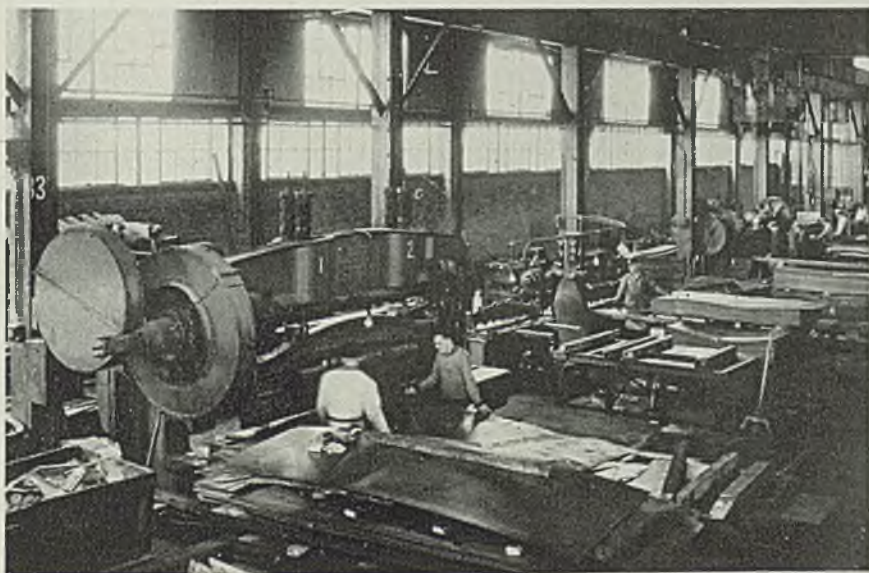
Timken Roller Bearing Co., Canton, O., as of May 1, had orders on its books for bearings for driving axles of 227 steam locomotives, 207 representing new construction and 20 remodeling. This is an indication of the growing use of special bearings on locomotives. Many of these will also have Timken bearings on engine and trailer trucks.

M. Wagner Inc., Glendale, Calif., manufacturer of permanent metal molds and plumbing supplies, announces that it has acquired the rights to a new process, developed by M. Wagner, president, for producing hollow products in permanent molds. The process now is being applied to the production of sinks and present plans call for its early use in production of laundry trays, bathtubs and other hollow products.

Hecla Coal & Coke Co., Pittsburgh, has purchased from receivers of the Tower Hill-Connellsville Coal Co. of West Virginia, plants of the Tower Hill No. 1 and 2 and Thompson No. 1 along with the remaining acreage, estimated at 400 to 500 acres. The sale was made by A. S. Alexander, Charleston, W. Va., and G. S. Baton, Pittsburgh, receivers. All buildings, machinery, tracks, tipples, and other equipment are transferred to the new owner.

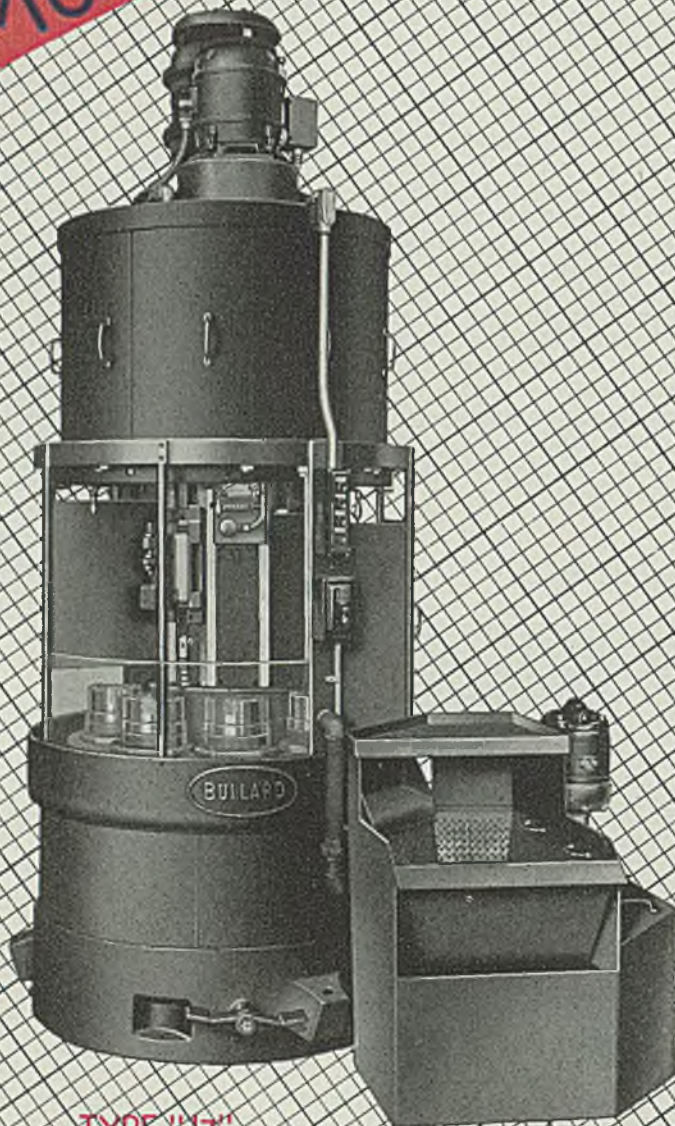
Denver Metal & Machinery Co., Denver, which recently acquired Morse Bros. Machinery & Supply Co., has changed its name to Morse Bros. Machinery Co., with main offices at 2900 Broadway. George G. Morse, president and one of the founders of the Morse company, has retired to devote his time to mining interests in Nevada. The new company is controlled by officers of the purchasing firm, Max Grimes, president, and J. T. McShane, vice president.

## To Double Plant for Servicing Automobile Sheets



**C**ONSUMERS STEEL PRODUCTS CORP., 6450 East McNichols road, Detroit, will double its plant by a steel and concrete building 80 x 540 feet to stock a wider variety of flat-rolled and other types of steel. The present plant—interior view of which is illustrated, will be used entirely for pickling, oiling and shearing flat material. A 20-ton and a 10-ton crane will operate on a 77-foot runway. At the doors of the automotive industry, this company pickles 400 tons of sheets daily, slits wide sheets, and reclaims wasters

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# MIRRORS OF MOTORDOM

DETROIT

**A** BREATHING spell from the continual outpouring of strike news from this beleaguered front may be a welcome interlude; so take a stroll with us over on Milwaukee avenue, facing the Chevrolet annex of the General Motors building, into a massive red brick structure whose 11 floors spread over nearly an entire city block and which is vaguely referred to as "GM Research."

Actually, General Motors research divisions are concentrated on five floors of about half the building, balance of the space being given over to Fisher Body planning, art and color departments, and to a few other enterprises such as United Motors Service. But on those top five floors of the westerly half of the building are massed the research brains of GM, ably guided by "Boss" Kettering whose homely philosophy on research problems and methods has filtered down through the organization to the last lathe hand.

## Toolshop Profits Carry Overhead

The working force numbers about 500, of which 200 are shop men, 120 are actual researchers, and the balance executive and clerical hired hands.

The large number of shop men is required to staff the extensive toolshop operated by GM research. This shop is busy nearly all the time on production work for various GM divisions and even solicits outside tool work, at prevailing prices. Even GM divisions must pay the going rates for work they want done here. The profits of the toolshop carry the overhead of the shop and reduce to an extent the budget necessary for the comprehensive research programs the corporation must continually keep moving.

The toolshop also does a considerable volume of business in supplying carbide tools to the industry, sharing this work with another Detroit interest.

GM research engineers profess little interest in new developments for 1938 models, or even for 1939 models.

BY A. H. ALLEN

Detroit Editor, *STEEL*

All that is water over their dam. Right now they are probing into ideas which will never see the light of production until 1941 or 1942, if at all.

A large share of their work is on phases of fundamental research. For instance, someone asks the questions: Why do not automobile engines operate at better efficiency? Why is efficiency at the flywheel only 23 per cent? At the rear wheels 10 to 18 per cent? What is to be done to raise this figure? There is meat for research engineers and they proceed to dig into it with a vengeance. Primarily, of course, the problem is one of fuel research and an extensive program of fuel research is under way to throw some light on these questions.

Higher octane fuels are one answer. Present automotive gasolines run from 50 octane on the low side to about 75 on the high. Aviation fuels run up to 87, and some synthetics have been developed with 120 octane rating.

With higher octane fuels, engine weights will come down further and efficiency will move up. In the past ten years, car weights have come down appreciably, but the buying public's demand for more room works against this trend. For example, specifications for the 1928 Buick were approximately the same as the 1936 Chevrolet, that is, as far as weight, size and other factors go. Yet the 1936 Chevrolet averages considerably greater gasoline economy compared with the 1928 Buick.

**G**M RESEARCH engineers are strong boosters for American steel mills. They will tell you steel quality in this country is far beyond that achieved by foreign mills. They will tell you the surface has only been scratched in determining the possibilities of weight reduction

through more intelligent application of less expensive steels by designers; that the need for expensive alloy steels is over emphasized.

In recent years metallurgists have borne the brunt of many complaints on part failures which actually can be traced to improper design or faulty manufacturing methods rather than to incorrect steel analysis. To back up this claim, GM researchers will cite results of an 8-year study of fatigue life of gears, one salient point of which is that a relatively small increase in fatigue life was achieved by a change in material analysis, while by revising design and manufacturing methods an increase of 500 per cent or more was possible.

## Scoff at Diesel for Passenger Cars

General Motors plans for a new diesel plant have revived talk of diesels for passenger cars, but GM engineers scoff at such reports. They say that at the present stage of development the diesel engine is economical only on long runs and with larger engines where quantities of fuel used are heavy. Another bugaboo as far as diesel fuels are concerned is dirt. Operating conditions for best performance of diesels must border on that of the hospital operating room, which is not exactly synonymous with your average automobile engine environment.

An outgrowth of the diesel development has been the suggestion of adopting injection systems for gasoline engines, dispensing with present carburetion. Injection systems do provide uniform distribution of fuel to all cylinders, but engineers find the cost of injection equipment so high that it is not at all adaptable to the gasoline engine as used in passenger cars today.

Research in copious quantities has been devoted to the subject of streamlining and body design in general. As every one knows, car builders have made important advances in the direction of streamlining, but this appears to have been mainly at the insistence of sales de-



## MIRRORS OF MOTORDOM

partments. If the public wants streamlining, then body engineers must supply it, whether it means anything as far as operating efficiency is concerned or not. If the competition is going to town on streamlining, then streamlining is the thing to do.

Actually, tests show streamlining has little effect as far as cost of operating a car goes, because average speeds are so low. Wind resistance is not an important factor until high speeds are reached, and a recent survey of drivers on express highways in Michigan, conducted in co-operation with state police, showed a very small percentage of the total number of cars clocked traveling over 60 miles per hour on open stretches of smooth road. And this survey covered a good many thousand cars over a considerable period of time.

### Forget Meaning of "Impossible"

Some interesting studies have been made on the location of the center of gravity of a car. While most cars today hug the ground more than in years past, the actual change in center of gravity, on the average, has been in the order of a few tenths of an inch. Location of the center of gravity is restricted by the limits of car tipping on the one extreme and skidding on the other. The latter is particularly dangerous since, when induced by a too low center of gravity, the driver does not become conscious of the skid until it is too late.

Sensation of skidding, by the way, is transmitted to a driver's brain through his posterior which suggests a new form of "rear-end" drive. It seems that a driver becomes aware of all untoward movements of his car through this part of his anatomy, one reason why airplane pilots are put through such a severe course of training in blind flying so they will become thoroughly accustomed to instant recognition of any change in the motion of their craft when they cannot make use of their vision.

GM research engineers have been imbued with the spirit of doing or attempting to do what your matter-of-fact scientist will dismiss as impossible. Trained by Mr. Kettering and his assistants to forget the meaning of impossible, these able researchers attack any problem from the angle of plain horse sense and

## 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 STEEL'S Detroit office

Week ended:		
May 22 .....		131,306
May 29 .....		131,421
June 5 .....		*101,629
June 12 .....		*108,182
June 19 .....		120,720
Week ending		
	June 19	June 12
General Motors .....	42,150	*37,783
Ford .....	28,740	29,240
Chrysler .....	28,500	*27,600
All others .....	21,332	*13,559

\*Revised. †Estimated.

often reason through to a solution which others might despair of attaining by the most adroit use of all known formulas, equations and textbook precepts.

This is not to infer that GM researchers have burned all their textbooks, but in the application of the literature to their problems, they manage to keep their tongues in their cheeks.

**A** SMALL, irate man with a hammer successfully stalled a large part of Chevrolet production up to last Wednesday, when he decided his co-workers in the gray iron foundry division at Saginaw were working too fast to suit him and proceeded to smash up molds ready for iron. His dismissal resulted in a UAW walkout, shutoff of castings from the plant and enforced idleness of other divisions dependent upon these castings. His actions are just another example of the ridiculous, inane and intolerable occurrences

behind the continued labor troubles of General Motors.

Chevrolet gear and axle plant in Detroit and the small parts plant at Bay City closed and 10,300 were without pay. The main plant in Flint was slowed down to half speed. Closings followed at Fisher plants in Buffalo, Cleveland and Baltimore. Chevrolet assemblies in Baltimore and Buffalo stopped. Then Muncie closed down. Later in the week, negotiations were successful in resuming at Saginaw, but the damage in lost production and lost pay was done.

An efficiency engineer with one of the auto plants here in Detroit is authoity for the story being told of difficulties encountered in locating a drinking fountain to the satisfaction of prospective drinkers. The men wanted it in one spot, the engineering department in another, while the union shop steward advised still a third location. Upshot was that after long hours of bickering, the men held a meeting, fired the union steward, elected a new man and ordered the fountain where they originally wanted it, only after it had been installed where the first steward specified in written orders.

### Union Enthusiasm Losing Steam

There is little question union enthusiasm is losing steam in a wide range of plants. Irate wives who are finding pay checks short of several days wages because of foolish walkouts are beginning to lay down the law to their husbands, and when it comes to wives versus union organizers, it's at least a 5 to 1 bet on the women.

Harry Bennett, personnel chief of Ford, put the quietus on two embryo unions or brotherhoods—Workers Council for Social Justice Inc. and the Ford Brotherhood of America Inc.—which bought newspaper space to solicit memberships of Ford employees. The latter organization folded willingly at Bennett's request; the former, of which three Ford workers are officers, was undecided as to its future course. The three officers claimed they had 10 day leaves of absence. Bennett said no such leaves had been granted and that unless the men returned to work they would be discharged.

The Workers Council stated it had borrowed the \$1355.20 cost of its full-page advertisement from "a person having no connection with the industry." Prospective members were asked for 25 cents initial payment and 25 cents monthly thereafter. Initial receipts were pledged against payment for the advertising. A short calculation indicates 5420 initiation fees would be required to cover the cost of the space, and from the looks of things now, someone is going to hold the bag.



# WINDOWS OF WASHINGTON

WASHINGTON

**M**EMBERS of congress on both sides of the capitol are getting restive and many of their families are interested in getting back home. Things are moving slowly in congress and little is being accomplished.

The administration has sensed this and perhaps the week-end party which the President will have on an isolated island in mid-Potomac this week is partially the result of this reaction.

For no good reason congressional action has been exceedingly slow during this entire session, with the senate generally meeting only two days a week for short sessions. The fact is that congress is making no progress. Many members would like to rush some most necessary legislation through and then adjourn or recess until autumn. However, this is apparently not in accord with the ideas of the President.

There is every reason to believe that congressional leaders think that they are in for a long session, although it is true that this is easily changed overnight, else why did the overworked vice president desert Washington last week, saying that he was tired and needed a rest. It is argued by some that Mr. Garner would not have left the capitol if he had not been pretty well assured that the congressional session would drag on perhaps through the summer.

## LEWIS AND HILLMAN NOT AGREED ON MINIMUM WAGE

Hearings will be concluded this week before the joint labor committees of the house and senate on the new hour and wage bill. Considerable testimony has been heard by the committees, mainly in favor of the bill and there is a definite impression that the whole matter has been staged to a high degree.

However, the death of Representative Connery, Massachusetts, last week may smooth the path, in view of the fact that he had made up his

BY L. M. LAMM  
*Washington Editor, STEEL*

mind definitely to fight for a 30-hour week, which he had always favored. Many who are close to the administration, however, feel that when the bill is delivered for signature it will contain 40-40 provisions, that is a 40-hour week and a 40-cent per hour rate, which is what the President has wanted.

A difference of opinion developed at the labor hearings last week between John L. Lewis and Sidney Hillman, a co-leader of the CIO, in connection with section 5 of the proposed bill. This is one of the major provisions of the bill.

## Wage Fixing Is Feared

Hillman spoke at considerable length before the joint committee in support of the provision which would empower the labor standards board to establish minimum wages below \$1200 yearly in industries where collective bargaining had been found to be inadequate or ineffective.

Lewis previously had opposed the provision in his testimony and claimed that it would lead to wage fixing and intruded into the proper field of collective bargaining.

During questions asked of Hillman by committee members the latter explained the conflict of opinion by citing differences of the coal and clothing industries in which the two leaders have gained their principal experience.

George H. Davis, new president of the United States chamber of commerce, appearing before the committee last week, claimed the total of unemployment measured in a "realistic" sense is considerably below the amount held in popular opinion.

Davis told the committee that if the bill contained only provisions as to maximum hours to be applied in all fields of economic activity the

new board's task would be enormous, "for the board has authority to vary hours up and down according to circumstances."

"I was told last week", continued Mr. Davis, "by a man who is in a position to study the data, that a 30-hour week would mean an unavoidable increase of 20 per cent in present prices of agricultural machinery. The hour provisions would undoubtedly place us quickly in the present position of France, where a government went into office a year ago with a pledge to reduce tariffs has so raised labor costs that it is now forced to consider increasing tariffs."

In connection with the administration of the government contract act Mr. Davis told the committee that "there appears to have been some experience worth noticing in the course of the administration of the Walsh-Healey act of last year, relating to government contracts. I understand that the attempt to use advisory committees in arriving at the minimum wages which may be set under that law has largely failed, because the advisory committees found the determinations prescribed by the act too difficult for accomplishment. Although that act has been in effect for nine months or more, I believe that there has been only one minimum wage order, respecting working clothing, I think."

## ROPER COUNCIL FAVORS FORTY-FORTY LABOR BILL

The Roper business advisory council, meeting here last week, gave final approval to an hour and wage report which was made to the President at the latter's request.

The report was submitted to the Chief Executive after he had made his hour and wage suggestion to congress and so nothing will be done with the council's report.

While no publicity has been given to the report and probably none will be, it is understood on high authority that the council approved a 40-40 provision. That is, that hours be not more than 40 per week and

that wages be not lower than 40 cents per hour. This is what the President, himself, suggested to congress and therefore he cannot very well file this report in his official waste basket, which is what is alleged to have been done with other reports of this body in the past.

Incidentally, while speaking of councils, it is practically assured now that the Berry council for industrial co-operation will pass out June 30. That should make the Roper council feel good. Because, try to disguise it as they did, there was no question the Berry organization was more than a thorn in the side of the Roper body.

In this connection, it is interesting to note that while Berry and his organization came into being through an executive order, not even an executive order will be issued as a fitting obituary.

The Berry council will best be remembered by the meeting held in Washington a couple of years ago when Berry tried to get industry and labor together and the meeting broke up in disorder.

Senator Berry, discussing the situation with the writer last week, insisted that while the personnel of his organization would be disbanded June 30 the council as such would continue. If it is to continue, it must furnish its own funds. Also the senator stated that the council had asked the President to appoint some government official to act as chairman, when and if it should meet in the future. No such appointment has been made up to this time.

#### **NLRB CHARGES INLAND VIOLATES WAGNER ACT**

Complaint was issued last week by the national labor relations board alleging that Inland Steel Co. has refused to bargain collectively with the steel workers organizing committee, in that during negotiations the company has shown that it would not enter a signed agreement covering wages, hours of employment and other working conditions, even though the terms proposed by the SWOC be acceptable to the Inland company.

The complaint also cites the company for two other violations of the Wagner act. An allegation is made that the company actively promoted a labor organization among its employes known as Steel Workers Independent Union Inc. It is also stated that the company interfered with its employes in the exercise of their rights of self organization by warning them not to join the SWOC or the Amalgamated. The complaint states that these acts of the company caused the employes of two plants to go out on strike on May 26.

The labor board states that the complaint was issued after investigation of charges filed with it by

SWOC and by lodges of the Amalgamated, representing employes in plants at Indiana Harbor, Ind., and Chicago Heights, Ill.

#### **GENERAL MOTORS CHARGED WITH UNFAIR PRACTICE**

The federal trade commission has issued a complaint against General Motors Corp. and General Motors Sales Corp. charging unfair competition and practices tending to create a monopoly in the sale of automobile parts, accessories and supplies. It alleges violation of both section 5 of the trade commission act and section 3 of the Clayton act.

The principal unfair practices alleged by the commission are the use of intimidation, oppression and coercion to compel dealers handling General Motors cars, against their will, to purchase parts, accessories, and supplies for use on such cars only from General Motors subsidiaries or affiliates.

These practices are alleged to have been effected by six General Motors subsidiaries for three years prior to October, 1936, by General Motors Sales Corp. subsequent to that time, the Sales corporation having acquired the assets of the dissolved subsidiaries, Chevrolet Motor Car Co., Buick Motor Car Co., Pontiac Motor Car Co., Olds Motor Works, Cadillac Motor Car Co. and General Motors Parts Corp.

The coercive and oppressive practices charged are alleged to have resulted in diversion of substantial trade from competing manufacturers of accessories and supplies and in depriving them of a market for their products, thus tending unduly to hinder competition and create a monopoly in General Motors in the automotive accessory and supply business.

#### **WAR DEPARTMENT FAVORS MANGANESE ORE STOCKPILE**

In connection with the piling up of mineral reserves the war department has recommended a million-ton stockpile of government-owned manganese ore.

The house military affairs committee has recently held hearings on the bill providing for such reserves, at which time J. Carson Adkerson, president of the American Manganese Producers Association, urged that domestic manganese ore be given its innings. Last week he filed a supplemental brief with the committee.

In this brief Adkerson recommended that the state department give the six months notice to Brazil before June 30 to the effect that the manganese ore duty will be restored at the expiration of the Brazilian trade agreement, Dec. 31, 1937. This will, over a six month period, Adker-

son pointed out, "encourage and permit importers to store within the United States, under the reduced rate of duty, all manganese ores they can find available in the world's markets and thereby cause the formation of a stockpile at no cost to the government. At the same time it will encourage and permit domestic producers immediately to make additional investments, carry forward development work and increase production to help take care of the needs of the United States, at no cost to the government."

#### **SCRAP EXPORT BILL IS MEETING OPPOSITION**

The legislative iron and steel scrap situation advanced a step last week. Danny Bell, director of the budget, who had been trying to co-ordinate the answers of the various government departments to the requests of congress for an expression of opinion on the Schwellenbach-Kopplemann bills, finally gave up the matter and suggested that each department send up such answer as it saw fit and let congress decide what shall be done. It has been nearly two months since the request went to the departments and not all have sent in their answers up to this time.

Announcement was made last week by Senator Sheppard, Texas, chairman of the senate military affairs committee, that he had appointed a subcommittee to handle the Schwellenbach bill. Senator Thomas, Utah, is chairman. The other members include Senators Johnson, Colorado; Schwartz, Wyoming; Bridges, New Hampshire; and Lodge, Massachusetts.

Secretary of Commerce Roper last week sent his reply to the two military affairs committees in which he suggested that this would not be a good time in which to legislate against scrap exports. He backed up the view of the secretary of state, already mentioned in this column. Mr. Roper said: "In response to your inquiry for the view of this department on S.2025, 'to provide for the protection and preservation of domestic sources of scrap steel,' I am attaching a copy of a letter under date of May 18, 1937, which I understand the secretary of state has forwarded to your committee.

"The department of commerce was ably represented on the executive committee on commercial policy and the department concurs in the conclusions reached by that committee indicating that the disadvantages of restrictive action would outweigh the possible advantages."

No date has been set for hearings by either the house or senate military affairs committee on the scrap export bills.

# Editorial

## Winking at Lawlessness Is Spark for Powder Keg

**A**T THE time of this writing, the labor situation is acute. In half a dozen communities conditions have reached the point where an impulsive act, a misunderstanding or other minor episode might easily precipitate a major riot.

It is to be hoped that nothing of that kind will occur. But whether it does or not, there is bound to be a serious discussion as to who is responsible for the present dangerous state of affairs. Why has it been necessary to resort to virtual warfare to settle this dispute?

The answer is not to be found in the immediate zone of conflict, nor can the principals directly concerned in the contest furnish a complete and satisfactory explanation. To appraise the situation intelligently, one has to get far enough away from the details to view the more important aspects of the problem in broad perspective.

Everything involved in the present mess goes back to one root—President Roosevelt's attempt to revamp the economic and social structure of the country so as to afford a better "break" for the "underprivileged" class. Among the scores of activities launched to further this objective was a labor movement, in which the President, in alliance with the leaders of professional labor unions, proposed and encouraged legislation favoring unionization and threw the active support of various governmental agencies to the favored unions.

### **Loyal Employes Resent Bar to Their Working; Vigilantes May Form To Compel Obedience to Law**

Section 7a of NRA and later the Wagner labor relations act were important instruments of the labor program. The Wagner act is one-sided in that it accords many privileges to union organizers without holding them responsible for any of their actions.

The one-sidedness of the Wagner act is freely admitted in Washington, but a number of administrative officials—when asked about the desirability of legislation to place certain responsibilities upon unions—have counseled delay in enacting such legislation. "Give the unions a chance to get organized" is their attitude.

Events of the past few weeks have proved that the irresponsibility of some of the unions is the major

cause of riot and bloodshed. Employers are obeying all laws, including the Wagner act, scrupulously. However, the real danger does not lie in the attitude of employers. Nor is it to be found directly in the lawless acts of the strikers or of the agitators and union leaders. The potential dynamite exists in the bitter resentment of workers who do not wish to strike or to join a union and of citizens who sympathize with the plight of persons who are denied the privilege of working.

Stated bluntly this nation is dangerously near to the peril of an uprising of vigilantes, which is being inflamed by the government's policy of condoning lawlessness on the part of communists, agitators and some professional labor union leaders. While part of the trouble may be ascribed to imperfections in the Wagner act, the major factor is the patent unfairness of the federal government in supporting lawless minorities at the expense of the civil rights of certain employes and of the public at large. More than that, the unwise policy of high officials in the Washington administration of giving the impression that it winks at lawlessness on the part of unionists is interpreted by some local law enforcement authorities as license for them to throw favor to strikers even if in doing so they trample upon the rights of other employes and of the citizens of the community.

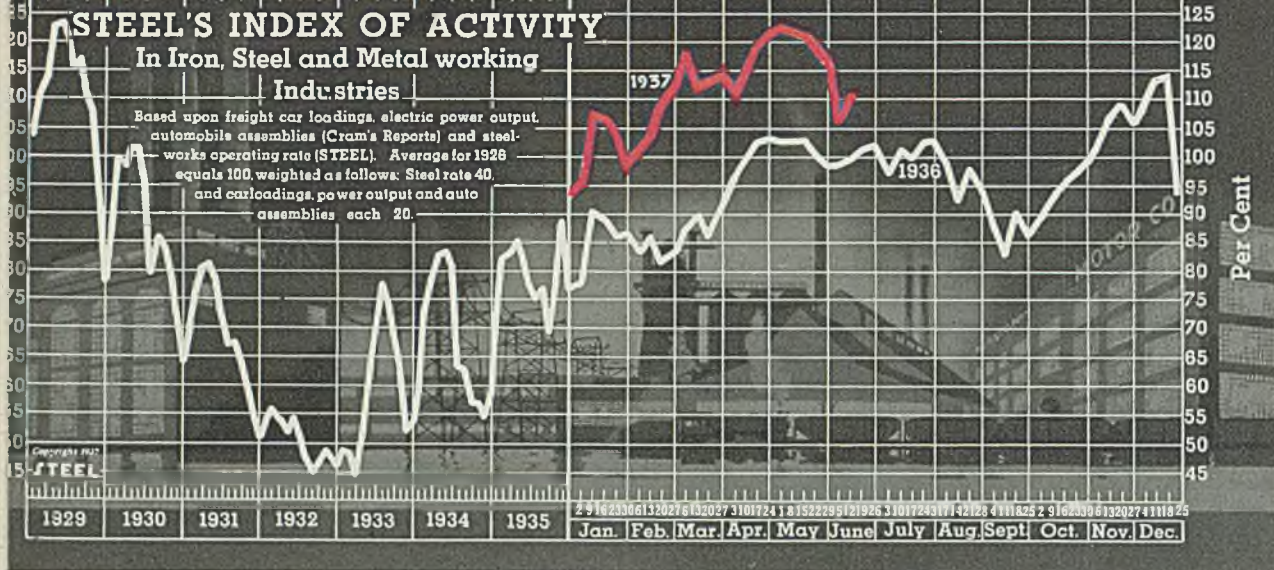
### **Public Opinion Forming Against Labor Racket; Firm Stand for Law by President Needed**

Public opinion is beginning to resent the government's espousal of coercion, intimidation, destruction of property and other lawlessness. In resorting to the methods of the vigilantes, citizens are prompted by the same motives of disgust and distrust which apparently induced Vice President Garner to go fishing. The American people cannot stomach the idea of Uncle Sam in the role of a racketeer.

The danger of a vigilante uprising, and in fact much of the dynamite in the present situation, can be avoided by a prompt return to respect for law and order. One man—the man whose silence thus far has been considered tantamount to tacit approval of lawlessness—has it within his power to avert the vigilante danger before it becomes uncontrollable.

Mr. Roosevelt could say publicly that dynamiting railroad tracks, intimidating employes by union representatives, blockading roads, mass picketing, etc. are unlawful and that such acts endanger the legitimate labor movement. If he would speak out firmly the radical and unruly element of the union drive would be put on the spot.

This would be a belated but magnificent service to the country.



The

STEEL'S index of activity gained 5.6 points to 110.7 in the week ending June 12:

Week 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	105.1†	98.8	79.3	82.3	69.9	51.0	73.5	97.9
June 12	110.7*	94.4	80.0	83.6	72.1	51.1	73.2	96.2

\*Preliminary. †Revised.

## Industrial Activity Regains Part of Recent Losses

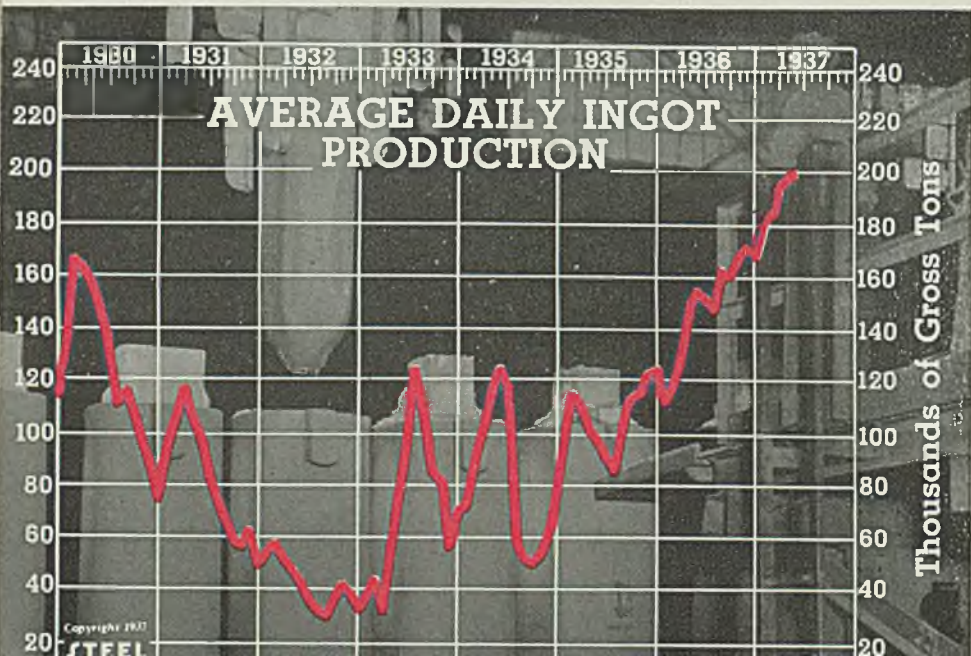
IN SPITE of numerous obstacles, industrial activity gained moderately in the week ending June 12. STEEL'S index for that seven-day period stood at 110.7, compared with 105.1 in the preceding week and 115.6 in the last week of May. In other words, the activity index regained about half of the loss it incurred during the week which included the Memorial day interruption.

Contributing to this slight rebound were improvements in railroad freight traffic, electric power output and automobile production. Steelworks operations re-

mained at about 75 per cent of capacity—the level which has prevailed since the strikes were called May 26.

The immediate future of industrial activity is dependent in large degree upon developments in the labor situation. Sporadic shut-downs in the automobile industry in recent weeks have created an unbalanced supply of parts. Consequently some manufacturers have been obliged to curtail operations until other units catch up. A similar state of unbalance may develop in the steel industry if the present situation continues long.

Business sentiment is uneasy, not only because of labor difficulties, but also because of a new wave of uncertainty as to the implications of government policy. This unrest, coupled with the recent rate of industrial activity, has prompted Col. Leonard P. Ayres to describe the second quarter as a period of "pessimistic prosperity."



	Gross Tons		
	1937	1936	1935
Jan.	182,181	112,813	106,302
Feb.	184,361	118,577	115,595
March	193,209	128,576	110,204
April	195,072	151,625	101,562
May	198,213	155,625	97,543
June	153,263	90,347	
July	150,874	87,224	
Aug.	161,351	107,997	
Sept.	160,043	113,000	
Oct.	168,333	116,398	
Nov.	173,496	121,170	
Dec.	170,448	122,936	

# BUSINESS TREND

## Class I Railroads Earn 2.89 Per Cent in First Four Months

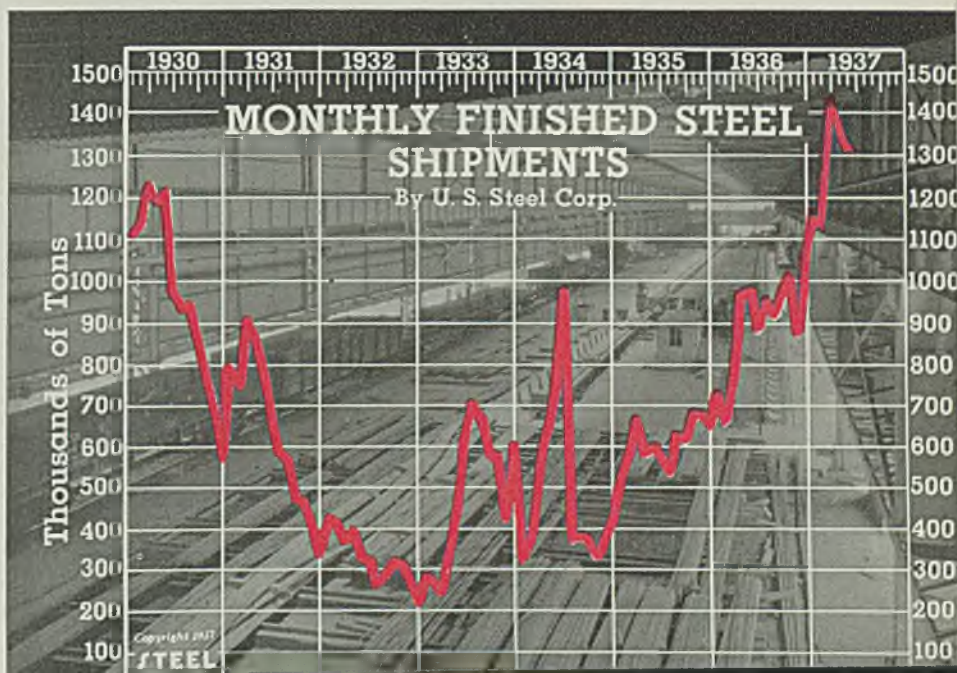
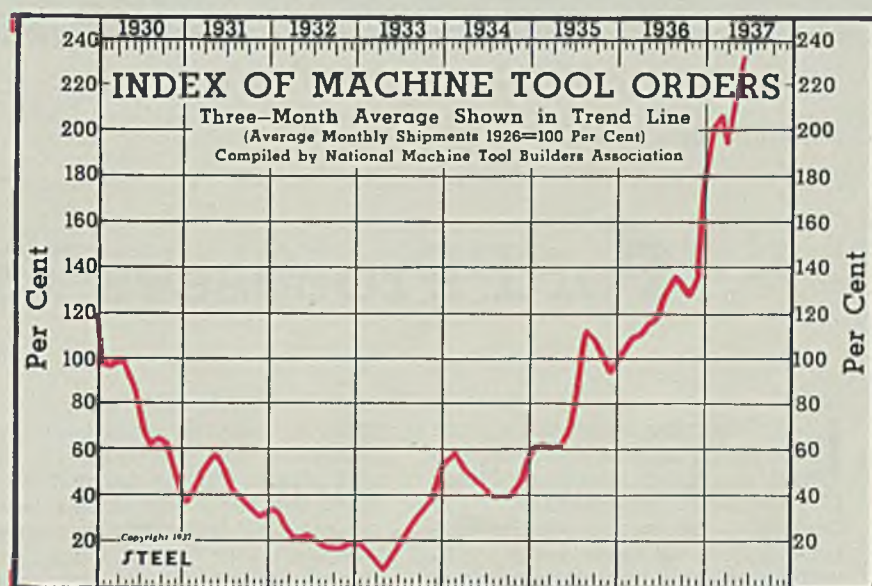
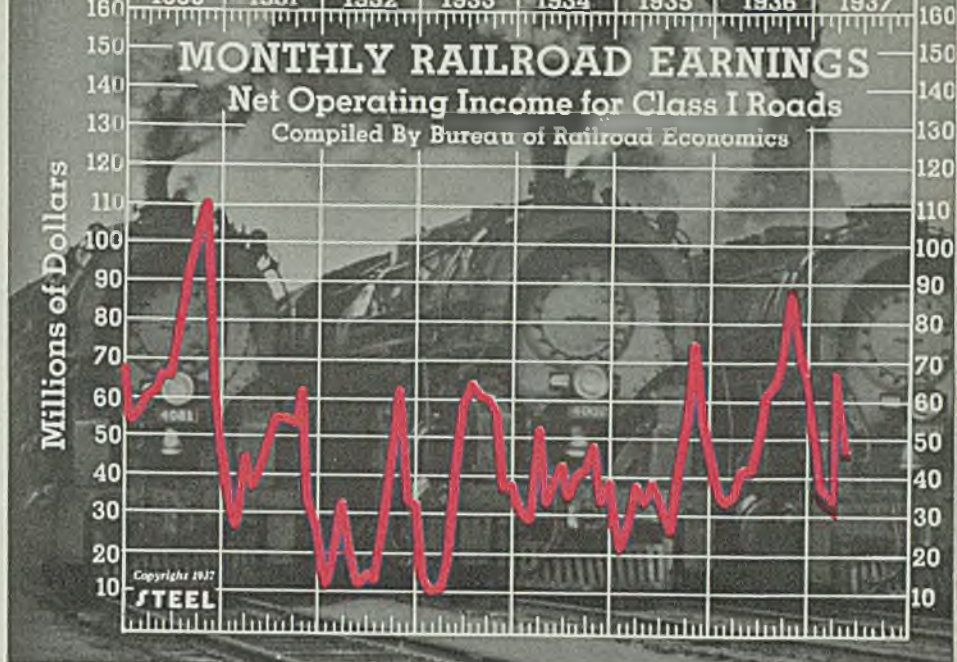
	1937	1936	1935
Jan....	\$38,436,679	\$35,728,532	\$21,934,645
Feb....	38,358,638	33,594,718	26,296,411
March..	69,379,328	35,205,513	38,129,871
April..	47,807,447	41,493,455	34,708,718
May....	41,842,147	39,598,511	
June...	50,312,580	34,102,703	
July...	61,773,765	26,919,343	
Aug....	64,680,717	42,156,706	
Sept...	70,166,026	57,349,265	
Oct....	89,851,409	75,454,501	
Nov....	72,410,571	54,224,290	
Dec....	70,519,601	46,020,695	

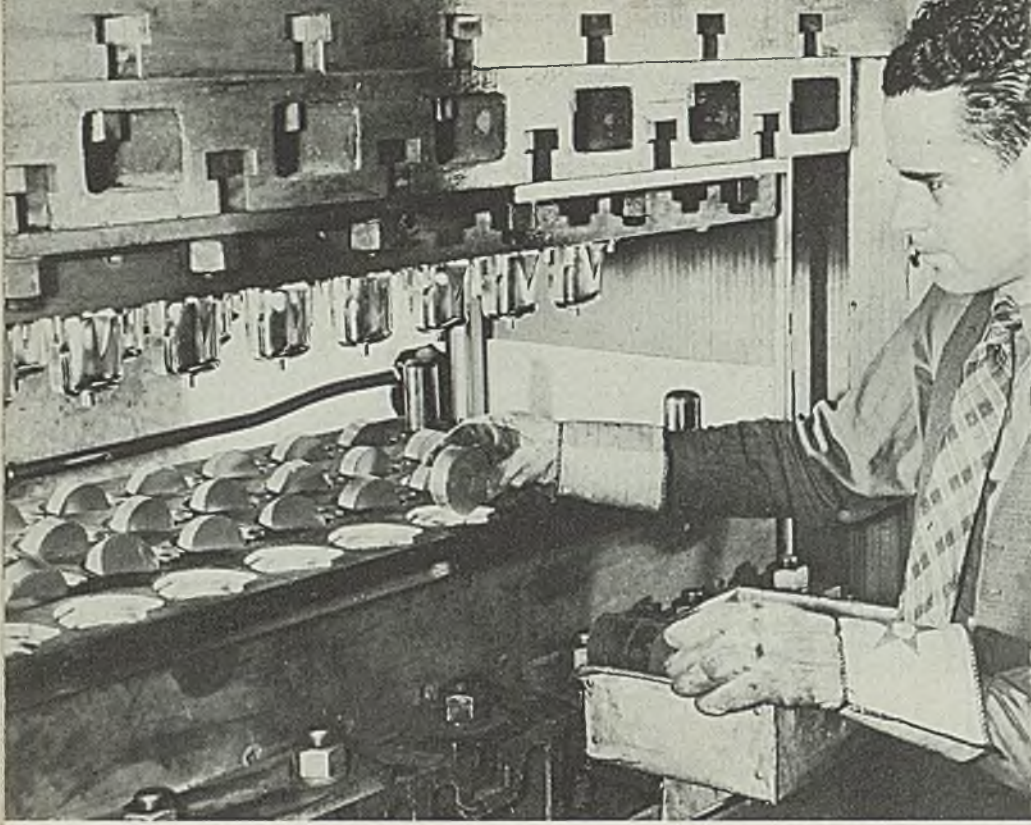
## Machine Tool Average Shows Sharp Gain in May

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

## Finished Steel Shipments Down Moderately in May

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





CHARGING one of the molds for ignition coil cases with preforms of soya plastics. Molding is done in exactly the same way as with "straight" phenolic plastics, the soya type being a modified form of phenolic

BY HERBERT CHASE

## Ford Processes 15,000 Pounds

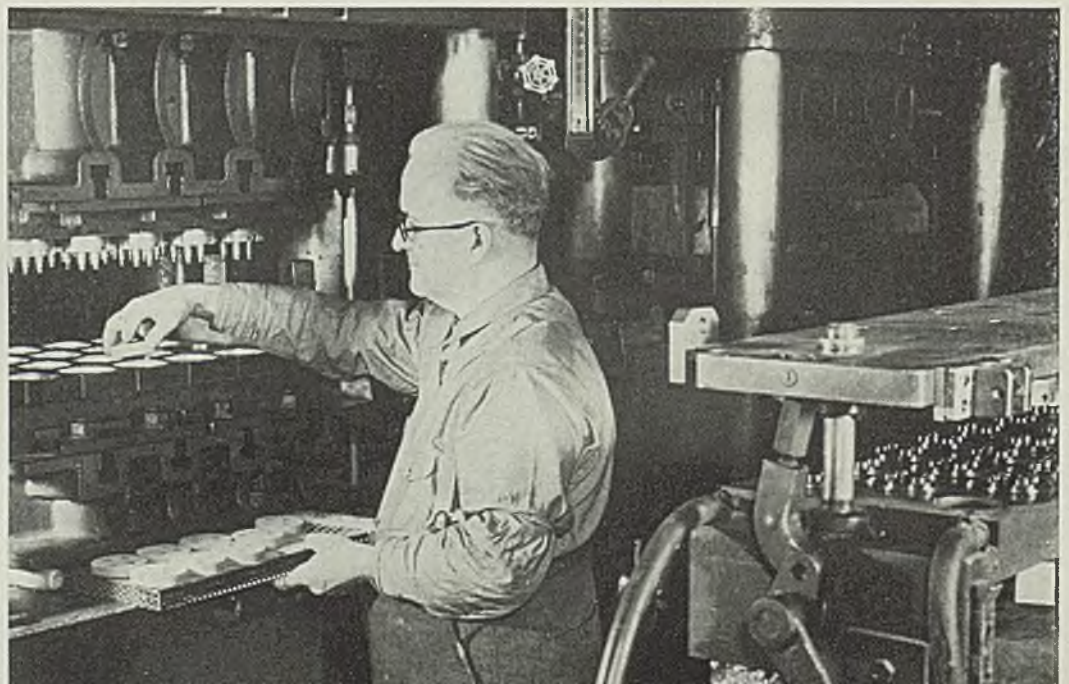
LESS has been heard and written in recent months about the use of plastics by the Ford Motor Co., but those conversant with the facts are well aware plastics continue to hold an important place in daily production as well as in plans for future development. Ford con-

tinues to manufacture and use soya plastics—a modified form of phenolic plastics—to the extent of about 20 per cent of present plastic requirements. This is the full capacity of the pilot plant erected for making soya plastics about a year ago. Small quantities of this plastic are also be-

ing purchased from an outside supplier which makes, in addition, a considerable part of the commoner form of "straight" phenolic plastics used to produce a majority of present plastic parts employed in Ford cars.

Besides the successful use of the

MOLDING of distributor plates from high-dielectric phenolic compound is done in the 20-cavity mold at the left. After molding but while still hot, the distributor plates are transferred to the cooling press shown at right and this is locked by the hand toggle.





◆

ONE of the molds employed for producing spool-shaped distributor rotors. This difficult molding requires the use of split bars for each set of five cavities. The operator is about to put a pair of these into the mold.



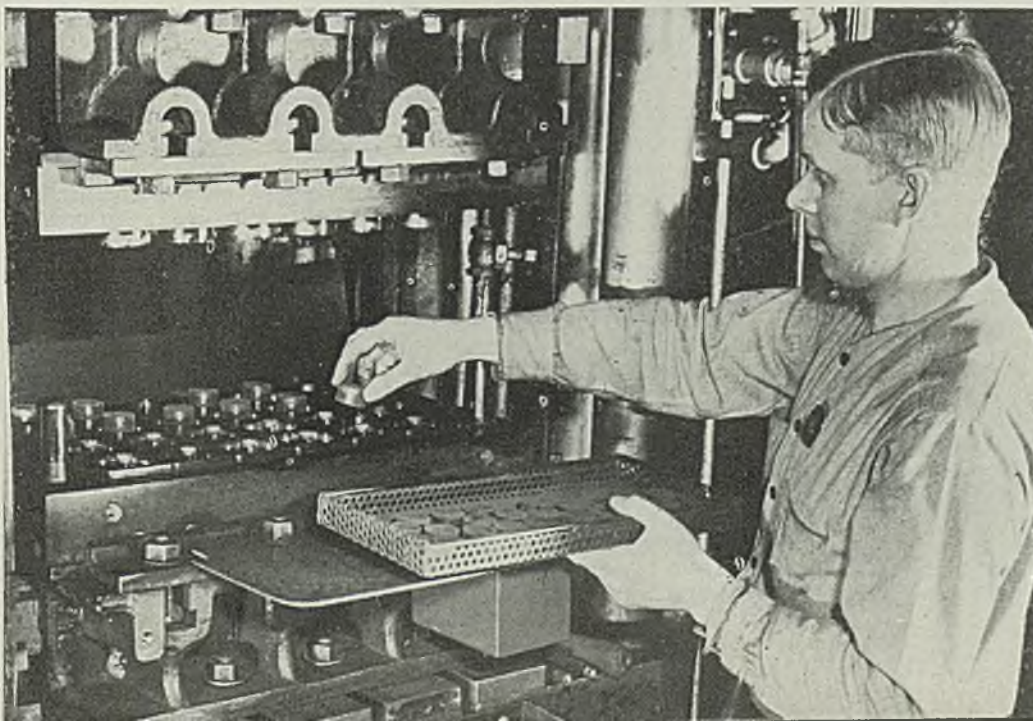
## of Plastics Daily for Auto Parts

present soya plastic, Ford laboratories are doing extensive experimental work with a different type of plastic, benzyl cellulose, in which the cellulose is obtained from the stalk of the soya-bean plant. Many experimental parts have been produced with this plastic and work is

continuing with it, partly because it yields a more flexible material than the present soya plastic and lends itself better to manufacture in light colors. To some extent, this development is proceeding because the soya plastic did not prove entirely satisfactory for the window frames

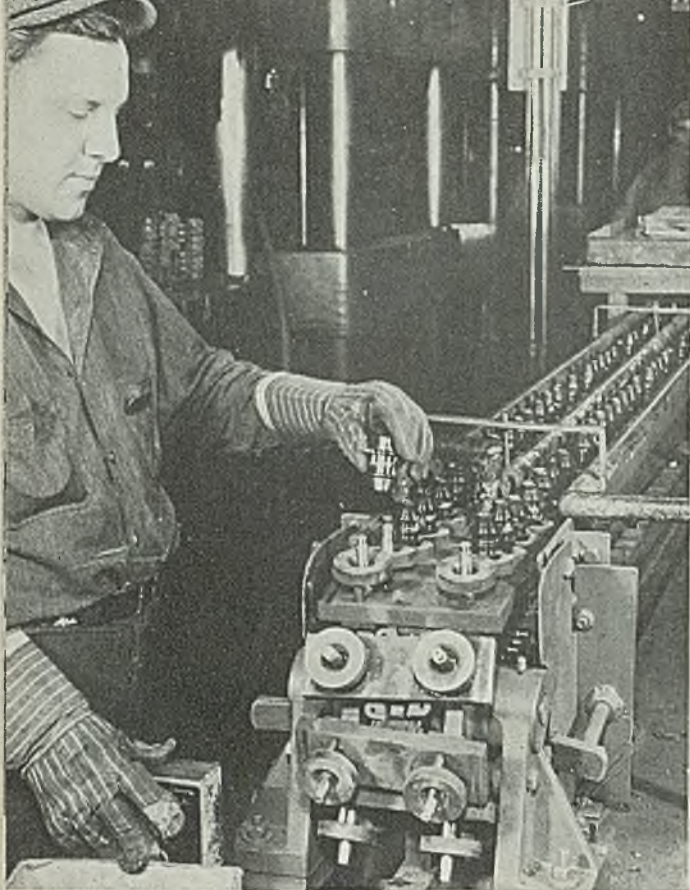
for which it was to have been used. Many of these frames were molded and used with success, but breakage occurred too often in assembly, especially when the frames were stressed unduly by the fastenings for attaching them to the body.

A plastic better suited for this ap-



◆

TWENTY-CAVITY mold used for production of water-pump impellers. They are molded from a highly water-resistant phenolic plastic, as in service they remain in continuous contact with the water or other solution in the engine cooling system



♦

AFTER withdrawal from the mold, rotors are placed on individual cooling fixtures mounted on the endless chain. On this conveyor they are carried through a cooling tunnel and back to a point near the loading station shown, where they are automatically kicked off and fall into tote boxes for removal to the machining department

♦

plication is needed and may yet be found in benzyl cellulose. This is a thermoplastic material and lends itself to extrusion and to injection molding, with both of which processes the Ford laboratory is doing intensive work. Because of this, the new molding department installed in the River Rouge glass plant about a year ago has not been extended as contemplated. The presses already installed, however, are employed in continuous production of soya plastic parts, namely the ignition coil case and its base, as well as the gearshift lever knob.

#### Preforms Shorten Cycle

Production of these parts consumes all the soya plastic which present units for making it can turn out, namely 3000 pounds a day. Molding is done on the same schedule as for other phenolic plastics and with the same group of 500-ton presses formerly employed for window frame production. Thus, coil cases are produced in 32-cavity molds and the base for the case in 60-cavity molds each of which run about seven to eight fillings an hour, the cycle including cooling in the mold to avoid warpage. Molding is done with preforms which are preheated to shorten the cycle and are charged into the mold with loading frames. As in all molding work, exacting requirements as to the quality of moldings turned out are rigidly adhered to, each part being inspected and gaged where particular dimensions must be held.

As already indicated, however, production of these parts in the new

molding department represents only a fraction of the total output of plastic moldings used in Ford cars. Production continues at full capacity in the older molding department.

Nearly all molding materials are preformed to facilitate handling and to assure a correct charge of each mold cavity. Many of the preforms are also of odd or special shapes especially adapted to the particular job and so made as to insure correct flow in the mold. Preforms are delivered to the presses, of which there are 60 in all, in containers carried on overhead chain conveyors and completed moldings are similarly carried to inspection and cleaning benches and such machines as are needed for preparing the moldings for use. This arrangement not only facilitates handling but saves floor space, as wide aisles are not needed between rows of presses. The latter are of large size, mostly 300-ton, and all are arranged so that the molds require no handling and have as many cavities as can be used to advantage for rapid production and required accuracy. Provision for preheating the preforms is made wherever this results in a material saving in time. Some moldings are cooled in the mold and others are cooled outside in special fixtures to prevent warpage and to maintain accurate dimensions.

Fairly typical of molding practice is that on the distributor plate. This is done in a 20-cavity mold, the charge including four brass inserts per cavity and preforms which are preheated to about 140 degrees Fahr. Instead of cooling in the mold, these

moldings are removed while hot and are inserted in a water cooled fixture with a hand-toggle locking mechanism. This prevents warpage and holds particular dimensions within the close limits required. High dielectric material is required for this part.

One of the newest moldings is the impeller for the water pump used on the 60-horsepower engine. This is a rather small molding, only 1 13/16 inches in diameter and with a maximum axial height of 3/4-inch. Its three vanes are of triangular section. Section thickness varies from about 3/32-inch on the flange to 1/8-inch or more at other places.

This piece is subjected in service to continuous contact with water or other cooling liquids, often at or near the boiling point. Since the seal against leakage is against the back face of this impeller, this face must be and remain perfectly flat. These are most exacting requirements and necessitate the use of a special water resistant material. In the axis of the piece is a small steel insert with a hook over which a spring holding the molding against its seat is looped.

#### Moldings Water Resistant

Molding of the piece is done in a 20-cavity mold in which the inserts first are placed. Each cavity then is loaded with a preform of water-resistant phenolic plastic which makes a strong and homogeneous, as well as water-resistant, molding. Twelve minutes is required for the complete molding cycle, including charging.

Since successful use in service requires the back face of the impeller to be and to remain flat despite contact with water and heat, the following operations are performed after molding: Each batch of moldings is soaked in boiling water for three hours. The back surface is then sanded flat on a belt sander. It is next hand sanded on a flat sheet of fine sandpaper. Next it is hand lapped on a surface plate with fine abrasive. In the succeeding operation it is tested for flatness on a surface plate using red lead and, if this test shows any irregularities, is further lapped until perfectly flat. Any flash remaining in the hub recess is cleaned out by hand and the hook in the insert is freed of any plastic which may have stuck there. A final visual inspection is then given each piece before it is passed for use. This well illustrates the extreme care taken to see that molded parts function perfectly in service.

Another painstaking job is done on the rotors used in the ignition systems. This is a spool-shaped part, difficult to mold, requiring high dielectric strength and including an annular brass ring insert with two projections. The part it-

self as well as the locating of the insert must be held within close limits, yet a split mold is required. Nevertheless, the rotors are produced in a 25-cavity mold having five sets of split bars. Three preforms are placed in each cavity, two being cylindrical with a hole in the center and the third being of U-shape. Despite this and the time required to place inserts and handle the split sections of the mold, molding is done on a 10-minute cycle. Several presses are required, however, to give the necessary output.

All rotor moldings are taken from the mold while still hot, but are placed in cooling fixtures to assure maintenance of the required dimensions, so far as this can be done by a fixture. Since many of the latter are required, they have been arranged on an endless chain conveyor. This is loaded by a helper who places the rotors on suitable pins as the chain moves. The conveyor passes through a cooling tunnel and back toward the loading station where the moldings are knocked off into a chute and are carried to an adjacent department. There accurate sizing is done on machines set up for this job exclusively.

#### Machining Is Automatic

Machining includes reaming the hole through the center of the rotor and facing the ends in an automatic lathe. The band insert is also finished, as are the points projecting from it, and the latter are wire brushed to remove burs. There is also a fine grinding and buffing operation on the band (against which a brush bears in service) to polish it and to remove tool marks. Gaging is done at the completion of the machining, the point length being held

within plus or minus 0.001-inch. Finally, each rotor is given a 12,000-volt leakage test to detect possible flaws in the insulation.

Not all parts produced from plastics in this department require or receive the same care in production and inspection or go through so many operations as do the rotor and pump impeller. Nevertheless, there is used in all cases enough attention to details to assure satisfactory performance in service as well as the maintenance of dimensions.

#### Black Parts Are Phenolic Plastic

In the main molding department, phenolic materials are used for all parts required in black or where color is not an important requisite. Some urea moldings are employed for light colored parts, except for a few minor ones made from cellulose acetate, or where the part might tend to change color under light exposure if produced from phenolic materials. Translucent dome-light lenses, horn buttons and door inlays are among the decorative parts produced in urea plastics, the first mentioned of these being in a highly translucent ivory color.

The molding of many other parts might be described in detail, but they involve, for the most part, either fairly conventional practice or methods identical with or closely resembling those already described. This applies, of course, to the parts usually classed as plastics but not including rubber, which is also molded, especially for steering wheels, in an adjacent department.

As in all Ford operations, cleanliness is characteristic of the molding departments. Since molding is concentrated on some 30 parts, or thereabouts, and all these are required in

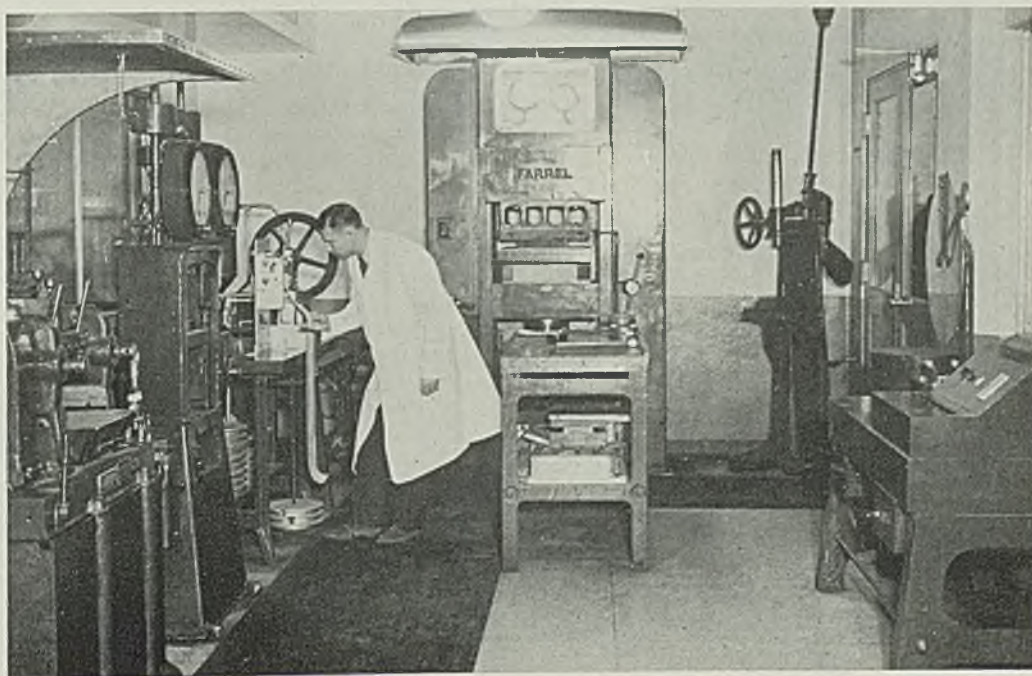
large quantities, conditions are different from those in many plants where a large variety of parts is made, often in relatively short runs, and special tooling, beyond the molds themselves, may not often be warranted. Nevertheless, a close study of Ford molding methods and those followed in inspection and testing would reveal many items which might well be adapted, perhaps with changes to suit them to production in smaller quantities, to molding in other shops.

Shipments of plastics from outside suppliers are timed carefully to meet production requirements and are used almost as rapidly as received. This assures the use of fresh materials and avoids holding them in storage long enough to result in deterioration. When running to capacity, the two molding departments supply almost the entire requirements of plastic parts for all Ford and Lincoln-Zephyr cars, the total consumption of plastic materials, exclusive of rubber, approximating 15,000 pounds a day.

## Issues Pamphlets on Gray Iron Uses and Advantages

Promoting the use of gray iron is the purpose of two new booklets recently published by the Gray Iron Founders' Society, 1010 Public Square Bldg., Cleveland. Designed for the use of purchasing agents, these booklets are entitled "New and Useful Facts About Gray Iron" and "O. K. After Machining," and are prepared in a nontechnical style to acquaint the readers with properties and uses of cast iron.

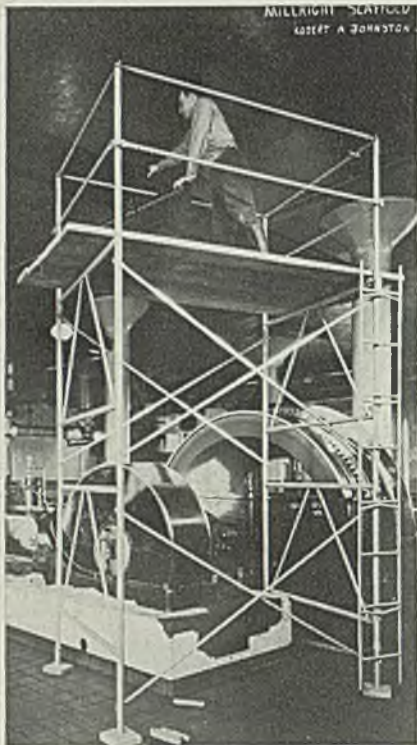
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PORTION of laboratory in which development of plastics, including the new benzyl cellulose type, is done. Press for experimental molding is shown in the background  
◆



# Knockdown Scaffolding, Made of Gas Welded Steel Pipe, Gains in Use

BY W. G. GUDE,  
Chicago Editor, STEEL

**S**CAFFOLDING, at one time almost synonymous with wood, is providing a growing market for steel. This tendency has been quickened the past 12 months by the development of a new type of steel unit which extends the various improvements incorporated in its design to practically all types of building construction. Known as the



Steel scaffolding also is extensively used for millwright and other interior work

Safway Steel Scaffold, it was introduced about a year ago by the Uecker Equipment Co., Wauwatosa, Wis. It consists of a few simple parts which may be quickly assembled to form one complete unit. Grouping of a certain number of units forms a rigid scaffolding of the desired height and breadth.

Principal parts of the unit are the end frames and cross braces. The frames are made by welding together four lengths of seamless steel tubing to provide a section 5 feet high and 5 feet wide. This tubing is 1.644-inch outside diameter, 1½ inch inside diameter, with No. 14

gage wall. Two stiffening braces, welded in place within the rectangle, also are seamless steel tubes, 0.894-inch outside diameter, ¾-inch inside diameter, No. 15 gage wall.

In joining the horizontal tubes to the vertical pieces, the former are cut at the ends to a point ¾-inch long, fitted in place and gas welded. Two ½ x 1¼-inch cap screws are welded near the top and bottom of the vertical tubes. Two end frames then may be joined by attaching diagonal cross braces to the cap screws and securing them in place by means of wing nuts. Cross braces are tubes, of the same diameter as the stiffening braces, with ends flattened for joining to the frames. A center bolt through the cross braces at their juncture provides additional rigidity to the assembled unit. The tubing is coated inside and outside with a corrosion resisting paint.

Assembly of the scaffold requires no skill, nor is there any weight handicap since the frame weighs only 35 pounds. To gain additional height, frames are affixed to the top of the first unit by means of coupling pins, cross braces are attached and the process repeated until the desired height is attained. To form a running scaffolding, units in the required number are located side by side and fastened together by means of the cross braces.

## Alignment Is Accurate

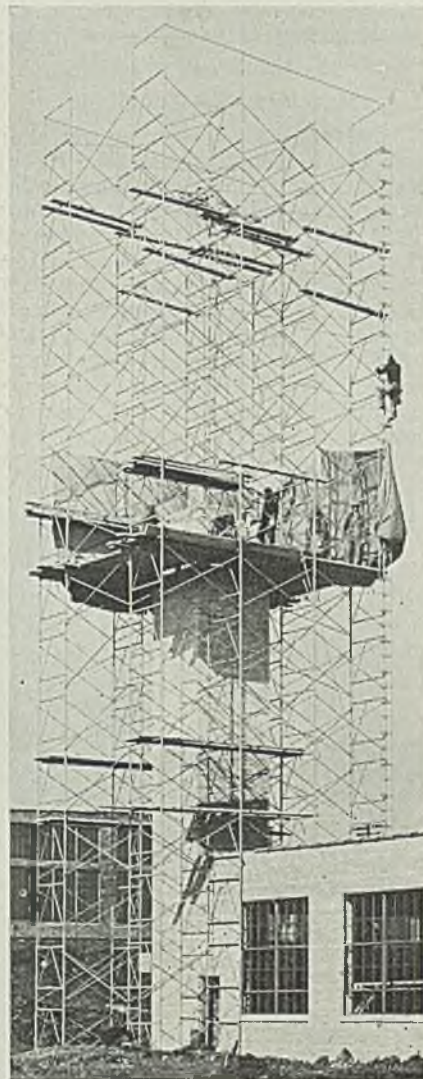
Coupling pins consist of 9-inch lengths of steel having an outside diameter the same as the inside diameter of the vertical frame tubing. A collar, 1-inch long and of the same wall thickness as the vertical tubing, is brazed to the outside of the pin at the center. When pins have been inserted in the tops of the four vertical tubes of the frames, a solid joint is provided for connecting with the frames to be located on top. Accurate alignment resulting from this method of assembly is indicated in the accompanying illustration of a stack scaffolding about 80 feet high.

Ample bearing surface on the feet of the ground unit is provided by base plates. Each of these is a flat steel plate with a short length of steel tube welded to its center. The tube fits into the end of the frame

tubing and has a spring friction clip to hold it in place. For use on uneven ground or sloping floors, an adjusting screw may be placed in the base. Special ladders which are self locking when affixed to the frame also are available. These are made in 5-foot lengths of welded tubular steel construction and are assembled, section by section, as the scaffolding is erected. When it is desired to use a few units at a time for indoor work, casters inserted in the base instead of base plates assist in moving the scaffold to different locations.

Tests by the Underwriters' Laboratories indicate that this scaffold will resist failure at loads considerably in excess of those experienced during service conditions. When a load was applied to a typical scaffold plank placed across the top of two end frames, no bending or distortion of the frames was noted though the plank broke at a load of 1550 pounds. A load of 16,000

*(Please turn to Page 72)*



Knockdown steel units assemble in accurate alignment as indicated by this 80-foot stack scaffolding

# MATERIALS HANDLING



## Storage Battery Exchange for Trucks Simplified by Use of Roller Tables

IN THE final analysis, one of the important contributions which properly applied materials handling equipment has made to American labor is the elimination of back-breaking jobs. Tasks which formerly were among the most undesirable, the most tiring and the most hazardous have been made easier and safe.

Cranes, hoists, conveyors, lift trucks, and other classes of equipment have contributed their share in this easing the burden of industrial workers. It is not surprising, therefore, to note that many of the recent refinements in materials handling have been in this direction, serving to reduce to a minimum lifting, hauling and other incidental operations in the day's work.

### Efficiency Is Improved

One of the interesting refinements along this line has been in practical operation for the past several months in the plant of the Acme Steel Co., Chicago. This company's electrical department has developed

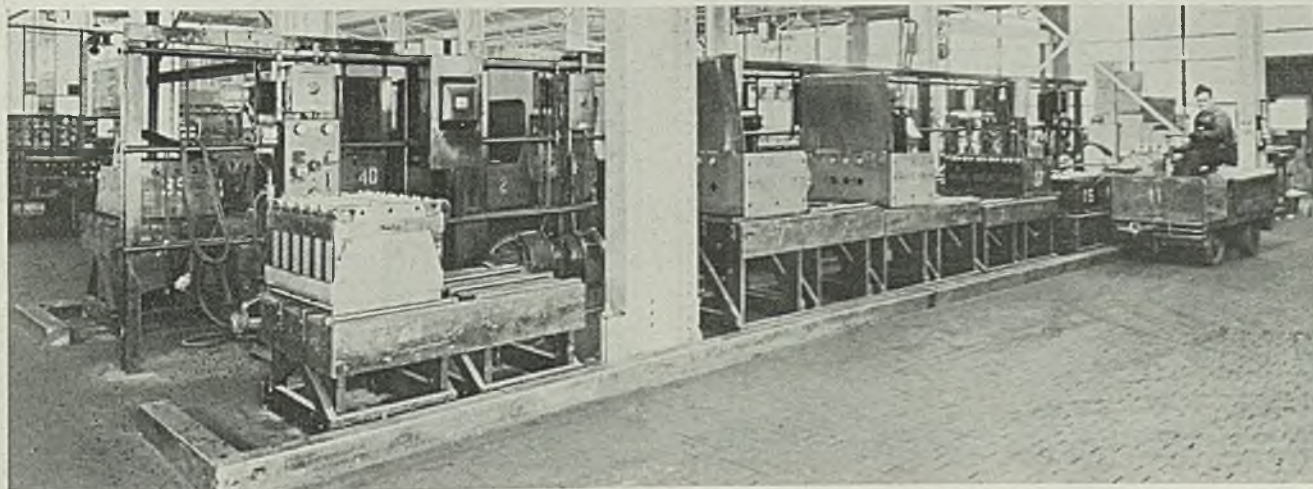
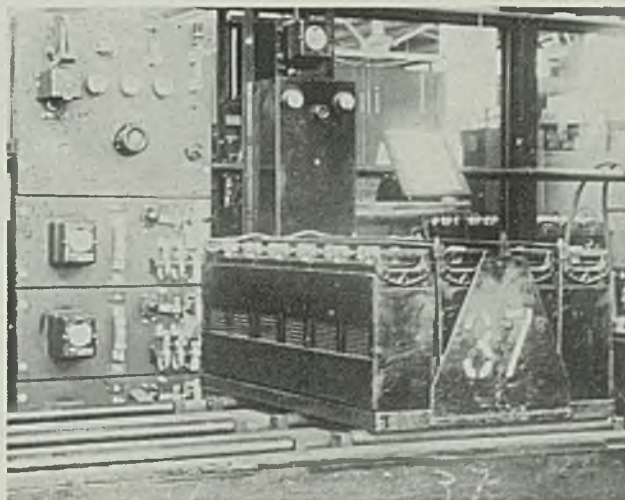
a method of battery exchange, which has made battery charging and renewal for its large fleet of electric industrial trucks a smoother and more efficient operation.

Like many other steel producers,

this company employs a wide variety of types of trucks, low-lift, high-lift, telescopic, fork and ram units. Consequently, the problem of battery charging is important to the entire plant handling system. In addition to providing greater insurance against stoppage of service, this new system simplifies battery exchange and is more efficient and economical than the former methods employed.

Featuring this system is the use of a number of charging tables

FIG. 1 (right) — Close-up of charging station showing battery in position on roller table top. Fig. 2 (below) — Tractor unit in position in front of low roller table in plant of Acme Steel Co. ready for battery exchange. Tables vary in height according to trucks to be serviced



# MATERIALS HANDLING



equipped with rollers. These tables are of various heights to meet the requirements of the various heights of the trucks to be serviced. In all, they provide room for a total of 33 sets of batteries. The rollers are of steel and are set on the table tops parallel to the charging panels, as can be seen in Fig. 1.

Fig. 2 shows a line of tables and gives a good idea of the different table heights. At the lowest table at the extreme right is a tractor stopped in position to make an exchange.

## How Exchange Is Made

Sequence of operations incidental to battery exchanging is illustrated in Figs. 3 and 4. In these views are shown a heavy-duty fork truck stopped in front of a table, while the operators easily slide the battery out onto the rollers. After this, by using a power cable, the truck is moved to a position in front of a newly charged battery and the operation is reversed, the charged battery being slid across the rollers into position on the truck.

There is an additional item of insurance in the Acme plant, and that is in the policy of maintaining an average of two batteries for each truck. Also, an improved method of clamping the battery trays has been developed and has been found most efficient. By means of this clamp-

ing arrangement, the trays are held firmly together in a single unit, eliminating any trouble with broken tray parts.

In a recent issue of *Storage Battery Power*, published by the Edison Storage Battery Division, Thomas A. Edison Inc., West Orange, N. J., additional details on some of the accomplishments of this system are elaborated upon. One interesting illustration of an electric industrial truck which is serviced in this manner shows a practical use of a fork truck for the operation in which ram trucks are used ordinarily. This attainment of a double duty is effected merely by moving the forks close together. In this position, they are run through the openings in a coil of strip steel, or through several smaller coils.

It is pointed out that since the adoption of modern handling methods, users of strip steel, for example, are now able to eliminate a number of handlings as compared to the older method where individual coils were received at the customer's plant. This has been accomplished by shipping multiple units on skids or pallets, each skid load consist-

ing of from 3 to 15 coils, the entire load being suitably bound to the skid or pallet by steel strapping.

Savings from skid shipment of coiled stock are said to run from \$3 to \$4 per car in unloading costs, as compared with costs under the former method of loading coils individually.

## Planned Production Flow Reduces Cost of Handling

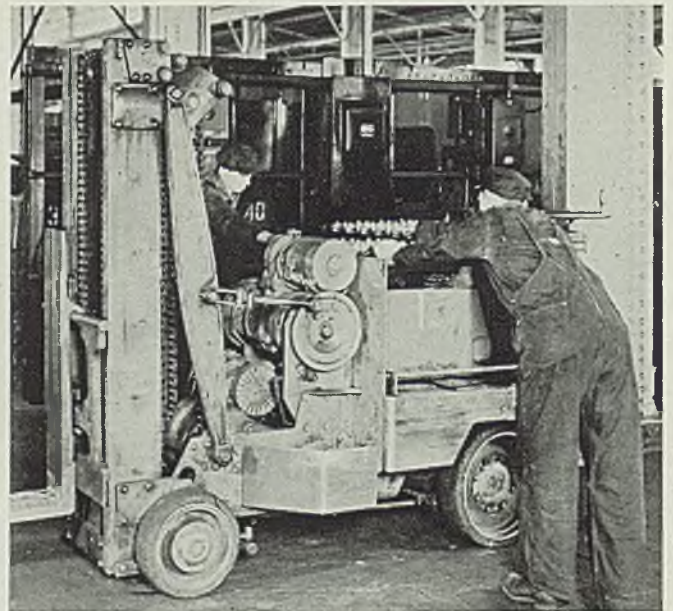
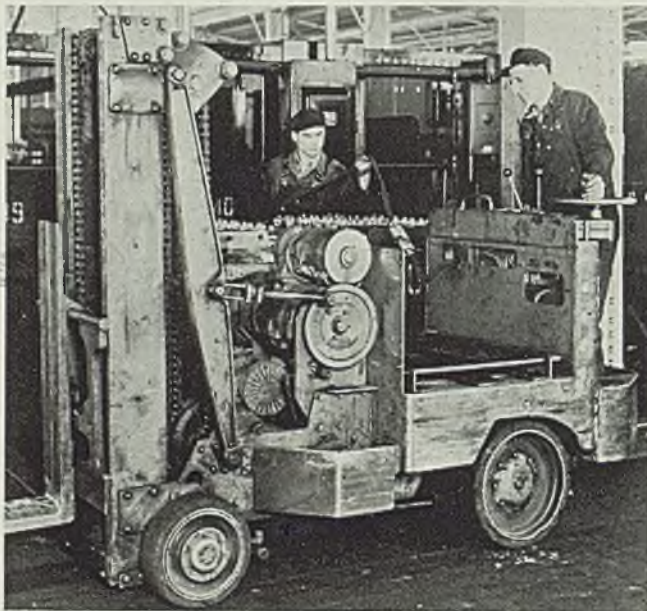
**P**LANNING the handling of work to reduce the amount of moving and turning and to provide storage space in the line of production flow is one way to lower the cost of materials handling. This is particularly true when the material is long steel bars and heavy tubing.

Round bars and extra heavy tubing up to about 8 inches in diameter are received in a midwestern factory in gondolas on the track alongside the plant. This steel stock is unloaded by a monorail hoist with the section extending over the track hinged to pull up or let down for the movement of freight cars. The heavy bar is turned about 60 degrees as unloaded to enter the door of the plant and carried on the monorail direct to the bar storage rack, also set at this same angle. A switch and "Y" in the monorail track in front of the large storage rack permits placing the bar or tube in any compartment the full width of the rack.

By turning the bar only 60 degrees the storage rack is set off to one side of the door. This leaves space

(Please turn to Page 89)

**FIG. 3** (left)—Heavy-duty fork truck in front of table onto which operators easily slide the battery to be charged. **FIG. 4** (right)—To move the truck into position in front of table holding newly charged battery, temporary connection is made to a power cable as shown. With the truck properly positioned, the charged battery is rolled into position

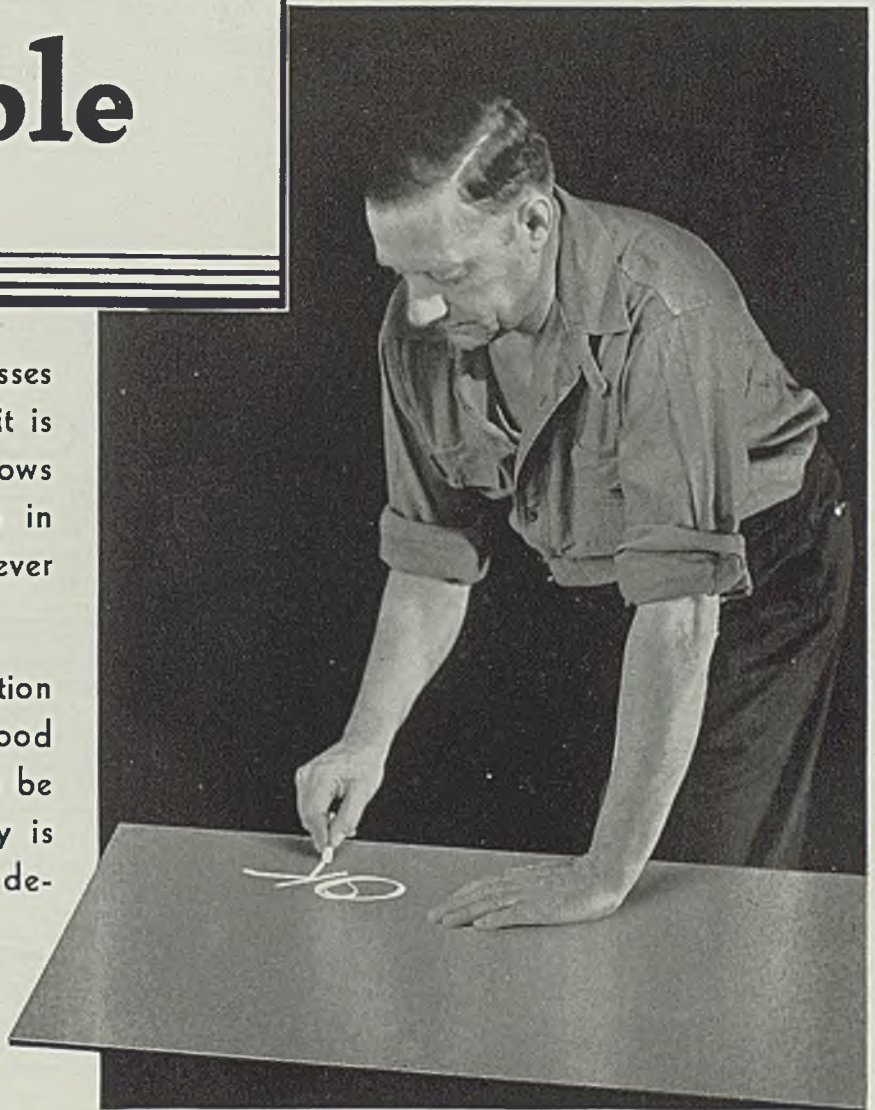


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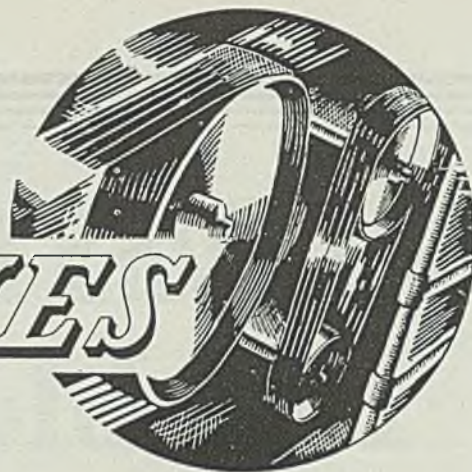
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# POWER DRIVES



## Installing Group Drive Lineshafts Without Overhead Construction

IN THE earlier days of the application of power to machines, lineshafts were in many cases mounted on the shop floor, or on the floor or ceiling of the basement and machines belted up through the floor. One reason for this was the general use of large shafts and the necessity of a firm foundation for the mounting.

With the general abandonment of the single large mainshaft drives and the division into numerous smaller group units the common practice developed of mounting shafts on the ceiling and belting down to the machines. Ceiling mounted lineshafts have the objections of belts obstructing light, maintaining a circulation of dust, static electricity and dripping oil (which are extremely objectionable in textile and some other industries), interference with the operation of overhead handling equipment, lack of substantial footings, and the increased hazards and difficulties of maintenance and servicing. To overcome one or more of these objections many concerns adopted individual machine drives.

### Use Concrete Trench

With the revised interest in modernized planned group drives, largely to obtain reduction in first cost and the annual fixed charge on investment plus improved electrical operating factors, transmission engineers have again turned toward the possibilities of underground or basement lineshaft installation.

Some textile mills, for example, have adopted a concrete trench approximately 20 inches wide by 24

inches deep for mounting the lineshaft directly beneath the row of knitting machines and belting up to the knitters. Motors are mounted in side extensions to the trench and chain-connected on short centers. Antifriction bearings on lineshafts and on totally-enclosed, self-ventilated motors reduce maintenance and necessitate only periodic servicing. The trenches are covered with removable sections of steel plates and are not crossed by trucks.

### Lineshafts in Tunnels

This practice is comparable to using the ceiling of the basement or of the floor below for mounting lineshafts with the additional advantage that it can be used where there are no basements.

Some recently installed paper mills also have placed in the basement the drives to the various sections of the mill and belt up through the floor. The advantage is a decrease in floor space and greater accessibility to the drive units.

Drives to the nail machines at the new South Chicago, Ill., wire mill of Republic Steel Corp. (Described in *STEEL*, p. 42-45, May 3, 1937) are from lineshafts mounted in tunnels beneath the floor. The 56 nail-making machines are driven in 4 groups each of 14 machines. Lineshafts are roller-bearing equipped. Belts, shafts and bearings are easily accessible for servicing and inspection because of the man-height tunnels in which they are mounted. Belts extending up through the floor to the nail-making machines are guarded above floor level.

This installation will give all the advantages of group drives together with the absence of overhead belts which would obstruct light for adjustments of machines and inspection of work. The absence of overhead lineshafts and belting permits unobstructed operation of overhead tramrails for supplying coils of wire to the nail-making machines and removes drives from the production floor.

Still another method of removing the lineshafting from the shop ceiling is to mount it on the floor between two rows of machines set back-to-back, using floorstands or inverted lineshaft hangers, or in pillow blocks on concrete pedestals. This practice is frequently used in connection with double rows of drill presses. Such lineshaft installations should be kept fairly short, which is good practice, and not cross aisles.

### Avoid Common Practice

Many types of machines are designed with the drive pulley so mounted that they must be connected to overhead or, at the extreme, to almost horizontal belts. With the numerous types of short-center drives available, many of which will work satisfactorily on centers of 50 to 60 inches, some of these machines can be connected-up in double rows back-to-back to a pedestal-mounted lineshaft.

The method of installation and location of a lineshaft is of considerable importance in overcoming the objections to group drives. One difficulty in modernizing group drives has been the tendency to follow common practice, such as over-



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head mounting, and not give full consideration to all methods available and then select one most suitable for any given requirements and limitations.

When transmission engineers give the same consideration to the selection of type of drive and its installation as they do to the machine driven, many practical, even though unthought of today, methods will be found for connecting up the machine. Because a practice has been discarded is no valid reason for not considering it. In altogether too many cases no thought is given to the drive, its control and wiring until the machine is received. The problem then becomes: "How quickly can it be connected up?" rather than how conveniently and efficiently.

♦ ♦ ♦

### Low Speed Drive Units

**N**ORMAL operating speeds from standard alternating-current motors operating at 1725 revolutions per minute, without countershafts or double-reduction drives, is obtained on the battery of small machines, shown in the accompanying illustration, by using a special speed reducer built with a special base for mounting the direct-connected motor. In this installation the speed reducers are on the opposite ends of the motors and not shown.

The entire unit is mounted on a special hinged base which is attached to the foot of the machine pedestal by two bolts. Belt tension is maintained by the weight of the motor and speed reducer.

The advantages of this drive are the ease and speed with which the drive unit may be attached to the machine and the compactness of the speed-reduction unit. Also, this installation permitted setting all machines at an angle without requiring a quarter-turn belt, as would

be necessary if driven from overhead. In addition the installation permits exceptionally good lighting on the work.

The neat wiring in flexible conduit with the conveniently mounted controls is worthy of notice. Power is received from conduits buried in the concrete floor. The drive is manufactured by Cullman Wheel Co., Chicago, in various sizes and ratings for individualizing drives to machine tools.

♦ ♦ ♦

### Meeting Speed Demands

**I**N A PLANT manufacturing two products of variable demand, each of which required processing at different speeds, the practice had been to change drive pulleys with a change of product. One product could not be processed at the higher speed without obtaining poor quality; production losses resulted from processing the other at the lower speed.

Changing pulleys required from 30 to 45 minutes interruption to production. As the operators were on piecework they objected to stopping to change pulleys and also to operating at the lower speed. Changes generally were made at the noon hour to avoid overtime but this often resulted in operating for over one-half day at the incorrect speed.

As the demand for each product could not be anticipated and changed with seasonal requirements, apportioning the machines to each speed was not practicable. The plan adopted was to install variable-speed transmission units of the block V-belt type operating on variable-diameter sheaves on 31 per cent of the drives, so they could be used for either type of product. Approximately 42 per cent of the drives were set at the lower constant speed

required and the remaining 27 per cent at the higher speed.

As a result the speed can be adjusted at once with a variation in requirements. Also, the cost of the installation was kept low, as only about one-third of the equipment was made available for the two products.

♦ ♦ ♦

### Providing for Overtime

**W**HERE considerable extra and overtime work is expected savings may be made by providing for it in the arrangement of machines and drives. For example, in a contract plating plant, where much of the work is of the "wanted day before yesterday" class, some of the polishing and buffing equipment has been changed over from group to individual drive. Thus only the machines required for overtime work need be operated.

Instead of using multispeed individual or group drives, machines and groups are operated at different speeds so that each group or unit is designed for a particular class of work. Thus by scheduling the work to the machines or groups there is no opportunity for the operator to buff or polish at an incorrect speed or wheel for the particular material or finish.

♦ ♦ ♦

In driving processing conveyors, such as ovens, where speed of travel and temperature are the controlling factors an indicating tachometer is almost as essential as the thermometer, especially where several products are handled, each requiring different timing. Remote control of the variable-speed drive from the instrument panel simplifies maintaining the proper speed.

♦ ♦ ♦

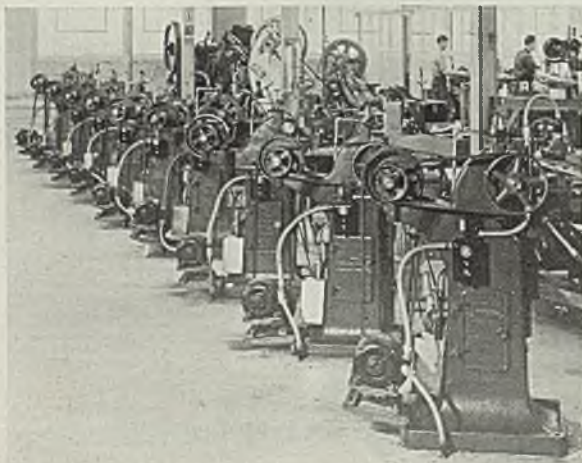
The addition of a variable-speed transmission in the drive to a vertical boring mill increased efficiency approximately 25 per cent with only negligible maintenance expense during the 7-year period it has been in operation.

♦ ♦ ♦

One dryer operating under unusually severe conditions of moisture, and heat is provided with 184 single-row, ball-bearing pillow blocks to eliminate interruptions, excessive maintenance and the increased load of overheated bearings.

♦ ♦ ♦

When machines are installed or overhauled they receive close attention for a while and then, too often, are neglected or ignored until trouble develops.



**S**PECIAL speed reducers drive this battery of small machines from standard constant-speed, alternating-current motors



# PROGRESS IN STEELMAKING

## Runout Table Drives

for

## Modern High-Speed Wide Hot Strip Mills

**C**ONSIDERABLE attention recently has been focused on the drive system for hot-run tables for handling hot strip after it leaves the last finishing stand of continuous mills. The handling equipment consists of a conveyor table composed of a number of rollers, coiling equipment, and piling equipment. The rollers of the hot-run conveyor table and the coilers are individually motor driven. The recent trend to wider mills delivering strip at higher speeds has presented a real problem in handling equipment for the strip. Should these individual rollers of the conveyor tables and coilers be driven by A-c. (alternating-current) squirrel-cage induction motors, or D-c. (direct-current) motors, is an important question at the present time.

To assist in properly answering this question, a comprehensive study, including a large number of tests, has been made. Before presenting the results of this study, the history of individual motor drives as applied to handling systems for continuous mills will be reviewed briefly.

The early installations of individually driven rolls on conveyor tables were made primarily for simplicity and to reduce the excessive maintenance that was present on the line shafting and open bevel gear group drive then in general use. Direct-current motors with some speed adjustment were the solution, and a great many were applied in tube mills, billet mills, etc. Soon alternating-current squirrel-cage induction motors were used to supplant

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By W. R. Hough  
Experimental Engineer,  
Reliance Electric & Engineering  
Co., Cleveland

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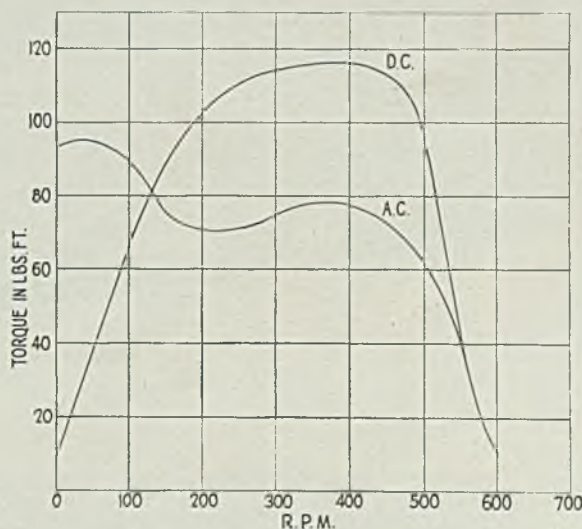
the direct-current motors, because of further simplicity and reduced maintenance.

### Required Individual Drive

Continuous hot strip mills were developed, and with them came the necessity for individually driven rolls with a speed range to match the flexibility of these new mills. Naturally, the same successful induction motors were used on the

runout tables and variable frequency motor-alternator sets provided to get adjustable speed. Each passing year finds each new mill planned to be wider and faster than its predecessor, and motors or the hot runout table rolls have jumped from the original fractional horsepower sizes up to real power units.

Consequently, the size of the alternating-current generating equipment has been increased proportionally to the stage where it represents the major portion of the electrical equipment for the runout table. Considerable thought has been given to the use of direct-current motors, for the table rolls, supplied by variable voltage. This type of drive reduces the physical size of generating and



**FIG. 1**—Curves of motor-developed torque versus acceleration of A-c. and D-c. motors

Table I  
Field Data for D.C. Runout Table Drives

	CASE I	CASE II
Transfer required	Yes	No
No. of rollers—last stand to collier	171	171
Group A	53	53
Group B	59	59
Group C	59	59
No. of collers	2	2
No. of motors per collier	8	8
No. of rollers collier to piler	129	129
Top delivery speed of last mill stand, ft./min.	2000	2000
Top speed of hot-run table, ft./min.	2200	2200
Width of roller, inches	84	84
Diameter of roller, inches	12	12
WR <sup>2</sup> of roller	160	160
Peak rate of delivery of mill		
one strip every	25 Sec.	25 Sec.
Average rate of delivery of mill		
one strip every	43 Sec.	43 Sec.
Operating speed:		
During transfer, ft./min.	1900	to zero
During colling and piling, ft./min.	2200	to 735
Maximum duty cycle:		
Low to high, seconds	9	9
Run at high, seconds	4	4
High to low, seconds	6	6
Stopped, seconds	6	—
Run at low, seconds	—	6
TOTAL	25	25

To show how these factors apply to a particular job, a hypothetical case is given as an illustration in Table I. This is fairly typical of present-day installations.

1—The drive selected must be capable of adequately disposing of the strip in the manner intended at the peak rate of operation of the mill

The peak duty cycle determines in both cases the sizes of equipment required. The factors determining the size of the equipment are as follows:

Equipment	A-c	D-c
Motors	Torque capacity heating	Commutation heating
Generators	Voltage regulation heating	Commutation heating
Motors driving generators	Commutation heating	Max. Hp. capacity heating

2—Drive selected shall perform smoothly

control equipment normally housed in the motor room; and as a result of this study, several direct-current runout table drives are being installed.

From this background of experience, it is evident that the factors to be considered in arriving at a decision are:

1. The drive selected must be capable of adequately disposing of the strip in the manner intended at the peak rate of operation of the mill.

2. The drive selected should perform smoothly to accomplish—

a. Handling of the strip without damage.

b. A minimum of cobbles with their consequent loss in production.

c. A minimum of mechanical maintenance incident to the shock of undergoing extreme speed changes suddenly and frequently.

3. First cost of equipment including—

a. Cost of individual motors, power units and control.

b. Cost of buildings for housing power units and control.

c. Cost of installation of equipment, including cost of wiring.

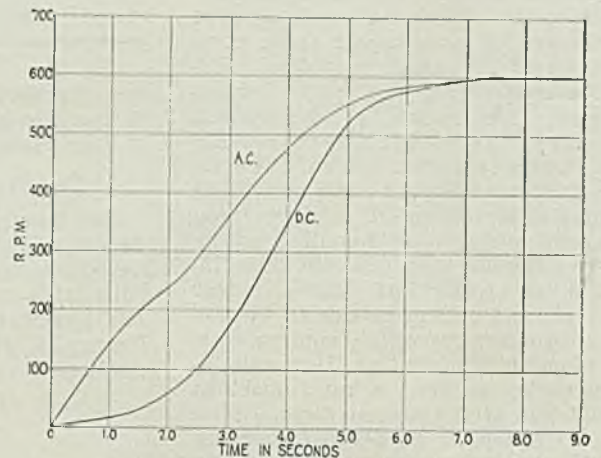
4. Cost of operation of equipment including—

a. Power cost.

b. Maintenance cost.

Fig. 1 shows curves of motor-developed torque versus speed for Case I for a 10-pole A-c. motor on across-the-line start at 20 cycles to 200 revolutions per minute and accelerated by frequency control from 200 to 600 revolutions per minute; and, for a D-c. motor accelerated by voltage control for 0 to 600 revolutions per minute. Both frequency control A-c. and voltage control

FIG. 2 — Motor speed plotted against time for acceleration of motor-driven rollers



D-c. are accomplished by motor-driven rheostat for maximum smoothness of operation.

Fig. 2 shows motor speed plotted against time in seconds for the acceleration of the motor driven rollers as a result of the application of the torque values as shown in Fig. 1.

Figs. 3 and 4 show similar conditions of deceleration.

The A-c. drive is less smooth than the D-c. drive in the range from 0 to base speed of approximately 240 revolutions per minute, due to the sudden application of torque for acceleration when starting across-the-line and to the sudden change in

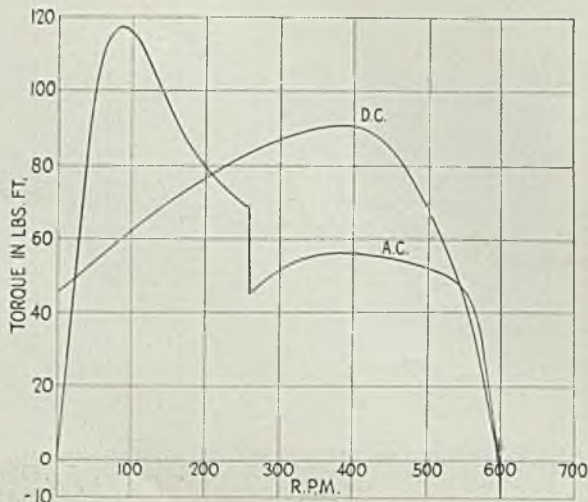


FIG. 3—Curves of motor-developed torque versus deceleration of A-c. and D-c. motors

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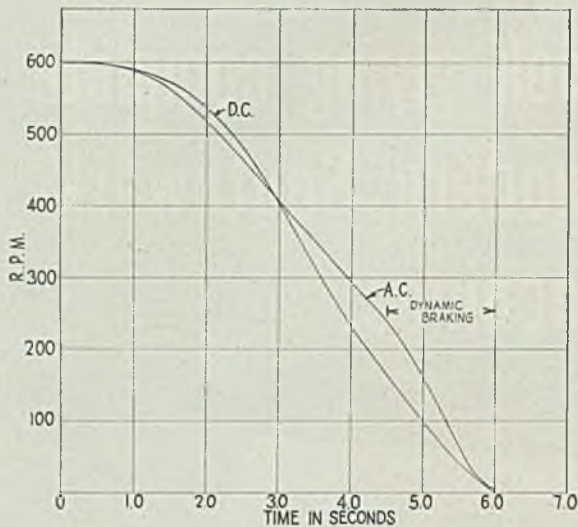


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**FIG. 4 —** Motor speed plotted against time for deceleration of motor-driven rollers

torque during deceleration at the instant that dynamic braking is applied. See Fig. 3.

The A-c. drive, therefore, results in somewhat greater strain on the mechanical equipment.

#### Advantage of High Torque

The high torque developed by the A-c. drive in the speed range of 0 to base speed, however, makes it possible to accelerate and decelerate the rollers between zero and top speed with lower rates of acceleration and deceleration at high speed. This is an advantage for the A-c. drive because the coefficient of friction between the strip steel and the roller is lower at the high speed, and consequently there is less chance of the strip slipping on the rollers when driven by A-c. motors than when driven by D-c. motors. This is a well-recognized principle made use of in braking of high speed trains.

Operation of the table between base speed and top speed by frequency control A-c. and by voltage control D-c. such as for coiling and piling (Case II) is accomplished with equal smoothness.

#### 3—First Cost—See Fig. 5

#### COST OF INDIVIDUAL MOTORS, POWER UNITS AND CONTROL

For the A-c. drive, the cost includes all equipment necessary, as-

suming an adequate supply of 600-volt D-c. power is available. This usually is available in the equipment which supplies 600-volt power to the main-drive motors for the rolling

mills. For transfer operation, a motor-generator set is included to supply power for dynamic braking. The D-c. drive includes all equipment necessary, assuming the main power supply used is 6600-volt A-c. and 230-volt D-c. for excitation only.

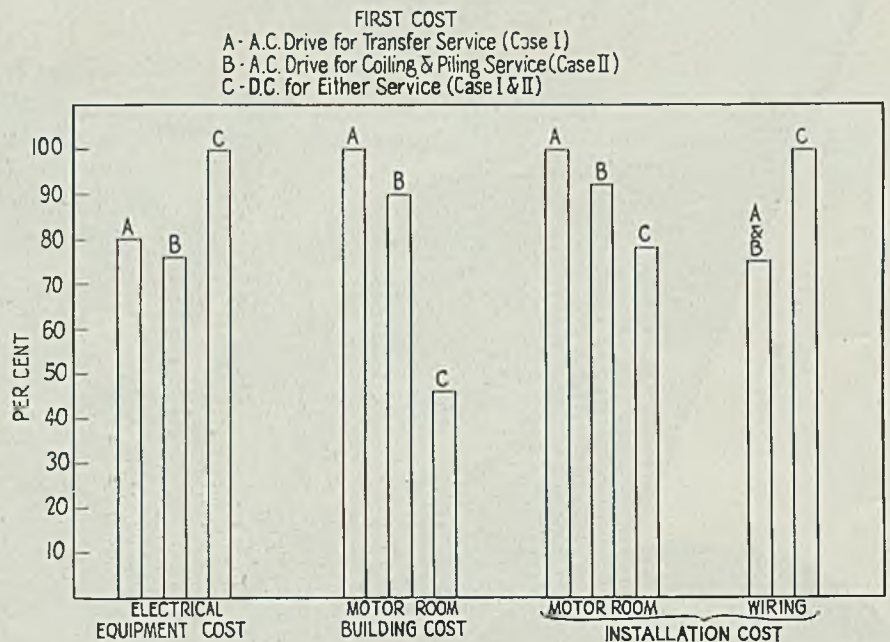
#### COST OF BUILDINGS FOR HOUSING POWER UNITS

A comparison of the actual square feet of motor room floor area required for power units and control panels is given in Fig. 5. The figure in dollars given in the summary assumes the area required for aisles is equal to the area required for equipment.

The additional motor-room cooling equipment required for the A-c. drive where motor-room cooling equipment is used, would cost approximately \$2500 more than that required for the D-c. drive.

#### COST OF INSTALLATION

The cost of installing power units and control is assumed to be in pro-



**FIG. 5—**Comparison of first cost with (A) representing A-c. drive for transfer service, case I; (B) representing A-c. drive for coiling and piling service, case II; and, (C) representing D-c. drive for either service, cases I and II

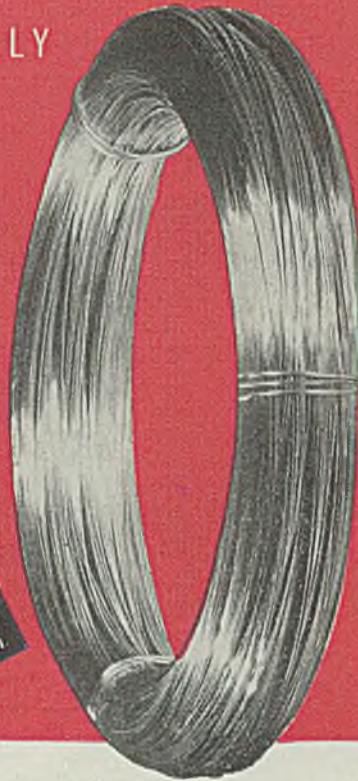
Table II  
Summary of Power Costs for Three Types of Operation

	CASE I Transfer Operation		CASE II Coiling Operation		CASE III Piling Operation	
	A-c.	D-c.	A-c.	D-c.	A-c.	D-c.
No. of slabs /year. ....						
No. of tons/year. * (Light gage material) .....						
Total k.w.h./year from 6600 volts A-c .....	$3.01 \times 10^6$	$2.24 \times 10^6$	$4.31 \times 10^6$	$3.19 \times 10^6$	$5.7 \times 10^6$	$4.5 \times 10^6$
Total cost/year @ \$.005/k.w.h. ....	\$15,050	\$11,200	\$21,550	\$15,950	\$28,500	\$22,500
Saving-power cost in favor of D-c. ....		\$3850		\$5600		\$6000
K.w.h./ton .....	3.58	2.67	5.12	3.8	6.78	5.35
Cost/ton .....	\$0.0179	\$0.0134	\$0.0256	\$0.019	\$0.0339	\$0.0268

\*—With heavier gage material the cost per ton would be appreciably less.

## CHEMICALLY

there are five elements other than iron to consider in steel wire, carbon, manganese, phosphorus, sulphur and silicon. Here we briefly discuss silicon. Other advertisements discuss other elements.



This photograph shows a cross section of a billet rolled from rimmed steel containing no silicon.



This low carbon steel billet contained 0.00% silicon. Note the homogeneous cross section and absence of rim.



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portion to their first cost. A comparison is given in Fig. 5. The cost of wiring is given as a ratio of the total ampere conductors.

#### 4—Cost of Operation of Equipment

##### POWER COSTS

Table II gives a summary of the power cost of A-c. and D-c. drives for three classes of operation, based upon a cost of 6600-volt A-c. power of \$0.005 per k.w.h. and an efficiency of conversion from 6600-volt A-c. to 600-volt and 230-volt D-c. of 85 per cent.

Transfer service (Case I) includes 171 table motors, power units and excitation. Operation is at 1900 feet per minute to zero for every strip.

Coiling service (Case II) includes 186 table motors, 16 coiler motors, power units and excitation. Operation including table motor-speed change from base speed to top speed for every coil, but no starting and stopping.

Piling service (Case II) includes 300 table motors, power units and excitation. Operation includes speed change from base speed to top speed for every strip, but no starting and stopping.

##### MAINTENANCE COST

Maintenance costs are difficult to state accurately. As an indication

Table IV  
Comparison of Brushes and Commutators

	A-c		D-c per cent
	With braking set (Case I) per cent	Without braking set (Case II) per cent	
Number of brushes	20	10	100
Brush area	50	20	100
Commutator area	50	20	100
Brushes in mill	0	0	88
Brush area in mill	0	0	65
Comm. area in mill	0	0	65
Number of main line single-pole contacts	100	80	14

size. The figures would indicate that the repair costs of 300 motors of the size considered in this typical runout table installation would be approximately \$1000 per year more for D-c. motors than for A-c. motors. These figures pertain only to costs of repairs made in the repair shop. It should be recognized that the D-c. drive will require additional maintenance in the form of brush replacement and motor inspection.

#### Maintenance Is Higher

The A-c. drive will require additional maintenance of motor room control.

Table III  
Advantage of A.C. Drive

(IN TOTAL FIRST COST)

	Transfer (Case I)	No Transfer (Case II)
Electrical equipment	\$45,000	\$53,000
Motor room building and air conditioning equip.	\$12,500	\$10,500
Installations	See Fig. 5	See Fig. 5
Net advantages	\$32,500	\$42,500

of maintenance problems, a comparison of brushes and commutators of comparable A-c. and D-c. drives are given in Table IV. The figures for the A-c. drive are given both with and without a dynamic braking set.

In the case of the A-c. drive, all of the brushes and commutators are a part of the power units which are in the motor room. There are no brushes or commutators in the mill. In the D-c. drive, the percentage of brush and commutators which are located in the mill is also shown in Table IV. The remaining brushes and commutators are, of course, located in the motor room.

#### Comparison of Repair Costs

The records of one large steel company, as a result of a study of all types of motors, indicate that the cost of repairs made in the repair shop for a group of D-c. motors is 172 per cent of the repair cost of a group of A-c. motors of equivalent

Table IV also shows a comparison of the minimum number of single-pole main-line contacts which would be used. This is given as an indication of possible control maintenance.

#### Summary

1. Both A-c. and D-c. drives will fulfill the requirements of adequately handling the steel delivered by the mill.

2. The operation of the table motors on coiling and piling (Case II) service is identical from the standpoint of smoothness of operation. The operation of the table motors on transfer service (Case I) and the coiler motors in coiling service, or in other words, motors in starting and stopping service, shows an advantage for—

a. D-c. in smoothness of operation.

b. A-c. in torque characteristics to prevent slipping of the strip on the rolls.

3. In total first cost, the A-c. drive has a cost advantage of approximately that shown in Table III.

4. In total power cost, the D-c. drive has a cost advantage of \$5000 to \$6000 per year, or approximately \$0.0065 per ton of steel (light gage). This figure is an average for a mill which may be designed for either Case I or Case II.

5. The cost of maintenance of equipment should show an advantage to the A-c. drive of about \$1000 per year in repair shop maintenance. The A-c. drive will require additional control maintenance in the motor room and the D-c. drive will require additional motor inspection and brush replacement.

6. In the cases considered in this study, the prospective buyer in arriving at a decision as to the type of drive to be purchased, should weigh the respective operating advantage of the two types of drives, the difference in first cost of equipment and the difference in power costs and maintenance costs.

7. It should be recognized that the figures shown are taken from the information obtainable in advance of actual experience with D-c. drives on modern wide, high-speed mills, and apply only to the hypothetical case outlined.

## Production Costs Lowered by Use of 4-High Mills

Reports of the spread in the cost of producing tin plate on 2-high hand mills and on 4-high stands differ widely. One maker is said to be producing black plate in coil form for tinning on a 4-high tandem mill at approximately \$12 lower a ton than the product coming off his conventional 2-high hot tin mills. At any rate, leading producers are making every effort to divert tin plate tonnage from their hot to the cold mills. The whole problem is one of turning out cold rolled tin plate with properties as specified by customers, namely, stiffness combined with ductility. The answer is sought by varying combinations of skin passing, alloying and heat treatment. Some of the important interests now are filling about one-third of their tin plate orders from cold strip mills and are confident that they will increase this proportion to one-half in the near future.

In view of the fact that less tin is required to plate cold reduced tin plate, it is of interest to note that research work in connection with electroplating indicates that this method of tinning will cut the tin consumption still further. There are, however, several problems concerning the physical properties of electrotin yet to be solved.



# Acetylene Flame Now Widely Used in Preparing Bearings for Rebabbiting

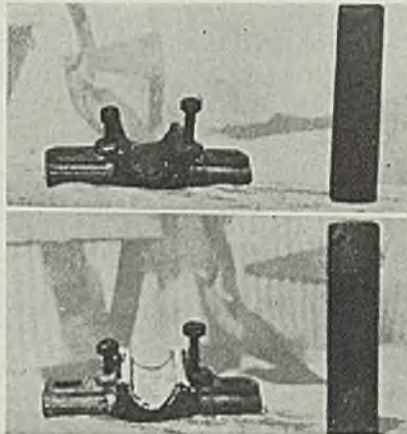
A SUFFICIENTLY thick layer of carbon on the surface of a mold acts as an insulator and prevents actual contact of the molten metal with the mold. Use of such carbon layers prevents sticking of the casting and deterioration of the mold. Too, a finer finish is obtained on the casting. Such carbon layers are used to a considerable extent in running babbit metal into bearings and also in lead molding.

It is easy, by means of the acetylene flame, to apply a hard, smooth carbon deposit, according to *Oxy-Acetylene Tips*, published by Linde Air Products Co., New York. An almost pure acetylene flame with little or no oxygen in it gives a homogeneous, adherent deposit of carbon. This is true whether the mold be made of cast iron or of refractory material. The acetylene flame simply is played by hand over the interior surface of the mold until an adequate deposit of carbon has been obtained. Cold molds are less easy to coat with carbon than when raised to their normal operating temperatures. In the case of a cold mold the deposit is of a hard, granular structure which may flake off with the first cast, whereas the deposit on a hot mold is smooth, velvety and somewhat oily in appearance and does not flake off as readily.

## Shut Oxygen Valve

Any welding blowpipe with a head or tip having an opening equivalent to a No. 45 drill or slightly larger can be employed in this operation. The oxygen valve should be shut off completely. Sufficient acetylene pressure should be used to force the flame away from the tip about  $\frac{1}{4}$ -inch. A flame of this velocity gives a harder deposit which

is more satisfactory. On the low pressure type of blowpipe an adjustment at the acetylene regulator of one pound per square inch pressure, when used with a  $\frac{1}{4}$ -inch diameter hose and with the blowpipe acetylene valve wide open, is



Top view shows bearing and smoked dummy shaft before running the babbit. Bottom view shows the babbit bearing with dummy shaft requiring a little touching up with the acetylene flame to prepare it for making another bearing

found sufficient for all purposes. A surface area about 8 x 12 inches can be smoked in 15 to 30 seconds, the 30-second period being preferred.

Flame is moved, in air brush manner, across the surface over which the lead or babbit is to flow. This weaving deposits a dense black coating of carbon over which lead or babbit flows readily and evenly without flaws or pits.

One plant has developed an interesting method for incorporating oil grooves in babbit cast by this method. The welding operator who does the work uses copper or steel

welding rod ground down until it is half-round along its entire length. The rod then is wound around the shaft in a spiral prior to smoking the shaft. In this way no difficulty is encountered in removing the rod after the bearing has been poured.

In one case where an acetylene blowpipe was not available, a small decarbonizing blowpipe was used for the work. In this case acetylene pressure of about 12 pounds per square inch was carried at the regulator. This caused the flame to leave the tip about  $\frac{1}{4}$ -inch and give a bright, luminous flame. The center of the flame was utilized as much as possible as this gave a harder and more adherent deposit of carbon. Occasionally the carbon comes off in spots, in which case the spots are touched up again.

## New Steam Drop Hammer to Form 500-Pound Forgings

A 25,000-pound steam drop hammer, one of the largest in the world, is under construction at the plant of the Clifford-Jacobs Forging Co., Champaign, Ill. Built by Erie Foundry Co., Erie, Pa., six flat cars were required to transport to destination the approximately 600,000 pounds of parts for this hammer. The train, shown in the accompanying illustration on the Clifford-Jacobs siding, included two specially constructed cars for the anvil block. This was cast in two sections weighing 105 and 109 tons, respectively, for the top and bottom halves. Placing of these halves in the heavily reinforced concrete pit required the services of two railroad wrecking cranes. The anvil rests on three crossed layers of 12 x 12-inch oak timbers bolted together. The new hammer increases the unit capacity of the plant from 200 to 500-pound drop forgings, for the railroad, petroleum and other industries.

Six flat cars were required to transport 600,000 pounds of parts for 25,000-pound drop forging hammer





# *SURFACE TREATMENT AND FINISHING OF METALS*

## Bright Zinc Plating Process Produces Brilliant Deposits Directly from Bath

BY RALPH M. DREWS  
Metallurgical Engineer, Bolt and Nut Division  
Republic Steel Corp., Cleveland

**F**IRST industrial installation of an exclusive process for bright zinc plating of small parts has proved highly successful at Republic Steel Corp., Bolt and Nut division, Cleveland. This plating process was developed over a period of several years of intensive research and has the unique property of producing deposits closely resembling the brilliance of polished chromium directly from the bath without the aid of a bright dip. Republic Steel Corp. quickly recognized the importance of this development and pioneered its commercial application. The plating unit and accessories which have been largely instrumental in its successful operation were designed and built en-

tirely in this plant. This plating process and equipment has been in operation for a period of time sufficient to establish its performance and has fulfilled the results expected.



### Supplants Cadmium Plating

Plating of iron and steel with zinc for rust protection has been widely practiced for many years. While deposits produced by the old processes have proved fairly effective for rust protection purposes, they have been objectionable from the standpoint of having a dull, lifeless appearance. It was largely for this reason that cadmium plating, which produces deposits of pleasing appearance, became established even though its

cost was considerably greater than zinc. There was, however, a sufficient demand for zinc coated rivets, bolts, and nuts to absorb the production of this new plating unit by customers who recognized the superior value of zinc and where appearance had not been a paramount factor. However, the highly satisfactory results of this process, combined with the increased cost of cadmium metal, has resulted in the supplanting of cadmium by zinc for the major portion of all materials formerly cadmium plated by this company.

On the basis of what was known at that time, it was decided that to insure the success of this new pro-





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The experience J. O. Ross Engineering Corporation obtained in providing air heaters and industrial ovens to all the large automobile manufacturers, provides the background from which to step ahead.

We are now prepared to assist in solving the problems confronting the designers of the steel home of the future; the streamlined train; the modern automobile; prefabricated steel bathrooms and other items requiring equipment for baked protective coatings on metal.

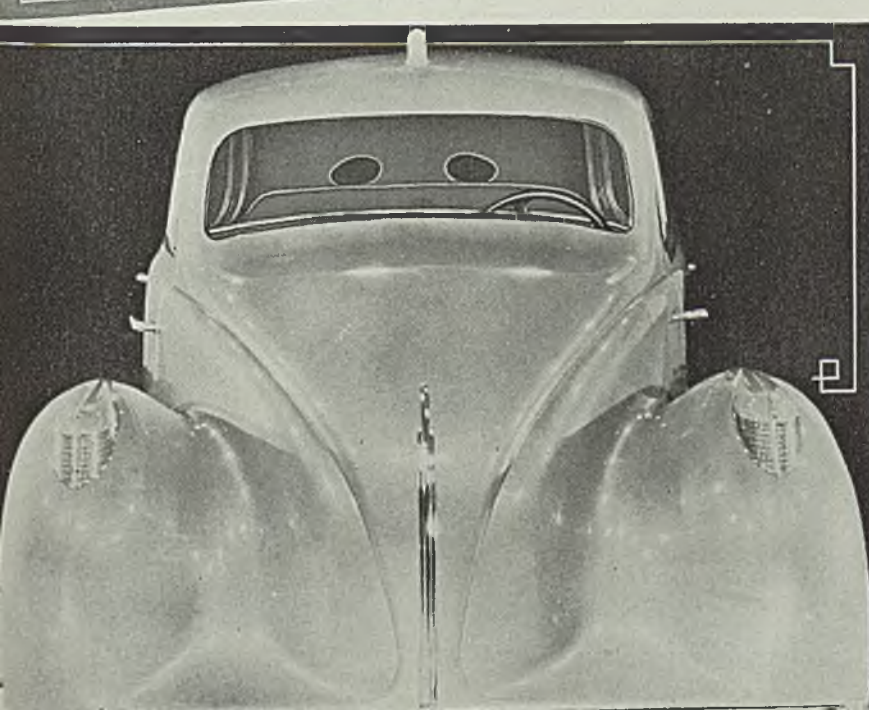
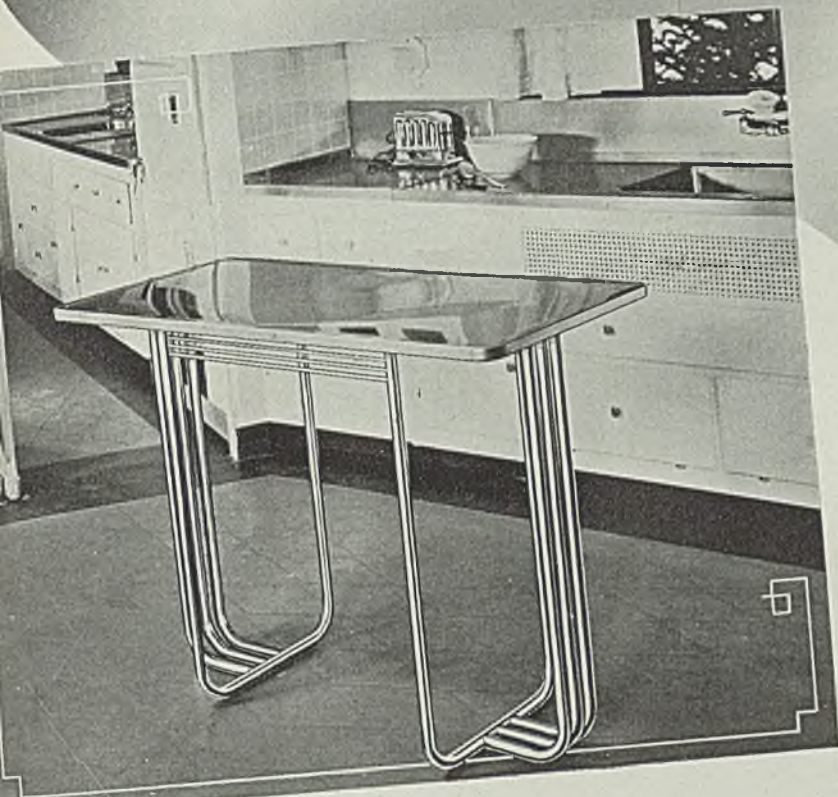
Permit our representative to discuss these problems with you or write for bulletins Nos. 122 and 123.



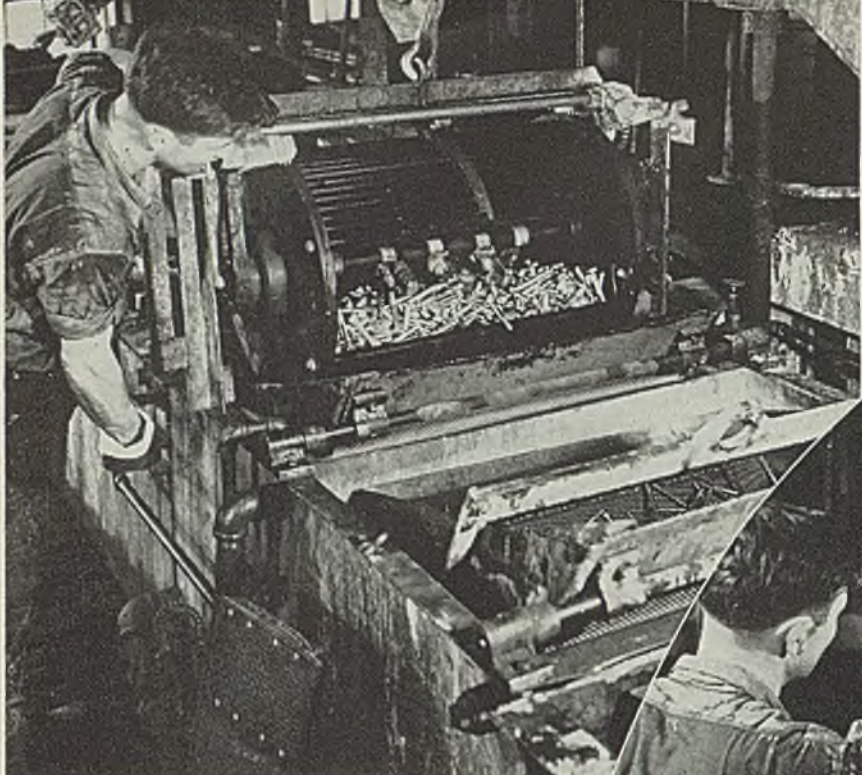
**J. O. Ross Engineering Corporation**

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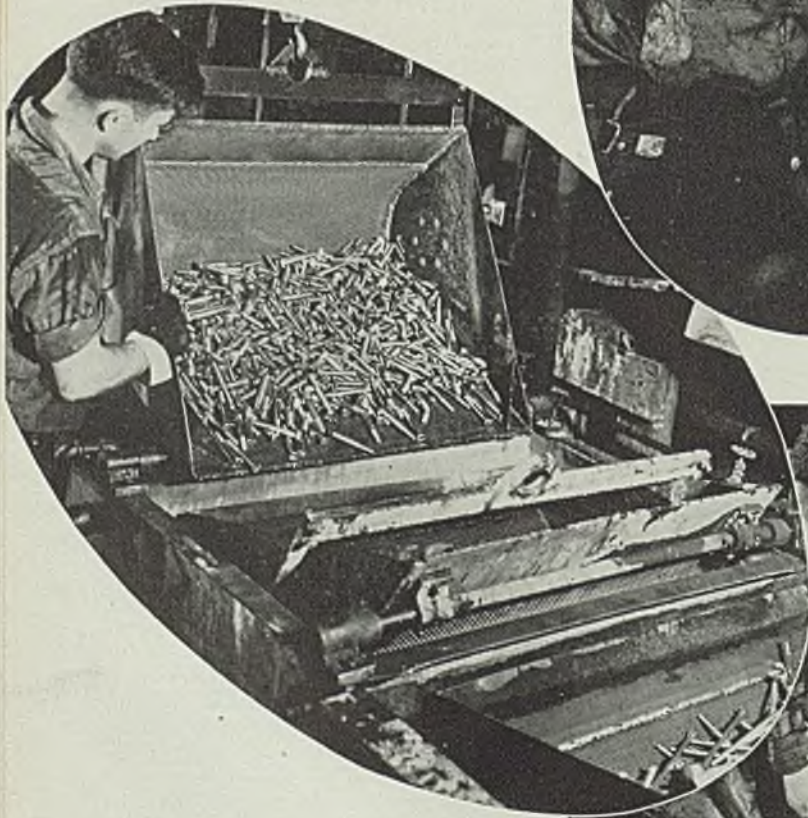
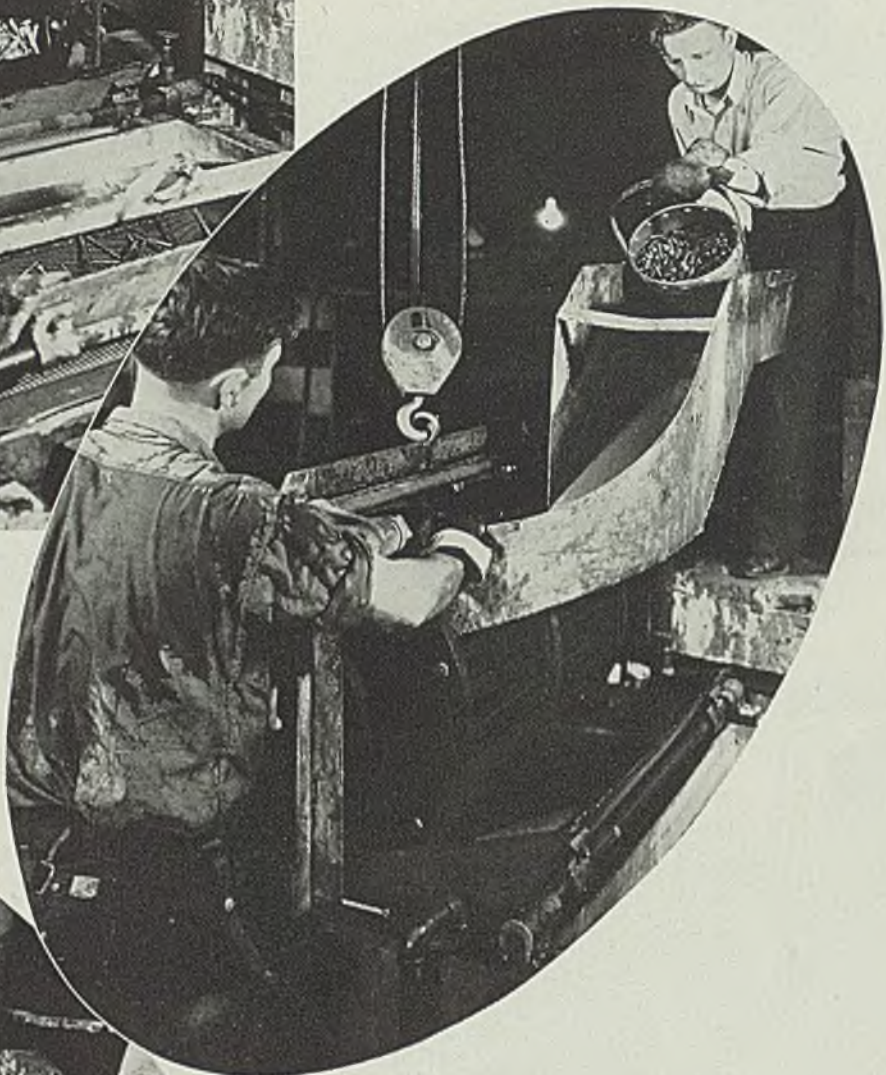
201 North Wells St. Chicago, Ill. 12953 Greeley Ave. Detroit, Mich. 2860 N. W. Front Ave. Portland, Ore.



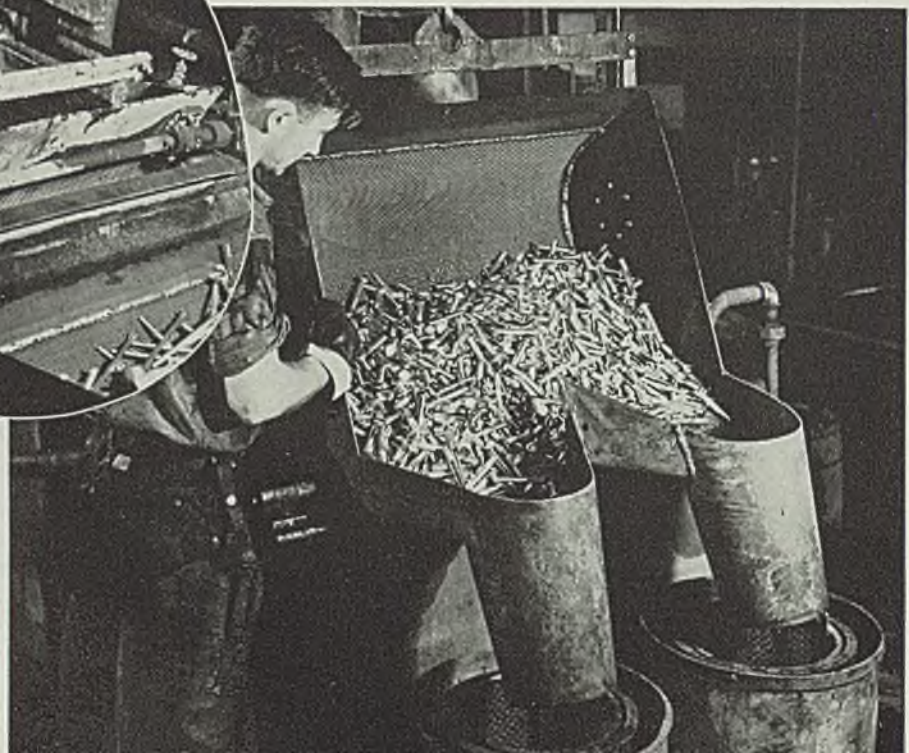
**H**ARD rubber barrels of squirrel cage construction are used in this installation. Shown left is barrel in rack over first rinse tank. Operator is rotating barrel to dump parts into first rinse basket



**R**IGHT, barrel has been rotated back to loading position and loading trough swung in place. Loading trough saves operator many steps between storage tank and plating barrel



**A**FTER replacing barrel in plating bath operator transfers parts from first rinse tank to second by raising first rinse basket with a small hoist as shown above. Parts are transferred from tank to tank in this manner until they reach the centrifuge, shown right, where last traces of water are removed



ess an efficient plating barrel as well as ample rinsing equipment and proper handling facilities for the work from the time it was plated until it was packaged would have to be provided. This led to design of barrels, means for loading and unloading barrels as well as a unique basket rinse and centrifuge drying arrangement.

It was believed that the perforated panel type barrel, in use in many plants today, did not provide sufficient openings for maximum efficiency of operations. Increasing the size of the holes would not solve the problem as the small parts would only become wedged in the openings or even fall out of the barrel. To overcome these difficulties a new type of barrel was designed and built in the company's own shops.

#### Squirrel Cage Construction Used

This barrel, shown in the accompanying illustrations, uses a squirrel cage type of construction which has proved entirely satisfactory. It provides a maximum area of openings for passage of electric current and has stepped up efficiency of operation to a marked degree. Electric current is led in through an axle shaft which runs entirely through the center of the barrel.

Electrodes, or "danglers", which reach to within a short distance of the inside of the barrel wall are hung from this shaft. These electrodes are weighted so they drag through the parts being plated as the barrel rotates thus furnishing multiple contacts and insuring even distribution of current. They are so constructed that when they are plated excessively with zinc they can be removed and hung on the anode buss bars to be deplated, thus salvaging the deposit of zinc as well as preparing clean electrodes for future use. This type of barrel has proved so satisfactory that it has been adopted as standard.

This electroplating unit, shown in an accompanying illustration, was placed in operation in January, 1936. It consists of a five barrel steel plating tank and a series of four steel rinse tanks, the last two fabricated from stainless steel. The four tanks are fed with cold running water the last of which is heated by a suitable steam coil. Ordinary plating room practicing of heating by leading live steam directly into the water was not followed in this case as certain impurities introduced by the steam caused staining of the deposit. The shallow steel baskets are fabricated from stainless steel and are mounted on a hinge in each rinse tank.

When a batch of parts is plated, the barrel containing them is lifted by a small electric hoist and carried to the end of the tank where it is placed in a specially designed loading and unloading rack located over the first rinse tank. The barrel is held in position, opened and then

rotated with a crank dumping the plated parts into the first rinse basket as shown in an accompanying illustration. It is then loaded with parts and returned to the plating tank, as also shown in an accompanying illustration. By this method dragout loss is reduced to a minimum as only plated work is rinsed while at the same time the barrel is released for plating with a minimum loss of time.

Plated parts are then transferred by raising the first basket causing them to roll and fall into the following rinse basket where they are allowed to remain while the operator removes another barrel of plated parts, unloads, loads and returns it to the plating tank, after which both batches are moved forward. This same procedure is followed until the first batch of parts is transferred to the hot water rinse where it is allowed to remain for only a time sufficient to heat the parts. Following this the parts are immediately dumped into the centrifuge and dried rapidly. With this new rinsing system, unique in its efficiency and mechanical simplicity, the rolling action imparted to the parts in dumping serves to thoroughly agitate them and expose fresh surfaces to the rinse water.

This provides a thorough rinsing which is very important when alkali plating solutions are used. When transferring from the hot water rinse to the centrifuge a large portion of the water falls off due to the rolling action of the parts when dumped. This reduces the centrifuging time to a minimum. The latter, of course, throws off the last traces of adherent moisture and the heated parts evaporate any dampness which may have remained after centrifuging.

#### Rinsing System is Efficient

The above system of rinsing and drying has proved itself far superior to the older methods of rinsing in the plating barrel or dip baskets and then drying in sawdust, on a steam table, or by centrifuging the dip basket.

In addition to the above features, a continuous external cooling and filter system was designed and built by this division to control the temperature of the plating solution as well as to remove objectionable impurities thereby providing a clean solution at all times.

The unit now produces 5000 to 9000 pounds of plated work per 8-hour shift under normal production conditions. If only heavy parts are being plated capacity is approximately 12,000 pounds. Average thickness of deposit is 0.0002 to 0.0005-inch.

The older processes for zinc plating are inefficient and deposits are coarse and porous in structure and dark in appearance. In addition, the

acid baths are characterized by a very poor throwing power, as a result of which zinc is not deposited at the base of screw threads and under bolt and rivet heads. As distinguished from these characteristics, deposits produced by the new process are not only quite uniform in thickness under bolt heads and at the base of screw threads but are more compact, dense and bright, thus improving resistance to weathering and corrosion. The deposits also exhibit a high degree of ductility making it possible to cold drive plated rivets and not crack or flake the deposit.

#### Cyanide Improves Throwing Power

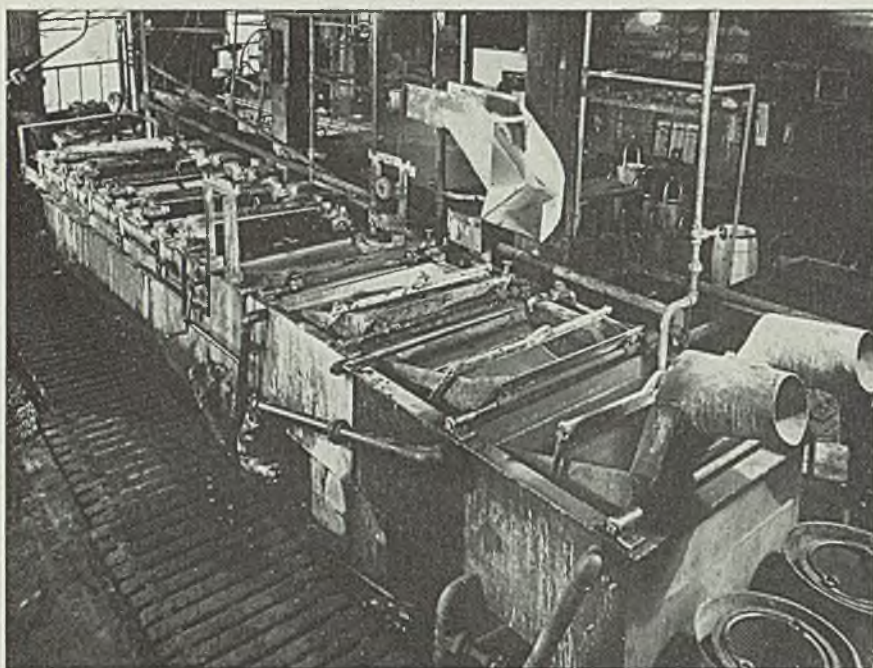
While the introduction of cyanide plating solutions improved the throwing power, very little improvement resulted in the appearance of deposits. To improve the appearance of the plate the deposition of high purity zinc was necessary since the introduction of minute quantities of impurities has a deleterious effect upon its appearance, whereas in the old processes in which appearance was not a factor the purity of deposit was not considered. This condition necessitated the adoption of high purity anodes which were not generally used in the old processes; furthermore, since it has been proved that the impurities commonly found in zinc impair its corrosion resisting properties it is obvious that the use of high purity anodes insures the production of zinc deposits having a maximum resistance to corrosion.

The solution used at the present time has the following composition:

- 4-6 ounces per gallon zinc (as metal).
- 10-12 ounces per gallon sodium hydroxide.
- 12-15 ounces per gallon sodium cyanide.
- 1/4-ounce per gallon molybdic acid.
- 1/7-ounce per gallon organic addition agent.

To secure the advantages of the process to its fullest extent it was found necessary to maintain close control of the sodium cyanide and zinc metal contents. The concentrations of these constituents in the solution are determined daily by analysis and, if necessary, adjustment is made to maintain a cyanide to zinc metal ratio of 2.5:1. Molybdenum and sodium hydroxide are determined by analysis once each week and maintained within the limits prescribed. The organic brightener is added as required which approximates 1 pound for every 6 tons of work plated.

Molybdenum codeposits with zinc to the extent of about 0.1 per cent and is the essential ingredient in the bath enabling the production of bright deposit without the use of a bright dip. It operates in conjunc-



**C**OMplete bright zinc plating installation is shown here. From left background to front is 5 barrel plating tank, loading and unloading rack, loading trough, rinse tanks and centrifuge. Parts are completely processed when they emerge from the centrifuge

tion with the organic brightener to produce a much brighter deposit than would be possible with the individual use of either agent alone.

Prior to the use of the organic brightener, deposit appearance was fairly satisfactory, however, it was found difficult to plate certain types of work and they would remain uncoated even after a prolonged plating time.

#### Organic Brightener Developed

The first method of correcting this difficulty was to give such parts a preliminary cadmium strike. Then upon transfer to the zinc solution they would take the deposit at the usual rate without further trouble. Research then developed the application of the above mentioned organic brightener which, when introduced into the plating solution, not only eliminated the necessity for a cadmium strike but increased the plating speed on all types of work and produced a more brilliant deposit of zinc.

The bath is operated at 70 to 85 degrees Fahr., using a tank voltage of 10-12 volts with a current density of 10-15 amperes per square foot, both of which conform to unusual barrel plating practice.

In the operation of any cyanide zinc solution it is found that the anode efficiency may vary from 100 to 105 per cent while the cathode efficiency is from 85 to 90 per cent. The result of this difference in efficiency was to cause a rapid rise in the zinc content of the solution which could only be counteracted by the removal of several zinc anodes and the substitution of insoluble steel anodes.

This method of control proved to be unsatisfactory and resulted

in continual shifting of steel and zinc anodes in the solution to maintain the proper balance. To correct this difficulty an anode using a very high purity zinc alloyed with an inert metal was developed. The advantage of this anode is that it can be adjusted to corrode at a predetermined rate. This efficiency is adjusted at 85 per cent and under commercial conditions varies from 85 to 88 per cent. Since this value is close to the cathode efficiency the zinc metal content is easily held constant except for dragout losses. Republic Steel Corp. was again the first to try this improvement under commercial conditions.

#### Instrument Compares Brilliance

The most distinguishing characteristic of the zinc deposit produced by this new process is its brilliance when compared with both zinc and cadmium deposits produced by the older processes. The actual brightness of the deposit has been measured by a specially developed reflectometer. This uses a source of light, which, after striking the sample is reflected onto a photoelectric cell the output of which in turn is measured by a microammeter. The light intensity is adjusted to give an output of 45 microamperes when reflected from a standard silver mirror.

Copper sheets, polished until they gave a reading of 32 microamperes, were found after zinc plating by the new process to give a reading of 41 to 42 microamperes. This reading could not be increased by bright dipping. Other bright zinc deposits which depended upon a bright dip for their brilliance gave readings of 15 to 17 microamperes undipped and 35 microamperes bright dipped. For

purposes of comparison bright nickel and bright chromium deposits have been measured under the same conditions and each gave a reading of approximately 34 microamperes.

Another advantage of the unusually bright surface produced by this process is its resistance to darkening or tarnishing upon handling or exposure as compared with deposits of lower brilliance. This combined with the fact that zinc is at least as corrosion resistant as cadmium and under many conditions is superior to it promises much for the future of this process.

## Announces New Line of Industrial Finishes

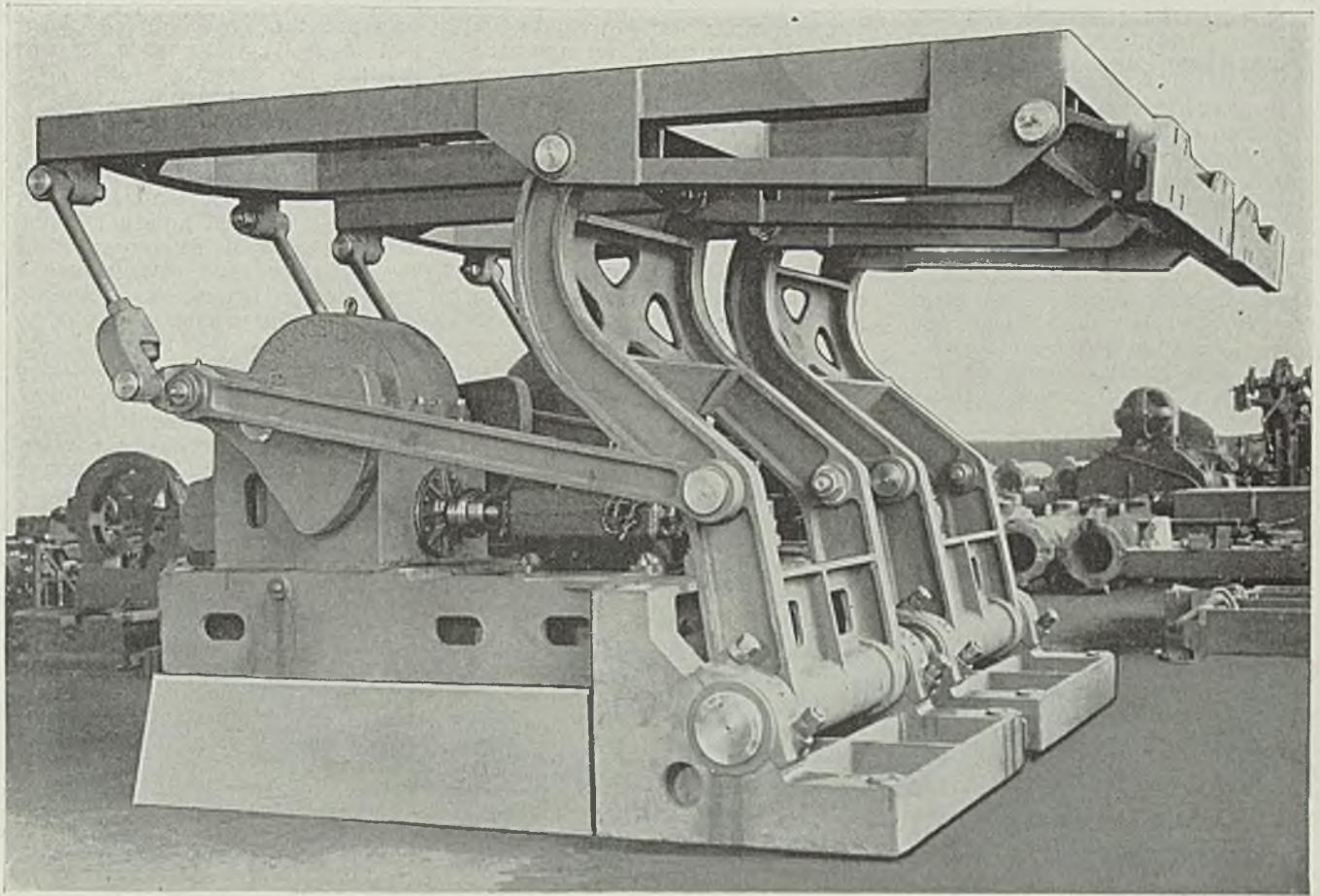
Announcement is made of a new line of industrial finishes offered by Everseal Mfg. Co., Inc., New York. These finishes, known as FWB-Everseal industrial finishes, were developed by this company's technical department in co-operation with the research department of Bakelite Corp., New York. They include abrasion resistant floor finishes, interior finishes, heat resistant aluminum finishes and many others. Information regarding specially formulated finishes may be obtained by writing to this company.

## Lacquers Are Designed for Electrical Equipment Use

A new line of clear and pigmented air-drying lacquers, especially designed for finishing electrical equipment and other products normally subjected to elevated temperatures, has been developed by Maas & Waldstein Co., Newark, N. J.

These new finishes, known as Durheat lacquers, are said to retain their flexibility, color, and adhesion indefinitely at temperatures up to 300° F. They are finding application for direct and indirect lighting fixtures, lamp enclosures, radiant heaters, electric signs subjected to heat, electric ranges, ovens, and similar equipment.

Durheat lacquers are supplied in clear, black, white, and all colors, and can be applied by either dipping or spraying. They can be applied directly to any metal except polished chromium. When used on the latter metal, the surfaces to be finished are first covered with a baked coat of Chromprime.



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Our large iron foundry making castings up to 100,000 lbs. is equipped to handle orders for parts or complete units to your specifications. We specialize in Alloy Irons, many of which were developed by us and are known as Paralloy. This embraces Nickel, Chrome and Molybdenum Alloys with a proper base mixture to secure consistent results, deliver high strength, improved toughness, maximum machinable hardness, and ready response to heat treatment. Special advantages are gained for forming dies or other castings that require resistance to abrasion.

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## Publishes Handbook on Vanadium Steels and Irons

To provide a complete review and reference source for chemical compositions, physical properties, heat treatments, recommended applications and fabricating procedure of all irons and steels in which vanadium is an alloying element, the Vanadium Corp. of America, New York, announces publication of a metallurgical handbook under the title, "Vanadium Steels and Irons."

This new handbook contains 189 pages, is bound in flexible leather-

ette and is illustrated with 71 photomicrographs and 178 charts and tables. Comprising an up-to-the-minute economic analysis of the place of alloy steels for structural applications, as well as for highly-stressed parts, the volume will be of particular interest to those engaged in fabrication and design.

Structural steels for light and heavy sections, S.A.E. alloy and related high-test steels, spring steels, cast steels, tool steels and nitriding steels are treated comprehensively with complete data on physical properties and heat treatment. In each case, conditions under which

most favorable service results can be expected are specifically outlined and suggestions are made for correlating the choice of alloy steel and its heat treatment with the fabricating procedure to be used.

The many charts and tables are based on latest authentic tests and analyses—an important point in view of the recent progress in the art. Bibliographic references under each chapter head also include a great deal of new work. A special chapter of the volume is devoted to consideration of high-test alloy cast irons, a field in which considerable progress has been made recently.

The index is particularly complete; in addition to direct references to particular alloy steels and their properties, it permits a rapid reference by application headings to the desirable alloy steels and recommended heat treatment.

Price of the volume is \$1.25, but it is available without charge to executives and engineers actually engaged in using or specifying alloy steels and irons who request it on their business letterheads. Requests should be addressed to the Vanadium Corp. of America, 420 Lexington avenue, New York.

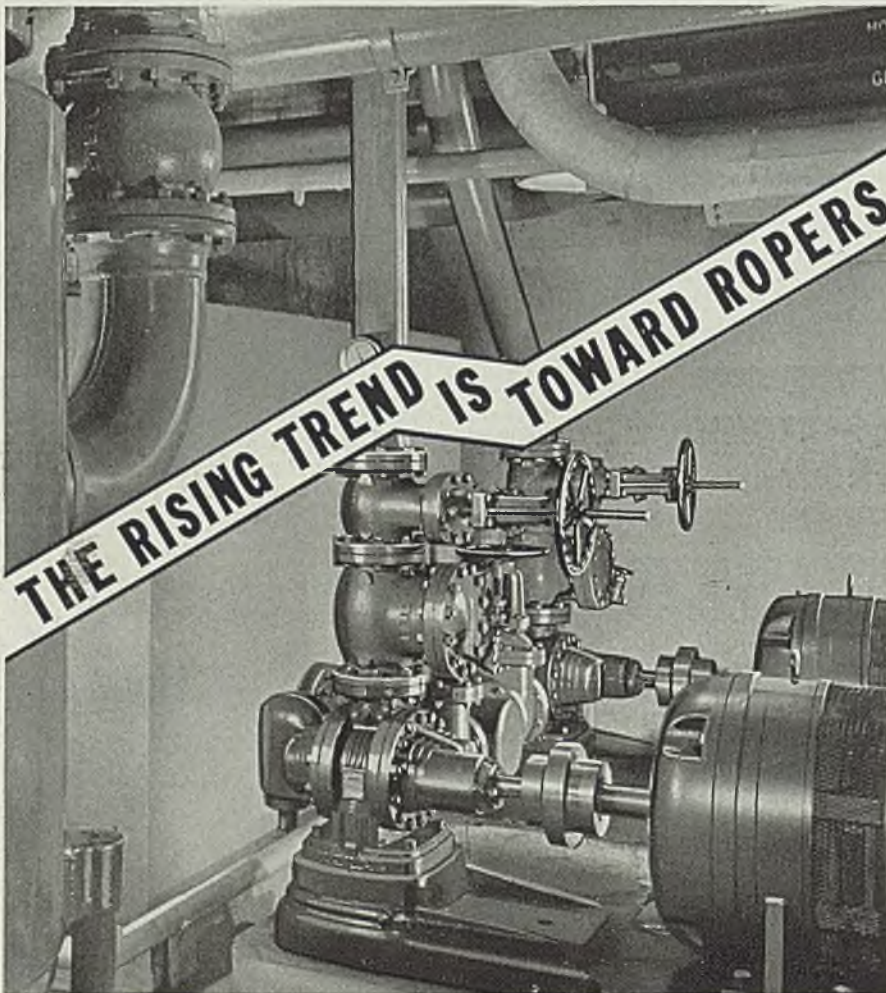
## Use Gas Welded Pipe for Knockdown Scaffolding

*(Concluded from Page 46)*

pounds was carried on the end posts of the frame before serious bending of the columns developed.

Advantages of this type of scaffold are obvious. Superior strength and rigidity not only give workmen a feeling of security that is reflected in increased efficiency, but also remove possibility of failure. There is no fire hazard. Parts are easily and quickly assembled and dismantled and require only a minimum of storage space. There is no deterioration of the material in this scaffolding. The Uecker company, with distributors in leading cities, rents its scaffold, thereby enabling the contractor to reduce his capital investment and to figure his costs on each job more accurately.

This scaffold also is sold and is being employed extensively on and in public and office buildings and stores for periodic cleaning, painting, etc. Recommendations of safety engineers of industrial plants also have resulted in growing adoption of the scaffold as standard safety equipment for various types of interior work. Safway scaffold is covered by United States patent 2,043,498, with similar claims allowed in Canada. Besides this basic patent other patents are pending in the United States, Canada and England.



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Important mill installations have become common—but NOT standardized. Each has its own problems. It is significant therefore that Roper Rotary Pumps, by their universal selection, should assume the status of a STANDARD equipment in so many SPECIAL installations.

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# Electroplaters Review

## Technical Progress at Twenty-Fifth Convention

**N**EARLY 550 members of the American Electro-Platers' society gathered at Hotel Pennsylvania, New York, June 14-17 for the Silver Jubilee convention of the organization. Platers from all parts of the country evidenced the most interest in years in the full four-day program which dealt with both the practical and purely scientific aspects of plating both ferrous and nonferrous metals.

### Over 200 Members Added

One of the principal highlights of the first session, opened by General Chairman Franklyn J. MacStoker of the Medal Art Co., New York, was an address by Charles H. Proctor, president of the Proctor Chemical Co., Clearwater, Fla., and original founder of the society. Mr. Proctor declared that solution of metal protection problems has not been reached and that the society should conduct its own research rather than depend so much on outside development work. E. Steen Thompson, society president and superintendent, finishing department, Hay Mfg. Co., Erie, Pa., declared in his presidential address that more than 200 members had been added in the past year and that the society faced the brightest future in its history. President Thompson, incidentally, used the same gavel with which the first convention was opened twenty-five years ago.

At the first afternoon's session headed by George G. Hogaboom, engineer, Hanson-Van Winkle-Munning Co., Matawan, N. J., Dr. William Blum of the national bureau of standards outlined the results of exposure tests of plated coatings on copper, brass, zinc and die-castings. As a result of these tests started in the spring of 1936, Dr. Blum has reached

the following tentative conclusions with regard to plated coatings:

1—Chromium coatings with no undercoat of nickel furnish very little protection.

2—On all base metals, the protective value increases with the thickness of nickel.

3—Relatively thin nickel coatings furnish more protection on brass than on zinc or steel. This is consistent with the customary practice of using less nickel on brass than on zinc for steel.

4—About the same protective action is furnished by a given thickness on zinc and on steel.

Dr. Blum is chairman of the Joint Committee on exposure tests of plating on nonferrous metals of the American Electro-Platers' society and the American Society for Testing Materials. The committee plans to extend its work and will expose new specimens in the spring of 1938. Various methods of preparation will be employed, especially on die-castings.

### Color Studies Made

During the past several years, exposure trials of electro-plated coatings on both steel and nonferrous metals have been conducted by the two societies and the bureau of standards. The results have been expressed in terms of numerical ratings assigned by members and associates of the inspection committee. While these results have been surprisingly concordant and consistent, they do not furnish a permanent objective record of the appearance. However, color photographs have been found to yield a satisfactory record of the color and appearance of any defects observable to the eye, such as cracks, blisters, peeling, tarnish and localized corrosion. The

chief limitation of this procedure is that mirror-bright surfaces, such as chromium plated finishes, record whatever color is reflected in them, for example, a blue sky. This difficulty may be overcome, however, by surrounding the specimens with translucent material or employing polarized light. This has been determined in work conducted by C. E. Vincent-Davies, of the R. & H. Chemical Department, E. I. du Pont de Nemours & Co., in cooperation with the bureau.

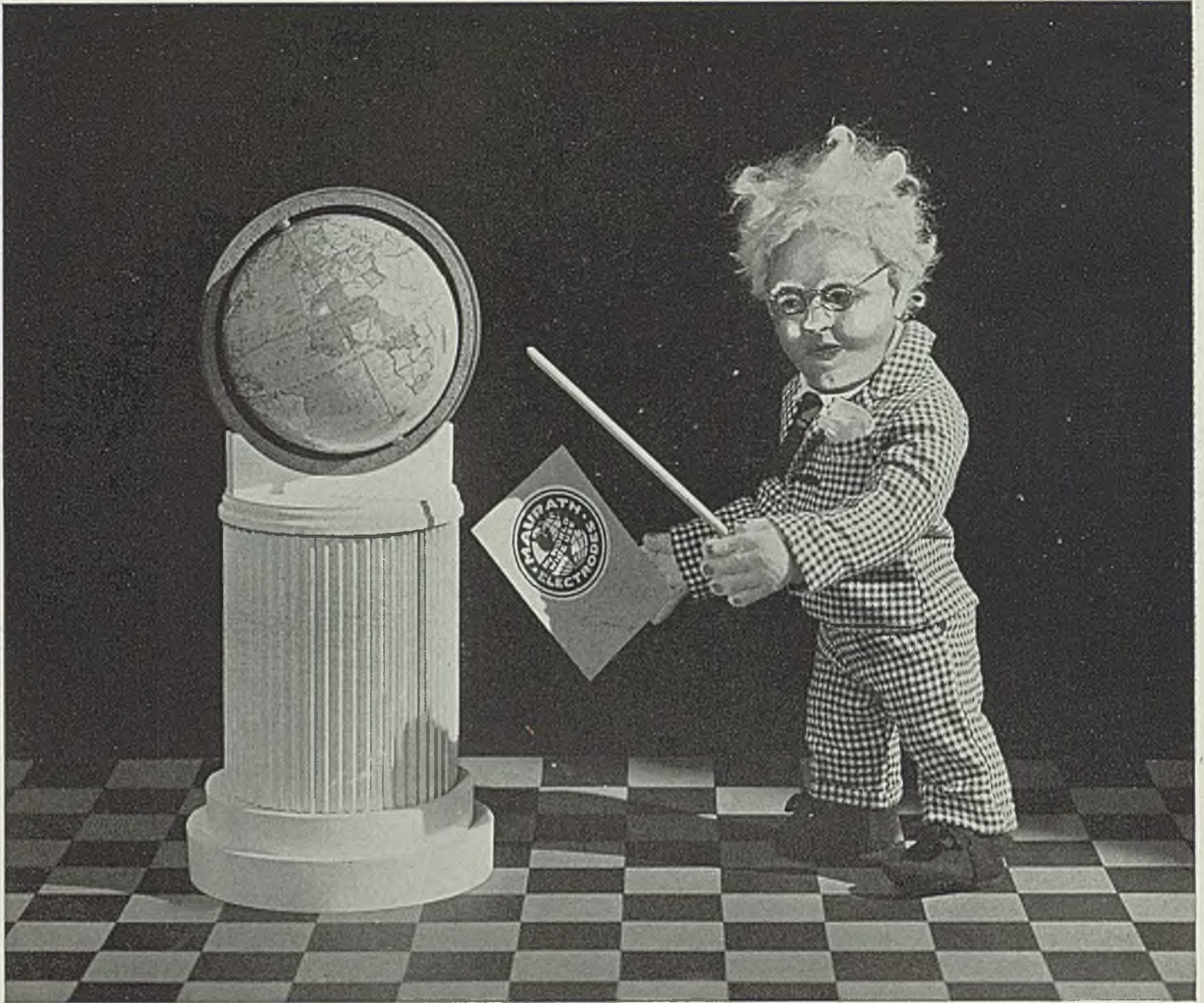
A new development of interest both to platers and users of plated products is the perfection of a new machine which will be marketed shortly for determining thickness of nickel coatings on non-magnetic metals. This machine employs the principle of magnetic attraction and is said to mark a vast improvement over present stripping methods in that it is not necessary to remove the coating and far less time is required. The operation of the machine was explained by Albert Brenner, also associated with the bureau of standards. Work now is under way on the development of a machine which will measure coatings on iron and steel and other magnetic materials.

### European Practice Described

Particularly interesting also was a talk by Walter R. Meyer, electrochemist, General Electric Co., Bridgeport, Conn. Mr. Meyer recently returned from Europe where he attended the first international electro-deposition conference, at which were represented technical experts from all principal European countries as well as the United States. Mr. Meyer found that wages prevailing in England and Germany were about one-third those in the United States and that the trend in working hours is upward, particularly in the former country. Seventy per cent of the work in Germany is going into armaments. Bright nickel plating is fairly widely used in England. No bright cadmium plating has been done in Europe so far since it is claimed that this coating does not have a corrosion resistance comparable with that of dull plating. Mr. Meyer found no bright zinc or tin plating in commercial use.

Germany is particularly short on nickel and is using anodized aluminum as a substitute in increasing amounts. Plants in that country are now able to reproduce photographs with extreme detail on anodized aluminum by dipping in silver nitrate. Increasing use of plated non-metallic materials, such as bakelite, is noted. The use of rectifiers in place of generator sets is becoming more general. According to one leading manufacturer of plating equipment in this country, some installa-

*(Please turn to Page 78)*



## Whitey Sez:

*"Spinning the globe in search of a spot untouched by a MAURATH product is like contacting the box-office for a 'first-nighter' — the choice locations have all been sold."*

MAURATH, INC., CLEVELAND  
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# WELDING, ETC.

BY ROBERT E. KINKEAD

## Design Is Result of Ten Million Years Experience

**A**CLEVELAND structural steel fabricator, the Austin Co., displays at its fabricating plant full size models of "tree-form" columns of welded construction. The design is the result of a serious study of how to build a more useful building at a lower cost. Of all of the hundreds of designers who have seen these columns none has expressed the slightest disagreement with the result although the columns have little in common with conventionally designed columns.

There appears to be a larger significance in this excellent achievement to the many men in the country who are struggling with problems of welded steel design.

1. Reversion to "tree-form" in place of handbook design is a somewhat belated recognition of the previously stated belief that Nature, in ten million years of experimentation with growing trees to resist stresses, is an authoritative source of information on the subject.

2. Designing to "use welding" is about the most futile undertaking in the world. Design to build a better building with less waste and lower cost leads to the correct solution.

3. Design to use "available structural shapes" is a convenient way of escaping the labor of fundamental design but an admission that one is not trying to do a "real job" but wishes to follow along and let the other fellow do the thinking.

## Welding vs. Casting

**A** CONSIDERABLE number of heavy machinery builders are confronted with the problem of deciding whether to extend their capacity to produce steel castings or to install machinery and equipment for the manufacture of welded steel assemblies to be used in the place of steel castings. The solution would not be so difficult to find if all parts could be made by either steel castings or welded assemblies.

As a matter of experience, some parts can be made of steel castings at far less cost than any conceivable welded assembly and others for which nothing but welded steel

**I**N 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.

would ever be used. The problem then becomes one of whether to make the welded jobs and buy the castings, or vice versa. The fact that deliveries of rolled steel and steel castings have lengthened out to a punishing degree also has a bearing on the subject.

There is no general basis of comparison by which the relative cost of a welding shop and a steel foundry can be stated. This relative cost depends entirely on the nature of the work. Thus a welding shop to produce 5000 tons of welded steel assemblies might cost one-fourth as much as a steel foundry to produce 5000 tons of castings per year. In other cases, centrifugal pump casings for instance, the welding shop would probably cost ten times as much as the steel foundry for the same output.

♦ ♦ ♦

## Argue Problem of Peening

**T**HE act of peening weld metal deposited by gas or arc welding is subject to wide controversy. Many say that no peening should ever be done. Most shops do a good deal.

Peening weld metal to relieve re-

sidual stresses from welding is an attempt to take advantage of a valuable property of steel. Under sufficient stress, steel becomes plastic and flows; but when the stress is removed, it again has an elastic range of deformation. During the period of plasticity it is a demonstrable fact that residual stresses are reduced.

Thus, a weld bead may be applied on one side of a steel plate to produce a residual stress just below the yield point of the plate. The plate will warp into a shape in which the side on which the bead was applied is concave to the observer. A relatively small amount of peening of the weld bead and adjacent metal will remove the residual stresses by plastic flow and the plate will return to its original shape before welding. From this simple demonstration of the principles to complicated peening operations involving use of strain gages, etc., is a long step.

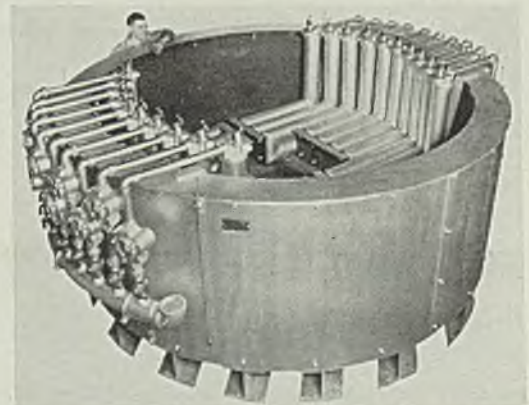
Much controversy revolves around the question of how much peening can be done without damage to the metal. Working on soft steel and peening not only weld metal but adjacent metal, the judgment of anyone experienced in the art may be trusted. Anyone around a metal-working shop would know that metal peened to a brilliant silvery finish is damaged. But even with such damage, it will be corrected if another layer of weld metal is to be applied to it. It is only on the top layer of a weld that permanent damage can be left on the job by peening.

The object of peening is to produce plastic flow. When that is accomplished, no further peening should be done. But between that point and real damage to the metal is a broad margin and it takes a great deal of hard and unnecessary work actually to produce the damage.

As is the case in most controversies, the broad field of useful knowledge lies between the two extremes of argument.

## Melts Mass of Lead

All steel, welded is this 120,000 pound capacity lead melting unit built by C. M. Kemp Mfg. Co., Baltimore, Md., for the Goodyear Tire & Rubber Co., Akron, O. To be used in casting lead billets for the hose sheathing department, unit is 9½ feet in diameter, 3 feet deep and uses natural gas to melt lead at a rate of 60,000 pounds an hour



## Announces Conference on Metal Fatigue and Creep

Massachusetts Institute of Technology, Cambridge, Mass., has completed its program for a special summer conference on fatigue and creep of metals to be held at the institute, July 15-16, as a conclusion to a 4-week course on strength of materials beginning June 21. The course and conference are being directed by Prof. J. M. Lessells, department of mechanical engineering. He will be assisted by Professors I. H.

Cowdrey, C. W. MacGregor, R. W. Vose, and a number of special lecturers.

The program for the conference on fatigue and creep of metals is as follows:

Thursday, July 15

MORNING  
*Creep*

"Introductory Paper," by H. J. French, International Nickel Co. Inc., New York.

"Theory of Creep," by A. Nadal, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Problems of Turbine Industry," by C. R.

Soderberg, Westinghouse Electric & Mfg. Co., Philadelphia.

AFTERNOON  
*Fatigue*

"European Developments," by H. J. Gough, National Physical Laboratory, Teddington, England.

"Corrosion Fatigue," by D. J. McAdam Jr., bureau of standards, Washington.

"Light Alloys," by R. L. Templin, Aluminum Co. of America, New Kensington, Pa.

"Structural Problems," by A. V. Karpov, chairman, A.S.C.E. committee on fundamentals controlling structural design.

Friday, July 16

MORNING  
*Creep*

"Problems of Turbine Industry," by E. L. Roblson, General Electric Co., Schenectady, N. Y.

"Problems of Valve Industry," by J. J. Kanter, Crane Co., Chicago.

"Problems of Oil Equipment Industry," by T. McLean Jasper, A. O. Smith Corp., Milwaukee, and A. B. Kinzel, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

AFTERNOON  
*Fatigue*

"United States Developments," by H. F. Moore, University of Illinois, Urbana, Ill.

"Problems of Electric Industry," by R. E. Peterson, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Problems of Railroad Industry," by R. W. Clyne, American Steel Foundries, Chicago.

"Problems of Aircraft Industry," by K. Arnstein, Goodyear-Zeppelin Corp., Akron, O.

## Electroplaters Review Technical Progress

(Concluded from Page 75)

tions of similar equipment already have been made here but that it is not considered practical where current load exceeds 10,000 amperes.

Particularly active discussions followed the presentation of all the papers. A paper on barrel electroplating read by Albert Hirsch, electroplater and chemist, Carey McFall Co., Philadelphia, Pa., recounting results of a series of experiments resulted in unusual comment from the audience. Among other things, it was found that the use of rubber-lined barrels proved more efficient than lead-lined. Included on the program was a paper on lacquers by Leo Roon, technical director, Roxalin Flexible Lacquer Co., N. Y.

Platers at the convention expressed the opinion that bright zinc plating would continue to make strong headway in competition with cadmium. It also was felt that the magnetic wheel method of dipping parts to be plated, now widely used abroad, would not find general acceptance here since it does not turn out a quantity of work comparable with the continuous processes now growing in favor here.



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Electric Storage  
Battery

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Combination  
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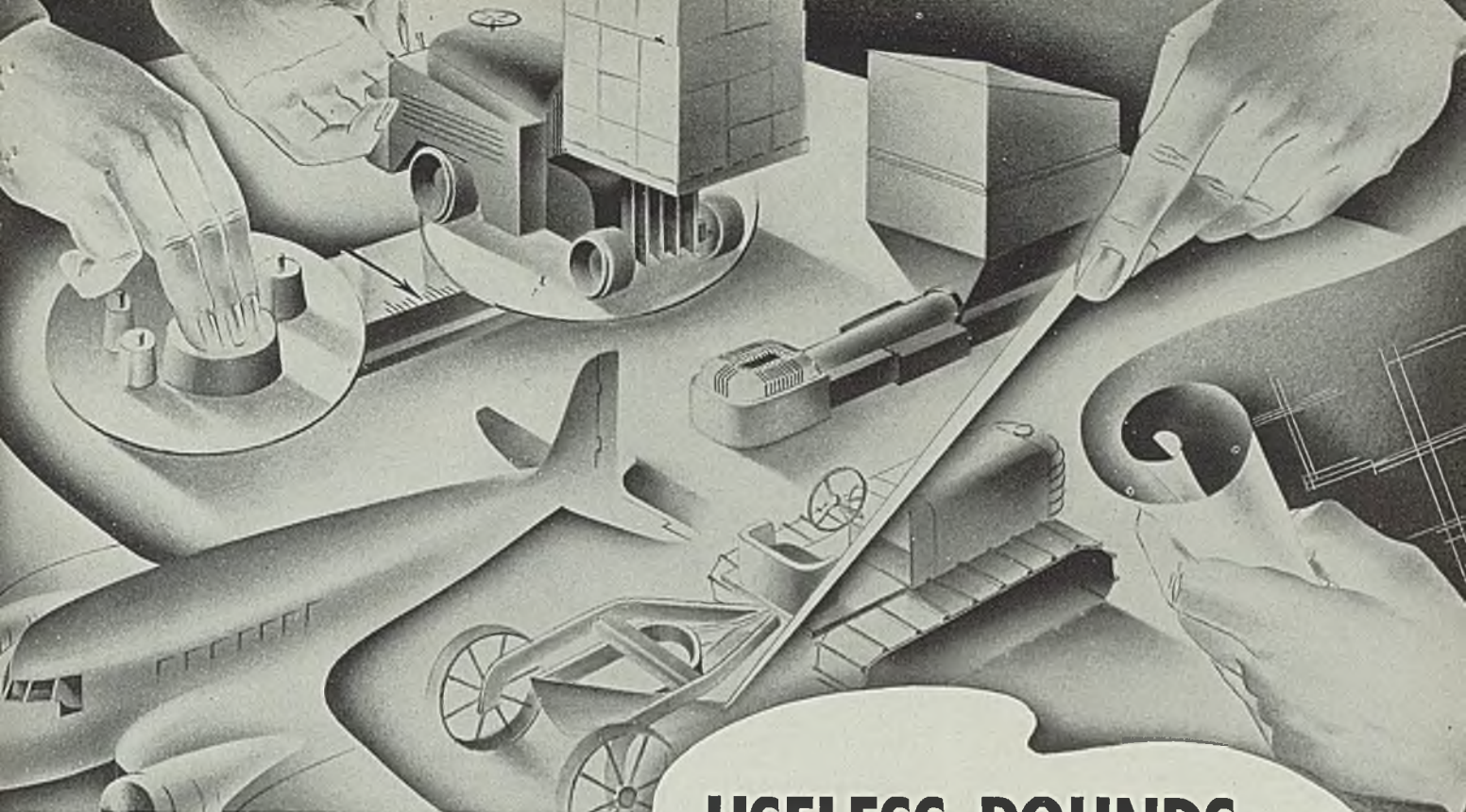
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*This identifies members of the Association*

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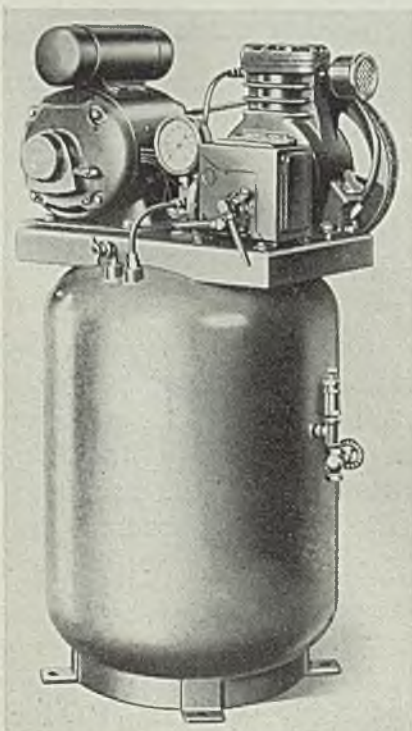
605 Hanna Building • Cleveland, Ohio

# NEW EQUIPMENT



## Air Compressors—

Ingersoll-Rand Co., Phillipsburg, N. J., has announced a new line of compact, air compressors in  $\frac{1}{4}$  and  $\frac{1}{2}$  horsepower sizes with automatic start and stop control, new style seamless steel tank and an improved check valve. For single phase current they are equipped with a brushless capacitor-type motor and a built-in, automatic protection switch giving overload and under-voltage protection. Rated for 150 pounds per square inch maximum pressure, they may be set for lower pressures or may be equipped with a reducing valve for still lower pressures. The  $\frac{1}{4}$  and  $\frac{1}{2}$  horsepower units are available on a 2.4 cubic foot tank, while the  $\frac{1}{2}$  horsepower size is also available on a 4.6 cubic foot tank in either horizontal or vertical mounting.



Ingersoll-Rand air compressor made in fractional horsepower sizes with seamless steel tank

Units can also be furnished less the tank. ♦ ♦ ♦

## Air Heater—

James Campbell Smith, Inc., Cleveland, is manufacturing an automatic, coal-fired air heater designed for both oven or process use and factory space heating. Clean in operation and with smoke virtually abolished, the unit consists of a combustion chamber to which coal is fed by a stoker on automatic control. Heat exchanger is similar to the oil and gas fired types used for many years by automobile companies in paint drying ovens. All equipment required for the heater is above ground and separate combustion chambers and ash pits are not needed as all are an integral part of the Smith unit. Ruggedly built for permanent installations, the self-contained heater is of the underfeed worm type. One motor, thermostat-controlled, drives both the fan for supplying air for combustion and the worm feed.

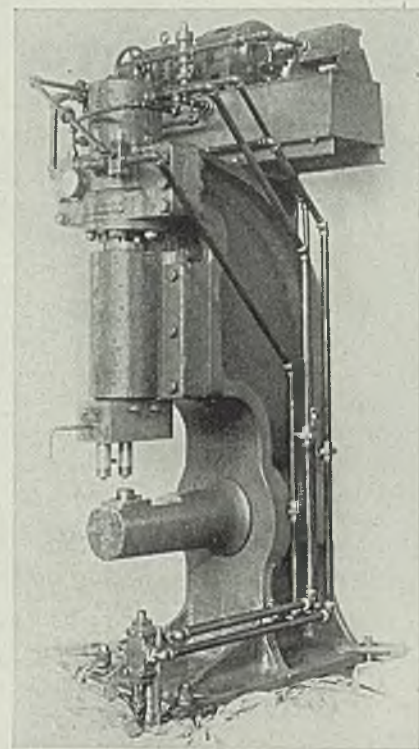
## Lathe Overarm—

Seneca Falls Machine Co., Seneca Falls, N. Y., has announced that a third slide or overarm is available as a standard attachment for any of its new style Lo-Swing Imp lathes. Operation of the third slide is synchronized with the other turning and facing slides and is entirely automatic. It may be used for taking a finishing cut after roughing with tools on the rear slide or for chamfering and similar operations. Slide is also heavy enough to be used for roughing. Operation is by means of a cam on the main camshaft and cam can be quickly set so the third slide may be timed to suit the particular job. ♦ ♦ ♦

## Boiler Spud Press—

Chambersburg Engineering Co., Chambersburg, Pa., is manufacturing a hydraulic press for inserting and closing  $\frac{3}{4}$ -inch and 1 inch boiler

spuds in two operations on 12-inch to 24-inch diameter boilers, 20 inches from end of shell to centerline spud. The 75-ton press is of downward acting plunger type with cast steel



Chambersburg press inserts and closes 1 inch boiler spuds in two operations totalling 6.7 seconds

frame. Pressing member is one piston, double acting type. In the first operation press has  $1\frac{1}{4}$ -inch closing stroke,  $\frac{1}{4}$ -inch pressing stroke, one second ram dwell and  $1\frac{1}{2}$ -inch return stroke. In second operation it has a  $1\frac{3}{8}$ -inch closing stroke,  $\frac{1}{8}$ -inch pressing stroke, one second ram dwell and  $1\frac{1}{2}$ -inch return stroke. Both operations are performed in 6.7 seconds. Mounted above press is Northern hydraulic pump and 5 horsepower motor. Control is a hand operated valve conveniently located and provided with positive

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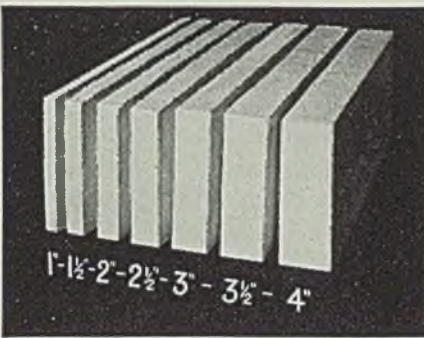
Hence . . . Superex has definitely proved itself the most efficient and economical block insulation for high-temperature industrial equipment. Safely withstanding all temperatures up to 1900° F., these blocks retain their high insulating effectiveness even under severe service conditions.

You will find Superex especially well adapted for the insulation of slab-heating, annealing and all types of controlled-atmosphere furnaces, producer-gas mains, hot-blast stoves, open hearths and regenerators, and soaking pits.

Engineering data sheets on Superex Blocks, Sil-O-Cel Brick and other Johns-Manville Insulations for high-temperature equipment may be had by addressing Johns-Manville, 22 E. 40th St., N. Y. C.



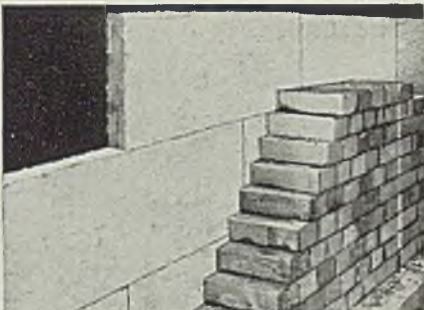
**SAFE AT HIGH TEMPERATURES.** Selected, calcined diatomaceous silica, blended and bonded with asbestos fibre, gives Superex unusual heat resistance. Safe at 1900° F. Stands up under severe service.



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For every temperature  
condition from 400° F. below  
zero to 3000° F. above

automatic control of upward travel of ram so that ram may be operated up or down over any part of the stroke.

• • •

#### Belt Sander—

American Floor Surfacing Machine Co., Toledo, O., has announced a new portable, electrically-driven, belt sander adaptable for use in metal finishing. New unit is manufactured in two models, one of which is equipped with a built-in dust collecting system. Abrasive belt is 3 x 25 inches with a speed of 820 feet per minute and for metal polishing

operations can be furnished in all grits from finest to coarsest. Motor operates on alternating or direct current, up to and including 60 cycles.

• • •

#### Strapping Tool—

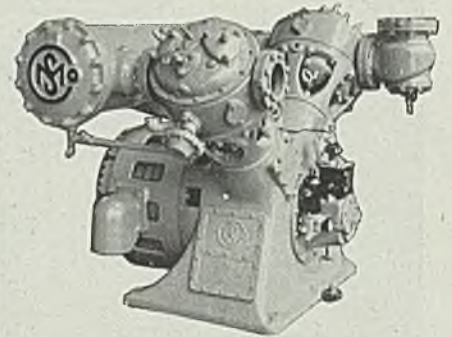
Signode Steel Strapping Co., 2600 North Western avenue, Chicago, is manufacturing a new direct drive stretching tool for tensioning steel strapping around large and heavy packages and bundles. New feature of the hand tool is automatic gripper action controlled at the handle.

When strapping operation is completed, drawing back the handle automatically releases the drawing and holding pawls, freeing the windlass, releasing strap gripper and leaving tool open for next operation.

• • •

#### Industrial Compressor—

Sullivan Machinery Co., Michigan City, Ind., has developed a new gas or air compressor known as the WN-112, available in displacement



New Sullivan compressor is available in four displacement sizes

sizes of 378, 480, 642 or 800 cubic feet per minute. New compressor of advanced design is a continuous heavy duty machine which, although built for any type of drive, reaches its greatest efficiency with built-in motor, thus equipped requiring only 6 x 8 feet of floor space. Vacuum pumps, boosters for steam or gas and low or high pressure machines are available in the new type construction. Compressor is also equipped with "dual-cushion" valves, feature recently perfected by company engineers. Installations of the WN-112 are easily made at any convenient point where electric power and running water are available.

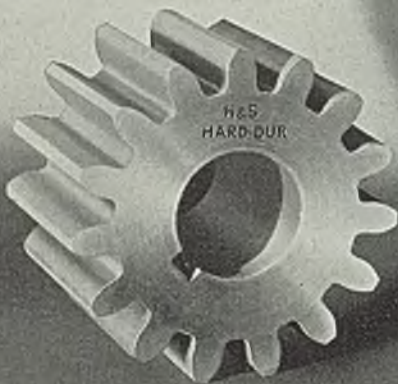
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#### Bus Support—

Delta-Star Electric Co., 2400 Fulton street, Chicago, is manufacturing a 12,000 ampere, 3-phase bus support. Designed for steel mill service, unit is self-contained, is 75 inches long and supports six hollow square, ventilated, 6-inch copper conductors on a short 220 volt switchboard bus. Clamps have rollers permitting bus expansion without stressing the porcelain insulators. All metal parts are nonferrous, preventing eddy current losses and heating. Interphase and end insulators are maintained in compression by means of three pipes threaded into the end plates. Designed to resist heavy short circuit

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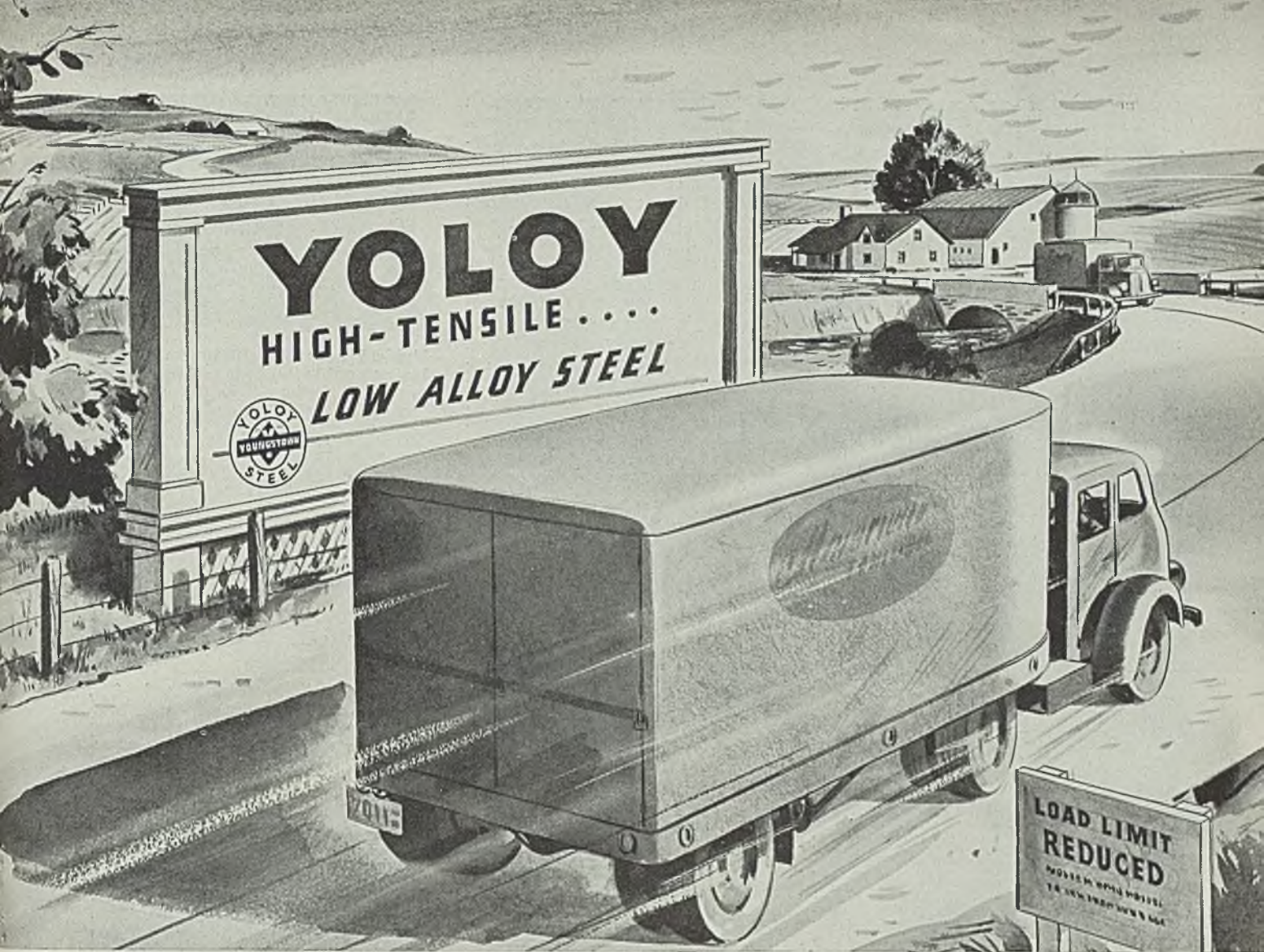
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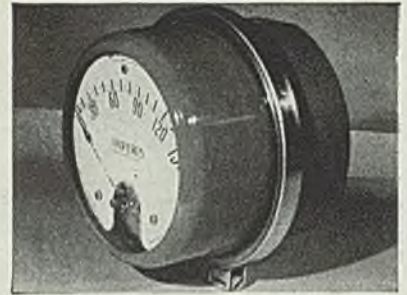
stresses, support has insulators rated 7.5 kilovolts.

• • •

**Plug-In Instruments—**

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced detachable instruments for general industrial use whose sockets may be cut into the conduit run feeding a motor or grouped in standard metal boxes to constitute a panel assembly. Instruments consist of a socket or mounting device provided with electrical connection jaws and an instrument mechanism mounted on a

plate having electrical connection blades on the back and enclosed in a waterproof housing of glass. Instrument unit is arranged to be plugged into socket automatically completing all electrical connections between the jaws in the socket and the blades on the instrument. The two units are then sealed together with a tamperproof sealing ring. Advantages of the new plug-in instruments include elimination of costly panels, wiring and mounting details and enable various instruments to be plugged in the same socket to obtain volts, amperes, watts, power factor, kilowatt hours or other readings. Instruments are



Typical new Westinghouse plug-in instrument is the type EA detachable ammeter fastened in its weather-proof socket by sealing ring

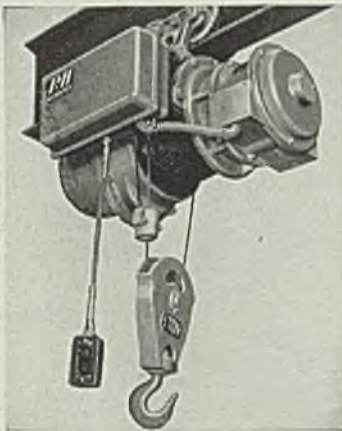
available for a wide variety of requirements and currents, and, because of their plug-in construction, are readily installed singly or in panel groups.

• • •

**Pump Units—**

Sundstrand Machine Tool Co., Rockford, Ill., has introduced a new line of pump units, known as WX models, designed for arbor presses, clamping fixtures, indexing devices, clutches and brakes. Quick action for the approach and return of a ram or clamping member is taken care of by a large capacity Sundstrand Rota-Roll pump, with a smaller pump of the same type producing the clamping or working pressure. Output of the smaller pump only is by-passed against the working pressure. Both pumps as well as control valves are contained in one housing and operated by a remote pilot valve, automatically or manually controlled. Mounted on the same shaft, both pumps are driven at 1200 revolutions per minute. The new units are available in several sizes supplied with either foot or flange mounting, while an oil reservoir with motor base for attaching a foot mounted unit can also be fur-

*These* **7 INTERCHANGEABLE MOUNTINGS**



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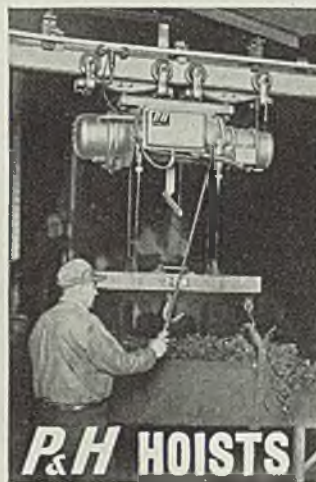
Through modern, simplified design, P&H Hoists are available with interchangeable mountings to meet all sorts of material handling applications. This feature makes it possible to change from one type of service to another at a minimum of time and expense. Check into the other money-saving features P&H Hoists offer you.

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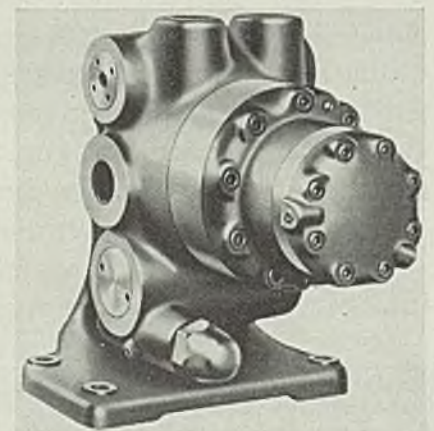
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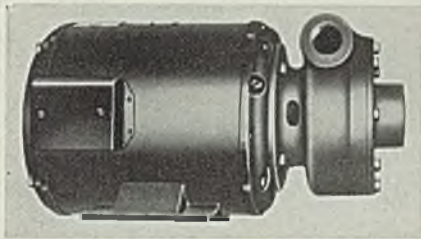
New Sundstrand unit has both pumps and control valves in one housing

nished, together with any desired type of remote pilot valve.

♦ ♦ ♦

#### Coolant Pump—

Pioneer Engineering & Mfg. Co., 31 Melbourne avenue, Detroit, has announced the Pioneer horizontal pump for coolants and lubricants, a new unit of the open impeller type directly connected to a full ball bearing, long hour, moisture-proof motor. Designed for higher efficiencies and higher heads than conventional coolant or lubricant pumps, the Pioneer, due to special bearing design, will function as well in a vertical as in a horizontal position. Instead of a conventional packing gland, a special mechanical seal is used at the shaft opening, which permits shortening distance between pump bearing and impeller by from 4 to 10 inches and makes the installation more compact. Shaft whip is also prevented, while shaft friction and its resultant power and heat losses, as well as need for periodic repacking, are eliminated. Unit operates at normal motor speeds, no speed reduction being



Due to special bearing design, the new Pioneer coolant pump gives equal performance either vertically or horizontally

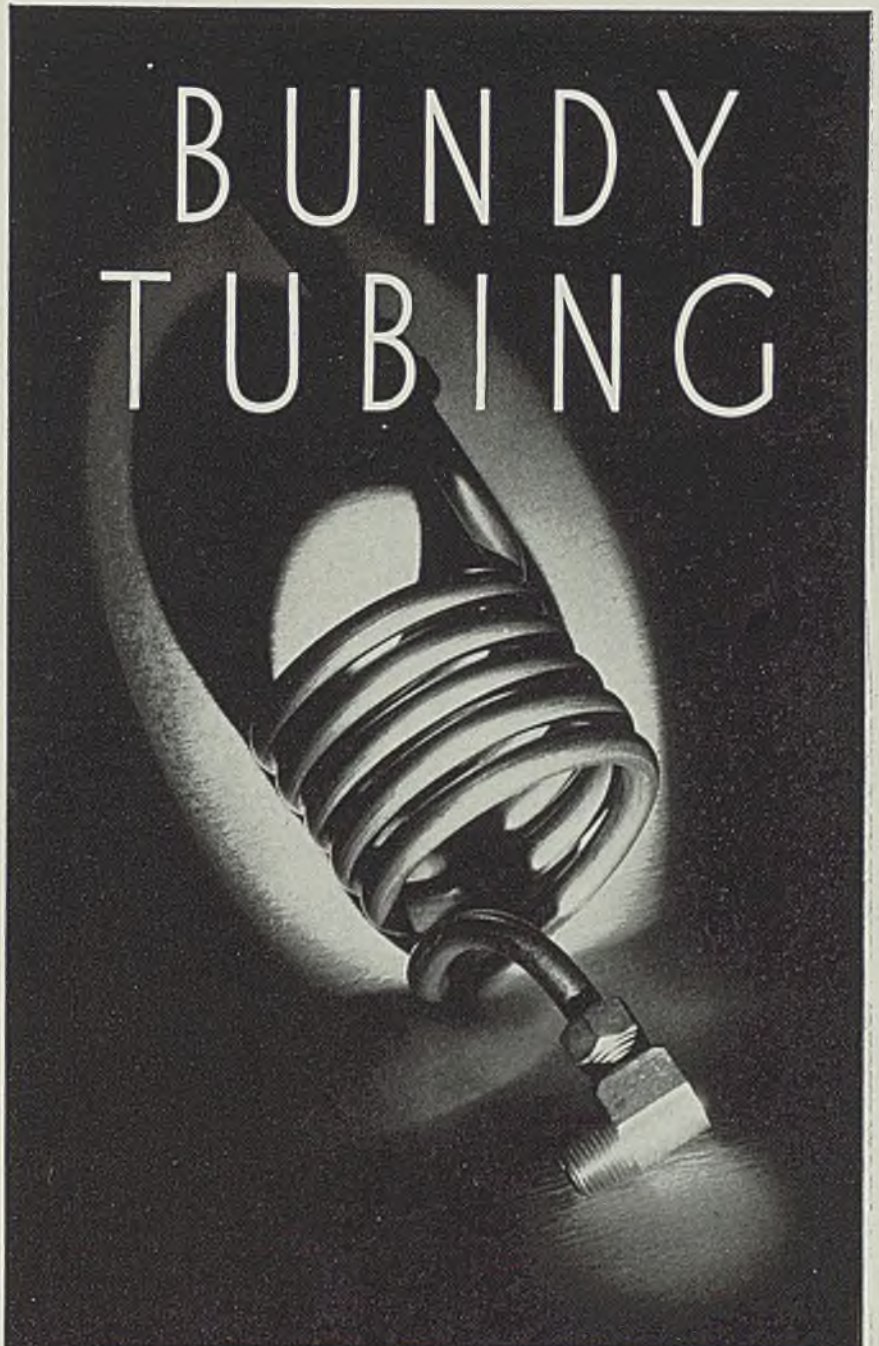
necessary unless highly viscous liquids are encountered. Single, two or three-phase motors are available with the pump.

♦ ♦ ♦

#### Push-Button Station—

General Electric Co., Schenectady, N. Y., has developed a new treadle-operated, watertight, push-button station, the type CR2940-2A18, for installations where an operator must have both hands free while starting or stopping his machine, and particularly suitable for use in damp or wet locations. Available with either single or double action treadle, the enclosing parts of the station, case and cover, are made of cast iron, and a cast iron foot pedal is built into the cover. Pedal, which operates a standard G-E heavy duty type, push button unit mounted inside the case, is provided with stops to limit its travel in either direction

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Bundyweld Tubing is rolled from copper-coated steel. Its double-walled construction provides a tube which combines workable properties with great strength and resistance to vibration fatigue and high temperatures. Its strength has been conclusively proven in many bursting and vibration tests. We will gladly quote from your blue prints or samples.

BUNDY TUBING CO.  
DETROIT

and extreme pressure on the pedal cannot endanger the electrical parts.

♦ ♦ ♦

#### Milling Cutters—

National Twist Drill & Tool Co., Detroit, has developed a line of inserted blade milling cutters known as Adjusto-Lock. Interlock of blade and body is so arranged that the two members must be moved apart before any lateral movement can take place. More than 300 separate anchoring points per square inch of blade surface assure that no shifting takes place while cutters are in

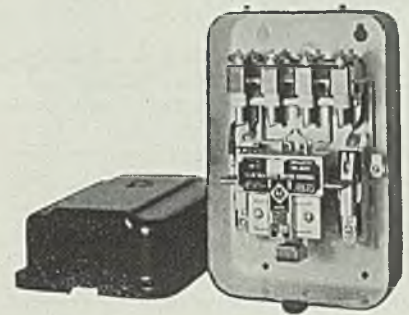
position. Locking wedge holds the blade against its seat in the body. Frictional locking has been done away with. Blades can be adjusted in any direction desired and re-locked as solidly as before.

♦ ♦ ♦

#### Air Motor-Starter—

Allis-Chalmers Mfg. Co., Condit works, Boston, Mass., has brought out a new type of across-the-line air motor-starter known as type AP-7 and equipped with "Ruptors," enclosing chambers which confine and depotentiate the arc formed by

circuit interruption. These chambers increase interrupting ability of the contacts and form an isolating



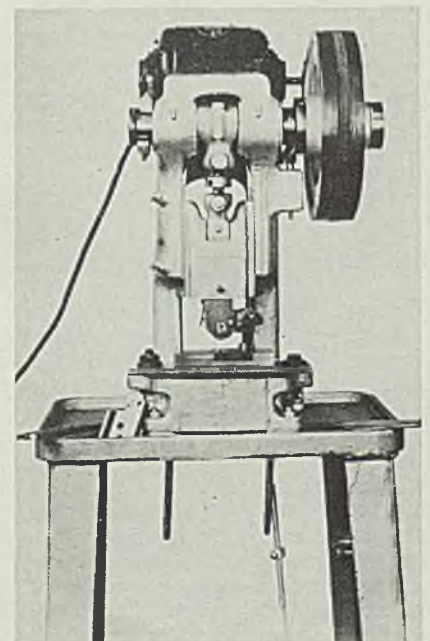
New air motor-starter has "Ruptors" to depotentiate arc formed by current interruption

barrier between contacts of opposite polarity. Other features of the new unit include vertical make-and-break, enclosed temperature overload relays, unit construction, silver double-break contacts accessible and quickly renewable and isolated pilot circuit. The starter is furnished for 7½-horsepower at 440 and 550 volts, 5-horsepower at 220 volts and 3-horsepower at 110 volts.

♦ ♦ ♦

#### Wire Numbering Machine—

Numberall Stamp & Tool Co., Huguenot Park, Staten Island, N. Y., has developed a new unit for use by wire mills and screw manufacturers in making pieces of test wires. Press is driven by a ¼-horsepower motor



Numberall machine automatically stamps numbers on wires from 1/16 to ½-inch in diameter

## INSURE AGAINST RUST

with

# TRAM-O-LENE

in

STEEL MILLS  
MANUFACTURING PLANTS  
STEEL WAREHOUSES

•

Easy to apply  
Spreads evenly and economically  
Prevents Scratching  
Easily removed

•

GIVES REAL PROTECTION  
AT A PRICE YOU CAN AFFORD TO PAY

•

*Write for prices and sample today*

**THE H. A. MONTGOMERY COMPANY**

Main Office: 17191 Swift Ave., Detroit, Mich.  
Refinery Division: P. O. Box 548, Findlay, O.

and has an automatic numbering head which consecutively stamps  $\frac{1}{8}$ -inch figures in a vertical position on wires. Three or four wheels are used which stamp figures up to 999 and to 9999 respectively. Wires from  $\frac{1}{8}$  to  $\frac{1}{2}$ -inch diameter can be rapidly marked, while numbering head can also be furnished to duplicate or triplicate the numbers stamped.

• • •  
**Rubber Pail—**

Udylite Co., Detroit, has introduced an acid resisting, unbreakable rubber pail of seamless construction

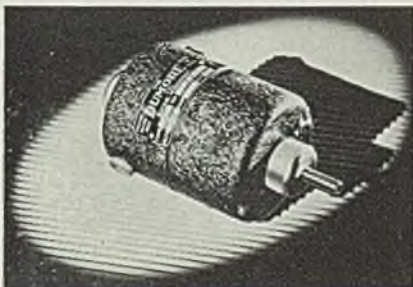


Udylite acid resisting, unbreakable rubber pail holds 12 quarts

and made of virgin latex compounded to give a tensile strength of 4000 pounds per square inch. Reinforced by ribs, it will hold 12 quarts liquid without noticeable bulging, while front side is reinforced with a 6 inch double thick wall. Rigidity is added to top periphery by detachable stainless steel handle. Also having a particularly versatile pouring spout, the pail is flexible and resilient, yet cannot be broken, dented, cracked or chipped.

• • •  
**Fractional Horsepower Motors—**

Dumore Co., Racine, Wis., has announced a new "H" motor available in several types such as ventilated, totally enclosed, sleeve and ball bearing with worm gear speed reduction units. Rugged and compact, the "H" embodies the latest features of modern motor design, is a standard totally-enclosed unit and is rated at 1/50-horsepower at 6500 revolutions per minute for 30-minute duty. Standard open motor, known as "HV," is rated at 1/50-horsepower at 5000 revolutions per minute con-



New Dumore motor is rated at 1/50-horsepower

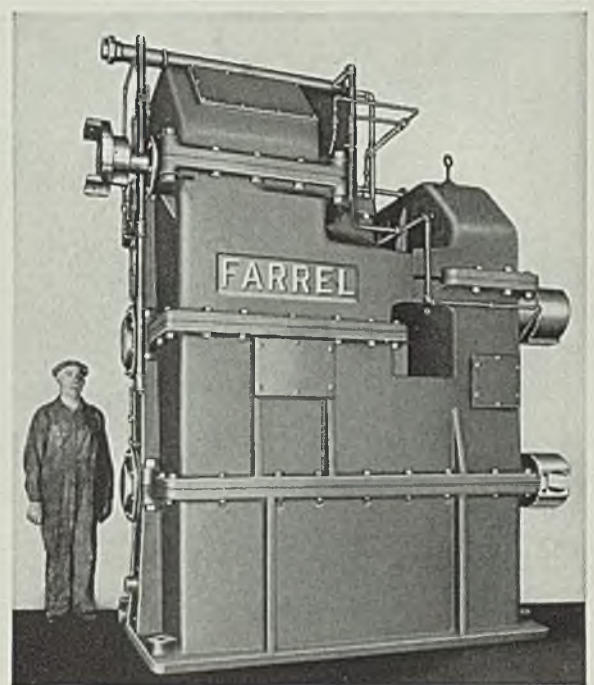
tinuous duty, or 1/55-horsepower at 4000 revolutions per minute for 30-minute duty.

• • •  
**Compressor Control—**

Worthington Pump & Machinery Corp., Harrison, N. J., has introduced, in its new magnetic unloader, an automatic start-and-stop control combined with automatic loading and unloading for motor driven, single-horizontal compressors. This device operates on standard electric equipment and can be installed wherever a conventional automatic

starter is used for controlling the compressor motor, only other provision necessary being a pressure switch to operate the pilot circuit. Pressure switch control is transferred electrically from the motor starter to the magnetic unloader and either position may be selected at will. If connected to motor starter, compressor starts and stops on the demand for air. When connected to magnetic unloader, compressor runs continuously and simply loads and unloads depending upon whether or not air is needed. Water cooling supply can also be automatically controlled.

**SPECIALLY  
 ENGINEERED  
 FOR THE JOB**



Five of these special drives were designed and built by Farrel to drive five stands of forming rolls of an Electric Weld Tube Mill. Each drive transmits 150 H.P. Three pairs of Sykes continuous tooth herringbone gears provide a ratio of 113 to 1. The pinion unit for connecting the drive with the rolls is built integral with the drive.

The gear cases are all cast steel of heavy section for maximum strength and rigidity. All shafts are mounted in anti-friction roller bearings. Gears are process hardened for wear

resistance and long life. The gears are lubricated by built-in sprays and bearings are flood lubricated, oil being supplied to both gears and bearings by a central lubricating system.

The successful operation of drives like these is the result of modern design, modern materials and modern methods of construction, properly combined and applied by engineers and mechanics who have a thorough knowledge of the problems involved. Their extensive experience may be helpful in solving your drive problems.

**FARREL - BIRMINGHAM**  
 Company, Inc.

110 Main St., Ansonia, Conn.—322 Vulcan St., Buffalo, N. Y.

# 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

**Rubber Wear**—Udylite Co., 1651 East Grand boulevard, Detroit. Circular dealing with Udylite acid-resistant rubber gloves, aprons and boots.

**Grinders**—Vonnegut Moulder

Corp., 1815 Madison avenue, Indianapolis, Ind. Catalog covering a long line of heavy-duty grinders and buffers.

**Tools**—Forsberg Mfg. Co., Bridgeport, Conn. Large catalog covering

line of Whale brand and Viking brand saws, saw blades, screwdrivers and other tools.

**Open Joint Checker**—William M. Bailey Co., Magee building, Pittsburgh. Catalog of American open-joint checkers for blast furnace hot blast stoves.

**Bufs and Compositions**—Hanson-Van Winkle-Munning Co., Matawan, N. J. Bulletin No. BC-104, pictures of various types of buffs and compositions and descriptions of their uses.

**Alloy Chart**—Revere Copper & Brass Inc., 230 Park Avenue, New York. Chart, "Chemical and Physical Properties of Revere Alloys," condensing constructive information on a file-sized sheet.

**Broaching Machine**—American Broach & Machine Co. division of Sundstrand Machine Tool Co., Ann Arbor, Mich. Circular describing new type PD pull down hydraulic broaching machine.

**Agitators and Mixers**—Patterson Foundry & Machine Co., East Liverpool, O. Catalog describing and illustrating the Typhoon portable power mixer as well as other types and models of mixers and agitators.

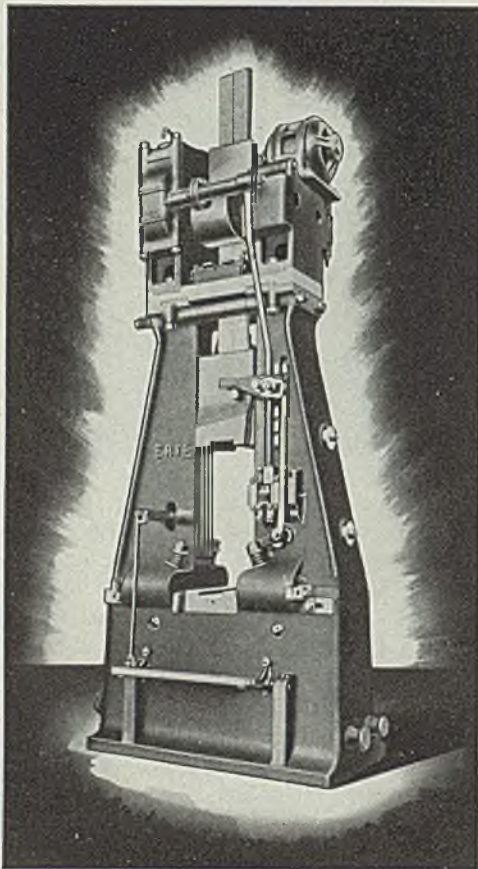
**Road Maintenance**—Caterpillar Tractor Co., Peoria, Ill. Booklet form 4052, covering Caterpillar "Auto Patrol," self-propelling road machines and describing their construction and uses.

**Industrial Furnaces**—W. S. Rockwell Co., 50 Church street, New York. Catalog No. 369, covering Rockwell gas, oil and electric furnaces, with 84 illustrations showing types of furnaces, installations and other equipment of the company's manufacture.

**Steam Turbines**—De Laval Steam Turbine Co., Trenton, N. J.; Pamphlet "Power and Heat Problems Yield to Improved Alloys and Better Design," gives information on how fuel costs in the generation of power may be reduced by 25 to 50 per cent; possible savings with steam at various pressures and temperatures are presented in a table.

**Electrical Equipment**—General Electric Co., Schenectady, N. Y. Booklet GEA-1743B, covering lightning protective equipment for alternating current rotating machines. Booklet GEA-2404A, presenting two-element, single disk watt-hour meters with illustrations of models and installations. Booklet GEA-2503, giving information and illustrations of surface air coolers for turbine-generators. Bulletin GEA-529C describing types TS and QS low speed synchronous motors. Bulletin GEA-2603, announcing a new indoor oil blast circuit breaker. Bulletin GEA-821F, describing pressure and vacuum switches.

## IN THE SPOTLIGHT



Still the center of attraction, spotlighted by the favorable opinion of its users—

**ERIE Type M Board Drop Hammer.**

Self-contained—no belts or line-shaft.

Efficient direct drive.

Cushioned motor mounting.

Heat-treated alloy steel gearing and shafting.

Open hearth steel frames and anvil, with high impact strength and fatigue resistance.

How much can you cut your present costs with this efficient, trouble free machine?

**ERIE FOUNDRY COMPANY**  
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**ERIE**

## MATERIALS HANDLING



### Planned Production Flow Reduces Cost of Handling

(Concluded from Page 50)

for the entrance of other smaller stock stored and handled separately.

The large automatic turret lathe used to cut the bar or tube stock and rough turn it into rings or disks is also set in line with the storage rack at this same angle. A similar switch and "Y" with hoist on a monorail takes the work from the rack and places it in position to feed straight into the lathe.

From this point on the work is placed in steel boxes on skids and handled by hand lift trucks. The longest haul in any case is less than 50 feet.

#### Practice Has Variation

An exception in this routine is made for bars and tubes of about 2½ inches diameter and under. These are turned about 100 degrees as removed from the car and go to a separate larger storage rack against the end wall of the building. Only in rare cases does this stock go to the large turret lathe. From this storage rack the bars or tubes are fed to a battery of smaller lathes which also rough turn the material into rings or disks.

The plant is laid out for similar flow of work from the rough machining and cutting operation through all subsequent operations to the storage shelves or packing and shipping room with no backward movement except for one minor line of special work. This item makes a single back-track and then enters the regular production flow of work for the remainder of the machining operations.

### Overlifting Still Leads Fatal Handling Injuries

POINTING out that "extra help or mechanical loading devices would eliminate many strains and injuries from objects that fall while being loaded, the New York State department of labor reports that 10 cases of fatal strains were among the 113 deaths in that state's industries during April. In three more cases death was due to injuries received when employes were struck by the objects they were handling. Two of these were heavy objects that fell back from trucks that were

being loaded. According to the report, "the high elevation of some truck bodies makes it difficult for men loading them to control the objects lifted." From time to time, STEEL has pointed out the inherent danger that lurks in certain materials handling practices, notably in what are commonly referred to as lifting operations. The state department of labor considers this class of handling one worthy of greater study on the part of all employers.

In March, this class of industrial fatalities again constituted one of the leading categories in the depart-

ment's tabulation of industrial deaths, a total of 18 lives lost as a result of accidents occurring when employes were handling heavy and sharp objects. Twelve of the 18 were due to overlifting, two to being struck by the object handled, two to sharp objects slipping and two to metal slivers. Many manufacturers have found that substitution of mechanical handling methods in place of manual operations has resulted in a reduction of accidents. An outstanding example of such results was described in STEEL, Dec. 7, 1936, page 51.

# "HERCULES"

RED-STRAND  
REG. U. S. PAT. OFF.  
WIRE ROPE

Furnished in Flattened Strand, Round Strand, Preformed, Steel Clad and Non-Rotating constructions.



**A GIANT**  
in Strength and Endurance

MADE ONLY BY  
**A. Leschen & Sons Rope Co.**  
ESTABLISHED 1857  
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# KRON

## DIAL CRANE SCALES

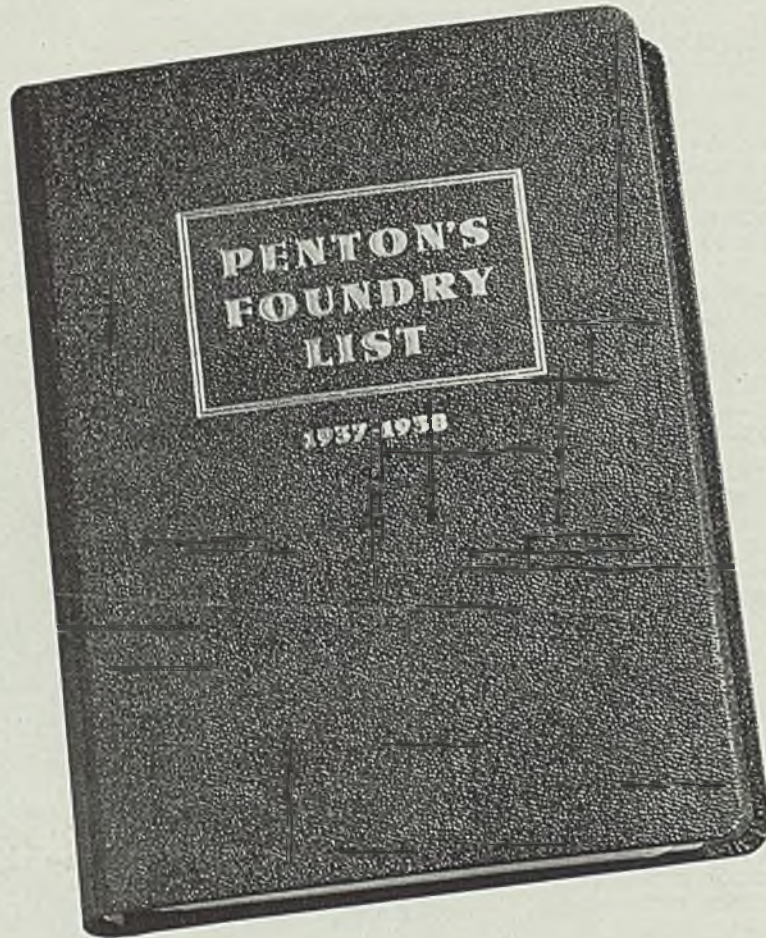
Weigh your materials accurately enroute  
Avoid costly extra handling

THE KRON CO.
BRIDGEPORT CONN.

# NOW AVAILABLE!

1937-1938 Edition of Penton's Foundry List



The only complete and up-to-date directory of all foundries in the United States and Canada. Revised to June 1, 1937.

Lists approximately 5464 foundries, giving names and addresses and the kind of metals melted, method of melting, number of units and melting capacity. Machine and pattern shop departments are indicated. A feature of this new edition is the supplementary, segregated listing of steel, malleable, die casting, permanent mold foundries for more easy reference.

The 1937-1938 edition lists:

Gray Iron.....	3426	Steel.....	311
Nonferrous.....	2822	Permanent Mold.....	152
Exclusive.....	1392	Die Casting.....	97
Departments.....	1430	Machine Shops.....	3360
Aluminum.....	2397	Pattern Shops.....	3383
Malleable.....	150		

Bound loose-leaf, page size 6 x 9, printed on strong, white ledger stock in typewriter type for easy, quick reference. Only one column of listings to each page, leaving plenty of space for notations. List arranged geographically by cities and states. Price \$50 delivered.

**THE PENTON PUBLISHING COMPANY**

1213 West Third St.

Book Department

Cleveland, Ohio



# Better Steel Buying Adds to Mill Backlogs

## Sheets and Plates

## Lead; Heavy Summer

## Trade in Prospect

**U**NEXPECTED and encouraging features are developing in the steel market and buying, while less than a few weeks ago, shows an increase over a fortnight ago, to the extent that deliveries in some instances are falling back.

This is true in sheets and plates particularly, with stiffening of demand in some other lines. While this tendency is not sufficiently marked up to this time to exert a strong influence on buyers, it seems to indicate a movement contrary to the expected summer lull. Deliveries of sheets are further deferred than in May, in the experience of a number of producers. In plates little progress has been made by eastern mills in reducing backlogs.

Some automotive tonnage is being booked, partly to complete 1937 lines and some for 1938 model campaigns. This tonnage is expected to increase in a short time. Railroad buying is appearing in good volume, with considerable in prospect. Seaboard Air Line has placed 10,000 tons of rails and some cars. Norfolk & Western has distributed about 10,000 tons of plates and other steel for its car and locomotive program.

Bids on a battleship were opened June 17 but steel specifications will not be ready for about eight months when drawings are completed. Another battleship will be built in a navy yard, the two accounting for a heavy tonnage of steel.

Prospects of agricultural implement and tractor manufacturers are excellent and activity in this line will be continued through the summer, a reflection of good conditions in the farming industry. These builders are taking steady tonnage of steel.

Gains in operating rate in five districts, unchanged rate in six and only a slight drop in one has resulted in the national steel operating rate pushing upward 1½ points to 75½ per cent of capacity. Eastern Pennsylvania gained 2½ points to 67 per cent, Chicago half a point to 63½, New England 37 points to 82, Detroit two points to 97 and St. Louis eight points to 93 per cent. Wheeling showed the only decrease, two points, to 93 per cent. No change was made at Pittsburgh with 92 per cent, Youngstown 30, Cleveland 46, Buffalo 89, Birmingham 83 and Cincinnati 93 per cent.

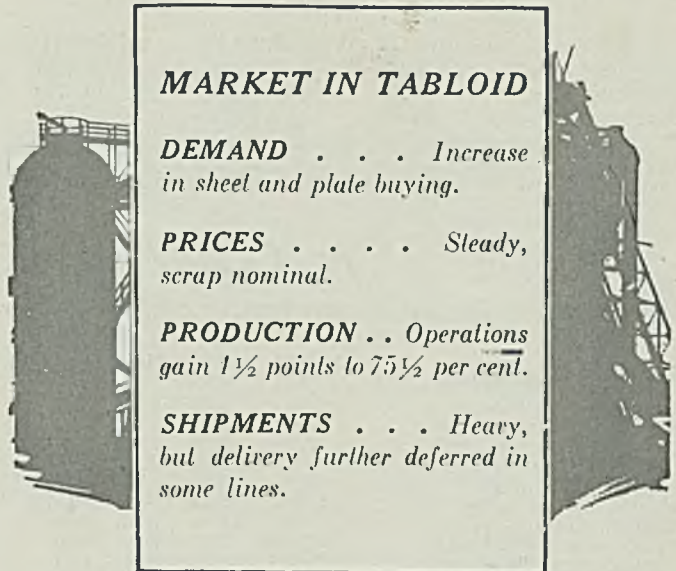
### MARKET IN TABLOID

**DEMAND** . . . Increase in sheet and plate buying.

**PRICES** . . . Steady, scrap nominal.

**PRODUCTION** . . Operations gain 1½ points to 75½ per cent.

**SHIPMENTS** . . . Heavy, but delivery further deferred in some lines.



Influence of the labor disturbances in Cleveland, Chicago and Youngstown has been felt to less degree than expected. In a few instances consumers have asked steel from other than their usual sources, but the total of this diverted tonnage is small.

A static condition prevails in scrap and appearances are that prices have come close to the bottom of the present decline. Export demand is light at the moment and domestic buying awaits further depletion of stockpiles. To a large extent prices are nominal as buyers and sellers mark time.

Pressure to transport the greatest possible tonnage of iron ore from the head of the lakes is shown by the record for largest cargoes being broken twice in the past week, in each case well over 15,000 tons being carried in a single bottom. With 33 freighters clearing Duluth-Superior harbor in a single 24 hours recently the total ore shipped that day was approximately 300,000 tons.

Automobile production advanced last week to 120,720 units from a revised total of 108,182 the preceding week. General Motors stepped up its output to 42,150 from 37,783 the preceding week, Ford lost a trifle with 28,740 compared with 29,240, and Chrysler's 28,500 compared with 27,600 the week before. All other car manufacturers ran up a total of 21,332, in comparison with 13,559 the previous week.

Composite price for steelworks scrap declined to \$17, a drop of 12 cents from the revised composite for the previous week. This is the level of mid-December. In the absence of sufficient trading to test the market prices are unchanged at Chicago and in the East, with Pittsburgh showing a slight decline. The iron and steel composite lost four cents, to \$39.80 and the finished steel composite again is unchanged at \$61.70.

# COMPOSITE MARKET AVERAGES

	June 19	June 12	June 5	One Month Ago May, 1937	Three Months Ago Mar., 1937	One Year Ago June, 1936	Five Years Ago June, 1932
Iron and Steel . . . .	\$39.80	\$39.84	\$39.86	\$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 . . .	17.00	17.12	17.50	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 19, 1937	May 1937	March 1937	June 1936	Pig Iron	June 19, 1937	May 1937	March 1937	June 1936
Steel bars, Pittsburgh . . . . .	2.45c	2.45c	2.40c	1.85c	Bessemer, del. Pittsburgh . . . . .	\$25.26	\$25.26	\$24.85	\$20.81
Steel bars, Chicago . . . . .	2.50	2.50	2.45	1.90	Basic, Valley . . . . .	23.50	23.50	23.10	19.00
Steel bars, Philadelphia . . . . .	2.74	2.74	2.74	2.16	Basic, eastern del. East Pa. . . . .	25.26	25.26	24.76	20.81
Iron bars, Terre Haute, Ind. . . . .	2.35	2.35	2.25	1.75	No. 2 fdy., del. Pittsburgh . . . . .	25.21	25.21	24.80	20.31
Shapes, Pittsburgh . . . . .	2.25	2.25	2.20	1.80	No. 2 fdy., Chicago . . . . .	24.00	24.00	23.20	19.50
Shapes, Philadelphia . . . . .	2.45½	2.45½	2.45½	2.01½	Southern No. 2, Birmingham . . . . .	20.38	20.38	19.88	15.50
Shapes, Chicago . . . . .	2.30	2.30	2.25	1.85	Southern No. 2, del. Cincinnati . . . . .	23.69	23.69	23.19	20.2007
Tank plates, Pittsburgh . . . . .	2.25	2.25	2.20	1.80	No. 2X eastern, del. Phila. . . . .	26.135	26.135	25.635	21.68
Tank plates, Philadelphia . . . . .	2.43½	2.43½	2.43½	1.99	Malleable, Valley . . . . .	24.00	24.00	23.60	19.50
Tank plates, Chicago . . . . .	2.30	2.30	2.25	1.85	Malleable, Chicago . . . . .	24.00	24.00	23.20	19.50
Sheets, No. 10, hot rolled, Pitts. . . . .	2.40	2.40	2.35	1.85	Lake Sup., charcoal, del. Chicago . . . . .	30.04	30.04	28.95	25.2528
Sheets, No. 24, hot ann., Pitts. . . . .	3.15	3.15	3.10	2.40	Gray forge, del. Pittsburgh . . . . .	24.17	24.17	23.75	19.67
Sheets, No. 24, galv., Pitts. . . . .	3.80	3.80	3.70	3.10	Ferromanganese, del. Pittsburgh . . . . .	107.29	107.29	90.80	80.13
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	Scrap				
Sheets, No. 24, galvan., Gary. . . . .	3.90	3.90	3.85	3.20	Heavy melting steel, Pittsburgh. . . . .	\$18.25	\$19.55	\$22.40	\$13.80
Plain wire, Pittsburgh . . . . .	2.90	2.90	2.85	2.40	Heavy melt. steel, No. 2, East Pa. . . . .	15.25	16.85	18.75	10.81
Tin plate, per base box, Pitts. . . . .	\$5.35	5.35	4.85	5.25	Heavy melting steel, Chicago. . . . .	15.75	17.55	20.90	12.75
Wire nails, Pittsburgh . . . . .	2.75	2.75	2.70	2.10	Rail for rolling, Chicago . . . . .	18.75	21.45	22.25	14.00
					Railroad steel specialties, Chicago . . . . .	19.25	21.35	22.35	14.40
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs. . . . .	\$37.00	\$37.00	\$36.40	\$28.00	Connellsville, furnace, ovens. . . . .	\$4.65	\$4.85	\$4.05	\$3.50
Sheet bars, open-hearth, Pitts. . . . .	37.00	37.00	36.40	28.00	Connellsville, foundry, ovens. . . . .	5.30	5.30	4.25	4.25
Billets, open-hearth, Pittsburgh. . . . .	37.00	37.00	36.40	28.00	Chicago, by-product foundry, del. . . . .	11.00	11.00	10.25	9.75
Wire rods, No. 5 to 3/4-inch, Pitts. . . . .	47.00	47.00	46.20	38.80					

# Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel	Tin Mill Black No. 28	Corrosion and Heat-Resistant Alloys	Structural Shapes
Prices Subject to Quantity Extras and Deductions (Except Galvanized)	Pittsburgh . . . . . 3.30c	Pittsburgh base, cents per lb.	Pittsburgh . . . . . 2.25c
Hot Rolled No. 10, 24-48 in.	Gary . . . . . 3.40c	Chrome-Nickel	Philadelphia, del. . . . . 2.45½ c
Pittsburgh . . . . . 2.40c	St. Louis, delivered . . . . . 3.53c	No. 302 No. 304	New York, del. . . . . 2.50¼ c
Gary . . . . . 2.50c	Granite City, Ill. . . . . 3.50c	24.00 25.00	Boston, delivered . . . . . 2.63½ c
Chicago, delivered . . . . . 2.53c	Cold Rolled No. 10	27.00 29.00	Bethlehem . . . . . 2.35c
Detroit, del. . . . . 2.60c	Pittsburgh . . . . . 3.10c	34.00 36.00	Chicago Chicago . . . . . 2.30c
New York, del. . . . . 2.73c	Gary . . . . . 3.20c	Hot strip . . . . . 21.50 23.50	Cleveland, del. . . . . 2.45c
Philadelphia, del. . . . . 2.69c	Detroit, delivered . . . . . 3.30c	Cold strip . . . . . 28.00 30.00	Buffalo . . . . . 2.35c
Birmingham . . . . . 2.55c	Philadelphia, del. . . . . 3.39c	Straight Chromes	Gulf Ports . . . . . 2.65c
St. Louis, del. . . . . 2.63c	New York, del. . . . . 3.43c	No. No. No. No.	Birmingham . . . . . 2.40c
Granite City, Ill. . . . . 2.60c	St. Louis, del. . . . . 3.33c	410 430 442 446	Pacific ports, f.o.b. cars, dock . . . . . 2.80c
Pacific ports, f.o.b. dock . . . . . 2.95c	Granite City, Ill. . . . . 3.30c	18.50 19.00 22.50 27.50	St. Louis, del. . . . . 2.52c
Hot Rolled Annealed No. 24	Pacific ports, f.o.b. dock . . . . . 3.70c	21.50 22.00 25.50 30.50	Bars
Pittsburgh . . . . . 3.15c	Cold Rolled No. 20	26.50 29.00 32.50 36.50	Soft Steel
Gary . . . . . 3.25c	Pittsburgh . . . . . 3.55c	Hot strip . . . . . 17.00 17.50 23.00 28.00	(Base, 3 to 25 tons)
Chicago, delivered . . . . . 3.28c	Gary . . . . . 3.65c	Cold stp. . . . . 22.00 22.50 28.50 36.50	Pittsburgh . . . . . 2.45c
Detroit, delivered . . . . . 3.35c	Detroit, delivered . . . . . 3.75c		Chicago or Gary . . . . . 2.50c
New York, del. . . . . 3.48c	Philadelphia, del. . . . . 3.84c		Duluth . . . . . 2.60c
Philadelphia, del. . . . . 3.44c	New York, del. . . . . 3.88c		Birmingham . . . . . 2.60c
Birmingham . . . . . 3.30c	St. Louis, del. . . . . 3.78c		Cleveland . . . . . 2.50c
St. Louis, del. . . . . 3.38c	Granite City, Ill. . . . . 3.75c		Buffalo . . . . . 2.55c
Granite City, Ill. . . . . 3.35c	Enameling Sheets		Detroit, delivered . . . . . 2.60c
Pacific ports, f.o.b. dock . . . . . 3.80c	Pittsburgh, No. 10 . . . . . 2.90c		Pacific ports, f.o.b. cars, dock . . . . . 3.00c
Galvanized No. 24	Pittsburgh, No. 20 . . . . . 3.50c		Philadelphia, del. . . . . 2.74c
Pittsburgh . . . . . 3.80c	Gary, No. 10 . . . . . 3.00c		Boston, delivered . . . . . 2.85c
Gary . . . . . 3.90c	Gary, No. 20 . . . . . 3.60c		New York, del. . . . . 2.78c
Chicago, delivered . . . . . 3.93c	St. Louis, No. 10 . . . . . 3.13c		Pitts., forg. qual. . . . . 2.80c
Philadelphia, del. . . . . 4.09c	St. Louis, No. 20 . . . . . 3.73c		Rail Steel
New York, delivered . . . . . 4.13c	Tin and Terne Plate		To Manufacturing Trade
Birmingham . . . . . 3.95c	Gary base, 10 cents higher.		Pittsburgh . . . . . 2.30c
St. Louis, del. . . . . 4.03c	Tin plate, coke, (base box), Pittsburgh . . . . . \$5.35		Chicago or Gary . . . . . 2.35c
Granite City, Ill. . . . . 4.00c	Waste-waste, 2.75c; strip . . . . . 2.50c		Moline, Ill. . . . . 2.35c
Pacific ports, f.o.b. dock . . . . . 4.40c	Long ternes, No. 24, unassorted, Pitts. . . . . 4.10c		Cleveland . . . . . 2.35c
			Buffalo . . . . . 2.40c



## Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.  
**Basing Points:**

	No. 2 Fdry.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	\$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:**

	25.26	25.26	24.76	25.76
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 Brmghm.	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	.....

	No. 2 Malle-Fdry.	able	Basic	Besse-mer
St. Louis from Birmingham	24.12	.....	23.82	.....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

**Low Phos.**

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$28.50, Phila. base, standard and copper bearing, \$29.63.

	Gray Forge	Charcoal
Valley furnace	\$23.50	Lake Superior fur. .... \$27.00
Pitts. dist. fur.	23.50	do., del. Chicago ..... 30.04
		Lyles, Tenn. .... 26.50

**Silvery†**

Jackson county, O., base: 6-6.50 per cent \$28.50; 6.51-7—\$29.00; 7-7.50—\$29.50; 7.51-8—\$30.00; 8-8.50—\$30.50; 8.51-9—\$31.00; 9-9.50—\$31.50; Buffalo \$1.25 higher.

**Bessemer Ferrosilicon†**

Jackson county, O., base: Prices are the same as for silveries, plus \$1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

## Refractories

Per 1000 f.o.b. Works		Chester, Pa., and Baltimore bases (bags) ..
<b>Fire Clay Brick</b>		\$45.00
<b>Super Quality</b>		Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) ..
Pa., Mo., Ky. ....	\$64.60	43.00
<b>First Quality</b>		Domestic dead - burned gr. net ton f.o.b. Chelwah, Wash. (bulk) ..
Pa., Ill., Md., Mo., Ky. ....	51.30	25.00
Alabama, Georgia ....	51.30	
<b>Second Quality</b>		<b>Base Brick</b>
Pa., Ill., Ky., Md., Mo. ....	46.55	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.
Georgia, Alabama ....	41.80	Chrome brick ..... \$49.00
<b>Ohio</b>		Chem. bonded chrome .. 49.00
First quality .....	43.70	Magnesite brick ..... 69.00
Intermediate .....	39.90	Chem. bonded magnesite 59.00
Second quality .....	35.15	
<b>Malleable Bung Brick</b>		<b>Fluorspar, 85-5</b>
All bases .....	\$59.85	Washed gravel, duty paid, tide, net ton. .... \$23.50
<b>Silica Brick</b>		Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail ..... \$19.00
Pennsylvania .....	\$51.30	Do., for barge ..... \$20.00
Joliet, E. Chicago .....	59.85	
Birmingham, Ala. ....	51.30	<b>Ferroalloys</b>
<b>Ladle Brick</b>		<i>Dollars, except Ferrochrome</i>
(Pa., O., W. Va., Mo.)		Ferromanganese, 78-82%, tidewater, duty pd. .... \$102.50
Dry press .....	\$30.00	Do., Baltimore, base .. 102.50
Wire cut .....	\$28.00	Do., del. Pittsburgh .. 107.29
<b>Magnesite</b>		Spiegeleisen, 19-21% dom. Palmerton, Pa., spot. .... 33.00
Imported dead - burned grains, net ton f.o.b.		Do., New Orleans .... 33.00

## Nonferrous

### METAL PRICES OF THE WEEK

*Spot unless otherwise specified. Cents per pound*

Copper				Straits Tin, New York		Lead	Lead East	Zinc	Aluminum	Antimony	Nickel
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery		Spot	Futures	N. Y.	St. L.	St. L.	99%	American Spot, N. Y.	Cathodes
June 12	14.00	14.12½	13.75	55.50	55.12½	6.00	5.85	6.75	20.00	14.75	35.00
June 14	14.00	14.12½	13.75	54.62½	54.25	6.00	5.85	6.75	20.00	14.75	35.00
June 15	14.00	14.12½	13.75	54.75	54.55	6.00	5.85	6.75	20.00	14.75	35.00
June 16	14.00	14.12½	13.75	55.12½	54.90	6.00	5.85	6.75	20.00	14.75	35.00
June 17	14.00	14.12½	13.75	55.25	54.95	6.00	5.85	6.75	20.00	14.75	35.00
June 18	14.00	14.12½	13.75	55.25	54.95	6.00	5.85	6.75	20.00	14.75	35.00

MILL PRODUCTS				OLD METALS			
<i>F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper</i>				<i>Nom. Deal. buying prices</i>			
<b>Sheets</b>				<b>No. 1 Composition Red Brass</b>			
Yellow brass (high) .... 19.75				New York .....			
Copper, hot rolled ..... 21.87½				Cleveland .....			
Lead, cut to jobbers .... 9.50				*Chicago .....			
Zinc, 100-lb. base ..... 13.00				St. Louis .....			
<b>Tubes</b>				<b>Heavy Copper and Wire</b>			
High yellow brass ..... 22.50				New York, No. 1 .... 10.50-10.75			
Seamless copper ..... 22.62½				*Cleveland, No. 1 .... 10.75-11.00			
<b>Rods</b>				*Chicago, No. 1 .... 10.25-10.50			
High yellow brass ..... 16.25				St. Louis, No. 1 .... 10.75-11.00			
Copper, hot rolled ..... 18.62½				<b>Composition Brass Borings</b>			
<b>Anodes</b>				New York .....			
Copper, untrimmed ..... 19.12½				New York .....			
<b>Wire</b>				Light Copper			
Yellow brass (high) .... 20.00				*New York .....			
				*Cleveland .....			
				*Chicago .....			
				St. Louis .....			

Light Brass				Zinc			
*Cleveland .....				*New York .....			
*Chicago .....				Cleveland .....			
St. Louis .....				St. Louis .....			
<b>Lead</b>				<b>Aluminum</b>			
New York .....				*Borings, Cleveland' 9.25- 9.50			
*Cleveland .....				*Mixed cast, Cleve. 13.00-13.25			
Chicago .....				Clips, soft, Cleve. 15.00-15.50			
St. Louis .....				Mixed, cast, St. L. 12.50-13.00			
<b>SECONDARY METALS</b>				Brass, ingot 85-5-5-5, 1cl, 14.00			
Stand. No. 12 alum. 18.50-19.00				*Stand. No. 12 alum. 18.50-19.00			





# Sheets

Sheet Prices, Page 94

**Pittsburgh**—Sheet bookings have shown improvement recently compared to the latter part of May. Galvanized deliveries now are around 23 weeks, compared to 22 at the start of June. Hot-rolled shipments are around 21 weeks, and box annealed 22 to 23 weeks. The most remarkable increase in new business is shown in cold-reduced sheets, which are now 11 to 12 weeks, compared to six weeks in the latter part of May. This gain in cold-reduced backlogs is due to automotive buying, mostly for 1937 models but some for the 1938 series. Because of strikes, sheet mill operations on the national scale are down compared to one month ago. Common black mills are operating at slightly better than 70 per cent, and galvanized mills at around 69 per cent.

**Cleveland** — Little change is apparent in sheet mill operations, as extended backlogs warrant practical capacity operations in mills not affected by strikes. In those thus affected, many customers continue to place orders for future delivery and in some cases have asked the mills to act as the middleman and place the tonnage with another source able to make reasonably prompt shipment. Seasonal conditions have influenced new business more than generally realized, although the decline so far has not been so drastic as in previous years.

**Chicago**—Sheet backlogs decline slowly by reason of the curtailment in output occasioned by strikes. Operating mills have sufficient business to accommodate capacity schedules for a large portion of next quarter, despite some seasonal let-down in consumption. Automotive needs will be curtailed further next month but requirements of the farm equipment industry held at a peak rate.

**Boston**—Sheet buying recedes gradually, although aggregate miscellaneous demand is fair with current business on standard gages and finishes promised for delivery in six to eight weeks.

**Buffalo**—While strikes have resulted in some hold orders on sheet tonnage releases on contracts continue broad and works here are still on near capacity schedules. Third quarter bookings are reported satisfactory and only prolonged labor troubles will reduce output in that period, it is predicted.

**New York** — Sheet tonnage is off, but incoming business is holding up better than in the case of the heavy products. A better delivery situation may be attributed in part to sus-

pensions at mills in the mid-west where strikes continue. So far there has still been little diversion in this district of tonnage from strike-ridden mills to other producers.

Breeze Corp., Newark, N. J., received the shelving contract for Archives building, Washington, requiring 6000 tons of sheets, shapes and plates.

**Philadelphia**—Sheet buying continues easier locally but increased automotive specifications in the Middle West, with labor suspensions there, sustain delivery schedules. In fact on some cold-finished grades deliveries are further extended than a week ago. Sheet sellers expect to participate in early distribution for the Reading car program which has been delayed.

**Cincinnati**—Little tonnage of district sheet mills has been diverted on account of labor troubles elsewhere. Rolling schedules continue at capacity. New specifications indicate domestic needs will take most of third quarter output. Some specifications are now being received for try-outs on new 1938 series of automobile models.

**St. Louis**—Despite improved sheet deliveries, backlogs continue heavy and pressure for shipments by some consumers continues strong. Stove and farm implement manufacturers in this general area are operating at high speed, and accounting for large tonnages of sheets being delivered into this district.

# Strip

Strip Prices, Page 95

**Pittsburgh**—The gain shown in hot and cold-rolled strip steel bookings continued last week. Several large automotive fill-in orders were placed. A few consumers affected by the strikes in other districts sought to satisfy requirements through local mills. This latter class of tonnage is not extensive yet, however. Miscellaneous buyers generally are active and electrical appliance makers are taking fair sized tonnages. Hot strip backlogs are slightly better than three weeks, while cold-rolled ranges around six weeks. Hot strip is quoted 2.40c, Pittsburgh, and cold strip, 0.25 carbon and under, 3.20c.

**Cleveland** — Deliveries on both hot and cold-rolled strip have improved considerably as most consumers are following a policy of cutting down stocks accumulated during March and April, before placing additional tonnage. This condition is further accentuated by seasonal influences and uncertainty caused by labor unrest. However, in those mills not affected by strikes operations

continue almost unchanged from the high level held during May.

**Chicago**—Strip demand is affected by a seasonal decrease in consumption among some users, with prospects for further curtailment in July.

**Boston**—A spotty, but slight improvement in narrow cold strip buying is noted by some rerollers. Incoming volume, however, is barely better than 60-65 per cent of shipments. Current orders are for the most part for early third quarter delivery, although some more volume has been placed through September.

**New York**—New buying of cold-rolled strip shows little change. Most consumers are asking early delivery and eastern mills are in a position to offer around four weeks. Demand continues well spread and prices firm. There has been little diversion of strip tonnage from strike-affected producers. Most consumers of hot strip have good stocks on hand or ordered and improved deliveries have operated against forward buying, although third quarter covering gradually improves.

# Plates

Plate Prices, Page 94

**Philadelphia**—Plate business is easier but is not showing the sharp drop seen in some other districts. Mills in this area have apparently not worked into backlogs much over the past week. One leading mill reports deliveries are more extended. Two mills have little to offer under eight weeks and another little under seven weeks. Another district mill is quoting 12 to 41 weeks while at the other extreme a producer offers four to six weeks. Largest deliveries are in heaviest gages, thickness having more influence than width. Norfolk & Western, in addition to 700 tons placed a week ago with a Pittsburgh mill, has closed on 5000 tons of plates with another Pittsburgh mill and has made other allocations. Its order is said to be close to 10,000 tons for its car and locomotive program. Reading Co. has not closed on all its car tonnages, considerable remaining unplaced.

New York Shipbuilding Co., Camden, N. J., submitted the lower of two outright bids on a battleship, June 17, with Bethlehem Shipbuilding Co., Quincy, Mass., quoting the other. Newport News Shipbuilding & Dry Dock Co. submitted alternate bids subject to adjustment for labor and materials over the four years of construction. This bid was low at \$46,212,500 compared with the Camden company's bid of \$55,875,824. Detailed specifications will not be

ready for about eight months. A similar ship will be built in a navy yard.

**Boston**—Several eastern mills are withdrawing protection on specified plate projects, giving such protection on shapes only. Demand for plates tends downward, although shipments and specifications are steady. Shipyards are taking good shipments and new work placed with yards in this district includes a 300-ton trawler with Bethlehem Shipbuilding Co. A 135-ton steel

yacht is being figured by the Lawley yard, Quincy, Mass.

**Cleveland** — Mills claim only a slight improvement in plate deliveries has been made since the first of the month, despite the fact that in most other steel products considerable headway has been made. No outstanding boiler or tank work is pending. Most recent tonnage is from miscellaneous specialty fabricators, who are only recently being affected by adverse seasonal conditions.

**Chicago**—Plates are the most active heavy rolled product here, with deliveries of around 10 weeks generally required. Active mills are unable to accommodate much additional tonnage diverted from strike-closed producers and some consumers are short on supplies. While little additional freight car business is in immediate prospect, backlogs will support heavy shipments of plates through at least most of next quarter. Lighter gages continue in active demand.

**New York** — Seasonal influences are having effect, but the trade attributes the sharpness of the recent decline principally to unsettled labor conditions. Oil company buying and railroad is the lightest in some time.

Electric Boat Co., Groton, Conn., is the only bidder for two submarines for the navy, June 17, requiring several thousand tons of steel, mostly plates. The navy closes Aug. 4 on four destroyers, involving a heavy tonnage of plates, shapes and bars.

**Seattle**—Routine marine jobs and general tank and pipe work call for fair tonnages of plates, all in small lots. Shops are not operating at capacity. Grant county commissioners will open bids at Ephrata, Wash., for furnishing an unstated tonnage of 18 to 24-inch culvert pipe and connecting bands.

### Plate Contracts Placed

340 tons, tanks for American Coal Co., Boston, to Chicago Bridge & Iron Works, Chicago.

195 tons, two digestors, Consolidated Water Paper & Pulp Co., Wisconsin Rapids, Wis., to Manitowoc Engineering Works, Manitowoc, Wis.

125 tons, plates and shapes, 200,000-gallon elevated steel tank, Buzzards Bay water district, Cape Cod, Massachusetts, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

### Plate Contracts Pending

600 tons, water tank and stand, Hammond, Ind.

250 tons, all-welded 1,500,000-gallon standpipe Greenhills project, Cincinnati; bids June 28 to resettlement administration, Washington.

100 tons plus, 30-inch shore dredge pipe; bids in to procurement officer, Portland, Oreg.

### Cold-Finished

Cold Finished Prices, Page 95

**Pittsburgh**—Bookings of cold-finished material show little improvement and incoming business is still exceeded by shipments. A few specifications from the automotive field appeared last week, but for the most part this source of consumption has been quiet recently. Little material has been booked so far as a



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result of the strikes in other steel-making districts. Cold-finished prices are steady at 2.90c, base, Pittsburgh.

## Bars

Bar Prices, Page 94

**Pittsburgh**—Backlogs of hot-rolled bars have shown a moderate increase recently, but apparently only a small proportion of the new bookings could be attributed to effects of the labor situation in other steel-making districts. Several fill-in orders have been received from the automotive field to round out production of 1937 models. Requirements of railroads and railroad equipment manufacturers are likely to be heavier in the next few weeks, while farm equipment and tractor manufacturers' needs continue steady. Hot-rolled bars are quoted 2.45c, base, Pittsburgh.

**Cleveland** — Specifications for commercial and cold-drawn carbon steel bars continue to register the gradual decline in effect since the middle of May. This recent trend has put some mills in a position to make deliveries within three to four weeks. Smaller requirements from automotive sources have played an important part in the recent decline. Demand from machinery and agricultural implement manufacturers has held up fairly well.

**Chicago**—Bar sales are well sustained, shipments being supported by continued heavy requirements of farm equipment manufacturers and miscellaneous users. Backlogs are slow to decline, with deliveries averaging around 30 days. Little inconvenience has resulted so far to consumers as a result of steel strikes, those mills still running generally being able to accommodate diverted tonnage though the amount of such business has been relatively small. Indications point to less than the usual slackening in bar consumption during early summer. Implement and tractor builders expect to continue brisk schedules through a large part of next quarter.

**Boston**—More alloy and forging bar business has been diverted from strike-hampered mills by consumers caught with low stocks. Buying is light, with commercial steel bars lagging behind special material.

**New York** — Bar demand is spotty, with deliveries affected somewhat by labor troubles in the mid-west, but still easy, as compared with a month or six weeks ago. Three to four weeks can be done on a wide range of specifications and in some instances two weeks or less.

**Philadelphia**—Bars are available

from several sources for delivery within three to four weeks although labor troubles have retarded schedules in some mills. General buying is still tapering.

## Tin Plate

Tin Plate Prices, Page 94

**New York** — While some smaller can companies in this district are having labor difficulties and are temporarily holding up shipments,

tin plate specifications continue heavy, at possibly the highest rate this year. Foreign tin plate inquiry also is brisk, but not up to that of a week to two weeks ago. With strikes at certain mills in the middle west, total operations continue off from the high point early in the month.

**Pittsburgh**—With the packing season underway, the large can companies recently have been exerting increased pressure for tin plate shipments. Mills unhampered by strikes

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(Pittsburgh District)

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report they have not received requests for assistance. Extra turns are the rule in mills in the Pittsburgh district, but the national average of operations is down to 85 per cent of capacity, due to the labor situation. Export inquiries for tin plate continue numerous.

## Ferroalloys

Ferroalloy Prices, Page 96

New York — Contract consumers of ferromanganese are specify-

ing heavily to get tonnage under way before July 1, when they will have to pay \$7.50 more than on current contracts. This increase became assured the beginning of last week when producers reaffirmed the prices that have prevailed on spot and all new tonnage for delivery in this quarter, \$102.50, duty paid. In view of the strong upward trend in ore prices this year, some consumers believed that they might have to pay still higher prices.

Much the same outlook prevails in domestic spiegeleisen, with con-

tract customers in general specifying freely to get in material before a \$3 advance for next quarter. Despite the fact that current prices were reaffirmed, most contract customers have protected themselves until the end of this quarter at the old prices, which expired on new business late in April.

## Pipe

Pipe Prices, Page 95

**Pittsburgh**—Heavy buying of oil country goods continues, partly a reflection of strikes in other districts and partly because of large drilling programs. In most cold drawn tubular products backlogs now average around ten weeks. In standard pipe jobbers' stocks have cushioned effect of strikes, but demand for boiler tubes and seamless goods is strong. Pipe line activity has been confined to small projects, but these are in good volume. In general the situation is far better than a year ago, and the balance of the summer will be active. Prices are steady.

**Cleveland** — Jobbers report a continued recession in activity so far this month in comparison with May, resulting from a rather marked decline in general industrial expansion and repair work. No serious shortage resulting from strikes in some mills is yet apparent, as jobber stocks in many cases has gone a long way to ease the condition here. Approximately 500 tons of both steel and cast pipe is pending in the Industrial Rayon Co's plant project on which bids have been extended to June 22.

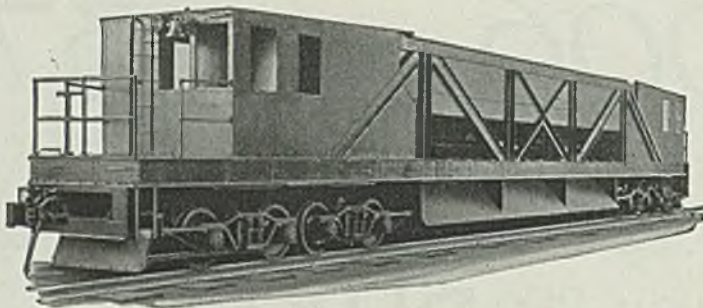
**Chicago**—Chicago closes bids June 22 on 358 tons of fittings of various sizes. Inquiries otherwise are light. The lag in building construction here is contributing to light demand for pipe though fair activity still is noted in some nearby states. Projects financed by federal funds remain considerably below the last two years.

**Boston**—Waterbury, Conn., is closing on 2500 tons of cast pipe, the largest inquiry in the district. New buying in small lots is well maintained. There has also been a flurry by several public utilities. Shipments against contracts are steady with the district foundry operating at a high rate.

**New York**—For a water line, Queens, 500 tons of 20-inch cast pipe is pending, but few large inquiries are out. Buying of small fill-in lots continues active. Several hundred tons are out for work in New Jersey. Foundry operations in a few instances are slightly lower.

**San Francisco** — Demand for cast

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iron pipe remains quiet and new inquiries are slow. Outstanding development was the opening of bids on 835 tons of 2 to 16-inch pipe for San Francisco. An award is expected within the next week. Bookings for the year now total 16,600 tons as compared with 13,891 tons for the corresponding period in 1936.

**Seattle** — Sizeable tonnages are lacking, business consisting of small lots out of stock. No important projects are up for prompt action. P. H. Birley has been granted a franchise for a \$15,000 system at Mossy Rock, Wash., involving pump unit and 3½ miles of mains. Bids were opened June 11 at Circle, Mont., for 19,000 feet of 2 to 8-inch cast iron, award pending.

### Cast Pipe Placed

2500 tons, 16 and 36-inch, Waterbury, Conn., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.

113 tons, 12-inch, extension to water system, North Royalton, O., to J. B. Clow & Son Co., Cleveland.

100 tons, 8-inch, class 200, Concord, N. H., to United States Pipe & Foundry Co., Burlington, N. J.

### Cast Pipe Pending

1100 tons, 4 and 16-inch, water extension project, Akron, O.; J. B. Clow & Son Co., Cleveland, low.

835 tons, 2 to 16-inch, San Francisco; Pacific States Cast Iron Pipe Co. low on 2-inch, American Cast Iron Pipe Co. low on 4-inch and United States Pipe & Foundry Co. low on 6, 8 and 16-inch pipe.

500 tons, 20-inch, Meadow Park, Queens, New York; bids in contractors' letting.

358 tons, fittings, Chicago; bids June 22.

200 tons, various sizes, Mendham, N. J.

## Wire

Wire Prices, Page 95

**Pittsburgh**—Demand for barbed wire, nails and woven wire fencing is light, but in other lines mills report active demand and have fair-sized backlogs. The automotive industry recently placed several tonnages, for 1937 production and 1938 models. Inquiry for export has increased recently.

**Cleveland** — Specifications have declined only slightly, despite seasonal influences and general feeling of uncertainty caused by labor unrest. Some mills are booked into August on some grades although shipments on most material can be made within six weeks. Consumers stocks are considerably lower than any time since the heavy buying during March.

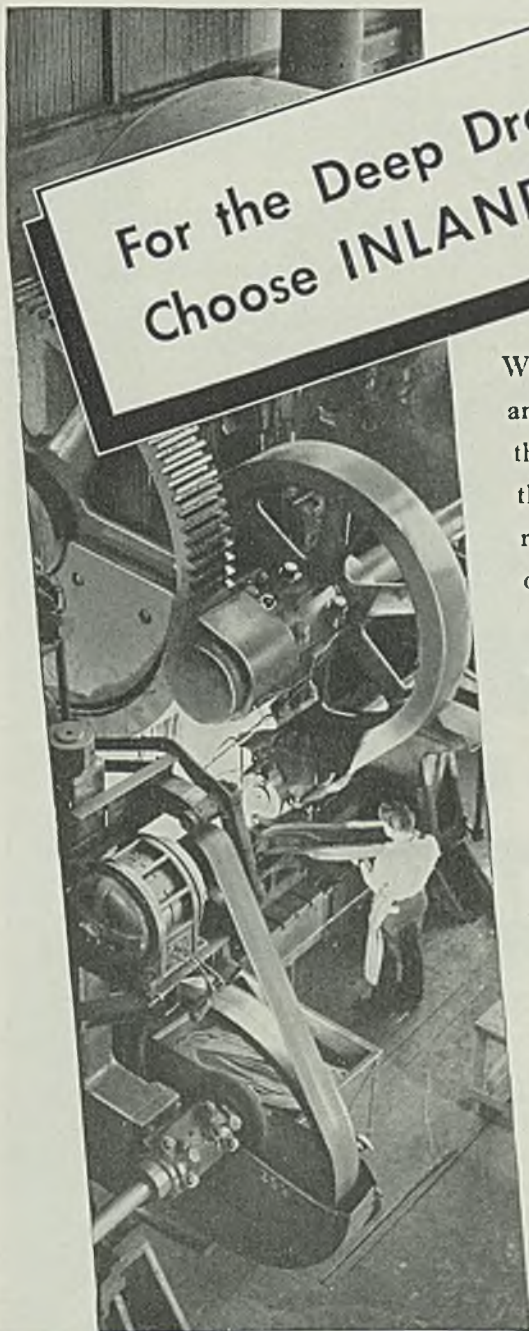
**Chicago**—Wire demand holds at the reduced rate noted several weeks ago though business so far this month is about equal to corresponding May period. Producers

expect further decrease in July due to curtailment in automotive industry and prospects for lighter activity among some miscellaneous users. Business in merchant products in farm acres continues to gain. Wire consumers have depleted stocks the past 30 days and some have found it necessary to buy again.

**Boston**—Demand for manufacturer wire holds well, with some decline in new buying of a few specialties. Shipments are still heavy, but with backlogs lower, less active op-

erations prevail in several departments. Early delivery is asked on most current orders. One General Massachusetts manufacturer of screw products has closed its plant because of labor controversy. Prices are firm.

**New York**—Bookings of some wire products are down slightly, notably in specialties. Specifications hold well and are diversified. Incoming volume is estimated at not more than 65 per cent of shipments. Deliveries are much improved as back-



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logs are reduced. Demand for wire for manufactured consumer goods continues brisk. Connecticut has bids on close to 16,000 feet of guard rail cable.

## Transportation

Track Material Prices, Page 95

Railroad buying is appearing in better volume than usual for sum-

mer months, indicating need for equipment and rails. Backlogs of car builders are sufficient to keep them busy into the fall and current buying is adding steadily to accumulated orders. Rail mills will have most of their early orders finished in July but secondary buying now appearing will defer the date of depletion. Mills are now meeting delivery needs without delay.

Seaboard Air Line has ordered 10,000 tons of 100-pound steel rails and track fastenings with the Tennessee Coal, Iron & Railroad Co. and Bethle-

hem Steel Co., deliveries to begin this month.

Seaboard Air Line has also ordered 200 all-steel 50-ton box cars from Pullman-Standard Car Mfg. Co. for fall delivery. Union Pacific has added 188 freight cars to the list of 2600 placed in its own shops.

All locomotives in service must be equipped with power reverse gears by Sept. 1, 1942, and all locomotives built after Sept. 1, 1937, are required to be similarly equipped, under an interstate commerce commission order last week.

St. Louis Southwestern has been authorized by federal court to buy 23 miles of 112-pound rail for a division used jointly with the Missouri Pacific, which will share the cost. Missouri, Kansas, Texas is considering inquiry for a round tonnage of 112-pound rail.

Norfolk & Western has placed close to 10,000 tons of steel for its car and locomotive program and the Reading Co. has further sheet tonnage to award. The Virginian is figuring on its third quarter needs.

### Rail Orders Placed

Seaboard Air Line, 10,000 tons, 100-pound steel rails and track fastenings, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and Bethlehem Steel Co., Bethlehem, Pa.

### Rail Orders Pending

Alaska Railroad, 215 tons tie plates for 70-pound rail; Youngstown Sheet & Tube Co. low bidder, \$46 F. O. B., Indiana Harbor, Ind.

### Car Orders Placed

Owens-Illinois Glass Co., 50 hopper cars to General American Transportation Co., Chicago.

Seaboard Air Line, 200 all-steel 50-ton box cars, to Pullman-Standard Car Mfg. Co.

Union Pacific, 188 freight cars, in addition to 2600 cars recently placed, to own shops.

### Car Orders Pending

Kennecott Copper Corp., ten dump cars. New York Central, six diners, four baggage-mail cars of lightweight steel; bids July 9.

### Locomotives Placed

Tientsin-Pukow Railway, China, 20 locomotives, 10 to Baldwin Locomotive Works, Eddystone, Pa., and 10 to American Locomotive Co., New York.

### Buses Booked

A. C. F. Motors Co., New York: Twenty 42-passenger for United Electric Railway Co., Providence, R. I.; eighteen 41-passenger for Eastern Massachusetts Street Railway Co., Boston; nine 30-passenger for New Orleans Public Service Co., New Orleans; seven 35-passenger for Alexandria, Barcroft & Washington Transit Co., Alexandria, Va.; three 36-passenger for Southeastern Greyhound Lines of

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**N**O need to incur the expense of machining Wyckoff Cold Drawn Steel Bars with the wide variety of standard sizes and shapes readily available through Wyckoff Warehouse Stocks.

In Wyckoff Cold Drawn Bars you not only obtain a complete choice of size tolerances but also a bright, smooth surface which cuts machining costs to a minimum. Why not obtain lower production costs, higher profits and more business with the aid of Wyckoff Cold Drawn Steel?

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General Offices: First National Bank Bldg., Pittsburgh, Pa.  
Mills at Ambridge, Pa. and Chicago, Ill.

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Warehouse stocks carried by nationally known distributors.

Delaware, Lexington, Ky.; three 36-passenger for Union Bus Co., Jacksonville, Fla.; two 36-passenger for Santa Fe Trail Transportation Co., Wichita, Kans.

Twin Coach Co., Kent, O.; Twenty-four 40-passenger for Georgia Power Co., Atlanta, Ga.; thirteen 41-passenger for Baltimore Transit Co., Baltimore; nine 23-passenger and three 31-passenger for Grand Rapids Railroad Co., Grand Rapids, Mich.; eight 23-passenger for North Shore Bus Co., Flushing, L. I., N. Y.; seven 25-passenger for Rochester Railways Co-ordinated Bus Lines, Rochester, N. Y.; five 31-passenger for New Orleans Public Service Inc., New Orleans; five 31-passenger for Chicago Surface Lines, Chicago; five 41-passenger for Eastern Massachusetts Street Railway Co., Boston; five 42-passenger for Cincinnati Street Railway Co., Cincinnati; four 23-passenger for Duluth Superior Bus Co., Duluth.

650 tons for stockhouse alterations, for Spang, Chalfant & Co., Etna, Pa. Aluminum Co. of America is inquiring for 960 tons for a storage building at New Kensington, Pa.

**Cleveland**—Structural fabricators continue close to capacity operations in an effort to work down huge backlogs accumulated over the last 60 days. However, new inquiries, particularly for public work, are far below this time last year. Private work is encouraging although limited to awards well under 100 tons. Steel piling, 700 tons, for the Cleveland Electric Illuminating Co., was

awarded to an unnamed interest, through the Great Lakes Dredge & Dock Co., Cleveland.

**Chicago**—Bookings have added to fabricators' backlogs, with inquiries light and fairly large tonnage is pending. Bridges predominate in awards, 4350 tons being involved in two structures in Oklahoma and New Mexico.

**St. Louis**—Improvement in structural requirements is reported by fabricators, though most jobs are small. Operations average about 50 per cent with backlogs large enough to insure that pace for several weeks.

## Shapes

Structural Shape Prices, Page 94

**New York**—Less new tonnage is out for figures, although pending volume is impressive, including 10,350 tons for New York city schools. Several thousand tons of sheet piling have been awarded. State bridge inquiry holds with close to 600 tons active in New Jersey.

**Boston**—Most larger structural projects have been placed. Tonnage contracts are fewer, although small-lot demand is active. About a score of bridges in Massachusetts, taking 1500 tons, are being figured. Construction and heavier bridges about to come out are substantial.

**Philadelphia**—Structural buying is spotty with forty-five hundred ton courthouse here and eight hundred ton school in North Philadelphia still leading pending inquiry, which is being augmented by some state and county bridge work. Shape deliveries are easier at around two to three weeks, with a variety of specifications now available from stock.

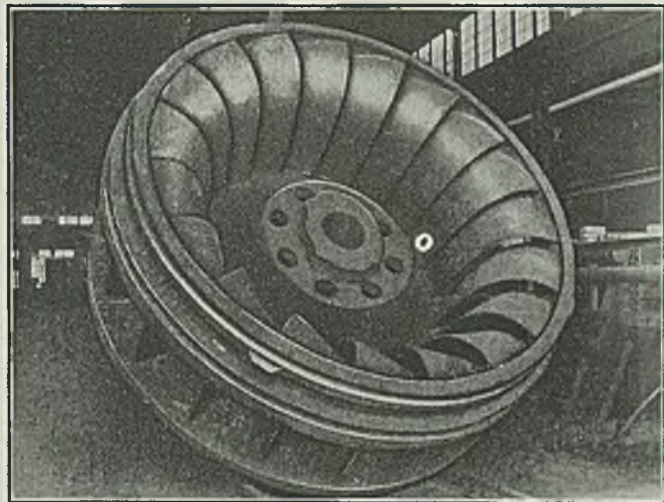
**Pittsburgh**—Awards show improvement, although most were under 1000 tons. Pittsburgh Bridge & Iron Works, Pittsburgh, will supply

## Shape Awards Compared

	Tons
Week ended June 19.....	32,080
Week ended June 12.....	15,403
Week ended June 5.....	32,915
This week, 1936.....	27,480
Weekly average, 1936.....	16,332
Weekly average, 1937.....	26,458
Weekly average, May.....	19,607
Total to date, 1936.....	497,109
Total to date, 1937.....	661,446

Includes awards of 100 tons or more

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**San Francisco**—Structural market was active with 3314 tons placed, bringing aggregate for the year to 104,261 tons, compared with 72,808 tons a year ago. The bureau of reclamation has placed five projects in California involving close to 1200 tons of sheet piling. They also cancelled the call for bids on 472 tons for three projects in California.

## Shape Contracts Placed

2950 tons, steel sheet piling, East river drive, Grand to East Twelfth street,

New York, contracts 3 and 4, to Bethlehem Steel Co., Bethlehem, Pa.; Frederick Snare Corp., general contractor.

2525 tons, plant addition, Electro-Motive Corp., LaGrange, Ill., to American Bridge Co., Pittsburgh.

2350 tons, bridge, Purcell, Okla., to J. B. Klein Iron & Foundry Co. and Capitol Iron Works, Oklahoma City, Okla.

1077 tons, including 175 tons, cutting edges, 845 tons, structural steel, and 57 tons, anchor bolts and frames, tower pier and foundations for anchorage and approach, Bronx-Whitestone bridge, New York, contract W-B-2 to Dravo Corp., Pittsburgh; Frederick Snare Corp., general contractor.

1025 tons, sheep pens, stockyards, St.

Paul, Minn., to St. Paul Foundry Co., St. Paul.

1000 tons, bridge, Shiprock, N. Mex., to Pittsburgh Des Moines Steel Co., Pittsburgh.

700 tons, piling, Cleveland Electric Illuminating Co., Cleveland, to unnamed interest; through Great Lakes Dredge & Dock Co., Cleveland.

650 tons, No. 3 stock house alterations and additions, Spang-Chalfant & Co., Etna, Pa., to Pittsburgh Bridge & Iron Works, Pittsburgh.

550 tons, court house, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through John J. Kennedy & Co., New York.

540 tons, boiler house, Potomac Edison Co., Cumberland, Md., to Ingalls Iron Works, Birmingham, Ala.; through Sanderson & Potter, New York.

500 tons, Municipal armory, St. Louis, to Atlas Iron Works, St. Louis.

430 tons, steel sheet piling, power house, Market street, New Orleans, to Carnegie-Illinois Steel Corp., Pittsburgh.

400 tons, highway bridge 37-B-2, United States department of agriculture, Victor, Idaho, to Minneapolis Moline Power Implement Co., Minneapolis.

400 tons, coke plant improvements, Carnegie-Illinois Steel Corp., Gary, Ind., to American Bridge Co., Pittsburgh.

375 tons, state highway bridge, Blairsville, Pa., to Jones & Laughlin Steel Corp., Pittsburgh.

350 tons, state highway bridge, RC-2457, Harpursville, N. Y., to American Bridge Co., Pittsburgh.

335 tons, shapes and bars, state bridges, Carter and Oklahoma counties, Oklahoma, to Capital Steel & Iron Co., Oklahoma City; C. K. Howard, Oklahoma City, general contractor.

335 tons, alterations and additions, warehouse, Chrysler Corp., Detroit, to Whitehead & Kales Co., Detroit.

300 tons, Flagler Memorial bridge, Palm Beach county, Florida, to Nashville Bridge Co., Nashville, Tenn.

300 tons, store and apartment house building, Ephrata, Pa., to A. B. Roth, Lancaster, Pa.

280 tons, state highway bridge, FAP-375-B, Belton, Mont., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

250 tons, warehouse and garage, West Point military academy, New York, to Belmont Iron Works, Philadelphia; James S. Mozzicato, Medford, Mass., general contractor. Truscon Steel Co., Youngstown, O., awarded reinforcing.

250 tons, Lehr and Cullet building runways, Libbey-Owens-Ford Co., Ottawa, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

250 tons, administration building, Catholic diocese of Kentucky, Anchorage, Ky., to Louisville Bridge & Iron Co., Louisville, Ky.

210 tons, bridges, Miles city, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis.

205 tons, bridge 651, underpass, N. D., to American Bridge Co., Pittsburgh.

200 tons, Kress store, Detroit and Wilshire boulevards, Los Angeles, to Ingalls Iron Works, Birmingham, Ala.

180 tons, 3-span steel springer bridge, Medway street, over Boston & Albany railroad, Milford, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; M. De Matteo Co., Roslindale, Mass., general contractor.

175 tons, highway bridge, Dallas county, Texas, to Bethlehem Steel Co., Bethlehem, Pa.; Thomas & Ratliff, Rogers, Tex., general contractors.

170 tons, state highway bridge, FAP-35, Pickett county, Tennessee, to Vincennes Steel Corp., Vincennes, Ind.

# Behind the Scenes with STEEL

## Gears

**L**ATEST use for special gears, in the popular eye, is in a special automobile recently thrown together in Germany for the use of the Pope as a result of his recent illness. The new creation is equipped with special gears which are intended to make the car ride more easily for his holiness when going around corners. It's a new one on us, but we know several American drivers who have need for such a gearbox on their jalopies.

## Bawth

**S**PLASHING around in our tub this morning, we could not help but be a little envious of the boys who are able to bathe in the latest creation — the "Coronation Bath." Completely regal from its crimson ceiling to the leopard skin on its crimson floor, the set-up has the royal monogram on the towels and shower curtains and a color map of the British Empire graces



the royal blue wall behind the tub. How we wished that we too could sit in the water just below the Cape of Good Hope, or stand in a shower face to face with merrie old England herself, surrounded by a gold silk shower curtain, singing "God Save the King" in a perfectly good bunghole barytone.

## Hot Stuff

**T**HOSE of you who have intent of going out tomorrow or the next day and stealing a mess of copper to sell as scrap had better think again, because it seems that is a most dangerous occupation these days. Over on Long Island

the other day a night watchman was surprised by a boy who fell through a skylight to the watchman's feet. On the roof above the watchman found more boys and a large section of the copper roof removed, ready to be carted off; up in Middletown, N. Y., a copper crook was stealing wire from light poles when the length he was pulling on fell across a high tension wire and sent him down a hot copper road to the marble orchard. So think again, and steal zinc or lead; it's not so hot.

## Fence

**I**F YOU are intending to visit the New York world's fair in 1939 by jumping over the fence, be sure to cart along your climbing ropes, ice axes and your most sonorous yodel, because we have just received word that the several miles of fence to be used in surrounding the big show will be all steel and three yards high.

## Logic

**T**HAT nothing is sure but death by taxes is reflected in communication from a fabricating plant recently queried by STEEL in regard to development of any new products. No, the company has done no developing, and here's why: Their time, they say, is taken up in trying to keep their plant going, explaining their operations and defending themselves against tax collectors. Under this setup there is no incentive to develop new products or improve existing ones since, they state, the reward for doing these things is penalization by the simple process of taxation.

## Colors

**I**N CONJUNCTION with the advertising department of STEEL we West Point with pride to Wean's absolutely uniformed soljers and that polychromatic riot of a red-gold-black-blue insert in this week's book. It isn't often that we see such a combo of colors in STEEL, and this time our circus blood boils, our fingers itch, and we imagine ourselves swinging out on a callope, instead of sitting at the console of the mighty office typewriter.

—SHRDLU

—The Market Week—

165 tons, building steel, U. S. treasury, state procurement division, CN 105, Westmoreland county, Pennsylvania, to Pittsburgh Bridge & Iron Co., Pittsburgh.

160 tons, state bridge, Calumet county, Pennsylvania, to Pittsburgh Bridge & Iron Works, Pittsburgh.

160 tons, high school, Waynesboro, Va., to Roanoke Iron & Bridge Works Inc., Roanoke, Va.

157 tons, piling, bureau of reclamation, invitation A-42,226-A, Holtville, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, building addition, Pittsburgh Plate Glass Co., Ford City, Pa., to Pittsburgh Bridge & Iron Co., Pittsburgh.

155 tons, piling, bureau of reclamation, invitation A-42,233-A, Knob, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, White river bridge, Barry county, Missouri, to Reynolds Mfg. Co.

150 tons, Reading Terminal viaduct repairs, Philadelphia, to American Fabricated Steel Co., Philadelphia.

150 tons, store, Sears-Roebuck Co., Augusta, Ga., to Southern Engineering Co., Charlotte, N. C.

150 tons, building, Pacific Nut Oil Co., Los Angeles, to Atlas Scraper & Mfg. Co., Bell, Calif.

150 tons, boiler house, Armour & Co., East St. Louis, Ill., to Duffin Iron Co., Chicago.

145 tons, West unit building, University of Kentucky, Lexington, to Louisville Bridge & Iron Co., Louisville, Ky.

140 tons, alterations building 4, U. S. Industrial Alcohol Co., Baltimore, to Maryland Steel Products Co., Baltimore.

136 tons, piling, bureau of reclamation, invitation 24,555-A, Potholes, Calif., to Carnegie-Illinois Steel Co., Chicago.

135 tons, bridge, New York New Haven & Hartford railroad, Mt. Vernon, N. Y., to American Bridge Co., Pittsburgh.

135 tons, piling bureau of reclamation, invitation 24,556-A, Potholes, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, Immaculate Conception Church, Memphis, Tenn., to Pidgeon-Thomas Iron Co. Inc., Memphis.

110 tons, bridge WPGH 98-B, Olney, Mont., to American Bridge Co., Pittsburgh.

100 tons, state highway bridge and approaches, Goffstown, N. H., to American Bridge Co., Pittsburgh; Sawyer & Swett, Winchester, N. H., general contractors. Joseph T. Ryerson & Son, Inc., Boston, awarded reinforcing.

100 tons, addition to plant, B. F. Goodrich Rubber Co., Los Angeles, to Bethlehem Steel Co., Los Angeles.

through Ballanger Co., Philadelphia, engineer.

360 tons, three state bridges, Nebraska.

560 tons, Pennsylvania state bridge between West Moreland and Armstrong counties; bids June 18.

500 tons, bridge, Louisville, Ky.

500 tons, bulkhead gates, frames, etc., Coulee dam; American Bridge Co., Pittsburgh, low.

500 tons, trash racks, etc., Coulee dam; A. J. O'Leary, Chicago, low.

450 tons, buildings, Springfield, Mass., Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

400 tons, court house and post office, Nome, Alaska; McDonald Construction Co., St. Louis. low on general contract.

400 tons, blending and bottling plant, Hunter-Baltimore Rye Distillery, Baltimore.

360 tons, gymnasium, University of Buffalo, Buffalo.

350 tons, bridge, Kenilworth, Pa.; bids July 1.

340 tons, warehouse, Bosworth Building Corp., Chicago.

300 tons, piling, bureau of reclamation, invitations, Calexico, Calif.; bids cancelled.

236 tons, state bridges, Woodbridge, N. J.; bids June 28, New Jersey state highway commission, Trenton.

235 tons, state bridge, Canaan, Conn.; bids in.

230 tons, three state bridges, route 35

### Shape Contracts Pending

6700 tons, three New York city schools; bids postponed to June 22.

3000 tons, state bridge, Connecticut river, Northampton-Hadley, Mass.; bids soon. Work also includes 1000 tons steel piling and 800 tons reinforcing bars.

3000 tons, sheet steel and piling, extension to Jacob Rills park, Long Island, N. Y.

2500 tons, buildings, Massachusetts general hospital, Boston; bids soon.

1900 tons, machinery bases, Rayon Machinery Corp., Painesville, O.

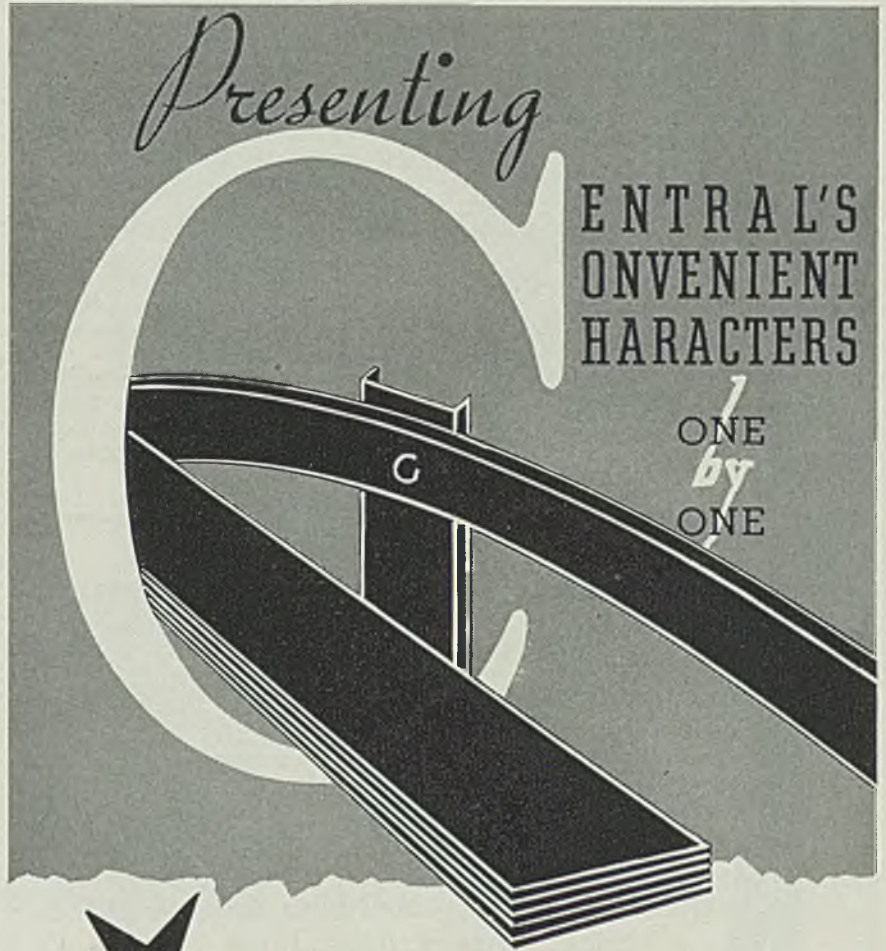
1200 tons, power house, Edison Electric Illuminating Co., South Boston, Mass.

960 tons, storage building, Aluminum Co. of America, New Kensington, Pa.

950 tons, state highway overhead crossing No. 1422, Fetterman, W. Va.

800 tons, soaking pits, Carnegie-Illinois Steel Corp., South Chicago, Ill.

750 tons, plant building, Duplan Silk Corp., Grotton, Va.; bids June 22,



### Highway Guard Rails

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

sections 13, New Jersey; bids June 28. 222 tons, consisting of 122 tons fabricated and 100 tons plain structural steel, pavement and I-beam bridge, Somerset county, Pennsylvania; Roberts Paving Co., Salisbury, Md., low, at \$639,018.62

210 tons, bridges, North river, Charlemont-Shelburne and Colerain, Mass.; bids June 29, department of public works, Boston, G. H. Lelano, chief engineer. Nine other steel bridges closing same date require approximately 600 tons additional.

157 tons, piling, bureau of reclamation, invitation A-42,216-A, Holtville, Calif.; bids cancelled.

155 tons, procurement division, treasury department, Haverhill, Mass.; bids in.

152 tons, state crossing Snohomish county, Washington; L. Coluccio, Seattle, general contractor.

150 tons, hangar, Cleveland airport, for Gulf Refining Co., Cleveland; bids June 30.

150 tons, bureau of roads span, Lincoln county, Montana; bids in.

150 tons, theater, 1603 Broadway, New York.

132 tons, piling, bulkhead, Newport Beach, Calif.; Case Construction Co., Alhambra, Calif. low.

132 tons, Fisher river bridge, Lincoln county, Montana; bids opened.

120 tons, fabricated structural steel, I-beam bridge, Centre county, Pennsylvania; A. G. Andrew Engineering Co., Tyrone, Pa., general contractor, low at \$104,471.89. Includes 45 tons reinforcing bars.

119 tons, crossing, Natrona county, Wyoming; bids June 22.

106 tons, theater building, Shaker Heights, O.; bids in.

100 tons, including piling, state highway project; bids at Olympia, Wash., June 29.

## Reinforcing

Reinforcing Bar Prices, Page 95

**Pittsburgh**—While awards are fair, placing of a number of projects apparently is being delayed longer than usual, possibly to wait until the labor situation is clarified. Prices are steady.

**Cleveland**—Reinforcing bar market continues fairly active despite uncertainty resulting from labor unrest. Public work has been inactive for some time and only a few projects of note are pending. Bids for the Industrial Rayon Co's plant, Painesville, O., involving over 2000 tons, have been postponed to June 22.

**Chicago**—Shipments continue fairly heavy and despite quiet in awards outlook is for sustained deliveries for 30 to 60 days. Private building will take substantial tonnages for several projects pending.

**Boston**—Awards approximate 1000 tons, including 350 tons for the Bills Brook dam project, Connecticut. Small-lot buying is brisk while close

to 400 tons has been closed for bridges. Prices continue to be shaded.

**New York**—Contracts are heavier, although greater part of more than 15,000 tons figured remains unclosed. Buyers are pressing for price concessions with some success, although mill prices are generally firm.

**Philadelphia**—Approximately 1000 tons reinforcing bars are involved in three projects placed here and close to 2700 tons in the Market street court house and school in North Philadelphia. Sellers see further good tonnage ahead with Pennsylvania state institutional program, involving heavy tonnage of bars as well as sizable tonnage of shapes expected to get under way shortly.

**San Francisco**—Awards aggregated close to 1500 tons, bringing the year's total to 41,366 tons, compared with 107,712 tons in 1936. Pending business now exceeds 11,000 tons, all of which will be placed this month.

**Seattle**—Mills are cleaning up backlogs with operations expected curtailed shortly. Lack of private construction projects is noticeable. Pending list is less than 2000 tons.

## Reinforcing Steel Awards

1320 tons, tower pier and foundations for anchorage and approach, Bronx-Whitestone bridge, New York, contract W-B-2, to Bethlehem Steel Co., Bethlehem, Pa.; Frederick Snare Corp., general contractor,

720 tons, rail steel bars, sewage treatment plant, Lansing, Mich.; to West Virginia Rail Steel Co., Huntington, W. Va.

719 tons, All-American canal project, Potholes, Calif.; 610 tons to Bethlehem Steel Corp., Bethlehem, Pa., and 109 tons of Judson-Pacific Co., San Francisco.

475 tons, Panama, to Virginia Steel Co., Richmond, Va. at \$28,737, awarded by lot.

450 tons, Delaware state cause-way, Wilmington, Del., to Taylor Davis Inc., Philadelphia.

441 tons, Shoshone project, Cody, Wyo., to Colorado Fuel & Iron Co., Denver, Colo.

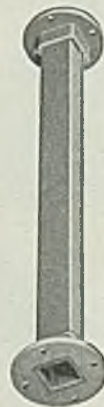
440 tons, bridge, Lehighton, Pa., to Bethlehem Steel Corp., Bethlehem, Pa.

400 tons, state bridge carbon county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; through Carty Contracting Co., Phillipsburg, N. J.

## CROSBY FOR STAMPINGS



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# THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

## Concrete Awards Compared

	Tons
Week ended June 19.....	9,355
Week ended June 12.....	10,403
Week ended June 5.....	7,493
This week, 1936.....	1,556
Weekly average, 1936.....	6,005
Weekly average, 1937.....	5,866
Weekly average, May.....	7,773
Total to date, 1936.....	161,344
Total to date, 1937.....	134,157

Includes awards of 100 tons or more.



380 tons, building, Publications Corp., Hoboken, N. J., to Igoe Bros., Newark, N. J.; through George Peterson Co., Harrison, N. J., concrete subcontractor.

350 tons, bulkhead wall and sewer construction, East river drive, Grand to East Twelfth street, New York, contracts 3 and 4, to Bethlehem Steel Co., Bethlehem, Pa.; Frederick Snare Corp., general contractor.

350 tons, Bills Brook dam, contract 27, Metropolitan district commission, Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Perini & Sons, Framingham, Mass., general contractors.

280 tons, viaduct, Dyckman streets, New York, for New York Central railroad, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, auto sales building, Van Ness avenue, San Francisco, to Bethlehem Steel Co., San Francisco.

240 tons, rail steel bars, ABC building, Chicago; to O. J. Dean Co., Chicago.

220 tons, for Catholic orphanage building, Louisville, Ky., to Louisville Bridge & Iron Co., Louisville, Ky.

220 tons, bulkhead for Consolidated Edison Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, mesh and bars, grading, paving and structures, Randalls Island park, New York, to Carroll-McCreary & Co., Inc., Brooklyn; A. Leopold, general contractor.

200 tons, bureau of reclamation, invitations, Potholes, Calif., to Judson Steel Corp., San Francisco.

190 tons, state bridge, Norwalk river, Norwalk, Conn., to Concrete Steel Co., New York; Mariani Construction Co., New Haven, general contractor.

168 tons, state bridge route No. 20 over Boston & Albany railroad and Westfield river, Huntington, Mass., to Truscon Steel Co., Youngstown, O.; Arute Bros., Inc., New Britain, Conn., general contractor.

152 tons, state highway project WP-37-4, Nassau county, New York, to Carroll-McCreary & Co., Inc., Long Island City, N. Y.; Edward M. Underhill & Son, Inc., Glen Cove, N. Y., general contractors.

150 tons, plant addition, Keasby & Mattison Co., Ambler, Pa., to unnamed interest; through McNickol Contracting Co., Philadelphia.

150 tons, southwest intercepting sewer No. 9, Chicago, to O. J. Dean Co., Chicago.

140 tons, mesh highway R C 3878, Steuben county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through William F. Yahey, New York, general contractor.

125 tons, bureau of reclamation, invitation A-22,019-A, Casper, Wyo., to Colorado Fuel & Iron Co., Pueblo, Colo.

116 tons, addition, to building 12, Veterans Hospital, Hot Springs, S. D., to Concrete Engineering Co., Omaha, Neb.; through Henry H. Hackett, Rapid City, S. D.

109 tons, Franciscan Fathers building, Oakland, Calif., to Concrete Engineering Co., San Francisco.

100 tons, girls' dormitory, state agricultural college, Logan, Utah, to Steel Engineers Inc., Salt Lake City; Frank Campion Co., Ogden, Utah, general contractor.

100 tons, state bridge, Merrimack river, Lowell, Mass., to Truscon Steel Co., Youngstown, O.; Coleman Bros. Corp., Boston, general contractors.

100 tons, highway bridge, Dallas county, Texas, to Concrete Engineering Co., Dallas; Thomas & Ratliff, Rogers, Texas, general contractor.

100 tons, state bridge, main avenue, Norwalk, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; through C. W. Blakeslee & Sons, New Haven, Conn.

## Reinforcing Steel Pending

2000 tons, plant, Industrial Rayon Corp., Painesville, O.; bids June 22.

1600 tons, high school, Ogontz and Olney avenues, Philadelphia, bids June 22.

865 tons, Salt river project, Phoenix, Ariz.

670 tons, project 42717-A, reclamation bureau, Phoenix, Ariz.

650 tons, Washington state span in Thurston and paving in other counties; bids at Olympia, June 29.

620 tons, building, Milwaukee-Western Mailing Co., Milwaukee.

500 tons, Columbia avenue viaduct, Cincinnati; bids in.

415 tons, transition structures, San

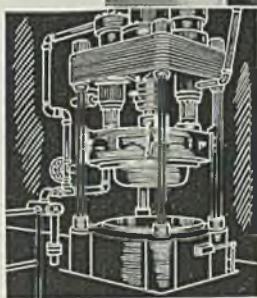
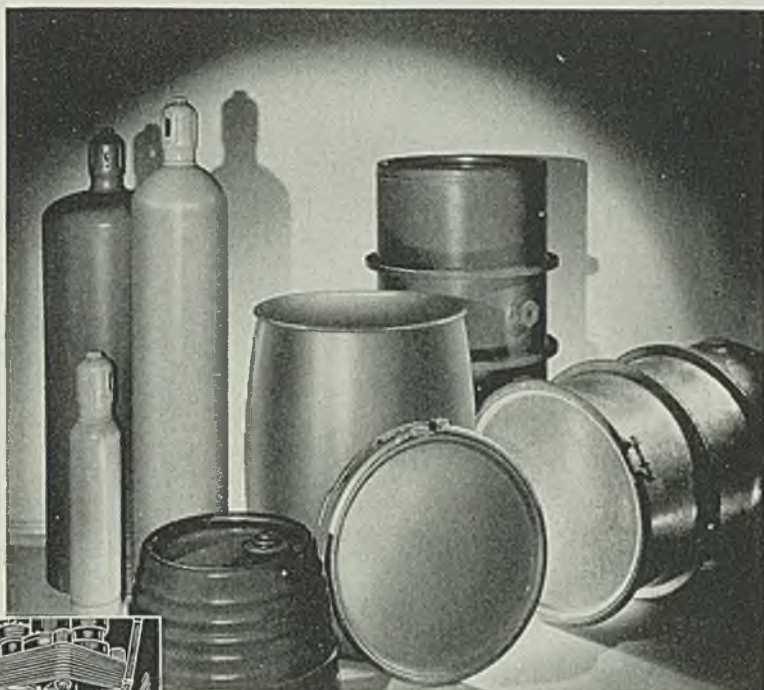
Gabriel dam No. 1, Los Angeles county, California; Concrete Engineering Co., Los Angeles, low.

413 tons, wharf, Fort Baker, San Francisco; Duncanson-Harrelson, San Francisco, low.

300 tons, Perth Amboy by-pass, route 35, section 13; bids June 28, New Jersey state highway commission, Trenton.

260 tons, including 130 tons steel boring piles, state bridge, North Kennebunkport, Me.; Concrete Construction Co. and Cerall Contracting Co., Chelsea, Mass., general contractors.

200 tons, additional requirement for Laurel Homes resettlement project, Cincinnati; David Gordon Building & Construction Co., Cincinnati, low.



## THERE'S MORE THAN EQUIPMENT BEHIND HACKNEY CONTAINERS

● Manufacturing competence, designing skill, and years of experience are responsible for the satisfactory performance of the millions of containers bearing the Hackney trade-mark.

Many industries have turned confidently to the Pressed Steel Tank Company for the most practical and economical solution of their container problems. Numerous metals

have been used in developing containers of almost every conceivable shape for all types of gases, liquids and solids.

Economy, dependability, efficiency and long life are characteristics of Hackney standard containers and special shapes—both in welded and seamless construction. Let a Hackney engineer help you solve your container problem. There is no obligation. Write today.

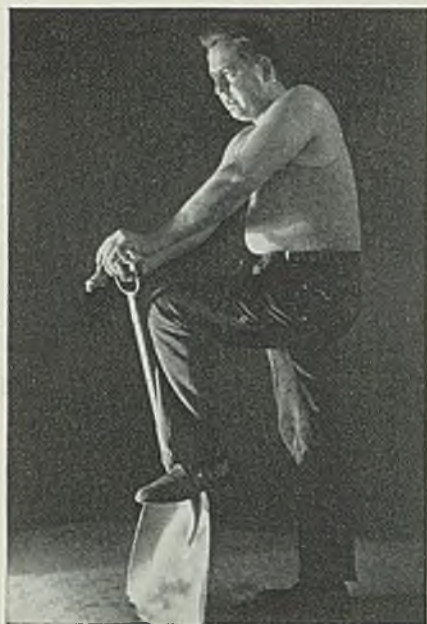


### PRESSED STEEL TANK COMPANY

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688 Roosevelt Building, Los Angeles

1387 Vanderbilt Concourse, New York  
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*Containers for Gases, Liquids and Solids*



## You Lose Money Every Summer

A man's working efficiency drops to 10% when the thermometer gets up to 110° . . . Keep your men cool and your production up with a breeze from Coppus Heat Killers.

They are the only kind of man-cooling fan that actually *directs* the cool air on the job and prevents recirculation of stale air.

Both types are portable, and can be used for cooling, drying, driving out foul air, etc. Write for Bulletin 160-4.



# FRESH AIR FOR MEN AND MACHINES COPPUS

COPPUS ENGINEERING CORPORATION, 359 Park Avenue, Worcester, Mass. Sales offices and distributors listed in Thomas' Register.

In Sweet's — Steam Turbines, Air Filters, Blowers, Heat Killers

- 192 tons, pavement and I-beam bridge, Somerset county, Pennsylvania; Roberts Paving Co., Salisbury, Md., low on general contract at \$639,016.62.
- 182 tons, bridge, Fetterman, W. Va.; T. A. Loving, Goldsborough, N. C., low on substructure containing 107 tons concrete bars; Pittsburg-Des Moines Steel Co., Pittsburgh, low on superstructure containing 75 tons concrete bars.
- 128 tons, highway work, San Bernardino county, California; bids July 1.
- 128 tons, highway work, Mohave county, Arizona; bids June 29.
- 120 tons, fleet mooring, Pearl Harbor, T. H.; bids July 7.
- 108 tons, Nichols Canyon debris basin, Los Angeles county, California; bids June 29.
- 100 tons, bridges, Woodbridge, N. J.; bids June 28, New Jersey state highway commission, Trenton.
- 100 tons, warehouse, Innis Spieden Co., Jersey City, N. J.
- Unstated, 248 foot overpass, Fremont county, Idaho; bids in.

## Pig Iron

Pig Iron Prices, Page 96

**Pittsburgh** — Bookings for third quarter have been well maintained. Spot demand continues quiet, with little reflection of labor situation in other districts noted. Although inquiries for export have increased, apparently little of this business has been taken here, the freight rates to the seaboard being a major factor. Most foundries are active, but some have fair stocks and have not been ordering as heavily as they would under price advance incentive. Shipments against old contracts are steady.

**Cleveland** — Despite the fact that most foundries have stocks for two or three weeks and considerable tonnage to be shipped this quarter, an encouraging amount of third quarter iron has already been placed. Some foundries hesitant about placing third quarter requirements have been urged to do so as a means of protection against continued labor disturbances.

**Chicago** — Pig iron shipments continue heavier than a month ago while new bookings are fair. Foundry operations are receding seasonally in some instances, with a further let-down in prospect when automotive schedules are curtailed. Farm equipment manufacturers will have heavy output through July. The market is firm at \$22, furnace, for No. 2 foundry and malleable.

**Boston** — Pig iron buying for third quarter has made further progress, confined mostly to medium and smaller consumers who failed to stock as heavily as larger melters. Considerable contracting for 300 to 500 tons has been done, such busi-

ness being well distributed among eastern sellers.

**New York** — Pig iron inquiry has further declined, with most sellers well covered for several weeks. A number of the larger consumers have been working to a considerable degree through the current quarter on tonnage placed at \$1 to \$3 a ton under present prices. This tonnage involved contracts placed before late February when the first of the two advances went into effect and consumers, working on this iron, have considerable second quarter tonnage to carry them into the next period. Much of this latter tonnage is yet to be released, and it is probable new contracts will be made. Export inquiry is less active, particularly with Japan now out of the market.

**Buffalo** — Demand for pig iron is steady and third quarter orders are beginning to come out. Consumers are cautious in buying in view of labor situation. Producers say there has been a very favorable reception of third quarter prices and that little second quarter iron remains to be shipped. Melt of hot iron continues heavy and steel works are taking less interest than usual in the merchant iron field.

**Philadelphia** — Pig iron consumers appear well covered for several weeks with some of the larger winding up specifications placed before the advances in first quarter. The trade here has booked a substantial tonnage for a French consumer for July delivery.

**Youngstown, O.** — After being idle six years the 95-year-old "Mary" furnace at Lowellville plant of Sharon Steel Corp., oldest stack in the district, went back into blast recently. This is the only hand-filled furnace in that section and employs 250 men, with capacity of 400 tons daily.

**Cincinnati** — Little forward buying is noted. Demand for castings is less active, and melters are meeting needs from old contracts, stocks or spot shipments. Lack of interest is applicable both to Northern and Southern iron. Foundries on heating equipment are on busy schedules.

**St. Louis** — Purchasing of pig iron has picked up noticeably, with reference to spot orders and future commitments. While the principal melters are well supplied, expectations of heavy requirements in the late summer and fall are inciting them to augment supplies. The melt is holding up extraordinarily well, the usual seasonal recession being little in evidence.

**Toronto, Ont.** — Pig iron buying for the past week compared favorably with that of preceding weeks. Melt-

ers show interest and inquiries for third quarter iron are appearing. So far, however, no third quarter contracts have been reported and melters recently have been buying on a hand to mouth basis. Spot sales are holding at their former high level of around 1700 tons weekly, in lots up to 500 tons with foundry iron almost two-thirds.

## Scrap

Scrap Prices, Page 98

**Pittsburgh**—Further sales of No. 1 heavy melting last week confirmed the \$18 to \$18.50 level. Although cast grades were slightly weaker, railroad specialties held their ground. Machine shop turnings, although in no great demand, were unchanged. There were evidences that scrap has become more easily obtainable, partly due to the steelworks labor situation in other districts.

**Cleveland**—Quiet prevails in the steel and iron scrap trade with prices largely nominal, though holding steady on small lots occasionally bought. Closing of several plants here and in the Valley has slowed shipments materially.

**Chicago**—Resumption of shipments to one mill still operating in this district has brought slightly more activity. New business for consumers is light, however, and scrap producers whenever possible are deferring sale of accumulations. Plenty of scrap still is available but the trade sees little prospects of resumption of former activity until closed plants are re-opened. Foundries are curtailing stocks and are making few new commitments.

**Boston**—While with the exception of stove plate, export prices on scrap for dock delivery are unchanged, several grades for domestic shipment are easier, with small demand. The Worcester, Mass., consumer continues to bid \$14.75, delivered, for No. 1 heavy melting steel; \$13.25 for No. 2 and \$13, skeleton. Dock activity is heavy, about 25,000 tons having been recently shipped or now loading.

**New York**—Dullness prevails in scrap, with prices and nominal and unchanged, but inclined to weakness in the domestic market. Export prices are unchanged and most activity is against old contracts.

**Buffalo**—Receipts of scrap have dropped sharply, especially from the east where export buying is again cutting into normal movement. It is estimated that June receipts by canal are only about 25 per cent of the total for the like period of 1936 and that little material is now available for water shipments to Buffalo. Nominal markets are the rule with buy-

ing quiet but shipments on orders brisk.

**Philadelphia**—Scrap prices appear to be scraping bottom, with heavy breakable cast higher and other prices unchanged, with one minor adjustment. There are no new export offerings here although some tonnage moved against an old contract when a boat left Girard Point early in the week.

**Cincinnati**—Iron and steel scrap are moving in fair volume to augment stocks feeding a high steelmaking rate, but mill apathy continues toward tonnage commitments. In absence of active bidding, dealers having taken a sidelines position, prices are considered nominal. Lowered quotations in nearby districts, combined with labor unrest, are elements in the soft undertone.

**St. Louis**—Downward trends in the market for iron and steel scrap, which have prevailed for several weeks, continues. There has been some purchasing, mainly of No. 2 heavy melting steel and steel specialties. The two leading east side mills took from 8000 to 9000 tons of heavy melting steel, distributing their orders among several dealers. The price paid was reported to have been 25 cents below the last pre-

ceding purchase of the same material. Delivery over the next 60 days is specified.

**Toronto, Ont.**—Iron and steel scrap continues active with local dealers reporting scarcity. Mills are in the market for all the heavy melting steel and turnings that can be supplied and there is a growing demand for automobile scrap, but in the latter material supply greatly exceeds demand at this time. Machinery cast is active and foundries are taking all this material available, with many unable to fill requirements.

## Warehouse

Warehouse Prices, Page 97

**Pittsburgh**—New business by warehouses has shown a slight improvement. For the most part, however, volume that might have been expected due to the steelworks labor situation has failed to materialize, although late last week indications were that the reflection would be greater. The heavy call for sheets continues. Prices are steady.

**Cleveland**—Warehouse distributors report that the number of

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**WELDIT MODEL W**  
*Automatic WELDING TORCH*

Thumb lever in handle controls welding flame. Release of thumb reduces flame to pilot size. No re-lighting or re-adjusting of flame necessary between welds. Saves 25% to 50% gas alone. Weight 13 oz. Length 14 1/2 inches. Tip sizes 3 thru 8.



**WELDIT MODEL A-20**  
*Automatic WELDING TORCH*

Has automatic shut-off (gas saving) feature for intermittent welding work or instantly adaptable to continuous welding job by simply sliding thumb lever into retaining or locking slot. Weight 1 lb. 10 oz. Length 18 inches. Tip sizes 2 thru 12.



**WELDIT MODEL "E"**  
**GASAVER**

Hanging torch on Gasaver hook, between welds, automatically shuts off intake lines, saves gas. Lifting torch off hook and passing across pilot light instantly produces full welding flame, no re-adjusting necessary.

## WELDIT ACETYLENE CO.

642 BAGLEY AVE. DETROIT, MICH.

*Free TEST FOR TWO WEEKS IN YOUR PLANT*

orders has somewhat increased so far this month although aggregate tonnage involved has not shown a corresponding improvement. To date only a little tonnage has been received from sources which usually purchase material from mills. Prices are firm.

**Chicago**—Sales show only a small decrease from the May rate, the let-down being less than seasonal. Consumers show little nervousness over labor troubles, steel strikes so far having influenced warehouse demand but slightly.

**New York**—Demand for steel out

of warehouse has declined materially since June 1. Slower buying affects bulk of products carried by jobbers, the drop in structurals being most pronounced.

**Philadelphia**—While smaller, warehouse orders are more numerous with the result dollar sales show little decline. Distributors describe buying as in excess of a year ago.

**Cincinnati**—An upward trend in warehouse demand is noted, traced to slower mill deliveries especially where suppliers are affected by strikes. Jobbers are finding difficulty in maintaining adequate stocks of sheets, plates and some structural items.

**St. Louis** — Warehouse and jobbing interests report business during the first half of June about on a parity with that of the similar interval in May. Interest is chiefly in lighter products, though plate demand is brisk, coming chiefly from barge and boat builders.

**Seattle** — Price structure remains steady but business is quiet and spotty, only small tonnages out of stock moving. Car lot buying is slight. Governmental expenditures have slowed and jobbers are feeling effects of scarcity of private construction. Sheets probably are in best demand.

breaks the recent record set June 5 by the steamer HARRY COULBY, with 15,031 long tons.

Approximately 300,000 tons of iron ore left the Duluth-Superior harbor in one day recently, with 33 freighters clearing port during a 24-hour period. The shipments were among the largest ever made in a single day, but no records are available to determine whether an all-time mark was set.

## Steel In Europe

Foreign Steel Prices, Page 97

**London**—(By Cable)—Producers of pig iron in Great Britain are rationing foundry consumers to 75 per cent of tonnage used last year. Shortage of steel ingots has caused some stoppage of tin plate production in South Wales and in general rerolling mills are operating intermittently, pending delivery of soft steel billets. Some sheet mills are making only 50 per cent of normal output on account of lack of sheet bars. Structural steel is in such heavy demand that mills are booked fully to the end of the year.

Exports of iron and steel products in May totaled 228,312 tons, a decline of 14,488 tons from the 242,800 tons exported in April. Imports in May were 98,054 tons, a gain of 9554 tons over the 88,500 tons imported in April. Much of the imported steel was in semifinished forms for rerolling in British mills.

The Continent reports some slowing down in export demand and premiums for urgent deliveries are no longer offered except on plates and sheets.

## Metallurgical Coke

Coke Prices, Page 95

New business in Connellsville beehive coke is slack, partly the result of the steelworks labor situation. Production the first week of June was around 63,000 net tons, compared to 68,700 tons in the last week of May and 19,300 tons in the week ending June 6, 1936. Bituminous coal output in the first week of June was approximately 1,000,000 tons under the last week of May.

The attention of operators in the coal and coke fields was focused sharply on the labor situation last week after John Lewis had ordered the picketing of all "captive" mines of Youngstown Sheet & Tube Co., Republic Steel Corp.; Bethlehem Steel Co., and Inland Steel Co. Most of the 19 mines had already been shut down previous to the order. Lewis then asserted non-captive



## "HOLIER" THAN THOU!

No, that's not an attitude we've struck. It's just a matter of business with us.

Since we sell holes—of every conceivable shape and size in Sheet Aluminum, Brass, Tin, Steel, Copper and Zinc, we can't help but feel just a little holier than most folks.

We've been perforators for a long time (which means we ought to know what it's all about), but we're still plenty fast on our feet in spite of our years in business.

We are in the habit of carrying large stocks of standard gauges — and we're in the habit of getting special orders out when wanted. Now do we get that order?

58 Years in Business

**ERDLE PERFORATING CO.**  
171 York St., Rochester, N. Y.

## Iron Ore

Iron Ore Prices, Page 98

**Cleveland**—Receipts of iron ore at lower lake ports this season to June 1, shipments to interior furnaces, and dock balances follow:

Port	Receipts Season	Shipments Season	Dock Bal. June 1, '37
Buffalo	1,032,071	182,086	810
Eric	480,510	484,748	42,715
Conneaut	1,832,755	2,003,500	1,058,515
Ashtabula	1,325,233	1,348,076	672,053
Fairport	427,710	516,458	304,173
Cleveland	1,984,190	1,537,816	239,480
Lorain	740,108	292,044	3,871
Huron	294,985	306,970	190,520
Toledo	406,857	203,481	32,053

Total	8,524,419	6,875,129	2,544,190
Year ago	2,650,851	2,827,790	3,973,624

Receipts at other than Lake Erie ports for May and the season to June 1 follow:

Port	Month	Season
Detroit	118,759	184,773
Indiana Harbor	386,488	491,871
Gary	1,185,900	1,428,084
South Chicago	1,381,717	1,669,231
Sault Ste. Marie, Ont.	92,585	116,471
Hamilton, Ont.	95,410	120,380

Total	3,240,859	4,010,810
Year ago	1,409,195	1,418,150

Inland Steel Co.'s steamer L. E. BLOCK operated by the Hutchinson & Co., Cleveland, left the Great Northern dock at Superior Wis., last week, with a new all-time record cargo of 15,410 gross tons of iron ore, for Cleveland. This tonnage

mines must refrain from shipping to the steel companies, and this brought a sharp reply from the Western Pennsylvania Coal Operators' association, which said such a decision on the part of the United Mine Workers of America would be a clear violation of existing contracts.

## Standard Carboloy Tools Offer Reduced Prices

Carboloy Co. Inc., 2967 East Jefferson avenue, Detroit, manufacturer of cemented carbide tools, dies, and wheel dressers, has developed three styles of standard Carboloy blanks, available at reduced prices. These are not general price reductions but are special reductions made possible through quantity production. The base price of Carboloy remains at 45 cents per gram.

The three styles in 96 sizes have been designed for wide application and are adaptable for use on more than 90 per cent of all carbide tools now in use. In many cases simple revisions in tool design will make possible use of standard blanks at substantial savings.

The standard blanks offer savings of 15 per cent or more on the price of Carboloy through large-quantity prices on small orders, immediate delivery and reduction in designing costs. Catalog M-37 gives prices, descriptions of standard tools and drawings of the 96 standard blanks in the three styles.

## Nonferrous Metals

Nonferrous Metal Prices, Page 96

**New York** — Price structures of the major nonferrous metals were weakened last week by developments outside of the markets themselves, including a financial crisis in France and prolongation of strikes in this country. While no price reductions with the exception of tin were made here, the foreign markets tended lower. Sentiment improved late in the week as the government took steps to hasten settlement of the labor trouble in the steel industry.

**Copper** — Export copper sold down to 13.00c, c.i.f. European ports, but sold up to 13.65c later in the week. Refiners' bids for red metal scrap fluctuated in line with the foreign market which stimulated the flow of material. Electrolytic sellers held quotations at 14.00c, Connecticut, reflecting their well sold position and the strong statistical position of the industry.

**Lead** — Buying eased off since consumers are fairly well covered on immediate requirements and incentives were lacking for forward buy-

ing. Prices held at 6.00c, New York.

**Zinc** — Prices held at 6.75c, East St. Louis, in the face of vulnerability to importation. The market was supported by heavy shipments from limited supplies.

**Tin** — Straits spot closed around 55.25c, compared with 55.50c at the end of the previous week. Tin plate makers continued pressed on deliveries.

**Antimony** — Interest in antimony was dull with prices unchanged on the basis of 14.75c, New York, for spot.

## Equipment

**Chicago** — While sales and inquiries are quieter, machinery sellers still encounter fairly heavy demand. Machine tool builders show some improvement in deliveries. Pending business includes only a few lots for railroads though this business this year has been the heaviest since before the depression. Outstanding among prospective orders is International Harvester Co's for its new Indianapolis plant.

## TUBE MILL EQUIPMENT OF MODERN DESIGN

Let us know your problems and we will be glad to be of service to you.

*41 years experience in building tube mills.*

**TAYLOR-WILSON MANUFACTURING CO.**  
MAIN OFFICE and WORKS  
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McKEES ROCKS, PA.

## THE BEST KNOWN NAME IN IRON

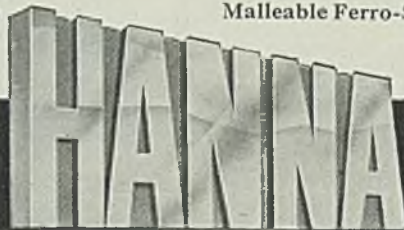
### HANNA PIG IRON

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## THE HANNA FURNACE CORPORATION

MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION

Buffalo

Detroit

New York

Philadelphia

Boston

# Construction and Enterprise

## Michigan

ADRIAN, MICH.—Southeastern Michigan Rural Electric Co-operative plans construction of 120 miles of power lines and generating plant, to cost \$250,000.

ADRIAN, MICH.—Hardie Mfg. Co. has awarded contract to Austin Co., Cleveland, for construction of a \$50,000 addition to its machine shop.

BERKLEY, MICH.—Trinity Tool Co.,

3708 West First street, has been formed with \$10,000 capital to manufacture jigs, fixtures, etc., by Albert Haegge, Detroit.

DETROIT—Cooper Products Inc. has been formed with \$50,000 capital stock by Morris Cooper, 2214 Taylor avenue, to engage in general manufacturing.

DETROIT—Murray Corp. of America, 1424 Aberle street, has awarded contract to Alfred A. Smith, Detroit, for erecting an addition to its shipping building, Marston avenue.

DETROIT—O. W. Burke Co., 1010 Fisher building, Detroit, has been awarded contract for erection of an engineering building, power house and manufacturing building to be erected at Fullerton avenue and Outer drive for the Argonaut Realty Co., General Motors building, Detroit.

DETROIT—Giffels & Vallet Inc., and L. Rosetti, 606 Marquette building, associated engineers and architects, are preparing plans for a power house extension for a Detroit manufacturer, for the installation of two heavy press pits for another manufacturer and for three body conveyor bridges, two substations and an air compressor installation for an automobile firm. They are also preparing plans for an office and factory extension for a Detroit manufacturer, for the installation of high pressure boiler and turbogenerator for a Detroit automobile company and for the installation of two power transformer stations for another automobile company.

EAST LANSING, MICH.—Robey Mfg. Co. has been formed to deal in metal articles, by Harvey D. Robey, 1010 East Grand river.

GRAND RAPIDS, MICH.—American Seating Co. has awarded contract to Owen, Ames & Kimball, Grand Rapids, for construction of a \$20,000 addition to its factory.

HIGHLAND PARK, MICH.—M. R. L. Engineering Corp., 14021 Brush street, has been organized by John E. Marsh,

Detroit, to conduct a machine shop.

MIDLAND, MICH.—Dow Chemical Co. plans a \$250,000 filtration plant, including a circular settling basin 142 feet in diameter and two filtration basins of same size.

RIVERVIEW, MICH.—Firestone Steel Products Co., maker of tire rims, Akron, O., subsidiary of Firestone Tire & Rubber Co., has acquired an 80-acre site here and is having plans prepared by Russell Engineering Corp., Detroit, for erection of a steel products building, approximately 300 x 700 feet, and for a power house.

SEBEWAING, MICH. — Sebewaing Tool & Engineering Co. has been incorporated with \$25,000 capital to manufacture tools and dies, by Albert C. Hoeh, Sebewaing.

## New York

BUFFALO—Crane Co., 836 South Michigan avenue, Chicago, plans building plant addition to cost over \$40,000. F. B. Backus, engineer and architect, 360 Delaware avenue, Buffalo.

JAMESTOWN, N. Y.—O. S. Johnson, architect, Fenton building, will soon let contracts for three story 35 x 80-foot steel factory for Jamestown Wood Finishing Co. Total cost \$40,000.

LANCASTER, N. Y. — Hazel-Atlas Glass Corp. plans erection of plant addition, to cost about \$77,000.

NEW YORK—Wilbert Products Co. Inc., 805 East 139th street, has had plans prepared by F. Chilson, 103 West Thirty-first street, for improving and constructing plant addition. Cost to exceed \$40,000, with equipment.

TONAWANDA, N. Y.—Linde Air Products Corp. plans constructing research laboratory, costing \$290,000 and proving laboratory, costing \$116,000.

## Ohio

CLEVELAND — City, department of public service, Miles E. Evans, director, room 217 City Hall, will take bids June 25 for one crawler-type diesel engine crane, with 50-foot boom.

COLUMBUS, O.—City, Robert Tucker, superintendent of electrical division, will open bids June 22 on a \$125,000 boiler and \$60,000 stoker for municipal light plant. Total equipment replacement will exceed \$250,000.



OUR AIM is to render service. A little more complete... more hospitable... more pleasing... than even the most exacting guest expects.

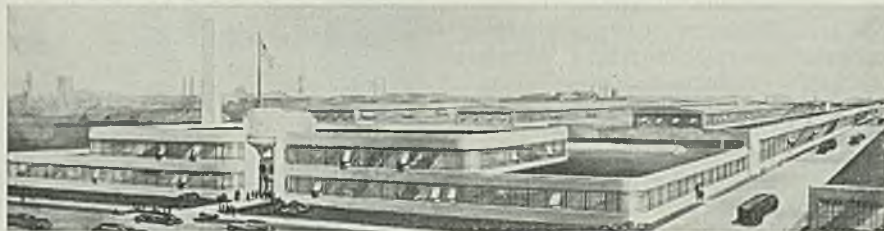
CHAS. H. LOTT  
Manager

Every Room Outside  
with Private Bath  
Single from \$2.50  
Double from \$4.00

# DETROIT LELAND HOTEL

CASS AT BAGLEY AVE.  
GARAGE IN CONNECTION

## New Plant Opened by Tin Plate Lithographing Company



CASPERS TIN PLATE CO. formally opened its new plant in Chicago's Central Manufacturing district, June 19. The new headquarters, one of several sites occupied by the company in Chicago since it started in business in 1922, typify latest developments in industrial plant design and were made necessary to accommodate increased output.

The Caspers company, now a leading factor in the lithographing and coating of sheet metal, was a jobber of tin plate upon its origin 15 years ago. Later a general line of steel sheets was added. In 1928 the sheet jobbing business was

disposed of and the company started the lithographing of sheet metal. While the jobbing of tin plate has been continued, the major activity of the company is the lithographing department. Most of the work is done on tin and black plate, employed extensively in the manufacture of containers and caps for the food and beverage industries. Material is furnished customers in the flat state, the company doing no fabricating of the processed sheets.

The new plant contains 94,000 square feet of floor space. Offices, located on the second floor, are decorated in striking color combinations.

**CUYAHOGA FALLS, O.**—City, K. L. Ewart, service director, will take bids June 28 for automotive and electric power line service equipment.

**DILLONVALE, O.**—Village, Peter Savage, mayor, will take bids in about 30 days for waterworks system, costing \$100,000. Paul W. Elwell, 5005 Euclid avenue, Cleveland, consulting engineer.

**MT. PLEASANT, O.**—Village, J. Harry Glass, mayor, will take bids in about 30 days for waterworks system, costing \$66,000. Paul W. Elwell, 5005 Euclid avenue, Cleveland, consulting engineer.

**WARREN, O.**—City plans constructing water softening and filtration plant, costing \$90,000. W. S. Harvey, city engineer.

**YORKVILLE, O.**—W. L. McKean has preliminary plans for general rehabilitation of water system.

**New Jersey**

**BERGENFIELD, N. J.**—Ganz Bros., inventors, designers and manufacturers of machinery, have purchased a tract on the south side of Newbridge road, and have begun erection of a modern one-story building.

**NEWARK, N. J.**—Dorfan Mfg. Co. Inc. has been incorporated with 2500 shares of no par to deal in metal products. Edward R. McGlynn, agent.

**Pennsylvania**

**ERIE, PA.** — Standard Stocker Co., 1701 Gaskill avenue, will take bids for erection of steel foundry, costing approximately \$100,000.

**FRACKVILLE, PA.**—Borough council is considering construction of municipal sewage system. Plans are being drawn and application for loan is expected to be made to WPA.

**YOUNGWOOD, PA.** — Robertshaw Thermostat Co., C. V. Miller, manager, plans one and two-story steel manufacturing building and installation of new equipment.

**Illinois**

**EAST MOLINE, ILL.**—John Deere Harvester Works has awarded contract to Tunnell Construction Co., Davenport, Iowa, for construction of four one-story storage sheds, 96 x 320 feet each, to cost about \$60,000.

**ROCKFORD, ILL.** — Sundstrand Machine Tool Co. will soon take bids for two-story, 120 x 125 foot factory addition. Estimated cost \$100,000. Peterson & Johnson, Rockford, architect.

**ROCKFORD, ILL.**—Star Pattern Model Works Inc., 726 Sixth street, has been incorporated to manufacture wood and metal patterns, by V. Olson, H. Hasselroth and E. Olson. Correspondent: Carroll H. Nelson, 304 Reliance building.

**Indiana**

**KOKOMO, IND.** — Chrysler Corp., 341 Massachusetts avenue, Detroit, plans installation of motors and controls, regulators, conveyors, electric hoists, loaders and other equipment in new branch automobile plant here for Dodge Bros. division. Entire project will cost \$1,500,000.

**MUNCIE, IND.** — Fuller Warren Co. plans to remodel its factory and put in a new foundry, an enameling department and install new equipment. Total cost \$40,000.

**Mississippi**

**KILMICHAEL, MISS.**—City, care of

mayor, plans constructing waterworks system, costing \$30,000. Application made to PWA for financial aid. W. E. Mallett Jr., Jackson, Miss., engineer.

**LEAKVILLE, MISS.**—City plans constructing waterworks system, costing \$55,000. Application made to PWA. W. E. Mallett Jr., Jackson, Miss., engineer.

**RIPLEY, MISS.**—Town receives bids June 25 for constructing waterworks filtration plant, including filter house.

**Missouri**

**ST. LOUIS**—Mississippi Valley Equipment Co., dealer, Chamber of Commerce

building, is in the market for diesel engine or steam turbine plant, with boilers, total capacity of about 3000 kilowatts; for steam turbine plant with or without boilers, 4000 to 7500 kilowatts, and diesel engine, 600 to 750 horsepower.

**Texas**

**BENAVIDES, TEX.**—City, J. M. Momeny, mayor, has plans in progress for waterworks system and sewers, costing approximately \$130,000. Will receive bids in July. Garrett Engineering Co., P. O. box 1726, Houston, Tex., engineer.

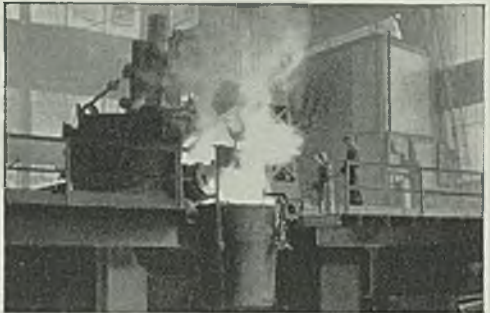
**DALLAS, TEX.**—Golman Baking Co., Corinth and Park streets, will erect a

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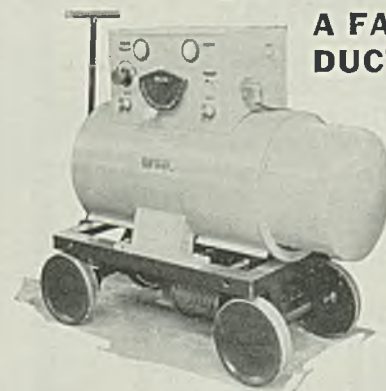
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\$200,000 plant on southwest corner of Ervay and McKee streets.

HOUSTON, TEX.—Howard Flint Co., ink manufacturer, 1901 Commerce street, plans erection of \$50,000 plant.

HOUSTON, TEX.—City, J. M. Nagle, public works director, is preparing plans for additional units to South End sewage disposal plant, to cost \$150,000. City is also considering calling election later to finance construction of disposal plant on 28-acre tract, and also plans expending \$175,000 for enlargement of North Side disposal plant.

MERCEDES, TEX. — Valley Rural Electrification association, Judge B. H.

Oxford, Mission, Tex., head, plans primary and secondary lines for rural electrification, including outdoor power substation and service facilities. Fund of \$930,000 is being arranged.

NEW CANEY, TEX.—Ray F. Jones, engineer, Houston, Tex., is drawing plans for power house and drainage system, to cost \$25,000.

ODESSA, TEX. — American Iron & Machine Works plans one-story, 90 x 160 foot steel machine shop and warehouse. Estimated cost \$48,000.

WILLIS, TEX.—City takes bids in July for deep well with pump and motor, 50,000-gallon elevated tank, 1500 feet of 8-

inch and 10,000 feet of 6-inch cast iron pipe. Estimated cost \$30,000. Garrett Engineering Co., P. O. box 1726, Houston, Tex., engineer.

**Wisconsin**

CLINTONVILLE, WIS. — Four Wheel Auto Co. has increased its authorized capitalization from \$2,000,000 to \$3,000,000, for additional working capital and plant expansion, details of which remain to be completed. Walter A. Olen is president.

GREENWOOD, WIS. — County Electric Co-operative, Andrew Hetland, president, will take bids soon for primary and secondary lines totaling 230 miles, with power substations and service facilities. Fund of \$225,000 has been arranged.

KENOSHA, WIS. — Nash-Kelvinator Corp. plans modernizing its plant. Cost to exceed \$150,000.

MARINETTE, WIS. — Ansul Chemical Co. plans two-story, 38 x 80 foot steel factory. Plans have been prepared by M. Hanisch, Marinette.

MARSHFIELD, WIS. — City electric and water department has accepted bids of A. R. Robertson Co., St. Paul, at \$107,324 for boiler plant equipment and additions to and alterations in municipal power plant. Helmick, Edeskuty & Lutz, 503 Essex building, Minneapolis, consulting engineers.

MILWAUKEE — Rundle Mfg. Co., 3305 West Forest Home avenue, has broken ground for factory addition, 60 x 100 feet, to enlarge output of bath tubs, lavatories, industrial wash basins, etc., Henry Held is president.

MILWAUKEE — General Foundries Co., 2570 North Thirty-second street, which recently purchased the gray iron shop, 180 x 200 feet, of the old Fuller-Warren Co., stove and range manufacturer, and an adjacent building of similar dimensions, is fitting the latter as pattern and carpenter shop, and cleaning room. Fred Busche is president.

OSHKOSH, WIS. — Wisconsin Axle Co., truck axle subsidiary of Timken-Detroit Axle Co., has petitioned city council to rezone area at Algoma and High streets to make possible erection of factory addition, 70 x 100 feet. Col. Willard F. Rockwell, Pittsburgh, is president.

**Minnesota**

ADRIAN, MINN.—City plans installation of a diesel power unit in the municipal light and power plant. F. J. Forkenbrock is city clerk. Druar & Millnowski, 830 Globe building, St. Paul, consulting engineers.

MADELIA, MINN.—City plans construction of a municipal light and power plant, including oil engine generators, electric distribution system, etc. Clifford Seymour is city clerk. Burlingame, Hitchcock & Estabrook Inc., Sexton building, Minneapolis, consulting engineers.

PRIOR LAKE, MINN.—Village will take bids June 25 for a municipal waterworks system, consisting of about 10,000 feet of cast iron pipe water mains, a 50,000-gallon steel water tank on a 100-foot steel tower and other incidental work. Harry Farrell is village recorder. Druar & Millnowski, 830 Globe building, St. Paul, consulting engineers.

ST. PAUL—Superior Metal Products Co., manufacturer of milk and ice cream cans, has awarded contract to Laurel Construction Co. for a factory addition.

THIEF RIVER FALLS, MINN.—Electric Welding & Machine Shop, Philip

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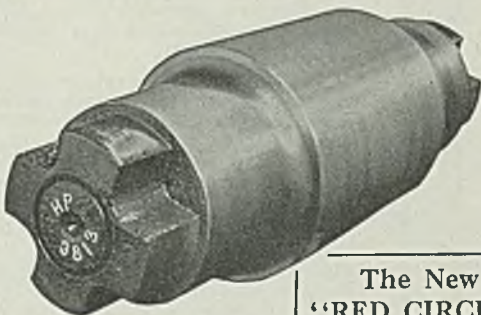
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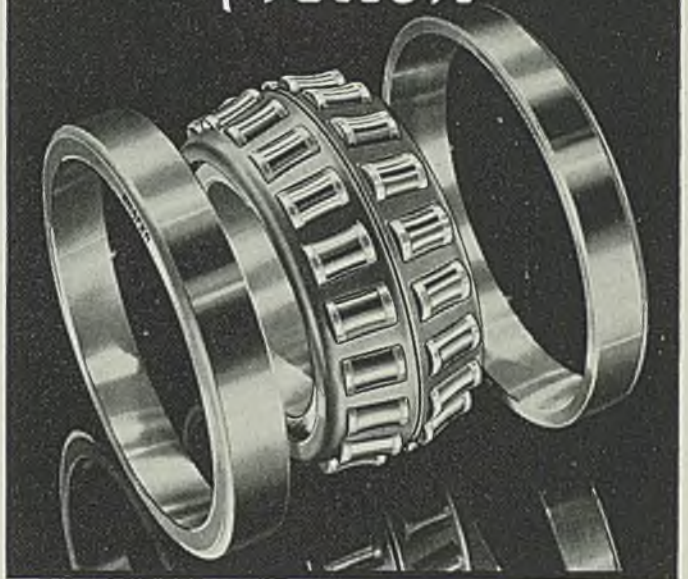


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Hawkins, proprietor, will soon start construction of a one-story shop, 50 x 100 feet.

**Kansas**

MOUNDRIDGE, KANS. — Continental Oil Co. has made final plans for erection of 800-kilowatt gas electric plant using three 400-horsepower units. Cost \$75,000.

**South Dakota**

FLANDREAU, S. DAK.—City, Carl Hanson, city auditor, will take bids the latter part of June for a municipal light plant, costing \$239,000. Buell &

Winter Engineering Co., 508 Insurance Exchange, Sioux City, Iowa, consulting engineer. (Noted April 5.)

**Iowa**

BELLE PLAINE, IOWA—City, E. N. Brown, city clerk, is planning construction of sewage disposal plant, including pumping station. Estimated cost \$105,000. Howard R. Green, Cedar Rapids, Iowa, consulting engineer.

CLINTON, IOWA—E. I. du Pont de Nemours & Co. has acquired an option on 200 acres bordering on the Mississippi river on which will be built a large plant for the manufacture of cellophane. The

first unit, which probably will be erected in the coming year, is expected to cost \$7,000,000.

INDEPENDENCE, IOWA—City, A. M. Norton, city clerk, is planning construction of a sewage disposal plant and will apply to PWA for allotment.

OTTUMWA, IOWA — Iowa Southern Utilities Co. has started construction of an addition to the steam power plant to cost \$150,000, which will include installation of two new boilers with a maximum sustained rating of 60,000 pounds of steam per hour each, a new and larger water softening plant and a larger water heater. A new feed pump and other equipment also will be installed. H. F. Darbyshire is manager. Federal Engineering Co., Central Office building, Davenport, Iowa, engineer.

WATERLOO, IOWA — Iowa Public Service Co., Sioux City, Iowa, has let general contract to John C. Miller Construction Co., Black Hawk building, Waterloo, for addition to steam-electric generating plant at foot of Lafayette street. Estimated cost \$1,000,000, including new equipment.

**Nebraska**

ARNOLD, NEBR. — Village board passed a resolution for issuance of \$50,000 bonds to finance purchase of local electric light plant and to make improvements and repairs of same.

HASTINGS, NEBR.—Metals Recovery Co. has filed articles of incorporation with the secretary of state, with a capital stock of \$50,000, to do mining, milling and smelting of ore. J. E. Uridil, James D. Conway, both of Hastings, and B. M. McAtee of Denver, are incorporators.

**Pacific Coast**

ALTURAS, CALIF. — Surprise Valley Electrification association has plans for primary and secondary lines for rural electrification totaling about 345 miles with power substations and service facilities. A 900-kilowatt generating station will be built. Fund of \$500,000 has been arranged through federal aid.

LOS ANGELES — Continental Motor Co., Detroit, William R. Angell, president, is considering establishment of a factory here.

LOS ANGELES—Stone & Webster Engineering Corp., 601 West Fifth street, will start construction immediately of a 235-mile single circuit transmission line from Boulder dam to the plant of the Southern California Edison Co. Ltd., 601 West Fifth street, Los Angeles, at a cost of \$3,000,000.

LOS ANGELES — Plans are being prepared by W. M. Bostock, structural engineer, 6221 Pacific boulevard, Huntington Park, Calif., for a factory building, 50 x 120 feet, for W. C. Hardesty Co., to be located at 5600 East Sixty-first street.

BELLINGHAM, WASH. — R. M. Roberg, manager, Puget Sound Pulp & Timber Co. will begin work next month on first unit of \$2,500,000 plant addition, increasing capacity to 240 tons of sheet pulp daily.

SEATTLE — Graham & Palnter, architects, are preparing plans for proposed addition to Virginia Mason hospital, to include power plant. Estimated cost \$56,000.

SEATTLE — Bids will be called by municipal light department July 1 for first unit of Ruby dam, Skagit river project, involving in excess of 275,000 barrels of cement, in addition to 800 tons of reinforcing and structurals.


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